Policlinico (Sez. Prat.), Rome

52:1-32 (Jan. 1-31) 1945. Partial Index

*Functions of Bone Marrow in Some Forms of Chronic Hepatitis. M. Milela.—p. 1.

Bone Marrow in Chronic Hepatitis.—Milela reports microscopic observations on the bone marrow obtained by sternal puncture in 13 cases of chronic hepatitis. There were 4 cases of atrophic cirrhosis of the Laënnec type, 4 of syphilitic hepatitis, 1 of amebiasis of the liver, 1 of Hanot cirrhosis, 1 of Eppinger cirrhosis and 2 cases of chronic ascitogenic hypertrophy of the liver. Erythropoiesis was inadequate in all of the cases. The maturation of the erythrocytes was arrested at the level of the polychromatic phase. Anemia in chronic disease of the liver is apparently due to the toxic action of the diseased liver on the bone marrow.

Archivos de Neurocirugía, Buenos Aires

1:129-250 (April-June) 1944. Partial Index

*Acute Cerebral Edema and Mesencephalic Hemorrhages as Cause of Death in Metastatic Tumors. R. M. E. Carrea.—p. 228.

Acute Cerebral Edema.—Carrea points out the cause of death in intracranial hypertension due to metastatic cerebral tumors. There is either a mesencephalic hemorrhage from cisternal hernia or cisternal hernia alone. Mesencephalic hemorrhage is fatal, whereas cisternal hernia is curable. Cisternal hernia of the temporal lobe is frequent in cerebral tumors. It manifests itself by a sudden appearance of symptoms of acute cerebral edema leading to respiratory difficulty which may rapidly result in respiratory paralysis. Treatment consists in putting the patient to bed with the head at a lower level than the feet. Intravenous injection of hypertonic dextrose solution and continuous ventricle drainage or repeated evacuation by ventricular puncture and transfusions of human plasma are indicated. Hypertonic sodium chloride solution is contraindicated. Failure of the therapy calls for surgical intervention, either section of the neck of the hernia or temporal lobectomy. When respiratory failure occurs just before the operation, artificial respiration should be practiced as long as the heart beats. The author's patient died from an acute respiratory paralysis. The heart continued beating for about ten minutes. Death was due to acute cerebral edema with formation of a huge cisternal hernia at the temporal lobe and an associated mesencephalic hemorrhage.

Obst. y Ginecología Latino-Americanas, Buenos Aires

3:71-154 (Feb.) 1945. Partial Index

*Erythroblastosis of Newborn Infants and Rh Factor. M. A. Etcheverry, H. Linares Garzón and J. C. Pereyra.—p. 93.

Erythroblastosis of Newborn Infants.—Etcheverry and his collaborators report observations on a family of 4 erythroblastotic infants. The young parents were apparently normal. The mother had three normal deliveries and an induced abortion. The first child was born with sclerema and had had convulsions from infancy. The 2 following infants died within one and two weeks after birth from acute jaundice and from acute hemolytic anemia. In the course of the fifth pregnancy it was established that the blood of the mother belonged to blood group A and was Rh negative, whereas that of the father and of the child belonged to blood groups O and A respectively and was Rh positive. Anti-Rh agglutinins were not present in the blood of the mother during the first months of pregnancy. They appeared about the eighth month of pregnancy and increased with such rapidity that it was necessary to induce labor near full term. The infant girl was born apparently normal. Her blood was of group A and was Rh positive. The blood of the umbilical cord showed strong reticulocytosis, highly increased indirect bilirubinemia and a scanty number of erythroblasts. Microscopic study of the placenta showed abnormal persistence of the Langhans layer, intraplacental hematoma with erythroblasts, erythroblasts in the chorionic vessels, and edema and hyperplasia of the chorionic villi. The infant exhibited jaundice three hours after birth. Transfusion with O-Rh negative blood in amounts varying between 20 and 50 cc. each was made four hours after birth and at intervals of twelve hours during the first week of life of the infant. She had fever during the first three days and splenomegaly. Jaundice became acute during the first week and then subsided. During the second week of life of the infant transfusion of O-Rh positive blood was administered by mistake. Immediately afterward the infant presented symptoms of acute anemia, which became grave in four days. The hemogram confirmed the diagnosis. The condition was controlled by transfusions of A-Rh negative blood. It was given first daily, then every other day and at longer intervals in doses of 50 to 180 cc. The infant was normal when discharged from the hospital at the age of 3 months. The authors direct attention to the meaning of sclerema in the newborn, which suggests erythroblastosis of the newborn in the family. They also point to the importance of blood transfusion in the therapy of erythroblastosis of newborn infants. Transfusion with Rh negative blood belonging to the O blood group or to the blood group of the infant should be administered.

Nordisk Medicin, Stockholm

22:1051-1106 (June 9) 1944

Renal Cancer, with Special Reference to Diagnosis. M. Bjørneboe.—p. 1051.
Puerperal Tetanus Following Criminal Abortion. T. B. Andersen and J. Øster.—p. 1057.
Solitary, Not Parasitic, Hepatic Cysts. H. F. Helweg-Larsen.—p. 1057.
Do Tubal Cells Occur in Endometrium? T. Hølund.—p. 1059.

Hygiea

Introductory Investigations on Disturbances in Daily Periodicity of Chloride Elimination in Depressive Psychoses. B. Bjerner.—p. 1061.
Abscess of Brain After Adenotomy. S. Dahlstedt.—p. 1069.
*Report Concerning Therapy in Cases of Infantile Paralysis. S. Backman.—p. 1072.
Clinical Determination of Albumin in Cerebrospinal Fluid. S. Izikowitz.—p. 1074.
Present Gonorrhea Problem. H. Haxthausen.—p. 1093.
Exercise Treatment in Thrombophlebitis in Lower Extremities. H. Heckscher.—p. 1094.

Therapy in Cases of Infantile Paralysis.—Backman advocates early short wave therapy in poliomyelitis as a natural method believed to act favorably on contractures and rigidity as well as on pain. Parallel attempts with this simple treatment and the more laborious Kenny method are suggested.

22:1107-1150 (June 16) 1944. Partial Index

Origin and Further Fate of Urobilinoids in Organism: Review. T. K. With.—p. 1107.

Hospitalstidende

Fractionated Spinal Anesthesia According to Sebrechts. A. R. Madsen.—p. 1113.
*Paroxysmal Paralytic Hemoglobinuria. A. Louw and H. E. Nielsen.—p. 1116.
Studies on Vesicles in Zoster and Chickenpox. S. Dahl.—p. 1120.

Finska läkaresällskapets handlingar

Polycythemia, Anemia and Calcified Spleen in Same Patient. Peculiar Hematologic Case. J. Forsell.—p. 1123.

Hygiea

Breaking Down of Fats in Organism. A. Gammeltoft.—p. 1135.
Possibility of Transmission of Syphilis by Transfusion Preparation. B. Swedberg and G. Widström.—p. 1138.
So-Called Myalgic Points of Pressure in Ischialgia. E. Sahlgren and O. Sjöqvist.—p. 1141.

Paroxysmal Paralytic Hemoglobinuria.—Louw and Nielsen found only 4 cases of paroxysmal paralytic myoglobinuria in the literature. Their case, the first in the Scandinavian literature, was in a boy aged 10, with history of repeated attacks of muscular pain and difficulty in walking since the age of 4, who was admitted for treatment during an acute attack. Spectroscopy showed excretion of myoglobin during the attack, when there was also pronounced creatinuria. The establishment of 8 cases of progressive muscular dystrophy in the boy's family suggests that this disorder and paralytic myoglobinuria may be different forms of the same condition, the latter representing the acute manifestation, the progressive muscular dystrophy the chronic form.

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MEDIASTINAL EMPHYSEMA

THE FRANK BILLINGS LECTURE

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BALTIMORE

When I was a young physician Dr. Frank Billings was one of the most distinguished figures in American medicine. I looked on him with admiration and awe. Therefore, to be asked to give this lecture, founded to pefpetuate his memory, is not only an honor but also a source of great pleasure. My only regret is that I have not a more worthy tribute for the occasion.

The subject of mediastinal emphysema is not a new one. Occasional cases with dramatic symptoms were reported a century or longer ago. However, during the past twenty years, especially during the past decade, experimental investigation and clinical observation have extended our knowledge and put it on a firm base. The conditions causing mediastinal emphysema are now well known; the mechanism of its production and its relation to associated manifestations, chiefly interstitial emphysema of the lungs and pneumothorax, have been clearly exposed; the symptoms that result are better understood and therefore its recognition has become easy. It is true that in most instances mediastinal emphysema is a benign condition but, even so, it is important that the physician should not confuse it with serious diseases to which it may bear a close resemblance. However, not infrequently grave and threatening symptoms arise and then a correct appraisal of the situation and prompt action may be life saving. Therefore it may serve a useful purpose briefly to review the present state of our knowledge concerning this interesting and important condition.

PATHWAYS FOLLOWED BY AIR IN REACHING THE MEDIASTINUM

Air may reach the mediastinum by four routes: (1) along the fascial planes of the neck, (2) through a perforation of the trachea, bronchus or esophagus into the mediastinum, (3) from the retroperitoneal space and (4) from the interstitial tissues of the lung. Other channels have been suggested as possible routes, but that these routes are ever followed has not been demonstrated conclusively. These hypothetical routes are (*a*) dissection of air between the parietal pleura and the chest wall, (*b*) dissection of air beneath the visceral pleura and (*c*) the passage of air from the pleural cavity to the mediastinum.

That air may enter the mediastinum along the fascial planes of the neck seems to be satisfactorily established. During deep dissection of the tissues of the neck,[1] especially during thyroidectomy and tracheotomy, surgeons have described hearing air being sucked into the mediastinum. Since under these circumstances pneumothorax also often occurs, it has been suggested that the pneumothorax may precede the mediastinal emphysema, the pneumothorax being due to injury of the pleura where it protrudes into the neck above the clavicle. That this sequence of events actually occurs has never convincingly been demonstrated. At the postmortem examination of patients who have died of mediastinal emphysema following, for instance, thyroidectomy, no evidence of injury to the pleura has been discovered; whereas, in the frequently repeated experiments of blowing air into the mediastinum and of producing mediastinal emphysema by forceful inflation of the lungs, pneumothorax regularly occurs and at autopsy a minute rent may be found in the mediastinal pleura, or the surface of the mediastinal pleura may be studded with small saccular protrusions, suggesting that air had entered the pleural cavity through a rupture of one of these vesicles, even though the actual point of rupture cannot be located. It is now well established that mediastinal emphysema is usually the result of rupture of pulmonary alveoli with the production of interstitial emphysema of the lung. Since operations on the neck are always accompanied by conditions (anesthesia, tracheal or bronchial obstruction, coughing) which are the familiar precursors of interstitial emphysema of the lungs, it seems altogether likely that mediastinal emphysema following such operations is often, probably even usually, a sequence to rupture of alveoli rather than to the direct aspiration of air into the mediastinum. In any particular case it might be impossible to decide which of the two routes air had followed. As proving that in certain cases air had been directly aspirated, the fact is cited that at autopsy no evidence of interstitial emphysema of the lungs had been found. This evidence is not altogether conclusive, for the preexistence of interstitial emphysema may be overlooked unless the autopsy is performed with especial care.

Air entering the deep fascial planes of the neck at a higher point may dissect downward and enter the

Read before the Section on Practice of Medicine at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Buford, C. G.: The Entrance of Air into the Mediastinum During Operations on the Base of the Neck, Surg., Gynec. & Obst. **26**: 540, 1918. Keis, J.: Studies on the Origin of Mediastinal Emphysema and Pneumothorax at Operation on the Thyroid Gland, München. med. Wchnschr. **81**: 669, 1934. Michels, M. W.: Pneumothorax and Mediastinal Emphysema Complicating Tracheotomy, Arch. Otolaryng. **29**: 842 (May) 1939. Ackerman, L. V., and Bricker, E. M.: Mediastinal Emphysema and Bilateral Pneumothorax Following Radical Dissection of the Neck, Arch. Surg. **43**: 445 (Sept.) 1941. Barrie, H. Z.: Interstitial Emphysema and Pneumothorax After Operation on the Neck, Lancet **1**: 996, 1940. Neffson, A. H.: Tension Pneumothorax and Mediastinal Emphysema After Tracheotomy, Arch. Otolaryng. **37**: 23 (Jan.) 1943. Work, W. P.: Mediastinal Emphysema and Bilateral Simultaneous Pneumothorax Complicating Tracheotomy in an Adult, ibid. **37**: 526 (April) 1943.

mediastinum. After tonsillectomy subcutaneous emphysema in the neck may occur and occasionally mediastinal emphysema follows. I have observed this train of events after puncture and irrigation of the maxillary antrum. It may follow deep wounds of the neck and wounds of the pharynx and buccal cavity.

It is clear that rupture of the lower portion of the trachea or of one of the main bronchi will allow air freely to enter the mediastinal tissues. Such an accident occurs only rarely from disease or from trauma. It has happened after lobectomy and pneumonectomy. In the early period of operating on the lungs, before technical procedures had been perfected, it was difficult to close the severed bronchus securely. Occasionally air leaked into the mediastinum, always with disturbing, sometimes with serious, results. Better methods of closing the bronchus have almost eliminated the danger of this accident. No doubt at times air may enter the mediastinum through a perforation of the esophagus. However, when this accident occurs there is always infection, and the serious symptoms of infection obscure the lesser symptoms that may arise from a small amount of air entering the mediastinum.

Circumstances That Cause Interstitial Emphysema of the Lungs

1. Trauma.
   a. Injury to chest with or without fracture of the ribs.
   b. Operations on the chest, particularly the induction of pneumothorax.
2. Increase of intrapulmonary pressure.
   a. Straining with the glottis closed.
      Heavy lifting.
      Straining at stool.
      Childbirth.
      Attempts to resuscitate the newborn.
   b. Occlusion, partial or complete, of the trachea or bronchi; usually accompanied by cough.
      Anesthesia, especially closed method or inflation method.
      Asthma.
      Bronchitis.
      Foreign bodies.
      Whooping cough.
      Pneumonia.
3. Spontaneous rupture of alveoli.

When from any cause air accumulates in the retroperitoneal tissues, it may travel along the aorta or the esophagus and enter the mediastinum. Perforation of the stomach or the intestine may be followed by mediastinal emphysema.[2] The injection of air into the peritoneal cavity as a treatment for peritoneal tuberculosis [3] and the injection of air into the perirenal tissues to facilitate roentgenography of the kidneys has often produced mediastinal emphysema.

The entrance of air into the mediastinum through the fascial planes of the neck, directly from a rupture of the trachea, a main bronchus or the esophagus, or from the retroperitoneal tissues through the diaphragm, occurs only rarely and is of little practical importance compared with the usual path of entrance through the interstitial tissues of the lung. When alveoli lying on interstitial bands of connective tissue rupture, air enters the tissues about and travels along the course of the arteries to the mediastinum. It is possible that air may proceed in the opposite direction and lodge beneath the visceral pleura, but pressure gradients take most of the air, if not all of it, toward the hilus of the lung.

2. McCorkle, H., and Stevenson, J.: Subcutaneous Emphysema Associated with Perforated Peptic Ulcer, Surgery **2**: 930, 1937.
3. Banyai, A. L., and Jurgens, G. H.: Mediastinal Emphysema as a Complication of Artificial Pneumoperitoneum, J. Thoracic Surg. **8**: 329, 1938.

There are many circumstances that cause interstitial emphysema of the lungs. I cannot name them all but will group them in the accompanying tabulation.

Penetrating wounds of the chest that pierce the lung may rupture alveoli and produce interstitial emphysema and mediastinal emphysema. Injury to the chest with fracture of ribs is the common cause. However, it has been observed again and again that crushing injuries to the chest without an open wound or fracture of the ribs may be followed by mediastinal emphysema. In performing artificial pneumothorax the needle often enters the lung and, if air is allowed to flow in, the interstitial tissues may become infiltrated and air reach the mediastinum.[4] Slight degrees of mediastinal emphysema occur frequently but usually are overlooked.

Mediastinal emphysema may follow any form of exertion but particularly straining with the glottis closed. Cases are recorded that have come on after heavy lifting, after straining at stool and many during childbirth. Faust [5] in 1940 collected from medical literature 130 reported cases arising during labor, most of them in primiparas.

Occlusion of the trachea or bronchi is a fertile cause of rupture of pulmonary alveoli. If the bronchial occlusion is complete there is collapse of the portion of the lung supplied by the bronchus with overdistention of the surrounding part of the lung; if the bronchial occlusion is incomplete there is distention of the portion of the lung supplied by the bronchus; if there is partial obstruction to the trachea both lungs become greatly distended. The overdistended alveoli may rupture. No doubt bronchial obstruction plays an important role in the production of mediastinal emphysema when it is associated with the administration of anesthetics,[6] although the increased pressure in the bronchial tree induced by certain methods of anesthesia may play an accessory role or even alone be the cause. It has been noted that mediastinal emphysema occurs particularly often when the closed method and the inflation method of inducing anesthesia are used. No doubt bronchial obstruction also plays a part in producing alveolar distention in inflammatory diseases of the lungs, especially when accompanied by severe paroxysms of coughing, for the commonest cause of bronchial obstruction is plugs of tenacious inflammatory material. This association occurs particularly often in pertussis, asthma [7] and pneumonia,[8] conditions frequently causing mediastinal emphysema. Foreign bodies in the bronchi act in the same way.

Of particular interest is the occurrence of mediastinal emphysema when there is no evidence whatever of the presence of any condition leading to increased intra-alveolar pressure.[9] It may come on in a perfectly healthy person when he is standing quietly or sitting in a chair. It has the appearance as though normal alveoli may rupture under ordinary conditions of intrabronchial pressure. If we assume that there must be some alteration of the alveolar wall, it is impossible to ascertain

4. Ehrenburg, G. E.: Emphysema of the Mediastinum as a Complication of Artificial Pneumothorax, Am. Rev. Tuberc. **26**: 738, 1932. Wustmann.[14]
5. Faust, R. C.: Subcutaneous Emphysema During Labor, Northwest Med. **39**: 24, 1940.
6. Marcotte, R. J.; Phillips, F. J.; Adams, W. E., and Livingstone, H.: Differential Intrabronchial Pressure and Mediastinal Emphysema, Surgery **9**: 346, 1939.
7. Rosenberg, L., and Rosenberg, J.: Subcutaneous Emphysema Complicating Bronchial Asthma, Am. J. M. Sc. **195**: 682, 1938. Skinner, H. H.: Asthma Complicated by Subcutaneous Emphysema in Children, J. Pediat. **18**: 117, 1941.
8. Berkley, H. K., and Coffen, T. H.: Generalized Interstitial Emphysema and Spontaneous Pneumothorax as Complications of Bronchopneumonia, J. A. M. A. **72**: 535 (Feb. 22) 1919.
9. Hamman, L.: Spontaneous Mediastinal Emphysema, Bull. Johns Hopkins Hosp. **64**: 1, 1939.

what it may be. The fact that spontaneous mediastinal emphysema tends to recur suggests that there may be an inherited defect of tissue quality. Macklin,[10] who has particularly emphasized the importance of bronchial obstruction in causing mediastinal emphysema, thinks that this mechanism may come into play even in cases seeming to arise spontaneously. It is possible that alveolar walls may be stretched and thinned by overdistention and yet rupture hours after the overdistention has occurred.

ESCAPE OF AIR FROM MEDIASTINUM

When air reaches the mediastinum and is confined there it will gradually be absorbed. Why in some instances it is confined within the mediastinum whereas in other instances it discovers an exit is not fully understood. One factor of importance is the amount of air that enters the mediastinum which determines the pressure it exerts. When sufficient pressure develops, air always escapes from the mediastinum. This occurs invariably in experiments on animals when the lungs are forcibly inflated. Nevertheless the pressure exerted by the air seems not to be the only factor concerned in its escape, since sometimes it escapes when there is little increase of pressure, whereas at other times it is retained within the mediastinum when there is evidence of great increase of pressure. Apparently the location of the air within the mediastinum is an importane factor, air escaping easily from certain locations but only with difficulty from others. It seems always to travel with greatest ease in the connective tissue surrounding blood vessels.

When air escapes from the mediastinum it may follow one of three paths: (1) into the subcutaneous and deep tissues of the neck, (2) through the diaphragm, about the aorta and the esophagus, to the retroperitoneal tissues and (3) into the pleural cavities.

The escape of air into the neck is readily detected and usually is convincing evidence of the presence of mediastinal emphysema. However, it does not invariably indicate that air has come from the mediastinum, for subcutaneous emphysema in the neck may occur when there is a wound of the chest communicating with the lung or when air enters the fascial planes from the buccal or nasal cavities. These possibilities must be excluded before we may consider it diagnostic of mediastinal emphysema. Air having escaped through the jugulum into the subcutaneous tissues of the neck, it may spread widely over the body, to the head, over the chest and abdomen, to the legs. Rarely the subcutaneous tissues are infiltrated with air from the top of the head to the soles of the feet. Occasionally air passes up the neck along the deep fascial planes and produces great swelling of the submucous tissues of the mouth and throat.

When air in the mediastinum pierces the diaphragm and spreads through the retroperitoneal tissues, its presence in these tissues may be difficult to recognize. Usually patients complain of pain in the abdomen, sometimes of pain on swallowing. The accident happens not infrequently during the induction of pneumothorax and at subsequent refills.

The association between mediastinal emphysema and pneumothorax is an intimate one, the two very often occurring together. We may sum up the present state of our knowledge concerning the relationship by saying that air from the mediastinum frequently enters the pleural cavity but that air from the pleural cavity never enters the mediastinum. The truth of this statement is supported by experiment and by clinical observation. It has an important bearing on our interpretation of certain clinical facts and makes clear the mechanism of what is commonly called tension pneumothorax.

Following injury to the chest there is often great shortness of breath and cyanosis. On examination pneumothorax is discovered and when the pressure in the pleural cavity is measured it is found to be very high. The usual assumption is that the lung has been ruptured and that a valvelike opening has formed which permits air to enter the pleural cavity but prevents it from escaping. This mechanism perhaps does occur, but certainly it is not the invariable one or even the usual one. In many such instances there is also subcutaneous emphysema in the neck demonstrating the presence of mediastinal emphysema. Therefore it is possible that the injury may not have caused rupture of the pleura but rupture of pulmonary alveoli with the formation of interstitial emphysema of the lung, then mediastinal emphysema, then pneumothorax through rupture of the mediastinal pleura. Sometimes pneumothorax occurs on the side opposite to the one that has been injured, so-called contralateral pneumothorax. Contralateral pneumothorax is very simply explained as secondary to mediastinal emphysema, whereas it is difficult to explain it by assuming the existence of any other pathway. Whenever subcutaneous emphysema in the neck and pneumothorax exist together, it is altogether probable that both are secondary to mediastinal emphysema.

The evidence of experiment demonstrates clearly that air may pass from the mediastinum to the pleura. When air is forcibly blown into the lung, pneumothorax always occurs if sufficient force is used. In animals when death comes suddenly during such an experiment, autopsy reveals bilateral pneumothorax with collapse of both lungs. The lungs then taken from the body may be inflated under water and no evidence found of a rupture or perforation of the visceral pleura.

THE EFFECTS OF AIR IN THE MEDIASTINUM

A small amount of air in the mediastinum may produce only trivial symptoms or none at all. Large amounts may cause very grave disturbance and in some instances lead to death. It has been commented on that when there is extensive subcutaneous emphysema the symptoms of increased mediastinal pressure are apt to be slight, whereas when there are grave symptoms of mediastinal pressure there is usually little subcutaneous emphysema. The entrance of air from the mediastinum into the pleural cavity does not offer such a safe escape for increased mediastinal pressure. The capacity of the pleural cavity will accommodate only a small amount of air before increased tension in the cavity adds to the symptoms of mediastinal pressure.

The effects of increased mediastinal pressure are similar to those of increased intrapericardial pressure. As the pressure rises the veins collapse, the inflow of blood into the heart is hindered, and if the pressure rises sufficiently high the circulation of the blood comes to a standstill. As the circulation becomes impeded, dyspnea and cyanosis come on and a little later pulmonary edema develops to aggravate these symptoms. If the pressure rises further the symptoms become more and more severe and finally end in death. Macklin has

10. Macklin, Charles C., and Macklin, Madge T.: Pulmonic Interstitial Emphysema and Its Sequelae: An Anatomical Interpretation, in Essays in Biology in Honor of Herbert M. Evans, Berkeley, Calif., University of California Press, 1943; Critical Review of the Literature with Extensive References, Medicine, to be published.

suggested that when mediastinal emphysema follows rupture of pulmonary alveoli the interstitial emphysema may press on the blood vessels and by interfering with the circulation in the lung promote dyspnea and cyanosis. Clinical observation demonstrates clearly that as the circulation fails pulmonary edema comes on, further to increase the respiratory embarrassment.

There are many experimental observations that demonstrate the course of these events. For instance, Jehn and Nissen [11] injected air directly into the mediastinum of rabbits and dogs. As long as the pressure in the mediastinum remained at ± 0 no recognizable symptoms developed, although breathing at times became more rapid and the blood pressure a little higher. As more air was introduced the blood pressure fell and the respiratory variations disappeared. Then came a period of apnea, followed by intense dyspnea and cyanosis; the veins in the neck stood out prominently, the eyes protruded and air appeared in the subcutaneous tissues about the jugulum. If the injection of air was stopped at this point some of the animals recovered, but in most there was an abrupt fall of blood pressure soon followed by death.

At the postmortem examination there was found extensive subcutaneous emphysema over the front of the chest, the air bubbles arranged in rows, resembling strings of pearls. When the mediastinum was opened the heart and large blood vessels were surrounded by air bubbles. The auricles, the upper and lower vena cava and the extrapulmonary portion of the large pulmonary veins were collapsed. Air was found along the esophagus and aorta, penetrating the diaphragm and collecting in the perirenal tissues. All of the organs showed a high degree of passive congestion.

At operation on man conditions have been found resembling those seen in animals with increased mediastinal pressure. For instance, Sauerbruch reports operating on a man after an automobile accident. "The collapsed lung was found lying against the mediastinum, which was blown up like a cushion. The vena cava was as large as a child's arm, the azygos vein as large as a man's thumb. Upon incision of the mediastinal tissue the air escaped and the mediastinum assumed its normal proportions."

THE CLINICAL MANIFESTATIONS OF MEDIASTINAL EMPHYSEMA

The symptoms of mediastinal emphysema are (1) pain, (2) subcutaneous and retroperitoneal emphysema, (3) obliteration of cardiac dulness, (4) peculiar sounds heard over the heart, (5) evidence of increased mediastinal pressure, dyspnea, cyanosis, engorged veins, circulatory failure, (6) pneumothorax and (7) roentgenographic evidence of air in the mediastinum.

When only a small amount of air gets into the mediastinal tissues no symptoms may be produced. The appearance of air in the subcutaneous tissues of the neck may be the first indication that mediastinal emphysema has occurred. No doubt slight degrees of mediastinal emphysema often are overlooked. Pain, sometimes mild, sometimes severe, may be the only symptom. Evidence of increased mediastinal pressure, dyspnea, cyanosis and embarrassment of the circulation occurs relatively seldom. I shall speak of each symptom separately, then group them together as they naturally occur to produce the typical clinical pictures of mediastinal emphysema.

The distention of mediastinal tissues with air nearly always causes pain. This is particularly conspicuous when mediastinal emphysema occurs in otherwise healthy persons, as it does, for instance, in spontaneous interstitial emphysema of the lungs. Indeed, there is clinical evidence that persuades me to believe that dissection by air of the interstitial tissues of the lungs may cause pain even before air reaches the mediastinum. Often patients complain of pain in the side for hours before the more severe pain and oppression of mediastinal emphysema come on. The pain is usually situated beneath the sternum and radiates over the chest, to the shoulders and sometimes down the arms, in which case it is quite like the pain of angina pectoris. In addition to sharp pain there is usually a feeling of oppression or constriction under the sternum, often with a little shortness of breath. Sometimes patients complain of pain on swallowing or on turning the head. When mediastinal emphysema follows operation or trauma to the chest, the pain caused by distention of the mediastinal tissues may not be clearly defined, since the patient's sensorium may be dulled or else the pain of mediastinal emphysema may be mingled with the pain of the operation or the trauma.

It seems to me that distention of the mediastinal tissues is a satisfactory explanation for the pain. The fact that the lungs and mediastinal tissues are not directly supplied with filaments from the spinal nerves is no valid objection to this view. In almost every part of the body distention and dissection of tissues cause severe pain even in locations not supplied with branches of the spinal nerves. The interesting suggestion has been made that the pain may be due, at least in part, to interference with the coronary circulation due to pressure on the heart by the distended mediastinal tissues. Whether or not this mechanism is really concerned I cannot say, but I think it unnecessary to invoke the mechanism to explain the pain since it is satisfactorily explained by ascribing its cause to the distention and dissection of mediastinal tissues.

If subcutaneous emphysema appears in the neck under circumstances in which there is no other cause for it, then we are assured that mediastinal emphysema is present. It is conclusive evidence of the existence of mediastinal emphysema and sometimes the only evidence. Why subcutaneous emphysema should occur in 1 case and not in another when in other respects the 2 cases are alike is not clearly understood. It seems that this difference must depend on the fascial planes along which the air chances to travel, some planes connecting freely with the subcutaneous fascia, other planes not connecting freely, and still other planes having no connection with them. It may be that when air has free access to the subcutaneous tissues increased pressure in the mediastinum is avoided, whereas when air is trapped in the mediastinum, symptoms of increased pressure are apt to arise.

If the mediastinal tissues that cover the heart become infiltrated with air, characteristic symptoms occur which are of great importance for diagnosis. The symptoms are two: obliteration of cardiac dulness and peculiar sounds heard over the heart. When only a small amount of air reaches the mediastinum cardiac dulness may not be obliterated and I have no doubt that at times the distinctive auscultatory signs may be absent, although in their absence it would be difficult to decide with certainty that mediastinal emphysema is present. I have not seen an instance of mediastinal emphysema clearly established by the evidence of subcutaneous emphysema

11. Jehn, W., and Nissen, R.: Pathology and Symptoms of Mediastinal Emphysema, Deutsche Ztschr. f. Chir. **206**: 221, 1927.

in the neck or characteristic roentgenograms in which the peculiar sounds over the heart were not heard.

These peculiar sounds consist of crackles, bubbles or churning sounds heard with each contraction of the heart. They may be heard only during systole or during systole and diastole, but always with systolic accentuation. They may be so soft that to be heard they must be listened for attentively; they may be so loud that they can be heard at a distance. Very often the patient himself is aware of the sounds and calls attention to them. They may be loudest over the lower portion of the sternum and to the left of the sternum or near the apex of the heart. They may be heard when the patient sits up and disappear when he lies down or be plainly heard when he lies on the left side and absent in other positions. When the presence of mediastinal emphysema is suspected the heart should be listened to carefully as the patient shifts from one position to another. The sounds are so characteristic that once having been heard thereafter their significance is unmistakable. They have been misinterpreted as the signs of pericarditis or pneumopericardium. I have the firm impression that some of the cases reported as instances of pneumopericardium were, in fact, instances of mediastinal emphysema.

Now that we are becoming aware of the fact that mild forms of mediastinal emphysema occur very frequently, we learn that increased mediastinal pressure is an unusual complication. Nevertheless, when it does occur it is a grave matter and it is especially important to recognize its presence since appropriate treatment may be life saving. I have already spoken of the observations made at experiments on animals and also by surgeons at operations on human beings after crushing injuries to the chest. With increasing rise of mediastinal pressure there is increasing obstruction to blood reaching the heart. The peripheral veins become distended and there are cyanosis and dyspnea. As the pressure in the mediastinum continues to mount, cyanosis and dyspnea become extreme and finally there is collapse with the signs of complete circulatory failure. There can be no slightest difficulty in appreciating the gravity of these symptoms; the important matter is to be aware of the mechanism that is causing them and to be prepared to deal with the situation effectively.

I have already commented on the fact that there is an intimate relation between mediastinal emphysema and pneumothorax. Very often they occur together. The important clinical point in this relationship is that when pneumothorax exists the presence of mediastinal emphysema may be overlooked. Perhaps if carefully searched for it will more often be found. It is a matter worthy of note that with spontaneous mediastinal emphysema there is an associated pneumothorax in about one third of the cases. The fact that the pneumothorax is usually very small and discovered only in roentgenograms makes it all the more important as evidence that the air in the pleural cavity had come by way of the mediastinum. The only other mechanism that might be suggested as a plausible explanation for the pneumothorax is to assume that air in the interstitial tissues of the lung had found its way not only to the mediastinum but also to the subpleural tissues and there had formed a pleural bleb which had ruptured. What evidence we have indicates that the first named mechanism is the usual one and that the second occurs rarely if ever. Therefore it is reasonable to surmise that cases of spontaneous pneumothorax may follow interstitial emphysema of the lungs and mediastinal emphysema,[12] even though the presence of mediastinal emphysema might elude clinical detection.

It is in considering the mechanism of tension pneumothorax that mediastinal emphysema comes prominently to the fore. The view generally held is that tension pneumothorax is due to a rupture through the pleura with a valvelike structure that allows air to enter the pleural cavity but prevents its escape. Since at autopsy it would be difficult to demonstrate the existence of such a valvelike structure, it seems to me that it requires a degree of credulity to accept this supposition. On the other hand, I find it much easier to accept the supposition that the pneumothorax is secondary to mediastinal emphysema. Were this actually the mechanism, it would not be necessary to assume the presence of a complicated valvular structure. There are certain clinical observations which convince one that at least sometimes pneumothorax is secondary to mediastinal emphysema. For instance, when following a blow to the chest, without fracture of the ribs or an open wound, pneumothorax occurs and at the same time subcutaneous emphysema in the neck, there can be little doubt that the sequence of events has been rupture of alveoli, interstitial emphysema of the lung, mediastinal emphysema, escape of air into the subcutaneous tissues of the neck and perforation of the mediastinal pleura with the production of pneumothorax. When the pneumothorax is contralateral this conclusion is well nigh inescapable.[13]

Careful fluoroscopic and roentgenographic examination is a valuable aid to diagnosis. In many instances collections of air are plainly seen, but often the evidence for the presence of air must carefully be sought. In the lateral view streaks of air sometimes may be seen in the mediastinal tissues between the heart and the chest wall. In the anteroposterior view a sharply defined translucent band outlining the course of the pericardium, especially along the upper part of the left border, is distinctive.

DIAGNOSIS

The diagnosis of mediastinal emphysema is easily made if the observer is familiar with the clinical manifestations. Many very mild cases occur with such slight and transient symptoms that the diagnosis may only be suspected but cannot definitely be confirmed. Pain, without fever, leukocytosis or other symptoms of a constitutional reaction, with obliteration of cardiac dulness and the presence of characteristic bubbling, crackling sounds with each contraction of the heart is a distinctive clinical picture. If, in addition, subcutaneous emphysema appears in the neck, the diagnosis is firmly established. The practical importance of these mild cases is that the diagnosis be correctly made. Often they are mistakenly diagnosed as coronary occlusion and pericarditis. Many cases have now been reported in medical literature and from these we are familiar with the varying details of the clinical picture. As an illustration I will cite briefly the following additional case:

A man aged 26 consulted my associate, Dr. Charles W. Wainwright, on Jan. 6, 1944 complaining of pain in the chest. On Christmas eve, while trimming a Christmas tree, he had been seized suddenly with severe pain in the left shoulder radiating to the upper part of the sternum, which forced him

12. Hamman, L.: A Note on the Mechanism of Spontaneous Pneumothorax, Ann. Int. Med. 13: 923, 1939.
13. Stephens, H. B.: A Consideration of Contralateral Pneumothorax as a Complication of Intrathoracic Operations, J. Thoracic Surg. 5: 471, 1936.

to bed, where he sat propped up on pillows, bending forward. This position had given him some comfort, whereas an attempt to lie down had made the pain worse. The intensity of the pain had soon abated, but soreness and discomfort had persisted for a week and at the time of his visit he still complained of pain when he took a deep breath.

He was a sparsely nourished man of healthy appearance. The general physical examination was entirely negative. An anteroposterior roentgenogram of the chest revealed no abnormality. Studies of the blood and of the urine gave normal results. The electrocardiogram was reported "Rate 83, sinoauricular rhythm, PR interval 0.16, QRS duration 0.08, T_1, T_2 and T_3 inverted. Normal axis. The concordant inversion of the T waves might suggest pericarditis."

What gave particular interest to this incident was the patient's history. At 15 years of age while at a summer camp he had had a sudden severe attack of pain in the shoulder, which had radiated over the upper part of the chest. Some pain and soreness had persisted for a month. At 19 years of age he had had a precisely similar attack. In July 1941, as a sequel to a mild sore throat, he had again been taken suddenly with a severe pain in the left shoulder, which had radiated to the sternum and had been greatly intensified by deep breathing. The following day he had entered the hospital and at the end of an examination the physician had told him that there was a definite pericardial friction and that he undoubtedly had pericarditis.

At about 1:30 on the morning of Jan. 20, 1944 the patient was taken with epigastric discomfort and distention. Thinking that these symptoms were due to indigestion, he induced vomiting. During the violent retching that followed suddenly he was seized by severe pain in the chest, which radiated upward to the shoulders. He described the sensation by saying it felt as though the chest was being forced apart by some expanding force. After the intense pain had passed there continued pain in the shoulders made worse by deep breathing and coughing.

Later in the morning he was admitted to the Johns Hopkins Hospital. Examination at that time again was quite negative. The heart and lungs appeared to be normal. However, the following day loud coarse bubbling sounds were heard with each contraction of the heart, at first only near the apex and only in certain bodily postures, later more generally over the body of the heart. At the same time subcutaneous crepitus was felt near the left sternoclavicular joint. A roentgenogram of the chest showed the heart and great vessels outlined by a thin radiolucent band, an appearance characteristic of air in the mediastinum. The electrocardiogram was identical with the one taken nine days before except that T_1, previously inverted, had now become upright.

On the third hospital day the peculiar sounds over the heart had disappeared and the patient was comfortable.

That the attack of pain on January 20 was due to mediastinal emphysema is clearly established. Therefore it is only reasonable to assume that the four preceding attacks of pain had all been due to the same cause.

Mediastinal emphysema occurring during the course of a severe febrile illness easily may be overlooked. It is a frequent complication of the specific infections of childhood, particularly of those with pulmonary disorders, measles, diphtheria and pertussis. During the influenza epidemic of 1917 and 1918 it was often observed, and in reports of the epidemic from military camps are excellent accounts of the clinical manifestations and of the mechanism of development.[8] In patients already prostrated and deeply intoxicated the added dyspnea and cyanosis of mediastinal emphysema may be misinterpreted. Heretofore the advent of subcutaneous emphysema in the neck is the symptom that has called attention to the presence of mediastinal emphysema.

After operation or trauma to the chest, dyspnea and cyanosis should always arouse the suspicion that mediastinal emphysema may be present. As a rule these symptoms are ascribed to a pulmonary complication, to faulty anesthesia or to the shock of the operation or trauma. I have seen instances in which the diagnosis of myocardial infarction has been proposed. Mediastinal emphysema is considered only when air appears in the subcutaneous tissues of the neck. I have already emphasized the fact that tension pneumothorax is usually, perhaps always, the result of mediastinal emphysema. It is reasonable to anticipate that a growing awareness of the importance of mediastinal emphysema with careful examination and thoughtful consideration will lead to the correct diagnosis in an increasing number of cases.

TREATMENT

A small amount of air in the mediastinum is an innocent matter. The air is soon absorbed and no harm results. In this respect it is much like spontaneous pneumothorax. The only importance of its recognition is that the diagnosis of some serious disorder is avoided. On the other hand, when the pressure in the mediastinum rises the condition becomes threatening and grave consequences may follow. Under these circumstances it becomes imperative to furnish an exit for the trapped air. This problem has been approached in a number of ways.

Many surgeons have accomplished the desired result merely by making a deep incision into the tissues of the mediastinum through the jugulum. At times suction has been applied to facilitate the escape of air or a catheter introduced with or without suction. Others have attached a specially curved, large bore needle to a syringe and with this instrument have explored the mediastinum. They describe that on occasions air has rushed out so forcibly that the plunger of the syringe has been ejected. Rarely these simple methods have not sufficed. Wustmann [14] made an incision through the jugulum, but even with suction no air could be aspirated because the aperture of the mediastinum was obstructed by a substernal goiter. The goiter was removed but still the obstruction persisted, apparently because of the thymus gland and large masses of thymus fat. Then the sternum was split and prompt relief followed.

Appropriate treatment for tension pneumothorax has long been established. It consists in frequent aspiration of the pleural cavity or, better still, the constant maintenance of atmospheric pressure. This may be done by using the apparatus for inducing pneumothorax or more simply by introducing a needle attached to a piece of rubber tubing the other end of which is inserted into a bottle of water. When there is clear evidence of associated mediastinal emphysema it might be an added advantage simultaneously to provide a way for the escape of air from the mediastinum. Gaudrault and Chalmers [15] in 1 case of mediastinal emphysema, occurring as a sequence to interstitial emphysema of the lungs, incised the mediastinal tissues through the jugulum and then induced pneumothorax to collapse the injured lung, hoping in this way to prevent the further escape of air from ruptured alveoli.

9 East Chase Street.

14. Wustmann, O.: Concerning the Occurrence and the Operative Treatment of Interstitial and Secondary Mediastinal Emphysema Following the Induction of Pneumothorax, Deutsche Ztschr. f. Chir. 231: 506, 1931.

15. Gaudrault, G. L., and Chalmers, D. M.: Emergency Treatment of Traumatic Emphysema of the Mediastinum, New England J. Med. 224: 940, 1941.

SULFADIAZINE IN TREATMENT OF RELAPSING MALARIAL INFECTIONS DUE TO PLASMODIUM VIVAX

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Interest in malaria has been stimulated in the United States by the high incidence of relapsing malaria in troops returning from service in endemic malaria areas. It has been observed in all hospitals receiving these patients that the relapse rate is high, particularly in Plasmodium vivax malaria. The recognized failure of quinine, atabrine and plasmochin in various dosages, singly and in combinations, to affect the relapse rate materially is a matter of concern and serves to emphasize the importance of developing new methods of treatment. For this reason and because the amount of available quinine has been considerably reduced, a search for more satisfactory compounds continues.

In monkeys the virulent Plasmodium knowlesi strain of malaria is highly susceptible to sulfanilamide.[1]

TABLE 1.—*Recurrences*

Total number of patients treated for malaria (exclusive of sulfadiazine group)	134
Number of patients who had recurrences	62
Percentage of recurrences	46.2

Reports concerning the effectiveness of related drugs on human strains have appeared in the literature during the past few years.[2] While these reports have been somewhat conflicting, the evidence thus far indicates that both quinine and atabrine are more efficient than any other drug so far tested in the treatment of naturally acquired P. vivax infection. The suggestion that sulfonamide compounds might be capable of eradicating an infection which was already clinically suppressed by a previous course of one of the other drugs resulted in the trial of such a program in treatment of a group of patients whose infection originated in the Southwest Pacific area. Furthermore, since it has been shown[3] that there are striking clinical differences between strains and between artificial (induced) and natural (acquired) malaria, it seemed worth while to investigate the effect of sulfadiazine on the particular strain contracted in the Southwest Pacific area.

The present report concerns a series of 33 relapsing infections treated in this fashion at the Percy Jones General Hospital. In each instance the diagnosis was established by demonstrating the parasite in the stained blood smear. Plasmodium vivax was found in every case. In 1 instance (D-10) Plasmodium falciparum gametocytes were also encountered. The patients were not selected but were taken in consecutive order as clinical relapses occurred during a six weeks period in the summer of 1943.

DETAILS OF TREATMENT

In all but 3 cases the acute clinical symptoms were controlled by administering 0.1 Gm. of atabrine three times a day for seven days. On the eighth day administration of sulfadiazine was begun according to the following schedule: On the first day 8 Gm. was administered, and then 1 Gm. was given every four hours night and day for one week. This schedule was modified only when the blood level of the drug went above 15 mg. per hundred cubic centimeters. This occurred in only 1 case. At the beginning of the second week the dosage was dropped to 1 Gm. every six hours day and night regardless of blood concentration, provided it did not go too high. Three patients, as indicated in table 2, were given quinine instead of atabrine over either a five or a seven day period, but otherwise standard conditions were maintained throughout. Blood sulfadiazine levels were obtained at the end of the first twenty-four hour period and at three day intervals thereafter. An attempt was made to maintain a blood level of 8 to 10 mg. per hundred cubic centimeters the first week. In the second week we were interested in the effect on the plasmodium of long continued exposure to the drug. The usual laboratory studies were made at the same time. These included leukocyte count, differential smear, hemoglobin and urinalysis. There were no toxic manifestations other than mild microscopic hematuria in 3 patients. This

TABLE 2.—*Observations in the Sulfadiazine Series*

Case No.	Number of Previous Attacks	Medication Other Than Sulfadiazine (Atabrine) Gm.	Sulfadiazine Blood Concentration, Mg. per 100 Cc. Maximum	Average	Minimum	Subsequent Relapses	Interval Until Relapse, Days
1. E-45	1	2.1	11.4	5.3	2.0	Yes (P.V.)	7
2. D-81	2	2.1	7.7	6.3	3.8	Yes (P.V.)	22
3. A-84	2	2.1	9.2	8.4	7.9	No	
4. D-2	3	2.1	12.7	9.1	4.5	No	
5. D-14	2	2.1	11.4	7.9	5.7	Yes (P.V.)	50
6. G-74	1	2.1	12.1	9.8	5.3	Yes (P.V.)	27
7. C-73	4	2.1	9.0	7.4	4.7	Yes (P.V.)	54
8. C-21	2	2.1	10.1	8.0	7.3	Yes (P.V.)	1
9. C-83	2	2.1	10.0	9.4	7.8	No	
10. F-100	2	2.1	11.4	7.1	5.0	No	
11. A-79	2	2.1	13.3	9.1	4.9	Yes (P.V.)	60
12. C-84	3	2.1	8.5	7.0	5.0	No	
13. G-72	3	2.1	8.3	7.4	6.7	Yes (P.V.)	30
14. G-27	2	2.1	6.4	4.7	3.3	No	
15. B-2	5	2.1	8.2	7.9	7.6	Yes (P.V.)	64
16. G-32	5	2.1	8.6	6.2	3.5	No	
17. C-77	0	2.1	13.9	7.1	3.4	Yes (P.V.)	68
18. C-25	1	2.1	9.0	6.1	5.1	Yes (P.V.)	3
19. A-99	3	2.1	11.8	9.0	7.5	No	
20. F-95	2	2.1	12.3	7.7	5.0	No	
21. B-52	1	2.1	12.1	8.9	6.7	No	
22. E-92	5	2.1	9.5	8.1	3.4	No	
23. A-77	3	2.1	10.2	8.1	4.7	Yes (P.V.)	55
24. D-97	3	2.1	12.1	6.4	2.5	No	
25. A-51	2	2.1	10.3	7.8	6.6	No	
26. A-90	1	2.1	8.6	6.9	5.0	No	
27. C-9	1	2.1	10.5	7.0	3.1	No	
28. C-73	10	2.1	9.4	7.1	4.1	Yes (P.V.)	3
29. A-49	2	2.1	9.5	8.4	7.8	No	
30. F-50	4	2.1	9.9	7.8	6.1	No	
		(Quinine, Gm.)					
31. D-8	3	15.0	12.3	10.7	7.8	Yes (P.V.)	33
32. D-10	4	20.0	8.6	5.6	3.0	Yes (P.F. and P.V.)	55
33. C-64	1	15.0	15.0	10.1	7.7	Yes	34

Total number of patients	33
Total number of relapses	16
Percentage of relapses	48.5

P.V.= Plasmodium vivax; P.F = Plasmodium falciparum.

From the Percy Jones General Hospital, Battle Creek, Mich. (Captain Bates).

1. Coggeshall, L. T.: Prophylactic and Therapeutic Effect of Sulfonamide Compounds in Experimental Malaria, Proc. Soc. Exper. Biol. & Med. **38**: 768, 1938.

2. Coggeshall, L. T.: The Cure of Plasmodium Knowlesi Malaria in Rhesus Monkeys with Sulfanilamide and Their Susceptibility to Reinfection, Am. J. Trop. Med. **18**: 715, 1938. Coggeshall, L. T.; Maier, J., and Best, C. A.: Effectiveness of Two New Types of Chemotherapeutic Agents in Malaria, J. A. M. A. **117**: 1077 (Sept. 27) 1941. Johnson, C. E., Jr.: Present Status of Sulfonamide Therapy in Malaria, Am. J. M. Sc. **206**: 327, 1943.

3. Boyd, M. F.: Some Characteristics of Artificially Induced Malaria, Am. J. Trop. Med. **20**: 269, 1940; On the Therapeutic Interruption of Artificially Induced Malarial Infections, ibid. **23**: 49, 1943. Boyd and Kitchen.[4]

did not require discontinuance of the drug but cleared spontaneously after increase in fluids and alkalization of the urine.

RESULTS

Table 1 shows a relapse rate of 46.2 per cent in 134 patients treated at this hospital from Feb. 15, 1943 to Sept. 15, 1943. As can be seen, these figures were obtained from the number of relapses following all types of treatment employed by us except sulfadiazine therapy. This group was excluded for purpose of comparison. A number of different forms of therapy were employed, consisting of various dosages and combinations of quinine, atabrine and plasmochin. On the basis of their effect on the relapse rate all of these methods of treatment were equally ineffectual. The use of plasmochin was discontinued on August 17, with the exception that it was given to a few persons with P. falciparum malaria. We have not observed any change in frequency of relapses since discontinuing its use.

Table 2 summarizes the pertinent data relative to the sulfadiazine series, such as blood level of sulfadiazine, type of malaria and intervals between treatment and recurrences up to Nov. 1, 1943.

Although it has been only three months since the last member of this group finished treatment, it is felt that sufficient time has elapsed to demonstrate the ineffectiveness of sulfadiazine in preventing recurrences of P. vivax malaria, since 16 of 33 patients, or 48.5 per cent, have already relapsed.

COMMENT

As shown by the charts, the incidence of relapse in the sulfadiazine treated group is almost exactly the same as in the group treated by various combinations of quinine, atabrine and plasmochin, despite the fact that in each instance in the sulfadiazine series the acute attack was controlled by atabrine or quinine. Conditions were standard for all patients, and satisfactory blood levels were maintained. The average of concentration per patient ranged from 4.7 to 10.7 mg. per hundred cubic centimeters. In the 16 cases that relapsed after sulfadiazine therapy the average blood concentration was 7.7 mg. per hundred cubic centimeters, while in 17 who have not yet relapsed it was 7.6 mg. In the relapsing cases the average peak concentration was 10.6 mg. per hundred cubic centimeters and the peak range from 7.7 to 15 mg., while in the nonrelapsing cases the average peak concentration was 10.2 mg. and the range from 6.4 to 12.7 mg. per hundred cubic centimeters. It is evident that there was no essential difference in blood concentration obtained in the two groups and that this therapy has no value in preventing relapses of P. vivax malaria. It is realized that there is considerable variation in susceptibility to treatment among strains of the same species, and this may be an important factor in the poor results obtained in this series. It is known that when a foreign strain is introduced into nonimmune persons the character of the infection tends to be more severe. Therapeutic malaria has been generally recognized as being far more susceptible to quinine, and the tendency to recurrences is much less. This relates particularly to any artificially induced malaria, where the relapse rate is practically nil. Most antimalarial drugs give satisfactory results in such patients. It is possible, therefore, that sulfadiazine may be useful in the treatment of therapeutic malaria, whereas it appears to be of no value in preventing relapses in naturally acquired Plasmodium vivax of the type encountered in soldiers returning from the South Pacific.

It is significant that only 1 patient in this group had his initial attack of clinical malaria in this hospital. It is generally accepted that each relapse reduces the chance of another one. The group receiving sulfadiazine showed no appreciable variation in the number of previous attacks from those treated with atabrine or quinine alone. As a matter of record, the average number of previous attacks for the group relapsing after sulfadiazine was 2.5 and for the nonrelapsing group it was 2.7. Consequently one can dismiss such a factor in the comparison of the recurrence rate between the two groups.

It seems worth while to discuss the problem of these persistent P. vivax malarial infections acquired in the South Pacific. There is considerable speculation at the present time as to whether they are more virulent and whether they have a greater tendency to have renewed clinical activity than strains of the same species reported elsewhere. In field studies there is always present the difficulty of differentiating relapses from reinfections. The most conclusive results come from the observations in therapeutic malaria, where the possibility of reinfections has been eliminated. Boyd's [4] investigations have shown that 68, or 45.6 per cent, of 149 patients whose infections were initiated by infected mosquitoes with the McCoy strain of P. vivax malaria had renewed clinical activity after termination of the initial attack. In this respect these experiences are comparable to those encountered at the Percy Jones General Hospital. However, there is one striking difference; whereas in Boyd's 146 patients 68 had only one recrudescence,[5] 23 had two, 8 had three, 4 had four, 2 had five and only 1 had six. The tendency for more recrudescences in the South Pacific infections was much greater, as over 50 per cent of the patients had more than three recrudescences and a few as many as twelve. It might be stated that this again could be attributed to the fact that this was a selected group, but most of the cases were not returned because of recurrent malaria but because of other disablements. Hence it seems from comparisons of the available data for these patients and Boyd's studies that the South Pacific P. vivax malaria has a greater tendency for persistent infections. The subject will be covered in greater detail in later studies from the same institution in connection with the complement fixation reaction and diagnosis of malaria.

SUMMARY AND CONCLUSIONS

Thirty-three patients with vivax malaria acquired in the Southwest Pacific area were treated with sulfadiazine over a two week period. Acute clinical symptoms were controlled by a course of atabrine or quinine immediately preceding sulfadiazine therapy. Sulfadiazine blood levels of 4.7 to 10.7 mg. per hundred cubic centimeters were obtained in each instance. Follow-up on these patients three months later revealed that 16 had relapses, an incidence of 48.5 per cent, whereas our relapse rate for patients treated by usual courses of atabrine or quinine was 46.7 per cent.

Sulfadiazine is of no value in preventing relapses in the strain of P. vivax malaria naturally acquired in the Southwest Pacific area and deserves no place in the therapy of this type of malaria.

4. Boyd, M. F., and Kitchen, S. F.: Recurring Clinical Activity in Infections with McCoy Strain of Plasmodium Vivax Malaria, Am. J. Trop. Med. 17: 833, 1937.

5. The word "recrudescence" is preferred following S. P. James's suggestion (Some General Results of Induced Malaria in England, Tr. Roy. Soc. Trop. Med. & Hyg. 24: 477, 1931) that they are sequels to the initial attack occurring within eight weeks after the previous one. Most of the infections studied at the Percy Jones Hospital fell into that category. James designated a relapse as a renewed attack of clinical activity occurring after a quiescent period of eight weeks to six months.

COLON SURGERY AND THE SULFONAMIDE DRUGS

WITH ESPECIAL REFERENCE TO THE ELIMINATION OF THE MIKULICZ OPERATION

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Results of colon surgery at the turn of this century, as compared with the results of the present day, are marked by great improvement in recent years. This improvement has been due to many factors. The most important of all has been the careful preoperative preparation of the patients. Formerly, patients were admitted to the hospital and in a day or two were operated on. The bowels were full of feces and teeming with bacteria, and as a result the mortality after operation often ranged from 60 to 70 per cent, even in the hands of the best surgeons.

In the past ten or fifteen years, however, it became apparent that certain measures could be taken to reduce mortality. It was shown that one cause of the high morbidity and mortality was lack of preoperative preparation. It became an axiom in our service that operation should not be performed unless preceded by at least a week's preparation. This preparation, which consisted of a preliminary purge followed by colonic irrigations, a liquid diet and parenteral feeding, is well known. Blood transfusions before, during and after operations became a routine measure. The results obtained with this method showed an appreciable improvement. There was an immediate reduction in the mortality following operations on the colon after this regimen.

Then with the introduction of the sulfonamides, a new era in the surgery of the colon was inaugurated. Sulfanilamide was given by mouth, the primary dose being 120 grains (8 Gm.) in twenty-four hours, followed by a reduction in the dosage each day up to the time of operation. Before closing the abdomen 5 to 8 Gm. of sulfanilamide crystals was placed in the peritoneal cavity.

Like all innovations in medicine, the new bactericidal or bacteriostatic agents were not universally accepted. Even now there is some skepticism about the efficacy of these drugs, and rightly so, in certain conditions. I was one of those to whom the magical effects of the drug had to be demonstrated. But it was not long before the benefits were practically illustrated, especially in streptococcic infections.

SUCCINYLSULFATHIAZOLE

In January 1939 we first used the sulfonamides in colon surgery. In 1941 Poth and Knotts [1] introduced the use of succinylsulfathiazole, which has enabled us to change our technic in colon surgery, just as the use of vitamin K has given us an added security against postoperative hemorrhages in the jaundiced patient.

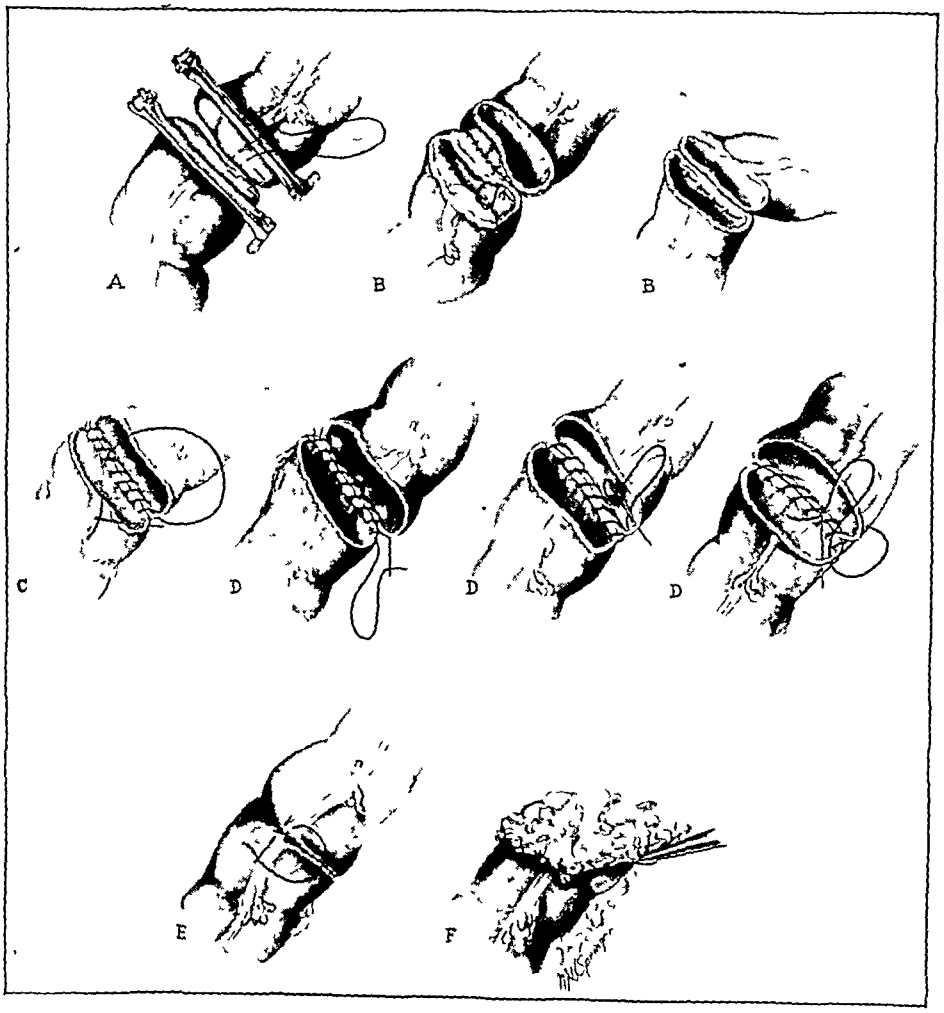


Fig 1.—*A*, first suture of linen thread on adjacent sides of the mesentery of the colon, *B*, interrupted mattress suture on an atraumatic needle with catgut, the knots of which are tied within the bowel, *C*, the adjacent free ends of the colon are sewed with a similar needle, threaded with 00 chromic gut, *D* (1, 2 and 3), the distal edges of the colon are brought together with a continuous Connell suture, *E*, interrupted or continuous Czerny Lambert sutures appose the serous surface; *F*, any available piece of fat is attached over the line of suture

Sulfonamides introduced intraperitoneally before the abdomen is closed are of benefit, and this policy has given our best results.

My associates and I experimented with most of the sulfonamide drugs as they were introduced, from sulfanilamide to sulfanilylguanidine, but we feel that succinylsulfathiazole is a product of real merit in rendering the coliform bacilli inert. This gives it an additional

From the services of the Jewish and Mount Sinai hospitals.
Read before the Section on Gastro-Enterology and Proctology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Poth, E. J., and Knotts, F. L.: Succinylsulfathiazole: A New Bacteriostatic Agent Locally Active in Gastrointestinal Tract, Proc. Soc. Exper. Biol. & Med. **48**: 129-130 (Oct.) 1941. Poth, E. J.: Succinyl sulfathiazole: Adjuvant in Surgery of the Large Bowel, J. A. M. A. **120**: 265-269 (Sept. 26) 1942.

advantage in the preparation of the patient. There is no necessity of estimating the blood concentration, because succinylsulfathiazole has no toxic effects. It simplifies considerably the preparation of the patients who are about to be operated on for cancer or any other lesion of the colon. The drug should be given in doses of 0.25 Gm. per kilogram of body weight for at least a week before the contemplated operation. It has been shown that it is not necessary, with the administration of this drug, to give colonic irrigations, because the drug has the property of diminishing the contents of the intestinal tract, rendering it practically empty. It is amazing to compare patients who have been prepared without succinylsulfathiazole with those who have had the preoperative preparation with this drug. It makes the use of the various aseptic procedures in anastomosis of colon to colon unnecessary. Furthermore, instead of giving the patient a rigid liquid diet as formerly, a low residue diet may be ingested with impunity. In a recent paper, in a report of cases, I [2] stated that a liquid diet was strictly enforced. In several cases in which operation was recently performed, a low residue diet and liquids were allowed. The colon, as usual, was empty and odorless. In some cases, however, we may be compelled to adhere only to a liquid diet.

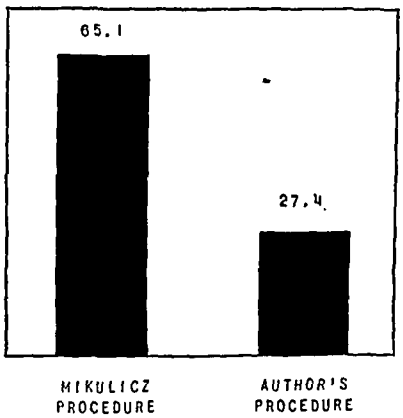


Fig. 2.—Average number of days in the hospital.

EFFECTS OF SUCCINYLSULFATHIAZOLE AND THE ONE STAGE OPERATION

Now, with the added assurance that the bacterial flora will be reduced to a minimum by the use of succinylsulfathiazole, a one stage operation, whenever feasible, has been performed. It is well known that the many stage operation, exemplified by the Mikulicz procedure, is probably the safest type of operation that one can perform on the colon. If one can avoid the multiple procedure operation and if one has had enough experience in performing the one stage operation, I believe that in time it will induce all surgeons to use this technic. It subjects the patient to less surgery, the operation is cleaner, the convalescence is much shorter and the cost to the hospital and patient is greatly reduced. For example:

E. D., a Negro woman aged 50, admitted to the Mount Sinai Hospital in the service of Dr. Abraham Trasoff on March 3, 1944, was in good health until a month before, when she began to have generalized abdominal pain. She noticed also that the abdomen began to swell. She had loss of appetite with increasing constipation and lost a few pounds in weight. She had high blood pressure for the past seventeen years and suffered a stroke in September 1942, with hemiplegia of the left side. The blood pressure was 220/140, hemoglobin 48, red blood cell count 7,800,000. She had a carcinoma of the transverse colon close to the hepatic flexure. The tumor was widely excised, and an end to end anastomosis was performed. Exactly two weeks after the operation she was discharged from the hospital, whereas after the old type operation, with its many inconveniences, she would have been in the hospital from eight to twelve weeks.

The pathologic diagnosis was primary, obstructing, annular, ulcerating adenocarcinoma infiltrating all the coats of the colon, the lymphatic channels and the serosal layer.

There was no semblance of infection. No drainage was used, but it is now thought preferable to use a Penrose drain without gauze down to the point of anastomosis. In the past twenty-five years this has been the only patient of the colored race operated on in a large series of cancer of the colon. She was hypertensive and was characteristically afraid of an operation. She died suddenly, while doing her housework, three weeks after her operation.

TECHNIC OF OPERATION

After the lesion in the colon is reached, Stone or de Martel clamps are applied above and below the growth, and excision is performed with the aid of the cutting current of the Bovie apparatus. With the peritoneal cavity well walled off with gauze sponges, the first suture of linen thread is then begun on the adjacent sides of the mesentery of the colon (fig. 1 *A*). The clamps are now removed. The next suture is an interrupted mattress suture, on an atraumatic needle with catgut, the knots of which are tied within the bowel (*B*). The adjacent free ends of the colon are sewed with a similar needle threated with 00 chromic gut (*C*). These sutures are all made on the posterior portion of the colon. The distal edges of the colon are now brought together with a continuous Connell suture (*D*). Interrupted or continuous Czerny-Lembert sutures of linen appose the serous surfaces (*E*). Any available piece of fat is then attached over the line of suture (*F*). Before the abdomen is closed, a piece of rubber dam is placed at the site of the operation to take care of any leakage that might occur.

MIKULICZ OPERATION

While I admit that the Mikulicz operation may be necessary in some selected cases, its field of usefulness will eventually be eliminated. The reasons are as follows:

1. Though it is true that the number of stages has been shortened by combining the first and second stages with the removal of the growth, nevertheless at least two or three successive steps are required, and in some patients who do not heal kindly, additional procedures may be necessary to close the colostomy. One patient was in the hospital 101 days—others ranged from 52 to 96 days.

2. The number of days of bed occupancy is also a prime consideration. As stated, every patient operated on by the Mikulicz method requires at least from eight to twelve weeks of hospitalization. Even if the patients are discharged between operations, the same length of time in the hospital is still required. We have reviewed, especially with this point in view, all cases recorded for the past twenty-five years in which we have performed the one stage in comparison with the two stage operation. The average stay in the hospital of the patient on whom the Mikulicz operation has been performed is 65.1 days. In the one stage procedure the average duration of hospitalization is 27.4 days (fig. 2).

3. Again, the inconvenience from the time the first operation is performed to the closure is considerable on account of the feces covering the field of operation. Several dressings a day are required, with a consequent additional drain on the hospital resources.

2. Behrend, M.: Succinylsulfathiazole (Sulfasuxidine) and the Elimination of the Mikulicz Operation, S. Clin. North America 24: 238-247 (Feb.) 1944.

ONE STAGE VERSUS MULTIPLE STAGE OPERATIONS

When obstruction is not present, there is seldom any necessity for a two stage operation on the colon for cancer. It is obvious that when there is an obstruction a preliminary colostomy must be performed as a primary procedure.

In secondary abdominal operations, adhesions are always an encumbrance. This is not an issue in the performance of the various stages of the Mikulicz operation, but where we have used the two stage operation in carcinoma of the cecum and ascending colon the adhesions found at the second operation were sometimes almost insurmountable. A one stage ileocolostomy therefore is preferred to the Mikulicz procedure for patients with cancer of the cecum and ascending colon.

The same may be said for the multiple stages of the Lahey and Rankin operations for carcinoma of the rectum. The one stage Miles abdominoperineal operation is so superior that I have practically abandoned the former types of operations.

An operation in which the Mikulicz procedure was avoided is illustrated by the following case:

R. L., a frail, very anemic looking woman aged 67, was admitted to the Jewish Hospital on March 12, 1944 to the service of Dr. Nathan Blumberg. On April 7 the operation was performed. Before admission she complained of abdominal cramps for the past two years. Hemoglobin was 39, the red blood cell count 2,770,000. The blood pressure was 150/70. Many transfusions were given prior to the operation, which was performed on April 4 for carcinoma of the transverse colon. The tumor was easily isolated, a de Martel clamp was applied and the mass was removed. An end to end anastomosis was then performed.

This was a bad risk. The patient looked ten years older than her actual age. Her convalescence was without incident. Her bowels moved on the fifth day following an oil retention enema. She was out of bed on the tenth day and ready for discharge on the fourteenth day following operation. While the Mikulicz operation is also a safe procedure, I believe, in this particular instance, the operation now advocated served its purpose better than the many stage operation.

Carcinoma of Colon *

Name	Postoperative Days in Hospital	Age	Sulfonamide Drugs	Duration of Symptoms	Type of Operation	Location	Result
E. F.	51	66	Succinylsulfathiazole, sulfanilamide	2 wks.	One stage, end to end anastomosis	Descending colon and sigmoid	Living
O. F.	42	71	Sulfanilamide	5 days	Cecostomy; resection of colon, end to end anastomosis	Perforation of descending colon	Living
H. C.	21	67	Succinylsulfathiazole, sulfanilamide	6 mos.	Resection and end to end anastomosis	Multiple carcinoma of transverse and descending colon	Living
E. K.	25	48	Succinylsulfathiazole, sulfanilamide	7 mos.	Excision and end to end anastomosis	Sigmoid	Living
F. G.	11	50	Succinylsulfathiazole, sulfanilamide	6 mos.	Resection and end to end anastomosis	Polypoid carcinoma of descending colon	Living
M. K.	29	66	Succinylsulfathiazole, sulfanilamide	3 mos.	One stage, end to end anastomosis	Rectosigmoid	Living
J. Z.	35	49	Succinylsulfathiazole, sulfanilamide	2 yrs.	Excision and end to end anastomosis	Rectosigmoid	Living
E. D.	14	50	Succinylsulfathiazole, sulfanilamide	1 mo.	Excision and end to end anastomosis	Transverse colon	Living
R. L.	36	67	Succinylsulfathiazole, sulfanilamide	2 yrs.	Excision and end to end anastomosis	Transverse colon	Living
A. C.	10	60	Succinylsulfathiazole, sulfanilamide	7 mos.	Excision and end to end anastomosis	Descending colon	Living
W. M.	29	64	Sulfanilamide	8 mos.	One stage abdominoperineal	Rectum	Living
N. M.	44	57	Sulfanilamide	4 mos.	One stage abdominoperineal; left ureterectomy	Rectosigmoid	Living
M. B.	24	63	Sulfanilamide	18 mos.	One stage abdominoperineal	Rectum	Living
R. G.	35	52	Succinylsulfathiazole, sulfanilamide	1 yr.	One stage abdominoperineal	Rectum	Living
H. S.	65	70	Sulfathiazole, succinylsulfathiazole	5 wks.	Ileotransverse colostomy	Ascending colon and cecum	Living
H. S.	36	62	Sulfanilamide	3 mos.	Ileotransverse colostomy	Cecum	Living
L. C.	23	67	Sulfanilamide, succinylsulfathiazole	1 yr.	Ileotransverse colostomy	Recurrent carcinoma of transverse colon	Living
F. C.	28	64	Succinylsulfathiazole, sulfanilamide	1 mo.	Ileotransverse colostomy; metastasis to liver	Cecum	Living
B. J.	34	69	Succinylsulfathiazole, sulfanilamide	1 yr.	Ileotransverse colostomy	Cecum	Died, gangrene of fingers
P. L.	69	67	Succinylsulfathiazole, sulfanilamide	1 mo.	Mikulicz	Sigmoid	Living
A. K.	75	55	Sulfanilamide	48 hrs.	Mikulicz	Sigmoid	Living
D. G.	61	60	Sulfanilamide	1 yr.	Mikulicz	Rectosigmoid	Living
P. C.	44	36	Sulfanilamide	1 mo.	1st stage Lahey; 2d stage Lahey	Rectum	Died 6 mos. later; generalized carcinomatosis
A. D.	14	54	Sulfanilamide	6 wks.	Colostomy	Sigmoid	Living
M. G.	31	49	Sulfanilamide	5 mos.	Colostomy	Rectum	Living

* Whenever succinylsulfathiazole is found in the same bracket above with sulfanilamide or sulfathiazole, the latter drugs, in 5 to 10 Gm. doses, are placed in the peritoneal cavity before the abdomen is closed. Spinal anesthesia was used.

MORTALITY AND MORBIDITY

In 1943 there was not recorded a death in twenty-four successive colon operations. These operations included all the types of procedure, depending on the location of the lesion. It must be stated here, however, that we did not begin the use of succinylsulfathiazole until August 1943. No case in this series was treated without some type of the sulfonamides such as sulfanilamide, sulfathiazole or sulfanilylguanidine. The outstanding difference with the use of succinylsulfathiazole is well expressed in Poth's statement that "the drug given in

therapeutic doses alters the feces, because they become semifluid and practically odorless. The coliform organisms are reduced to such low values that B. coli cannot be demonstrated by growth on desoxycholate plates." All multiple and one stage operations were performed under spinal anesthesia, with the results shown in the table.

On December 31 the twenty-fifth patient died from multiple emboli of the ulna and radial arteries causing gangrene of the fingers of the left hand:

B. J., a woman aged 70, admitted to the Jewish Hospital on Nov. 19, 1943, had been admitted four years before for carcinoma of the rectum with involvement of the posterior vaginal wall. A one stage abdominoperineal operation was performed at that time, with a resulting permanent colostomy. She made a good recovery and lived a normal life until her next admission in November 1943. At this time a mass was felt in the right iliac region, which also proved to be cancer. A one stage ileotransverse colostomy was performed. About three weeks before her death she developed cyanosis of the fingers of the left hand, followed by gangrene of these digits (fig. 3).

This case illustrates the fact that successive carcinomatous lesions in different parts of the colon in the same individual may occur after the primary lesion has been operated on. Four years before the first lesion was in the rectum; the second was in the cecum and ascending colon. She unfortunately was attacked by multiple emboli affecting the left hand and fingers, ending in dry gangrene. This was followed by cyanosis and signs of beginning gangrene of the right hand and fingers.

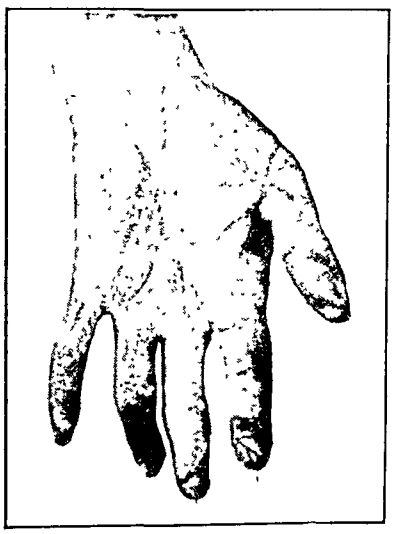


Fig. 3.—Gangrene of fingers following operation for carcinoma of the cecum and ascending colon.

The use of spinal anesthesia must be considered as another contributing factor in the reduction of the mortality of colon cases. When a prolonged operation is contemplated, continuous spinal anesthesia is employed; in other cases a single dose of 150 mg. of procaine is used. Since 1928, spinal anesthesia has been used for over 90 per cent of the patients operated on.

SUMMARY

As stated in the beginning of this paper, good colon surgery was done before the entrance of the sulfonamides. Better results were due to an insistence on the preparation of these patients at least a week before operation. With a primary purge and an absolute liquid diet, the contents of the bowels were greatly reduced. In addition, parenteral fluids and blood transfusions were given.

It remained, however, for the sulfonamides to reduce the number of cases of peritonitis and infections.

The ultimate, however, was reached when succinylsulfathiazole was introduced. Here was a drug that could be given in large doses without toxic effects. It reduced the number of coliform bacteria per gram of wet stool from 10,000,000 to 100 organisms. It enabled us to reduce the several stage Mikulicz operation to a single procedure.

255 South Seventeenth Street.

STUDIES ON MERCURIAL DIURESIS

V. SUDDEN DEATH FOLLOWING INTRAVENOUS INJECTION

REPORT OF THREE CASES, WITH ELECTROCARDIOGRAPHIC STUDIES IN TWO

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Mercury is a protoplasmic poison. It precipitates protein. The clinical use in the form of the nonionizable compounds in the organic mercurial diuretics has become very extensive in the therapy of edema and the symptoms resulting from accumulations of fluids. This diuretic action is just as powerful in the ionizable inorganic mercury compounds as in the organic ionizable combinations.

The diuretic action represents the very early toxic action of mercury on the renal tubules. The positive mercury ion released in small amounts from the organic mercurial diuretic accounts for the renal and diuretic effects. Sollmann, Schreiber and Cole have demonstrated that ionizable inorganic compounds of mercury are more potent in diuretic action than nonionizable organic mercurials. Mercury has been known for its diuretic activity since the time of Paracelsus and was a constituent of the Guy's Hospital pill, which contained calomel, squill and digitalis.

The earliest reports of sudden death were made by Redlick [1] in 1925 with three deaths from the use of novasurol. Intravenous salyrgan was indicated as the cause of death by Wolf and Bongiorno [2] in 1931. Sundaram [3] added one in 1934 and Greenwald [4] and Seymour reviewed two deaths in 1937. Another fatal episode was noted by Tyson [5] in 1941. Several extensive clinical reports appeared in 1941 and 1942, adding to the published fatalities, all appearing suddenly during or shortly after the intravenous injection of an organic mercurial diuretic administered to promote the removal of fluid from the body.

Experimentally in 1922 Salant and Kleitman [6] had observed ventricular fibrillation in dogs following intravenous administration of inorganic mercurial salts and mercurochrome. Jackson [7] in 1926 reported that he was able to produce death regularly by ventricular

From the Cook County Hospital and Loyola University School of Medicine, Chicago.

Read before the Section on Pathology and Physiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Redlick, F.: Wien. klin. Wchnschr. **38**: 359 (March 26), 1925.
2. Wolf, I. J., and Bongiorno, H. D.: Canad. M. A. J. **25**: 73 (July) 1931.
3. Sundaram, S. K.: Idiosyncrasy to Salygran, Correspondence, J. A. M. A. **103**: 60 (July 7) 1934.
4. Greenwald, H. M., and Jacobson, S.: J. Pediat. **11**: 540 (Oct.) 1937.
5. Tyson, Mary Catherine: Danger of Intravenous Mercurial Injection, J. A. M. A. **117**: 998 (Sept. 20) 1941.
6. Salant, William, and Kleitman, Nathaniel: J. Pharmacol. & Exper. Therap. **19**: 315 (May) 1922.
7. Jackson, D. E.: J. Pharmacol. & Exper. Therap. **29**: 471 (Oct.) 1926.

fibrillation within three to five minutes in normal dogs under ether anesthesia by intravenous injection of various mercurial compounds.

Chastain and Mackie [8] in 1940 studied the effects of the sodium salt of pyridinedicarboxymercuri hydroxy propylamide theophylline (Esidrone), an organic mercurial diuretic combined with theophylline, when given intravenously to normal dogs under barbiturate anesthesia. By using five or six times the corresponding clinical dose they were regularly able to produce death by ventricular fibrillation. They found that twelve to fifteen seconds after the intravenous administration the electrocardiogram showed deviations of the ST interval and ST junction and the T waves followed by ventricular flutter and ventricular fibrillation. Death occurred in three to five minutes. We have published four investigations on Esidrone since 1938. This contribution represents the fifth report on the use of Esidrone. We observed Chastain and Mackie's report but found that their fatal results appeared consistently only after fifteen times the usual corresponding clinical dosage, so we did not attach to it the significance it probably deserved.

A symposium of several articles dealing with the toxicity of mercurial diuretics and reports of a considerable number of deaths appeared in THE JOURNAL on July 25, 1942. The contributions were made by DeGraff and Lehman,[9] Barker, Lindberg and Thomas,[10] Brown, Friedfeld, Kissin, Modell and Sussman [11] and DeGraff and Nadler.[12]

DeGraff and Lehman studied the relative toxicity of the various organic mercurial diuretics on the commercial market. Their work, carried out on cats, was very comprehensive and corroborated the evidence presented by Salant and Kleitman, Jackson, and Chastain and Mackie. DeGraff and Lehman showed that Esidrone was the most toxic of the mercurials, followed in order by salyrgan, mercurin, mercupurin with salyrgan theophylline, the least toxic. They demonstrated that the added theophylline radical played no important role in the production of sudden death and that previous treatment by various drugs such as ammonium chloride, phenobarbital, intravenous aminophylline and digitalis had no effect on the lethal dose of at least one of the mercurials. They also observed that dilution of the drugs is of little value in preventing sudden death. Nor were they able to prove that the rate or speed of the intravenous injection contributed to the toxicity and fatal termination. H. T. Hyman [13] believes that the reactions and sudden deaths are due to technical and not pharmacodynamic reactions. He maintains that the reaction resembles the syndrome of speed shock, anaphylactic or anaphylactoid responses, in which the blood is rendered noncoagulable. However, the evidence would seem to indicate that death is caused by the direct action of these drugs on the heart. Ventricular fibrillation or respiratory failure secondary to cardiac action is the usual manifestation and cause of death. Ventricular tachycardia frequently precedes the onset of ventricular fibrillation.

8. Chastain, L. L., and Mackie, G. C.: South. Med. & Surg. **102**: 5 (Jan.) 1940.

9. DeGraff, A. C., and Lehman, R. A.: The Acute Toxicity of Mercurial Diuretics, J. A. M. A. **119**: 998 (July 25) 1942.

10. Barker, M. H.; Lindberg, H. A., and Thomas, M. E.: Sudden Death and Mercurial Diuretics, J. A. M. A. **119**: 1001 (July 25) 1942.

11. Brown, George; Friedfeld, Louis; Kissin, Milton; Modell, Walter, and Sussman, R. M.: Deaths Immediately Following Intravenous Administration of Mercupurin, J. A. M. A. **119**: 1004 (July 25) 1942.

12. DeGraff, A. C., and Nadler, J. E.: Review of Toxic Manifestations of Mercurial Diuretics in Man, J. A. M. A. **119**: 1006 (July 25) 1942.

13. Hyman, H. T.: Sudden Deaths After Use of Mercurial Diuretics, J. A. M. A. **119**: 1444 (Aug. 22) 1942.

REPORT OF CASES

CASE 1.—W. S., a white youth aged 20 years, first examined May 2, 1940, gave a history of rheumatic fever and known heart disease for the previous nine years. The presenting complaints were dyspnea, orthopnea and cough, with edema of the lower extremities. The patient weighed 109 pounds (49 Kg.), the respiratory rate was 30 and he had an irregular pulse of auricular fibrillation with a rapid rate of 130 per minute. The blood pressure was 104/60. He was in definite congestive heart failure, with the left heart border extending to the left midaxillary line. The rapid irregular rate and presystolic, systolic and diastolic murmurs were audible over the precordial area. The liver extended almost a hand's breadth below the costal margin, with pronounced edema grade 4 of the lower extremities. The urine contained 4 plus albumin with a specific gravity of 1.026. The Kahn reaction was negative. The blood count showed normal findings. The chest film corroborated the pronounced enlargement of the heart, and the electrocardiogram demonstrated the auricular fibrillation. The diagnosis was rheumatic heart disease, with mitral stenosis and mitral regurgitation, aortic regurgitation, pronounced hypertrophy and dilatation of the right and left ventricles, the left auricle, auricular fibrillation and severe congestive heart failure.

Under rest, sedatives and digitalis 300 mg. the congestive failure disappeared and the ventricular rate was brought down to about 66, when a maintenance dosage of 200 mg. daily permitted the patient a fair degree of activity, although he could not go to work. He was seen at approximately three week intervals as an office patient until Sept. 4, 1941, about sixteen months after the first consultation, when a weight gain of 10 pounds (4.5 Kg.) was noticed. The digitalis was increased, but the next office visit showed an additional gain of 8 pounds (3.6 Kg.) on Oct. 6, 1941, when he was told to remain at home, where he was visited every few days. The response to digitalis 500 mg. daily was unsatisfactory. The signs of congestive failure became pronounced, with the symptoms severe, so 1 cc. of mercupurin was administered intravenously.

A diuretic response of 4,100 cc. resulted. Three days later a second dose of equal amount was used with 1,300 cc. output in twenty-four hours. The symptoms did not improve with a third injection of 1 cc. two days later, with only 1,000 cc. of urine. Two cc. of mercupurin from the same box was given two days later. The injection was made at a rate similar to the previous administrations, rather rapid in all instances. Very shortly after the withdrawal of the needle the patient complained of pain in the precordium, was very restless and became rapidly unconscious, with convulsive movement of the eyes and general twitching of the skeletal muscles. The pulse prior to injection was rapid and irregular, becoming very rapid as the symptoms of the episode appeared, finally became thready and disappeared. Death occurred within a few minutes after the injection. The clinical evidence supported the diagnosis of the onset of ventricular tachycardia followed by ventricular fibrillation.

CASE 2.—W. M., a white man aged 68, entered Cook County Hospital on April 14, 1938 complaining of shortness of breath, loss of appetite and swelling of the legs and abdomen of one year's duration. The past history was irrelevant.

The patient breathed with extreme difficulty. There was cyanosis of the finger nails. The blood pressure was 166/102. The cardiac apex was palpated at the left anterior axillary line in the sixth interspace. A loud systolic murmur was audible over the apex and at the aortic cartilage. The heart tones were distant and rapid; the rate was 130 per minute but regular. Rales of congestion were audible in the lungs. The liver was three finger breadths below the costal margin. Free fluid was present in the abdomen. Peripheral edema was massive. The laboratory evidence showed a negative Kahn reaction, red blood cells 4,530,000, white blood cells 7,300. Hemoglobin was 70 per cent and the differential count was 56 per cent lymphocytes and 44 per cent polymorphonuclears. The nonprotein nitrogen was 43 mg. per hundred cubic centimeters. Blood carbon dioxide was 48 volumes per cent. The urine showed a specific gravity of 1.020, albumin 2 plus, sugar negative. The x-ray film demonstrated cardiac enlargement,

some enlargement of the aortic arch and pulmonary congestion. The diagnosis was hypertensive and arteriosclerotic heart disease with pronounced enlargement of the heart and congestive heart failure, grade 4. The electrocardiogram taken three days after admission showed left axis deviation, auricular extrasystoles, ST junction depression in lead 4, the ST interval and

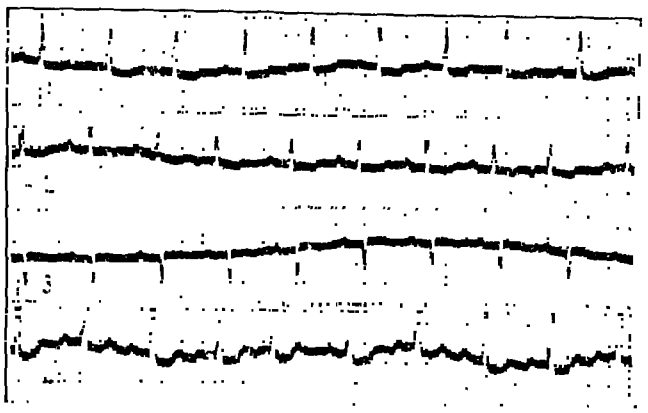


Fig. 1 (case 2).—Tracing of April 17, 1938.

T changes in leads 1, 2 and 4. Part of the latter evidence presumably could be from the heavy digitalis medication which was initiated shortly after admission and for three days prior to the electrocardiogram. Morphine and atropine were employed to quiet the patient. On April 18, 1938, 1 cc. of Esidrone was administered with a 5,900 cc. urinary output resulting and much improvement. This continued at a rapid pace, and the patient showed such amelioration that on April 28 he was discharged to the cardiac outpatient clinic with compensation completely restored. He continued to attend the clinic at irregular intervals, using digitalis as advised. He was readmitted to our hospital service on Aug. 20, 1938. Digitalis was increased. On August 24 1 cc. of Esidrone was given intravenously. A pronounced diuresis ensued, and he requested discharge on August 26, promising to attend the cardiac clinic.

His next admission occurred on Oct. 8, 1938, again with decompensation. The same routine was instituted but on Oct. 11 2 cc. of Esidrone was given with 4,900 cc. urinary output, and much improvement in his clinical symptoms. He was discharged Oct. 19, 1938, edema free.

His last admission occurred on Nov. 6, 1938, with anasarca and severe symptoms. The digitalis, morphine and atropine

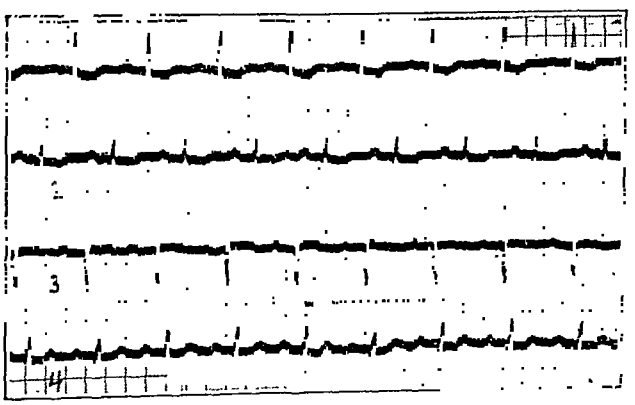


Fig. 2 (case 2).—Four lead electrocardiogram before injection of intravenous mercurial.

were given as before on his previous admissions. Esidrone 1 cc. was injected intravenously on November 8 and 2 cc. on November 11. Good diuresis was obtained. On November 15 a recheck electrocardiogram (fig. 2) was made just prior to injection of 2 cc. of Esidrone, administered intravenously at a rate similar to all other injections. Attention is directed to the PR interval of 0.22 second present prior to the injection. Within a few seconds after the injection the patient became extremely restless and decidedly dyspneic, with a rapid, weak, irregular pulse. The electrocardiograph was rapidly attached to the patient and a four lead tracing taken (fig. 3) showing the ventricular fibrillation. Death ensued a few minutes after the injection. Five injections were given intravenously to this patient prior to the last injection and two of the five were of equal potency to the dosage of the final injection.

CASE 3.—In a series of studies on diuresis produced by mercurials injected intravenously, as previous publications have indicated, the methods included repeated and frequent electrocardiographic tracings. One study embraced the immediate effect of the mercurial injection on certain cardiodynamic records. One method of procedure included the immediate action of the drug on the electrocardiographic tracing, necessitating

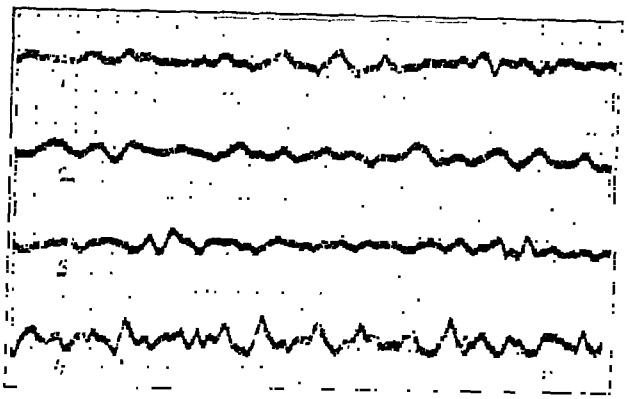


Fig. 3 (case 2).—Ventricular fibrillation about three minutes after intravenous injection.

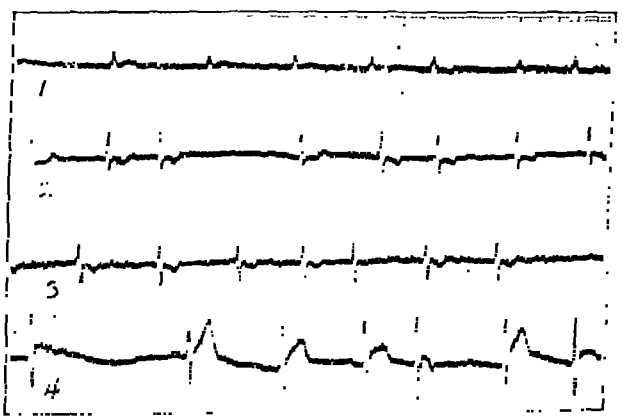


Fig. 4 (case 3).—Four lead electrocardiogram immediately before intravenous injection.

continuous attachment of the patient to the electrocardiograph through lead or derivation 2. This patient was number 76 in a series studied on this particular investigation and the injection was number 1438, many of which were injections on private patients, a few even injected in the office on ambulatory cardiac patients. This introduction to case 3 is given to indicate that we were prepared to take continuous tracings, which were done in the unfortunate case to be described, surprised and excited as we were at the disastrous episode.

A white woman aged 69 was admitted on March 12, 1940 with an examining room diagnosis of organic heart disease with decompensation. She gave a history of dyspnea, orthopnea, cough and edema of long duration. The dyspnea first appeared on exertion and subsequently became severe with pronounced nocturnal attacks. The past history revealed no evidence bearing on her present complaint, nor did an inventory of the various systems indicate any important additional complaint.

The patient was well preserved and weighed about 165 pounds (75 Kg.). She sat up in bed because of difficulty in breathing. The temperature was 97 F., the respiratory rate 44. She had a very irregular pulse of auricular fibrillation with a rate of 140 and a blood pressure determination of 160/110. The left heart border extended beyond the left anterior axillary line in the sixth intercostal space; the heart sounds were clear, with the irregular character of auricular fibrillation, very rapid, 125 per minute, with a systolic murmur at the apex. There was flatness at the right base, indicating fluid and congestive rales throughout the chest on both sides. The liver extended three fingerbreadths below the costal margin and was decidedly tender. There was an extensive edema of the lower extremities. The laboratory studies revealed on urinalysis a specific gravity of 1.020, albumin a trace, sugar a trace, epithelial casts and 1 to 5 pus cells per field. The nonprotein nitrogen was 3.1, creatinine was 2.3 and blood chlorides were 445 mg. per hundred cubic centimeters. The Kahn reaction was negative. Hemoglobin was 92 per cent. Red blood cells numbered 4,920,000 and white blood cells 11,600, with 76 per cent polymorphonuclears. The chest film revealed pronounced left ventricular enlargement and pulmonary congestion, with evidence of fluid in the right chest. The diagnosis was hypertensive and arteriosclerotic heart disease with pronounced hypertrophy and congestive heart failure. The patient was given 200 mg. of digitalis three times a day, ammonium chloride 2 Gm. three times a day, fluid restriction, and morphine and atropine for sedation.

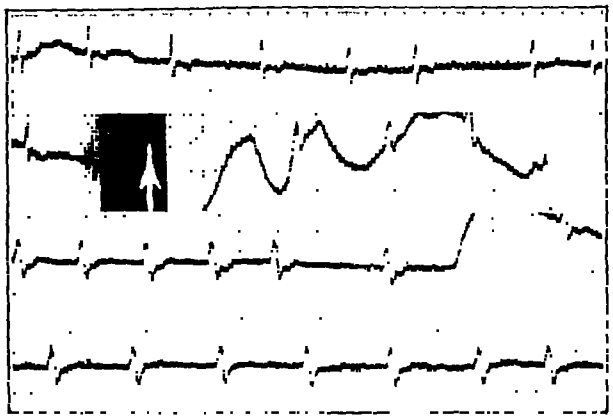


Fig. 5 (case 3).—Entire chart and all subsequent tracings are lead 2 derivation. The injection was made after the control tracing lead 2 in uppermost row. The arrow indicates the time of the intravenous injection. The machine was continuously connected to the patient and all the tracing represents a lead 2 connection. The text describes the sequence of events.

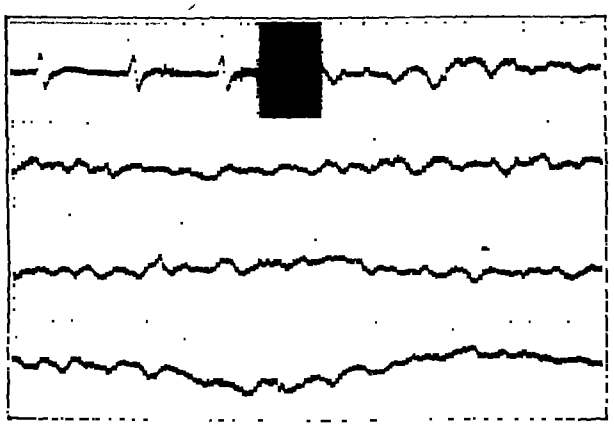


Fig. 6 (case 3).—Change to ventricular fibrillation.

On March 16 the heart and pulse rate had dropped appreciably, but the symptoms, chest signs of fluid, and the edema were not much improved. An injection of a mercurial was decided on to hasten improvement. The preliminary electrocardiographic four lead tracing and a tracing of lead 2 were taken before the mercurial diuretic Esidrone 2 cc. intravenously was given. The instrument was shut off for the injection and then turned on. Immediately on injection, which

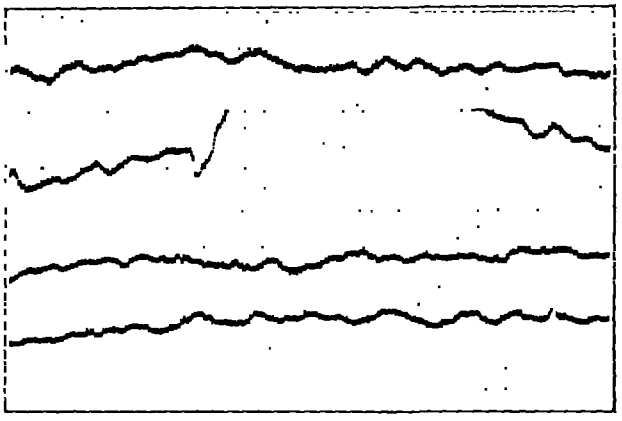


Fig. 7 (case 3).—Gradual weakening of cardiac ventricular action.

was rapid, the patient complained of chest pain, became acutely dyspneic, lost consciousness and moved excitedly in the bed. The instrument was still connected and throughout the entire episode was run on lead 2. There were a few short interruptions while the mechanical motor was being wound. The train of events can be described by a discussion of the electrocardiograms. Figure 4 is the four lead electrocardiogram with evidence of auricular fibrillation, an irregular ventricular rate of 80, low voltage R_1, almost isoelectric T_1, depressed ST interval in 2 and 3 with diphasic TS and S in 2 and 3. The influence of digitalis is accountable for most of this evidence. In figure 5 the first top tracing is the control lead 2 electrocardiogram. The tracings are all lead 2 derivations until the termination of the episode. Shortly after the beginning of the second tracing Esidrone 2 cc. was given intravenously, the instrument being turned off for the injection and then immediately started again; the patient began moving, accounting for the straying of the beam, but two things are immediately discernible: first, the ventricular complexes have changed their appearance, now having a duration of 0.15 second compared to 0.06 second, the ST junction has dropped 2 mm. and the

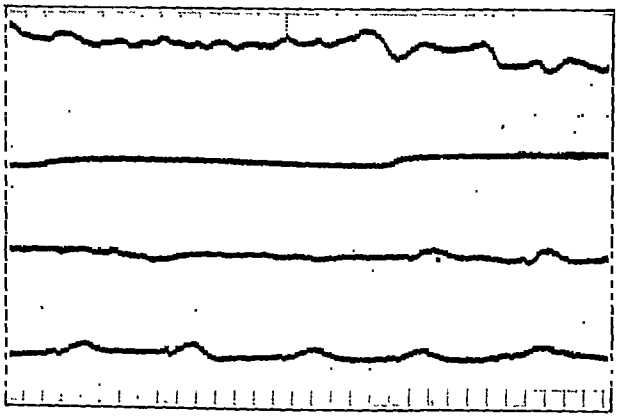


Fig. 8 (case 3).—Almost complete standstill except in bottom tracing, where the movements represent QRS complexes.

T is almost isoelectric. The QRS complexes are more equally spaced at first, 0.64 second, then gradually extending to 0.84 second, until in figure 6 in the first tracing there is a change to ventricular fibrillation, which continues throughout all lead 2 tracings on this chart, with figure 7 indicating a gradual weakening of the cardiac ventricular action and almost heart

standstill in figure 8, until the bottom tracing, when some type of rhythmic activity is noted. This action occurs at 1.2 seconds approximately fifty times a minute. These represent QRS complexes; in figure 9 the deflections succeeding these small QRS movements are T deflections. In figure 10 these small deflections appear rhythmically closer at 0.56 second intervals, gradually subsiding, so that in the first tracing of figure 11 there is cardiac standstill. An injection (at *A*) into the heart of

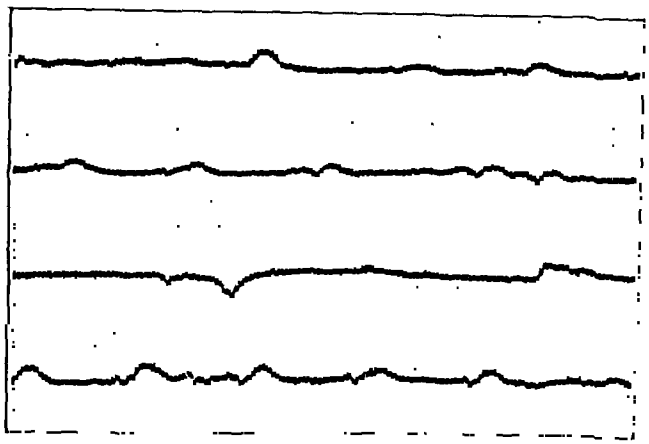


Fig. 9 (case 3).—QRS movements are followed by T deflections.

1 cc. of 1:1,000 epinephrine was followed for twenty-eight seconds with no evidence of cardiac activity in the tracing. The second tracing in figure 11 was a continuation of the twenty-eight second tracing and shows a ventricular impulse followed by a 6.26 second cardiac standstill, then seven similar S deflections with a sudden reversal to upright R complexes with gross notching, each having a duration of approximately 0.2 second. The bidirectional variation of the ventricular complexes does not alter to any significant degree the individual contours. The intraventricular conduction deformity persists. This continues through the first tracing of figure 12 and the initial portion of tracing 2, when cardiac standstill of 1.8 seconds occurs, followed by a single ventricular extrasystole. These upright ventricular complexes are rhythmic, occurring at 0.6 second intervals. They can be interpreted as evidence of a slow ventricular rhythm similar in form to a ventricular

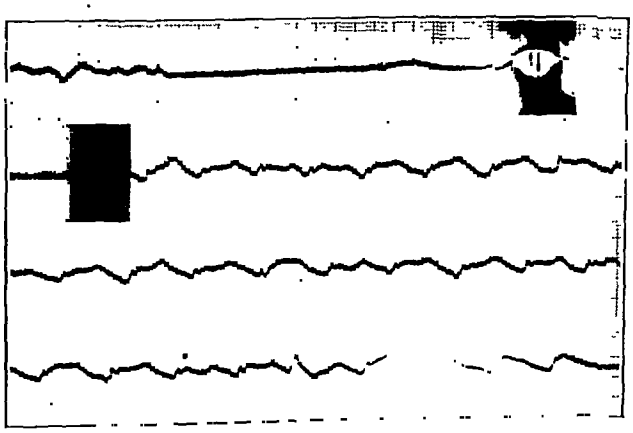


Fig. 10 (case 3).—The small deflections gradually subside.

tachycardia or flutter or parasystole at a rate of 100 impulses per minute. The contour changes again in the third strip, with gradual weakening in figure 13 with long periods of cardiac standstill. The last line of the tracing in chart 10 was continued for fifty-eight seconds and the patient was pronounced dead.

COMMENT

In the review of the clinical reports published it must be noted that many of the deaths occurred in individuals who had received several to many injections of the drugs intravenously. No deaths were found following intramuscular injections, similar to the findings in our first 2 cases. The deaths occurred more frequently when the larger doses were employed. The drugs are dispensed in a 10 per cent solution, 1 cc. giving 100 mg., containing from 35 to 43 mg. of mercury in the different drugs. Thus twice the amount of mercury is used in the larger doses.

Several observers have published electrocardiographic evidence in the experimental observations. Barker, Lindberg and Thomas reveal in detail the changes appearing in the experimental electrocardiogram. The tracings which we demonstrate are the only ones which we have been able to find in the published reports of the sudden deaths.

Experimental evidence does not support the view that sensitization is the mechanism whereby the "shock" dose produces death. Dr. Macht [14] attributes the sudden death after intravenous injection to intravascular clotting. This point of view would emphasize the contributory factor of increased clotting property produced by digitalis when digitalis is being used. Thus Dr. Macht suggests the use of an anticoagulant such as heparin prior to the intravenous use of the mercurial diuretic.

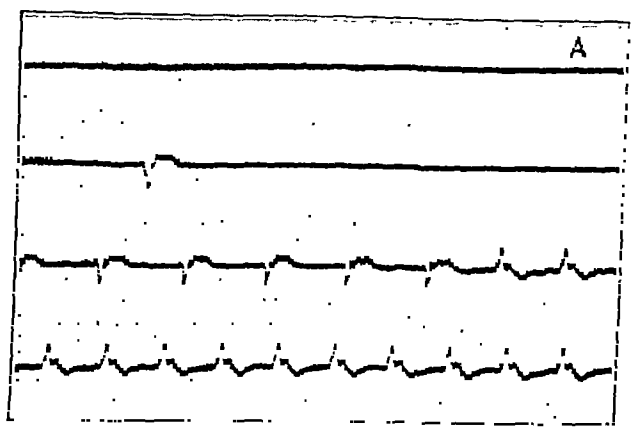


Fig. 11 (case 3).—Cardiac standstill, injection (at *A*) of epinephrine 1 cc., ventricular impulse in second tracing, S deflections in third, followed by reversal to upright R complexes.

Most clinical and experimental evidence points to the direct action on the heart by the mercury ion. Where intraventricular conduction deformities are so constant in the experimental evidence any degree of block should be carefully studied before using the intravenous route of administration. A more careful attitude to the weight: dosage ratio should be observed and the large doses in the small patient probably should not be employed.

It is impossible at the present time to predict which particular injection carries the danger of sudden death. There is no evidence that dilution, slow rate of injection or smaller dosage or prior atropinization will prevent the fatalities. No reports of sudden death have been found from deep intramuscular injection or the rectal or oral use of these substances, although focal abscess at the site of the injection has been experienced and gastrointestinal complications have been met. The other objections to oral, intramuscular or rectal use of the organic mercurials are well established in addition to the more frequent unsatisfactory diuretic results when compared to the intravenous injections.

14. Macht, D. I.: Personal communication to the authors, May 10, 1944.

SUMMARY AND CONCLUSIONS

1. Three patients died suddenly after intravenous injection of a mercurial diuretic. One patient received mercupurin and two Esidrone.

2. Each of the 3 patients received the dose of 2 cc., representing 200 mg. of the drug and 78 mg. and 66 mg. and 86 mg. respectively of the mercury.

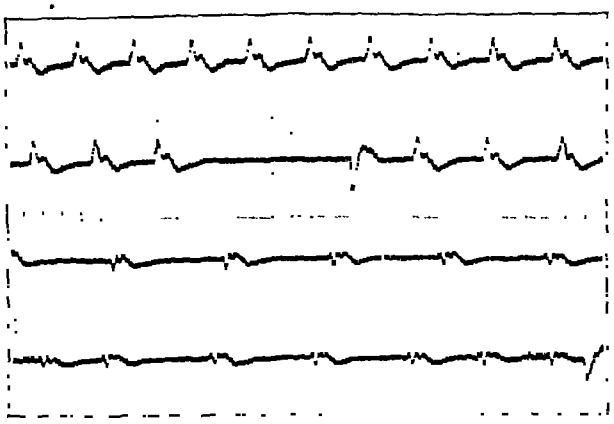


Fig. 12.—Cardiac standstill of 1.8 seconds in second tracing followed by a single ventricular extrasystole. Upright ventricular complexes, the contour changing in the third strip.

3. Two patients had received prior injections of the mercurial diuretics before the fatal episode. There were no reactions to these prior injections.

4. Electrocardiographic studies are available in 2 patients with tracings shortly before and during the reactions.

5. Both patients showed the development of ventricular fibrillation following the drug.

6. In 1 patient an almost continuous electrocardiogram was obtained with lead connection 2 attached. The resulting electrocardiogram showed changes very similar to the experimental electrocardiogram reported

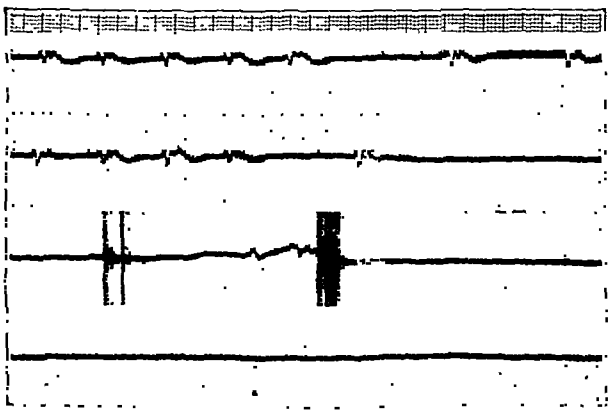


Fig. 13 (case 3).—Gradual weakening, with periods of cardiac standstill.

in the anesthetized dog, such as the changes in the ST junction and the ST interval, the intraventricular conduction deformity and changes in the T waves.

7. Ventricular tachycardia did not occur in the patient with the continuous tracing, although ventricular rhythm of a bidirectional character was noted.

8. Ventricular complexes were resumed after cardiac standstill by intracardiac injection of epinephrine.

9. Intravenous injection of mercurials should not be discontinued, but the realization of danger of their use must be ever present. This is in addition to four such possible other dangers as the dehydration syndrome, the depletion of chlorides, the disturbance of the electrolytic balance and the sudden mobilization of large amounts of digitalis from the edema fluid.

10. The disadvantages of the other avenues of administration should be weighed against the danger of sudden death from intravenous use.

ABSTRACT OF DISCUSSION

DR. JOHN W. SCOTT, Lexington, Ky.: What Dr. Volini and his associates have described is not unrelated to the shock often seen in these patients twelve to twenty-four hours after the injection of the drug. I have had an interesting experience with patients who had suffered such shock to an extent that 1 patient was unwilling to continue the drug. There were 3 of these, all in the seventh decade, 2 with rheumatic heart disease, mitral stenosis and auricular fibrillation, the third with thyrotoxic heart disease and coronary sclerosis. A lyophilized vitamin B preparation, recently introduced, was dissolved in 2 cc. of mercupurin. This immediately yields a crystal clear solution. Given intravenously, diuresis was unimpaired; there were no untoward symptoms. There was freedom in 2 of the patients from the shock which had been disturbing. In the third, distressing muscle cramps, which regularly occurred the night following the injection, were abolished. This method has been used fifty or sixty times on the 3 patients with not a single unfavorable occurrence. It is planned to use some of the components of the B complex singly in order to determine whether one or more than one is responsible for this effect. The action of the diuretic thus modified is more smooth and no less effective.

DR. ITALO F. VOLINI, Chicago: The distinction should be made between speed shock and the collapse or exhaustion subsequent to the injection, as indicated in the twenty-four hour period following an injection. Poll and Stern have indicated that many persons suffer from considerable chloride depletion. This can be combated by giving the patient chlorides. Usually the ammonium chloride which is administered will maintain the chloride balance up to the level that is desired. Of course, most of these patients are seriously ill and many things can happen. Some of them develop vasospastic or even organic encephalopathies; following the injection many of them become quite exhausted. It favors thrombosis. Some even, as attention is called to this in the literature, develop symptoms of renal insufficiency with the development of uremia. One has to be careful in the prediction of prevention of symptoms of shock and define what is meant by shock before one can state that any type of therapy will prevent such a mechanism. In speed shock in the experimental animal the signs of anaphylaxis are frequently found. One finds the evidence of incoagulability of the blood.

Neurotic Conflict Between the Individual and Society.—With its fondness for cults, the world in the past few decades has reared temples to the gods of the normal. The cult of normalcy has gathered about itself priests and prophets who loudly exhort all who would be saved to worship at the shrine of perfection. Apostles swarm the land and invoke the spirits of science in their zeal to bring balm to those unfortunate souls who cannot fit into the Procrustean bed of their own making. Mental hygiene and physical hygiene and spiritual hygiene and political hygiene and a host of other kinds of hygiene are fervently broadcast and foretell the coming of the millennium. The great gods have proclaimed it: all shall be of one measure, all shall be normal. All conflict shall cease, and the soul shall be at peace with itself and the world. Mirabile dictu. —Wechsler, I. S.: The Neurologist's Point of View, New York, L. B. Fischer, 1945.

ADMINISTRATION OF PENICILLIN BY RECTAL SUPPOSITORY

PRELIMINARY NOTE

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ERNA ALTURE-WERBER, PH.D.
AND
PHILIP ROSENBLATT, M.D.
BROOKLYN

Many investigations are being pursued in an effort to circumvent the parenteral administration of penicillin. Several reports [1] indicate the feasibility of oral administration by elimination of the destructive action of hydrochloric acid in the stomach. In general, it requires a fivefold increase in dosage to achieve penicillin serum assays comparable to that obtained by intramuscular injection. The conjoint use of retarding agents has in some measure prolonged the effects of the individual dose.

The rectal administration of penicillin has not been attempted, probably because of the assumption that the presence of the penicillinase-producing colon group of organisms might serve as an impenetrable barrier. Despite our own misgivings in this direction, experiments were undertaken to explore the possibilities of rectal administration because of its simplicity, the wide latitude in the selection of adjuvants and the obvious clinical advantages. Probatory results have been so promising as to merit this preliminary report.

Varying amounts of the sodium salt of penicillin [2] were incorporated by hand in a simple cocoa butter base. Suppositories were inserted rectally without any previous preparation in hospitalized in-bed patients, selected at random, and in healthy ambulatory volunteers. The 14 subjects were instructed to retain the suppository, which caused little, if any, momentary discomfort. Blood samples were withdrawn hourly for twelve hours and after twenty-four hours for penicillin assays.[3]

The results following a single dose penicillin suppository are presented in the table. Appreciable penicillin blood titers were obtained in 12 out of 14 instances. Effective levels were found after twenty-four hours in 2 instances and for four to twelve hours in an additional 7 subjects.

Correlation between dosage and penicillin levels was not entirely consistent in this limited experience with crude material. Maximum levels up to 0.768 Oxford unit per cubic centimeter of serum were obtained with the million Oxford unit dosage. Prolonged minimum levels of 0.012 Oxford unit per cubic centimeter were observed with all dosages employed. In interpreting the results and establishing subsequent procedure it is noteworthy that the five most unsatisfactory results—including the two blanks—all occurred in the ambulatory volunteers. The most sustained effects were noted in hospitalized recumbent patients.

Work is in progress to revise the technic of administration, including the preliminary preparation, the adoption of an ideal retarding base and the use of other salts of penicillin, in order to achieve optimum results.

Penicillin Blood Levels—Oxford Units

No.	Case		Dosage, Million Oxford Units	Hours 1	2	3	4	5	6	7	8	9	10	11	12	24
1	L. L.	A*	1.0	0.768	0.144	0.196	0.048	0.048	0.048	0.048	0	0	0	0	0	0
2	H. L.	R†	1.0	0.192	0.024	0.012	0.012	0.012	0.012	0.012	0	0	0	0	0	0
3	M. L.	R	1.0	0.384	0.192	0.048	0.024	0	0	0	0	0	0	0	0	0
4	A. K.	R	0.5	0.048	0.096	0.024	0.024	0.012	0.012	0.012	0.009	0.012	0	0	0.012	0
5	C. G.	R	0.5	0.048	0.048	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0	0	0	0.012
6	L. D.	R	0.5	0.096	0	0	0	0	0	0	0	0	0.012	0.048	0.032	0.016
7	V. W.	A	0.5	0.192	0.024	0.012	0.012	0.012	0.012	0	0	0	0	0	0	0
8	E. M.	A	0.5	0.128	0.036	0	0	0	0	0	0	0	0	0	0	0
9	E. B.	A	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
10	M. M.	R	0.3	0.012	0.384	0.096	0.024	0.024	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0
11	R. R.	R	0.3	0.030	0.015	0.030	0.015	0.040	0.015	0.015	0	0	0	0	0	0
12	F. K.	A	0.3	0.128	0.032	0	0	0	0	0	0	0	0	0	0	0
13	E. R.	A	0.3	0.012	0.012	0	0	0	0	0	0	0	0	0	0	0
14	M. K.	A	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0

* A indicates ambulatory healthy volunteers. † R indicates recumbent hospital in-bed patients selected at random.

The sustained minimum serum titers of 0.012 Oxford unit per cubic centimeter are effective against the gonococcus, pneumococcus and hemolytic streptococcus. Clinical trials in patients with gonorrhea, pneumonia and tonsillitis are projected.

SUMMARY AND CONCLUSIONS

Prolonged, effective penicillin blood levels have been obtained following the administration of penicillin by rectal suppository.

177 New York Avenue, Brooklyn 16.

Aided by grants from friends of the Hospital and the Dazian Foundation for Medical Research.

From the Department of Medicine and the Department of Laboratories, Jewish Hospital of Brooklyn.

1. Libby, R. L.: The Oral Administration of Penicillin in Oil, Science **101**: 178, 1945. MacDermott, W.; Bunn, P. A.; Benoit, M.; DuBois, R., and Haynes, W.: Oral Penicillin, Science **101**: 228, 1945. György, P.; Vandegrift, H. N.; Elias, W.; Colio, L. G.; Barry, F. M., and Pilcher, J. D.: Administration of Penicillin by Mouth, J. A. M. A. **127**: 639 (March 17) 1945. Little, C. J. H., and Lumb, G.: Penicillin by Mouth, Lancet **1**: 203, 1945.

2. Mr. John L. Smith of Chas. Pfizer & Company, Inc., supplied the penicillin used in this study.

3. Rosenblatt, P.; Alture-Werber, E.; Kashdan, F., and Loewe, L.: A Method for the Determination of Penicillin Levels in Body Fluids, J. Bact. **48**: 599, 1944.

Leprosy in China.—Leprosy is widespread over China, from Manchuria in the north to Kwangtung and Hainan Island in the south and from the province of Chekiang on the east to that of Sinkiang on the west. It is estimated that more than a fourth of the world's 4,000,000 lepers are found in China. At least half of the people of China live in areas in which leprosy occurs. Hospitals and facilities for the treatment of lepers are entirely inadequate. In 1937 only twenty-seven leprosariums, with 4,050 beds, were operating in China.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

THE Rh FACTOR AND THE PUBLIC HEALTH LABORATORY

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ANNA I. VAN SAUN
Director

AND

EVELYN L. BROWN. B.A.

PATERSON, N. J.

At first glance it would seem that the usefulness of the public health laboratory for Rh factor determinations might be open to question. Certainly it would not have occurred to us to enter a field which up to very recently was rather preempted by hospital laboratories and very few of those.

Our entrance into this somewhat unusual field was due to a request from the Maternal Welfare Committee of the Passaic County Medical Society. One of our largest hospitals was not ready to take on the added burden of Rh determinations for its blood bank and it was suggested that we do this work for them. It was also suggested that, since we received a very large number of specimens for premarital and antepartum Wassermann tests, we should perform Rh determinations on these specimens. Accordingly, after a preliminary period of study we began this work as a routine in June 1944. Blood grouping was also added, since marital blood incompatibility sometimes is due to a difference in blood groups too.

Nearly 3,000 blood specimens have been tested, the great majority of them ante partum. We soon found that there simply was not enough testing serum to include premarital specimens and but 616 of these were tested, of which 12 per cent were Rh negative.

Approximately 15 per cent of the specimens received from antepartum sources were Rh negative. All Rh negative specimens were retested with at least three different serums secured from different sources, and those giving anomalous results were checked by Dr. Philip Levine in his laboratories at Linden, N. J. We feel that checking negatives with several serums is of the highest importance.

We also request a specimen of blood from the husband of each Rh negative woman. The obstetrician secures this for us. Thus far each husband has been cooperative with the exception of 2, who could not see that they had anything to do with it! Of 98 husbands tested, 80 were Rh positive and 14 were Rh negative. The husbands of 4 Rh positive women were Rh negative. Prospects for an Rh negative woman to secure an Rh negative husband are not very brilliant, it would seem. No doubt many more Rh negative husbands would have been noted had all husbands of our antepartum patients been tested.

Of 749 specimens which have been tested for the hospital blood bank 14 per cent were Rh negative, thus forming a nucleus for the hospital's Rh negative donor's club.

The county medical society receives a copy of all our Rh negative results with name and address of the patient. This looks to the formation of a County Rh negative Donor's Club. Of course many of the antepartum patients could not at present be used as donors, but on the other hand the list of usable donors grows.

Seven cases of erythroblastosis have come to our attention through this work. All of the mothers were Rh negative with one exception. All of the fathers were Rh positive. All the babies were Rh positive. The one exception to the Rh negative mothers could not be explained. Father, mother and baby were Rh positive, though the infant was definitely erythroblastotic. Three of the babies lived, as the result of appropriate treatment with transfusions of Rh negative blood. The child of the Rh positive parents died.

But one mother of an erythroblastotic infant developed any appreciable amount of agglutinin.

The members of the Passaic County Medical Society, especially the obstetricians, are well satisfied with the results of our experiment and apparently wish it to be continued.

From the Division of Laboratories, Board of Health, Paterson, N. J. Assistance and suggestions were received from Dr. Alexander Wiener of New York, Dr. Philip Levine of Linden, N. J., and Dr. Theodore Graham and other cooperating members of the Passaic County Medical Society.

Clinical Notes, Suggestions and New Instruments

LOW TEMPERATURE THERAPY FOR PRESERVATION OF LIMBS

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There has recently appeared in the literature an article[1] in which refrigeration anesthesia in surgery is discussed from both the experimental and the clinical point of view. The character of this work on the whole is of such high grade that if all of the author's conclusions are accepted without question or challenge it will cause an unnecessary delay in the application of a therapeutic measure that has proved itself beyond any doubt to be of great value in surgery of the extremities. In the body of the paper the statement is made that "cooling per se does not seem to have a beneficial effect on an inflammatory process. While the infected part is cooled there is an inhibition not only of bacterial growth and toxin production but also of the normal tissue response. Release from the cooling may aggravate the eventual inflammatory response." In the summary the further statement is made that "it was hoped that refrigeration might enable us to preserve the vitality of many limbs suffering from those afflictions which would ordinarily have to be sacrificed. Bacterial growth is retarded by refrigeration, but so also is the tissue response to inflammation, and on the release of the cooling the inflammatory reaction may be even aggravated."

The experience that has been acquired at City Hospital with the use of low temperature treatment, as introduced and originated by Drs. Frederick M. Allen and L. W. Crossman,[2] is so contrary to the assumptions and to the theoretical conclusions that have been drawn by Dr. Richards that the following case is presented:

REPORT OF CASE

Mrs. H. P., aged 57, admitted to the medical service of Dr. A. B. Cannon at the City Hospital on April 18, 1943, had been suffering from a chronic osteoarthritis of the right knee

From the surgical department, City Hospital.

1. Richards, V.: Refrigeration Anesthesia in Surgery, Ann. Surg. **119**: 178, 1944.

2. Allen, F. M.: Reduced Temperatures in Surgery. Am. J. Surg. **52**: 225, 1941. Crossman, L. W.; Ruggiero, W. F.; Hurley, V., and Allen, F. M.: Reduced Temperatures in Surgery: Amputation for Peripheral Vascular Disease, Arch. Surg. **44**: 139 (Jan.) 1942.

for the past four years. Her family history was negative. About six weeks before her admission to the hospital she warmed her feet near an oven and on the next day she noticed a blister on her left knee. A few days later this blister opened spontaneously and discharged a yellow watery fluid. Shortly thereafter the skin on the anterior surface of the leg became red, macerated and excoriated. Examination at the time of admission showed that the skin on the anterior surface of the left leg was red, edematous and macerated. There were irregular patches of necrotic tissue throughout this area. The patient was put on sulfadiazine therapy. On April 25 an urticarial rash developed on the forearms and on the face. This was associated with pruritus and was diagnosed as a drug rash. The chemotherapy was discontinued. In the meantime, in spite of the sulfadiazine treatment, the local condition had become much worse. The necrotic tissue had increased in extent and the adjacent inflamed tissue had become widely undermined and was bathed in pus. Treatment with zinc peroxide was now instituted. During all this time the temperature of the patient was septic.

On May 3 the attending physician advised a midthigh amputation as a life saving remedy and requested surgical consultation. At this time, as surgical consultant, I noted that the patient had an extensive necrotic suppurative cellulitis of the right foot and leg. There was complete absence of cutaneous tissue on the anterior aspect of the leg extending from the junction of the upper and second quarters above to the junction of the third and fourth quarters below. This area extended inward to the posterior aspect of the limb. The tissue external to this area was gangrenous in the lower half of the leg and spottily gangrenous in its upper half. The remaining skin was extensively undermined in all directions. The entire inflamed area was covered by a very foul smelling exudate. The tissues above the infected area extending into the thigh were very edematous. In answer to the question of therapy, an amputation through the thigh would be synonymous with cutting through highly infected tissues resulting either in local stump gangrene or probably general sepsis. For this reason I considered amputation at this time contraindicated. The choice appeared to be between chemotherapy and low temperature treatment. The patient had had chemotherapy while in the medical ward, but the infection continued to spread. For this reason an attempt was to be made to treat the condition with refrigeration. The prognosis was grave. The patient was transferred to the surgical ward and the treatment was instituted.

May 8, twenty-four hours after the application of the treatment, the body temperature had been normal and the odor of the discharges was now entirely gone. There had been a definite regression of the cellulitis, and the general condition of the patient was considerably better.

May 12, for the past twenty-four hours the extremity had been in the air chamber (in this apparatus the temperature of the limb can be kept at the required low level and the uncovered limb can be observed at all times and all changes can be noted). On inspection this morning the air chamber was found to be operating imperfectly, so that the required low temperature had not been maintained. The temperatures in the air chamber and in the room were the same. The limb this morning showed a pronounced reactivation of the infection and was hot to the touch. The patient felt considerable pain in the limb and her body temperature had risen to 102 F. The limb was to be placed back into the refrigeration blanket.

May 14 the acute character of the infection noted previously appeared to be under control, and the body temperature was normal this morning.

June 1 the refrigeration treatment had been discontinued forty-eight hours before in order to determine the natural status of the limb without treatment. This was followed by a recurrence of the active inflammation. Gangrene had developed in the three outer toes, and the general body temperature had risen to 102.2 F. We could not tell whether the infection had been fully controlled, and treatment was stopped as a test measure. The treatment was to be resumed and as soon as the infection was under control a midthigh amputation was to be done. It appeared that the virulence of the infection was so intense that it was controlled only during the exposure of the limb to the low temperature and recurred as soon as the normal room temperature obtained. For this reason it was felt that the proper procedure would be to obtain control of the infection and to amputate when that time had been reached.

June 7 it was observed that since resumption of the refrigeration treatment the body temperature had been normal. The general condition of the patient was now satisfactory and the local condition had improved very perceptibly. The gangrenous areas on the toes were beginning to separate. The other gangrenous areas on the limb were also beginning to separate, and the inflammation of the surounding skin had subsided to a considerable extent. If this improvement continued, it was felt that very possibly an amputation might be avoided and that the limb might be saved. The treatment was to be continued with this in view.

June 21 the foot was still covered with an extensive necrotic slough extending from all the toes half way up the dorsal and plantar surfaces. The two outer toes were completely necrotic. The other toes appeared viable and could be made to move voluntarily. The ulcerated areas of the leg and thigh were clean and were beginning to show small areas of newly formed islets of epithelium. The results so far were really remarkable and could be laid to the door of the continuous refrigeration treatment.

By July 28 the patient's right lower extremity had been exposed to refrigeration therapy for eighty-nine days continuously. With the exception of a small superficial slough on the inner aspect of the big toe and a slightly larger dry slough on the inner aspect of the ankle, the limb showed a complete absence of inflammation. The ulcerated areas were clean and were lined with abundant healthy granulations. Islands of new epithelium were scattered throughout the granulation tissue and new epithelium was growing in from the outer edges of the ulcerated areas.

In view of the unexpected reparative progress that the patient had made, it was decided to discontinue the refrigeration treatment, because it now seemed to be perfectly safe to do so without any fear of a lighting up of the infection. From now on to the time of her discharge from the hospital, healing progressed rapidly and the ulcerated areas, for which skin grafting had been planned when the infection had cleared up, showed such rapid epithelization that this procedure was held in abeyance until the full effect of the spontaneous healing could be seen.

On June 2, 1944 all the ulcerated areas were completely covered with newly formed epithelium. The heel was now also completely healed. The patient had an osteomyelitis of the tip of the heel with sequestrum formation. This was treated expectantly. The dead bone was extruded spontaneously, granulation tissue grew over the exposed bone and new epithelium in turn grew over the granulations. On October 16 the patient was transferred to the municipal hospital for chronic diseases for the treatment of her osteoarthritis.

COMMENT

This case report is published because it is, as far as I know, one in which refrigeration or low temperature treatment was employed for the longest period of time on record, with the successful preservation of a limb that under ordinary circumstances would have been amputated. It also shows the necessity of continuing with the treatment until the infection is fully and completely overcome.

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Special Articles

The Committee on Standards of the Scientific Advisory Committee of the National Foundation for Infantile Paralysis recently reported to the Advisory Committee the results of a study made on the evaluation of different methods of treatment on the after-effects of poliomyelitis. The report is published in THE JOURNAL *with a view to indicating to physicians who are responsible for the care of such patients the standards that should prevail in drawing conclusions as to the results accomplished.*—ED.

EVALUATION OF THE RESULTS OF TREATMENT IN INFANTILE PARALYSIS

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In taking note of its assignment to set up standards by which to evaluate the end results of the different methods of treatment of the after-effects of poliomyelitis, the Committee first made an effort to define the boundaries of its task.

In the present state of our understanding of poliomyelitis the uncertainty of diagnosis is well recognized, and it is a matter of common knowledge that any large series of cases, whether they were gathered during an epidemic or in interepidemic times, may reasonably be supposed to include examples of other diseases. The first requisite of evaluation, then, accuracy of diagnosis, is approachable but not ideally attainable.

A second requisite for the fair comparison of two forms of treatment is equal sampling of cases. In this respect poliomyelitis affords unusual difficulty. The expression of the infection varies in any epidemic from negligible or even undetectable symptoms in one patient to a rapidly fatal issue in another. A patient who is totally incapacitated at the height of his infection may recover so rapidly that within a few weeks no appreciable residuum persists. Injustice is done when one investigator, including in his series a number of early cases, claims credit for his results when compared with those of another investigator whose series comprises only cases showing residual paralysis two weeks or more after onset. In selecting clinical material for the evaluation of many of the manifestations of poliomyelitis it appears necessary to include, in both the study and the control groups, cases of all types—not only those with residual paralysis or deformity, but also those in which no muscle weakness is detected.

Another aspect of the problem of sampling has to do with controls. If a particular method of treatment has received favorable notice in the public press and in radio broadcasts, failure to apply this method may arouse vigorous protest from patients or their parents. It then becomes difficult, if not impossible, to explore new methods by impartial comparison even though, in the light of our present knowledge, the variability in residual after-effects is governed to a greater extent by such factors as the age of the patient, the inherent character of the epidemic and other imponderables than by any therapeutic agent or practice which has thus far been put into our hands. Consequently, many of the claims advanced for the value of this or that therapeutic agent actually rest on evidence which fails to pass impartial examination.

On this question of controls, then, the Committee desires to put itself on record as being strongly in favor of the adoption in the field of the alternate case method, particularly the alternate paired case method, with age, severity of the attack and extent of paralysis being taken into account whenever any method of treatment is to be appraised.

A broad concept of the evaluation of therapeutics in poliomyelitis must take account of all the sequels—physical, psychic and social—and treatment should be directed at all of these disorders; but, for comparison of the effects of different forms of treatment, paralysis and deformities are selected for study because they are subject to objective measurement. The Committee strongly urges that an objective assessment of muscle strength be obtained in each case studied at the earliest period in the course of the disease at which such an examination can be carried out with reliable accuracy and without detriment to the patient.

The Committee recognizes the desirability of attaining quantitative measurement in the setting up of standards. The problem, however, is not a simple one. The use of any dynamometer, even of a relatively simple device like Lovett's spring balance, demands cooperation from the patient, implies a constancy of the patient's attention and effort which is not always attainable, and is believed to be beyond the range of technical competence of all except those who have devoted considerable time to the actual application of such apparatus, whether they be technicians or physicians. Moreover, satisfactory standards of reference for different muscles at different patient ages and for different patient backgrounds in relation to nutrition, innate muscle strength, previous illness and so on are not available, and the error involved in the use of the contralateral member in the individual patient is only too obvious. While fully recognizing the desirability of perfecting methods of quantitative measurement of muscle function as a research project, the Committee believes that broad application of some such method as the spring balance technic will cloud the issue by implying an accuracy which does not exist.

It is therefore recommended that emphasis be placed on standardization of a scheme of muscle evaluation which can be widely applied by adequately trained physical therapy technicians, by orthopedists or by any physician willing to take the necessary training in the technic of the test. For the purpose of recording residual paralysis, common usage has demonstrated the resistance tests with and against gravity to be the most practicable. There is unanimity of use but diversity of nomenclature. The following terms are recommended as a standard to produce uniformity, and the following symbols are advised as a standard unit expression of muscle strength:

5 = N = Normal	= No apparent deficiency.
4 = G = Good	= Approximates normal but fatigues more readily.
3 = F = Fair	= Where part can perform function against gravity but is definitely weak.
2 = P = Poor	= Where muscle is so weakened that it cannot perform its function against gravity but with removal of gravity can function.
1 = T = Trace	= Where there is slight contractility of the muscle.
0 = O = Zero	= No evidence of contractility of muscle fibers.

Of these alternative symbols, the ciphers are held preferable to the initial letters for purposes of record because they are less subject to error in reading if the records are to be pooled for analysis.

The Committee has examined a number of record forms, or so-called muscle charts, in current use in different parts of the country and is still working on the design of a form which combines the advantages of all those studied. When this is completed, which is expected in the near future, the Committee proposes to submit its record form to the Committee on Publications with the recommendation that copies be made available for distribution through the Foundation. In this way it is believed that active interest in objective evaluation of the patient's status will be fostered and that comparison of groups of patients treated by different methods will be greatly facilitated.

The Committee gave some thought to that portion of its assignment which might be held to include the devising of new methods and technics of assessment of the status of a patient who exhibits some of the aftereffects of poliomyelitis. It was generally agreed that so-called "stimulation of research" on the part of committees is liable to be sterile, that the needs are well recognized by all competent investigators in the field, and that it rests in the nature of things that in the course of time, as new methods of mensuration become available, these will be tested out experimentally on patients with poliomyelitis with a view to their more general application. As a matter of record, the accompanying list is appended of various methods of assay which deserve further consideration in any intensive effort directed at improving the evaluation of a patient's status:

Methods of Assay

Loss of normal neuromuscular function	Electromyogram Chronaxia Response to measured intensity and frequency of sinusoidal current Response to galvanic and faradic stimulation
Incompetence of specific muscles	Vital capacity measurement (intercostals) Fluoroscopic evaluation of respiration (diaphragm) Cystometric measurement (disturbance of bladder function)
Atrophy of muscle	Volumetric measurement by oncometer Soft tissue roentgenograms Photography against a measured grid background
Atrophy of bone	Roentgenographic mensuration of length and thickness Roentgenographic measurement of density of calcification Photography
Emotional status with respect to the disease	Psychiatric evaluation

From a historical point of view, most of the contentions over the relative effectiveness of one or another mode of therapy have dealt with the manifestations evident at a comparatively late stage of viral invasion, at a time when the infectious agent either is firmly established or has already inflicted irreparable damage, whereas there is no argument whatever over the disappointing results of all efforts to kill the virus within the host or by artificial means to neutralize its attack. When a practicable and truly effective virucide at last becomes available to clinical medicine, as we may confidently hope will come to pass, then all efforts to set up standards for the evaluation of treatment of aftereffects may be expected to lose their point. With sulfadiazine and penicillin in the current armamentarium for the treatment of pneumococcic pneumonia one no longer hears any debate over the value of digitalis or whisky for patients with lobar consolidation.

THE COORDINATION OF MEDICAL AND BLUE CROSS PLANS

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Voluntary prepayment plans are making a worthwhile contribution to health security and have important potentialities. Beginning in 1932 hospital service plans have developed to the point where there are seventy-eight of such plans in the United States, with an enrolment of over 16,000,000 persons. Before the end of the year it is likely that plans will exist in all states. At the present time in three states over 30 per cent of the population of the state is enrolled and in seven states between 20 and 30 per cent of the population are enrolled. In a number of urban centers—Cleveland, Ohio, Rochester, N. Y., Rockford, Ill.—to name a few, over 50 per cent of the population belong to the hospital service plan.

At the present time there are in operation nineteen medical service plans sponsored by local and state medical societies. These plans have a total enrolment of over 1,800,000. New plans are rapidly being organized in every section of the country, and enrolment in already existing plans is beginning to increase rapidly. Thus far almost all the medical service plans are limited to surgical and obstetric service, and, when these are not provided by the hospital plan, to x-ray, laboratory and anesthesia service in connection with hospitalized cases. The proper actuarial basis for these limited services has been established or is being rapidly established. A workable pattern of administrative technics seems to be in process of crystallizing. In short, it looks as if medical service plans are at about the same stage of development as hospital plans were in 1936 or 1937 and that a rapid growth of these plans paralleling the development of hospital plans is to be expected.

One of the most important problems which must be solved if medical and hospital plans are to achieve their full potentialities is that of their proper coordination with each other. On this point there are offered the following observations based on a survey of prepayment plans which we have been conducting for the U. S. Public Health Service. In the course of that survey thirty-eight of the Blue Cross and all but two of the medical plans were visited.

RELATIONSHIPS BETWEEN MEDICAL AND HOSPITAL PLANS

In general, there are four types of relationships to be found between the medical and hospital plans.

A. *No coordination.* Each plan is separate and distinct and there is no coordination of their activities.

B. *Separate corporations, separate executive directors and to some extent separate administrative staffs.* Each plan performs certain functions for itself, notably approval of claims, payment of hospitals or physicians and maintenance of relations with hospitals or physicians. One plan contracts to perform certain other functions, usually enrolment, billing and record keeping, for the other, or there is joint control of these functions.

C. *Separate corporations and separate boards of directors but a single executive director with one administrative staff.* The medical plan is administered by the

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Blue Cross plan. The medical plan has no employees of its own; the two plans are separate only in their policy making bodies.

D. *One corporation.* One organization with a single board of directors offers both hospital and medical service.[1]

The accompanying table lists the present medical plans, shows their present membership, last year's growth, the ratio of medical plan members to Blue Cross plan members, the percentage of the population of the area enrolled in the medical plan, and the type of relationship with the Blue Cross plan or plans in its area.

The table shows that, of the nineteen plans,[2] two plans with a total of 308,000 members have arrangement A, no coordination with the Blue Cross plans in their area. California Physicians' Service has arrangement A with the Blue Cross plans in the northern part of the state and arrangement B with the Blue Cross plan in the southern part of the state. Arrangement B is held by three plans, Michigan, New Jersey and Pennsylvania, with a total of 822,000 members. Nine plans with a total membership of 327,000 have arrangement C and four plans with a membership of 135,000 have arrangement D. It is noteworthy that all the plans started in the last two years have either arrangement C or arrangement D.

The common goal of the Blue Cross and the voluntary medical plans should be to give protection against the costs of illness to as many people as possible. Which of the four possible relationships will facilitate the achievement of this goal most quickly and effectively?

Medical Service Plans: Year Started, Present Membership, 1944 Growth, Ratio of Members to Blue Cross Plan Members, Percentage of Population Covered and Type of Arrangement with Blue Cross Plan

Name of Plan	Area Served	Year Started	Membership 1/1/45	Growth in 1944	Ratio of Medical Plan Members to Blue Cross Plan Members	Percentage of Area's Population Covered	Type of Arrangement
Oregon Physicians' Service and affiliated county bureaus	Oregon	1929	108,000	1	257.0[3]	9.2	A
County Medical Service Bureaus	Washington	1933	200,000[2]	1	330.0[3]	10.5	A
California Physicians' Service	California	1939	130,000	40,000	56.0[3]	1.6	A-B
Medical and Surgical Care	Utica, N. Y.	1939	30,277	8,384	29.6	5.0	C
Michigan Medical Service	Michigan	1940	763,755	160,100	61.6	14.3	B
Western New York Medical Plan	Buffalo	1940	37,920	17,831	10.2	3.4	C
Medical Service Association[4]	North Carolina	1940	30,624	30,000	60.8	1.9	C
Hospital Care Association[4]	North Carolina	1943[4]	33,236				D
Medical Service Association of Pennsylvania	Western Pennsylvania	1940	22,000[2]	13,263	3.0[2]	0.6[2]	B
Hospital Savings Association	North Carolina	1941	63,717	24,346	27.3	1.95	D
United Medical Service	New York City	1942	77,412	39,851	4.4	0.9	C
Massachusettts Medical Service	Massachusetts	1942	75,770	53,604	7.9	1.9	C
Colorado Medical Service	Colorado	1942	45,136	34,516	16.6	4.2	C
Medical-Surgical Plan of New Jersey	New Jersey	1942	31,213	15,198	4.8	0.8	B
Group Hospital Service	Delaware	1943	36,326	24,318	37.4	13.3	D
Surgical Care, Inc.	Kansas City	1943	27,636	21,382	24.9	4.1	C
New Hampshire Physician Service	New Hampshire	1944	2,000[2]	2,000	6	6	C
Huntington Hospital Service	Huntington, W. Va.	1944	2,000[2]	2,000	6	6	D
Nebraska Surgical Plan	Nebraska	1944	500[2]	500	6	6	C

1. Not known; probably less than 15,000.
2. Approximate.
3. The Blue Cross plan in Washington has 60,000 members, that in Oregon 42,000. These are different persons than those enrolled in the medical plans, and the same is true of part of the enrolment in the California Blue Cross Plans. Elsewhere the members of the medical and Blue Cross plans are the same persons and the other figures in this column show the percentage of Blue Cross members who are enrolled in the medical plan.
4. Both plans are administered by Hospital Care Association. Membership is gradually being transferred from Medical Service Association to Hospital Care Association.
5. There are two statewide Blue Cross plans in North Carolina. Their medical plans have enrolled 3.8 per cent of the state's population.
6. Plan but recently started.

COMPARISON OF THE FOUR RELATIONSHIPS

A. This relationship leads to competition and conflict. In Washington and Oregon the county medical societies have long had their medical service bureaus offering complete medical care, including hospitalization, to employed persons. The hospitals were dissatisfied with these plans because they had no share in their control and because little progress in providing hospital care on a prepayment basis to all the people of the state was being made. Accordingly they started Blue Cross plans. In Washington and Oregon the medical plans and the Blue Cross plans were (when visited in January 1945) competing with each other, although there were elements on both sides who recognized the drawbacks of this situation and were endeavoring to find a basis for cooperation.

In northern California, California Physicians' Service and the Blue Cross plans formerly cooperated. That cooperation broke down and competition ensued. California Physicians' Service developed its own hospitalization, and the two Blue Cross plans developed their own surgical indemnity plans.[3]

In short, arrangement A is thoroughly bad. The medical plan is forced in self defense to develop its own hospitalization insurance, and the hospital plan must offer surgical coverage. Hence the situation develops into two plans, one sponsored by the medical profession and the other by the hospitals, competing with each other. Competition is a good American institution in its place. However, these plans are really nonprofit community services. Prestige and public support are attracted to them because they are sponsored by the medical profession and the hospitals. When the plans compete with each other that prestige and

1. These relationships are discussed by Mr. Lester H. Perry in an article entitled The Coordination of Medical and Blue Cross Plans, THE JOURNAL, Feb. 10, 1945, p. 321. We have arrived at different conclusions from those set forth by Mr. Perry.

2. The numerous county medical societies plans in Washington are here considered as if they were one plan. Likewise Oregon Physicians' Service and its affiliated county bureaus are also considered as if they were one plan.

3. The Oakland Blue Cross plan has sold its surgical rider to 30,000 of its 96,000 members, and the Sacramento plan has sold its surgical rider to 10,000 of its 28,000 members.

public support is dissipated. Nothing could be more detrimental to the growth of voluntary plans than the present situation on the West Coast. The potential market for prepayment is enormous, but little headway can be made until the medical and hospital plans get together.

B. This is an advance over A because it at least brings the two plans together and avoids competition and strife. A disadvantage may be that the cord binding the two plans is tenuous and may break down, leading back to situation A.

When two plans cooperate, certain activities must be performed jointly or by one plan for the other. Enrolment, collection of subscription charges, maintenance of records showing subscriber eligibility for care, publicity and public relations are of this character. There must be joint use of certain office facilities. Certain activities can be performed by each plan for itself, notably approval of claims, payment of hospitals or physicians and maintenance of relations with hospitals or physicians. (Thus, in Michigan and New Jersey the Blue Cross plans handle enrolment, collection of subscription charges and maintenance of subscriber records for the medical plans. The latter approve medical claims, pay physicians and maintain relations with the profession. In southern California there is joint maintenance and joint control of the sales force. The Blue Cross plan maintains subscriber records for both plans.)

Furthermore there must be coordination of the two plans with respect to major policies. In order not to confuse the public and impede acceptance of the two plans, enrolment regulations must be similar, the provisions as to types of cases covered or not covered, waiting periods, and so on, must be alike. Any change in the rates or benefits of the one which renders it more or less attractive will affect the sales of the other which is coupled with it.

One difficulty with B is that, in effect, it sets up two masters in the same household. The director of the medical plan may have his ideas as to how enrolment should be conducted and on the choice of the man or men to do it. The two directors may have conflicting ideas on the best methods of keeping subscriber records, on publicity and public relations. Each director, in time, will tend to have his own ideas as to how the other plan should be run. If either plan is forced to raise rates or to cut benefits in order to make ends meet, this will slow down sales of the other, and the director of the other plan will have his own ideas on how the situation could have been avoided or should be handled. In short, the two plans are really joint undertakings. The public which pays its dues to one organization thinks of them as one and cannot be persuaded differently. The success of the one affects the success of the other. Yet there are two administrators, and this always makes for trouble.

There are also questions of prestige. If the hospital plan is well developed by the time the medical plan is offered, the two plans together will be sold as Blue Cross, and the medical plan and its director will not like this. If the Blue Cross does the selling for the medical plan, it is the Blue Cross representative who meets potential subscribers. His main loyalty is to that organization. This is true not only of the field men but of all Blue Cross employees who give some of their time to the medical plan. The hospital plan may be pushed, the medical plan considered an extra. The Blue Cross director has to sell a service concerning which he has no say.

The director of the medical plan meets with the board of directors of the medical plan, and the director of the hospital plan meets with his board. Neither board has first hand knowledge of the problems of the other plan with which it is coupled. Conflicts between the two boards on joint matters may not be easily resolved. Further, if friction between the two directors reaches the point where neither will give way to the other, then each board will tend to back up its own director.

An advantage of B is that responsibility for the success of the medical plan is concentrated on one person who gives it his whole time and attention. The medical plan may be a side line with the hospital plan director, but the medical plan director is there to see that its problems receive due consideration.

Arrangement B is the one possessed by the Michigan plan which has more members than the combined membership of all the other plans which are cooperating with Blue Cross. It has worked here owing in large measure to the personalities of the men involved. That Michigan Medical Service has so many members demonstrates not so much the superiority of B as that it was coupled with a Blue Cross plan which had a meteoric rise and that from the beginning the automobile industry with its great groups of employees demanded joint hospitalization and medical coverage. It is significant that many of those connected with Michigan Medical Service and Michigan Hospital Service believe that the two should be unified.

We think plan B is not likely to be successful in many instances. It is apt to succeed in spite of, not because of, its administrative soundness. It contains the seeds of trouble and is likely to go backward to A or forward to C.

C. C is an improvement over B. From the director down, there is one single administration. There is one head within the organization. The difficulties of C are that it is not the most convenient method of securing coordination between the boards of the two plans and that the director is in a sense serving two masters and may feel less responsibility to the one than to the other.

On many matters, as we have seen, there must be joint determination of policy between the two plans. What size groups should be enrolled? What percentage of participation within a group should be required? Should individuals be enrolled? On what basis? Should rural enrolment be undertaken? Should there be resort to advertising? What types of publicity should be undertaken? Should higher rates be charged to individuals who drop out of groups? The one board must agree to any change of rates or benefits desired by the other. On all these matters of joint policy or interest, the executive director must go back and forth between the two boards. One board decides on a certain matter. The other board considers and suggests a different solution. The first board must reconsider. It is a waste of time on the part of all concerned. Joint meetings of the two boards and interlocking of some of the personnel will help to cut down this waste.

Under arrangement C the executive director of the two plans is apt to feel that he is really the employee of one or the other. Under most existing plans with arrangement C the director draws all his compensation from the hospital plan. Under a few he receives an extra $1,000 or $2,000 from the medical plan. This

situation encourages the executive director to feel that his allegiance is wholly or mainly to the hospital plan, and, as in B, possibly to think of the medical plan as a side line.

The medical profession may think that C is preferable to D, one board for both plans, because under C it has full control of the medical plan. Actually this is illusory. Where so many matters are of concern to both plans, then in effect any decision of one board must be approved by the other. The board of one plan must assent to any major decision of the other plan board. This means that one board shares control with the other. The separation of the two boards simply makes it more difficult for joint decisions to be arrived at.

Under C the medical plan has a head but no body. An arrangement under which one plan entrusts its entire fortunes, all its administration, to another plan probably cannot long endure. We feel that the solution, when both groups are ready for it, is to go on to D.

One sees the difficulties of C in clearer perspective if one projects thought to the time when dentistry and nursing are offered on a prepayment basis. Will there be a dental board and a nursing board with the director of the hospital plan serving as executive for all? Obviously, merger is the answer.

D. Arrangement D seems the common sense arrangement when the two groups are ready for it. It is the one to which the plans probably will ultimately come. Under this arrangement the hospital plan, as such, ceases to exist; the medical plan, as such, ceases to exist. Instead there is a combined medical and hospital plan—a health service plan.

Under this arrangement there is one single corporation with one board and one director. There is complete coordination of medical and hospital prepayment because they are unified. One single organization gives maximum economy, single authority, maximum public acceptance and equal responsibility on the part of the plan's employees to all services which they render. The director of this one health plan would feel equal responsibility to both hospital and medical prepayment. The board of directors should have equal representation from the hospitals and the medical profession. For example, the Chapel Hill, N. C., plan has a board of twelve members, four elected by the state medical society, four by the state hospital association and four public representatives. It goes without saying that the name of organization should reflect its makeup and purpose. It should not be —— Hospital Service but —— Health Service.

The Blue Cross symbol should be retained because of its public acceptance, but any device within the cross should symbolize health service in general.

An important advantage of arrangement D is that it facilitates solution of the vexing problems of the inclusion of radiologic and pathologic services and of anesthesia and physical therapy, when performed by physicians, in hospital and medical service plans. These services are medical services, yet the charges for them often or usually appear on the hospital bill and are therefore thought by the public to be hospital services. Physicians in these specialties quite properly desire that these services shall be included in the medical rather than in the hospital plan. Yet until the medical plan has as extensive a membership as the hospital plan the inclusion of these services in the medical plan and their exclusion from the hospital plan has the disadvantage for the subscribing public that a lesser portion of the hospital bill is covered. Furthermore, even if enrolment in both plans is coextensive, and the aforementioned services are offered under the medical plan, administratively it is simpler, where the charges for the mentioned services appear on the hospital bill, for the hospital plan to pay the full hospital bill and to debit the medical plan for its expenses on behalf of these services, rather than for one organization to pay part of the bill and the other organization to pay the other part. All of these difficulties are avoided if Blue Cross and medical plans are transmuted into a joint hospital and medical plan—a health service plan—with a changed name and changed board of directors to give proportionate representation to the two groups.

There are several difficulties in the way of ready acceptance of arrangement D. One difficulty is that in some places neither the medical profession nor the hospitals are ready for it. They are too afraid of each other to get at such close quarters. (In discussing this proposal one hears the doctors say they are against it because the hospitals would control, and the hospitals say they are against it because the doctors would control.)

Another difficulty is that a single combined plan means, in effect, a single reserve to back up both hospital and medical contracts. In many places the hospitals would be unwilling to underwrite the medical contract and vice versa. The hospital plan may have substantial reserves and be on a sound and tested financial basis. Medical plans are as yet on more of an experimental basis and, until the medical plans are also on a sound and tested financial basis and have some reserves, unification may not be desired.

A third difficulty is that the laws of a number of states say that medical and hospital prepayment must be provided by separate corporations. It would seem, however, that legislatures would in most states be responsive to recommendations of the medical profession and the hospitals and that laws could be changed. It is also possible in some instances to have two corporations but have the same board members on each.

A fourth difficulty is that the central organization of Blue Cross plans, the Hospital Service Plan Commission, was developed through and is affiliated solely with the American Hospital Association. If local Blue Cross plans are to be transmuted into joint medical and hospital plans, it is essential that the central organization of the plans should undergo the same transformation.

These difficulties can be easily removed if both the medical profession and the hospitals make up their minds to do so and face realistically the problems involved in the successful development of prepayment plans. Until these difficulties are removed, arrangement C is probably preferable.

CONCLUSIONS

Cooperation between medical and hospital plans is essential. This cooperation can be achieved under various arrangements, any one of which can function at least temporarily with success, depending on the stage of thinking of those who do the cooperating. Complete unification of hospital and medical plans into Blue Cross Health Service Plans seems to provide the final and best solution. It represents the end of the road. But less forthright arrangements may not be without their temporary value.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

At the October 1943 meeting of the Council it was decided that reports should be made on (1) the status of prophylaxis by Hemophilus pertussis vaccine and (2) the status of passive immunization with human hyperimmune pertussis serum. A report on the current status of prophylaxis by Hemophilus Pertussis Vaccine appeared in THE JOURNAL, *Sept. 30, 1944, page 294. The following statement on the Status of Passive Immunization and Treatment by the Use of Human Hyperimmune Pertussis Serum has been adopted by the Council for publication.*

AUSTIN SMITH, M.D., *Secretary.*

THE STATUS OF PASSIVE IMMUNIZATION AND TREATMENT IN PERTUSSIS

BY THE USE OF HUMAN HYPERIMMUNE SERUM

HARRIET M. FELTON, M.D.
PHILADELPHIA

Severe whooping cough in infants is one of the medical conditions before which the physician of today often feels completely inadequate. The incidence of this disease has dropped significantly during the past five years, but the mortality rate in children under 1 year of age continues to be very high. The statistics have been difficult to evaluate because many cases have not been reported, and in infants death is frequently caused by the complications of the disease rather than the actual disease itself. It has been estimated that about 25 per cent of the infants under 6 months of age who contract whooping cough succumb.[1] Active immunization cannot be applied directly to this highly susceptible group, since it is felt that the mechanisms for producing active immunity are not mature. It is obvious, therefore, that any specific method of prevention or treatment of whooping cough in this younger age group must consist of the administration of serum containing specific antibodies in large enough doses to combat existing infection.

The development and use of human hyperimmune pertussis serum has followed attempts at passive immunization and treatment by the use of whole blood, normal serum and convalescent serum, which have been tried with no particular success for a number of years.[2] A review of the literature covering this subject by Bradford[3] in 1935 concluded that the use of convalescent serum modified the disease if given before catarrhal symptoms appeared but was of doubtful aid when administered after the disease had become well established.

Jundell[4] in 1933 was the first to report the use of serum resulting from the inoculation of human beings with pertussis vaccine. Each of 5 whooping cough patients was treated with serum from one parent who had been immunized with pertussis vaccine. The immunization was begun as soon as exposure was discovered and consisted of two to three intramuscular injections at intervals of five to six days. The serum was collected on the fifth day after the second or third injection and was administered in three to four doses of 60 to 80 cc. every two to five days. This series was very small, but it was felt that the serum had been of some value.

In 1936 Kendrick[5] reported the preparation and use of "reinforced convalescent or hyperimmune" human serum in the prophylaxis of exposed infants. Adult donors with positive childhood histories of whooping cough were given a series of injections totaling 7 to 20 cc. of a suspension of 10 billion Hemophilus pertussis organisms per cubic centimeter. Each serum was positive for agglutinins and gave a very strong opsonic reaction. Serum was used in 10 to 20 cc. doses, given as soon as possible after exposure and, in addition, another dose of 10 cc. some days later. Of 11 infants injected before the onset of symptoms 9 escaped the disease, but it was felt that treatment in 6 cases after the onset of symptoms was not of benefit.

In 1937 McGuinness, Stokes and Mudd[6] reported the first results of the use of lyophiled hyperimmune whooping cough serum. This serum was used for prophylaxis in 12 children and for treatment in 15 others. Adult donors with a history of whooping cough in childhood were used. The donors were given one course of Sauer type vaccine every four months and were bled at the end of the first four months and at varying times thereafter. The serum was separated from the whole blood, rapidly frozen for storage, pooled, frozen and dried. After the first year of production of this serum the immunization schedule was changed to give three courses of three weekly injections totaling 90 billion organisms at four month intervals and to obtain serum samples at approximately one month after the third course. Agglutination titers were determined and, if found to be 1:1,280 or over, the donors were eligible for the serum pools. The results of this first small series suggested that this type of serum was of definite value in prophylaxis. It was felt that the number of treated patients was so small that the therapeutic effect could not be determined.

Katsampes, McGuinness and Bradford[7] in 1939 reported improvement in 18 of 22 children who were treated with the same hyperimmune human serum. Fifteen of these children were under 6 months of age. There were no deaths in this series of cases.

In 1939 Cohen and Lapin[8] produced a hyperimmune serum by giving donors 20 cc. of either Sauer's or Mishulow's vaccine over a six to eight week period. Serum was collected one or two weeks later. Following prophylactic use of this serum in 10 cc. doses for infants and 20 cc. doses for older children, 8 of 12 exposed infants, or 67 per cent, escaped the disease. At the same time following doses of at least 15 cc. for infants and 40 cc. for older children of convalescent

1. Lapin, J. H.: Whooping Cough, Springfield, Ill., Charles C Thomas, 1943, p. 17.
2. Paterson, D.; Bailey, R. H., and Waller, R. G.: Control of Whooping Cough with Serum and Vaccine, Lancet **2**: 361-364 (Aug. 17) 1935. Kereszturi, Camille; Hauptman, David, and Park, W. H.: Value of Convalescent Serum for the Prevention of Common Contagious Diseases of Children, Am. J. Dis. Child. **50**: 309-323 (Aug.) 1935. Meader, F. M.: Prophylaxis of Whooping Cough, ibid. **53**: 760-767 (March) 1937. Meader, F. M., in Round Table Discussion on Convalescent Serum Therapy: Convalescent Serum in Whooping Cough, in Report of Proceedings of Eighth Annual Meeting of the American Academy of Pediatrics, J. Pediat. **14**: 264-267, 1939. Cohen and Lapin.[8]
3. Bradford, W. L.: The Use of Convalescent Blood in Whooping Cough, with a Review of the Literature, Am. J. Dis. Child. **50**: 918-928 (Oct.) 1935.
4. Jundell, I.: Has Specific Serum of Adults Any Value as a Remedy Against Whooping Cough: Acta. pædiat. **15**: 1-11, 1933.
5. Kendrick, Pearl, in Round Table Discussion on Prophylaxis and Treatment of Whooping Cough: *A Note on the Use of Reinforced Convalescent or Hyperimmune Serum for Passive* [illegible] *of Infants Exposed to Pertussis*, in Report of the Proceedi [illegible] Meeting of the Academy of Pediatrics, J. Pediat. [illegible]
6. McGuinness, A. C.; Stokes, J., Jr., and [illegible] Uses of Human Serums Preserved by the Lyophile Process, J. Clin. Investigation **16**: 185-196 (March) 1937.
7. Katsampes, Chris; McGuinness, A. C., and Bradford, W. L.: Effect of Hyperimmune Human Serum (Lyophile) on the Humoral Antibody Titer in Pertussis, Am. J. Dis. Child. **58**: 1234-1239 (Dec.) 1939.
8. Cohen, P., and Lapin, J. H.: Prophylaxis Against Whooping Cough in Exposed Children, with Special Reference to Serum, J. Pediat. **15**: 78-85 (July) 1939.

serum 28 of 33 (85 per cent) exposed children escaped pertussis. It will be noted that a larger dose of convalescent than of hyperimmune serum was used.

Cohen, Weichsel and Lapin [9] in 1940 used hyperimmune and convalescent serum in doses of 5 to 40 cc. in treatment. The former was used in 12 cases and the latter in 36 cases. About 50 per cent of the patients were under 1 year of age. The authors concluded that, if given early enough and in large enough doses, hyperimmune serum could be of benefit in some cases and that striking results could be obtained in others. These workers felt that this serum was of definite value in severe cases. The donors for this serum had received 170 to 200 billion organisms over a six week period and were bled two weeks after the last injection.

McGuinness, Bradford and Armstrong [10] in 1940 found that when lyophiled hyperimmune human serum was used in doses of 10 cc. for the average child and 20 cc. for the very young and intimately exposed children, and if given before the catarrhal stage, 78.3 per cent of 65 exposed children escaped the disease. Of the 18 cases in which whooping cough developed in this group, 13.3 per cent were very mild, 4.8 per cent were mild and 3.7 per cent were moderate. At this time a study of the use of this serum for treatment in a group of 100 cases was reported. The total dosage was from 40 to 50 cc. given in two or three doses at two day intervals. The results were recorded as excellent 32, good 31, moderate 20, questionable 14 and deaths 3. The deaths all occurred in infants under 2 months of age with severe bronchopneumonia, and not 1 of these infants had received a full dose of serum. Attention was called to the fact that the expected mortality rate for the age group under 6 months is 25 per cent. Fifty-one of the 100 cases were in this age group. It was observed in this series that the best results were obtained when the therapy was begun in the first two weeks of the disease.

Flosdorf, McGuinness, Kimball and Armstrong [11] in 1941 discussed the methods of preparation and assay of hyperimmune human serum. A comparative study of two schedules of immunization in the production of serum of high agglutinative titer was made. One group of donors was given a standard series of a total of 7 cc. of Sauer's single strength vaccine (10 billion organisms per cubic centimeter) over a period of three weeks. This was repeated at three to four month intervals for three or four times. A second group was given the standard series and then monthly injections of 2 cc. of vaccine. Titrations for agglutinins were made at the end of one or two weeks after the initial course of vaccine in each group, and donors whose serum titer was not as high as 1:1,000 or 1:1,500 were rejected. Bleedings of 200 to 400 cc. of blood were made at monthly intervals and the titers determined. It was recommended that the final titer of the pools be 1:1,280 or preferably 1:2,560. It was found that the second schedule was not only just as effective in raising the agglutinin titer but that there was less variation in the titers of this group when followed over a period of a year. Therefore this procedure appeared to be preferable.

Frank, Patton and Hamilton [12] in 1942 reported a mortality rate of 20 per cent in a series of 30 consecutive cases of whooping cough with bronchopneumonia treated with hyperimmune serum. No statement of the method of preparation or agglutinative titer of this serum was made. These authors reported a mortality rate of only 4 per cent in 77 consecutive cases treated with sulfathiazole. The conclusions drawn were that the serum had no specific effect but was "good supportive therapy." The doses of serum given in this study were below the minimum doses recommended by McGuinness.

In 1944 McGuinness, Armstrong and Felton [13] presented the results of further studies in prophylaxis and treatment by the use of lyophiled hyperimmune human pertussis serum. A change in the immunization schedule was reported. Since 1942 the Philadelphia Serum Exchange has used intermediate strength Sauer vaccine (15 billion organisms per cubic centimeter) in four weekly injections with a total of 7 cc. One month after the first course a sample of the donor's serum is titrated for agglutinins and if a titer of 1:2,560 has been reached the donor is eligible for the serum pool. At monthly intervals the titer is determined and an injection of 2 cc. of vaccine is given. The average pools of serum obtained by this schedule of vaccination have a titer of 1:2,560, as compared to 1:1,280 previously obtained with the use of single strength vaccine and the original schedule of injections. The results of the use of this serum in 308 exposed susceptible infants and children showed that 78.6 per cent did not contract whooping cough. Of 137 children continuously exposed 67.9 per cent escaped, in contrast to the expected 10 to 20 per cent in unprotected children. In this series it was observed that the duration of exposure was a very important factor since 44 (66.6 per cent) of the cases developed after continuous intimate exposure, 19 (28.8 per cent) after short intimate exposure and 3 (4.5 per cent) after casual exposure. The importance of adequate dosage was stressed by the authors, who recommend the administration of two injections of 20 cc. each from three to five days apart for all children who are subject to continuous exposure. The serum was given either intramuscularly or intravenously. It was observed that the best results were obtained when the serum was given in the first two weeks after exposure. It has been suggested that children who are exposed for periods extending beyond three weeks after the second prophylactic dose of serum has been given should receive an additional dose to maintain the antibody level over this long period.

The aforementioned authors reported the use of lyophiled hyperimmune serum after the onset of paroxysms in 442 patients with whooping cough; 236 of the patients were under 1 year of age and 176 were in the first six months of life. The results were classified as follows: excellent or good results 70.2 per cent, moderate results 19.9 per cent, poor results 8.6 per cent, and deaths 1.3 per cent. These results are consistent with the previous report on the first 100 cases treated. The minimum dosage recommended for treatment of older children or severely ill infants at this time is three 20 cc. injections given forty-eight hours

9. Cohen, P.; Weichsel, M., and Lapin, J. H.: A Comparative Study of Therapeutic Agents in the Treatment of Pertussis, J. Pediat. **16**: 30-35 (Jan.) 1940.

10. McGuinness, A. C.; Bradford, W. L., and Armstrong, J. G.: The Production and Use of Hyperimmune Human Whooping Cough Serum, J. Pediat. **16**: 21-28 (Jan.) 1940.

11. Flosdorf, E. W.; McGuinness, A. C.; Kimball, A. C., and Armstrong, J. G.: Studies in H. pertussis. Preparation and Assay of Hyperimmune Human Serum, J. Pediat. **19**: 638-643 (Nov.) 1941.

12. Frank, W. P.; Patton, E. F., and Hamilton, P. M.: Treatment of Whooping Cough Bronchopneumonia, J. Pediat. **20**: 720-722 (June) 1942.

13. McGuinness, A. C.; Armstrong, J. G., and Felton, H. M.: Hyperimmune Whooping Cough Serum: Further Studies, J. Pediat. **24**: 249-258 (March) 1944.

apart. Occasionally a fourth dose may be required some time later. The intravenous route is suggested for all critically ill children, although most of the serum has been given intramuscularly. In severe cases several intravenous doses of from 50 to 100 cc. may be necessary. The total number of deaths in the group reported was six. These patients were all moribund and none of them received the minimum recommended dosage of serum. Five of the deaths were in the group under 6 months of age, making a fatality rate of 2.8 per cent for this group, as compared with the expected rate of 25 per cent in untreated infants. Fifty-five of the patients in the study were known to have bronchopneumonia. At the time treatment was begun, 39 of these patients were given the minimum dosage of serum and no sulfonamide therapy. There were no deaths, and 25, or 64 per cent of the cases had excellent or good results. The percentage of children showing little or no response was somewhat higher among the older children, since they received proportionately less serum than the smaller children.

Scheinblum and Bullowa [14] in 1944 reported results of the use of lyophiled hyperimmune pertussis serum in treatment of 23 critically ill patients at the Willard Parker Hospital; 52.1 per cent of the patients responded with good results, 13.3 per cent with questionable results, and in 8.6 per cent of the cases the serum was ineffectual. It was observed in this study also that the best results were obtained in the younger children. There were 12 infants between 1 and 3 months of age, 75 per cent of whom responded with good or moderate results, and there were no deaths. There were 2 moribund patients in the study, 1 receiving only 20 cc. of serum intramuscularly and the other 40 cc. of serum intravenously before death. It was observed that there were 2 patients treated as late as the eighth and ninth week of the disease who responded with good results. In 11 of the 23 patients pneumonia developed as a complication, and in these chemotherapy in the form of sulfadiazine was used in addition to serum, both prior to and simultaneously with the serum. It was found that, while the temperatures fell following chemotherapy, the general condition of the patient remained unchanged until serum was given.

COMMENT

Until very recently there has been no therapeutic measure which has been able to influence greatly the clinical course of whooping cough, particularly in young infants. The development of the specific serum which is now called hyperimmune serum has been under way for less than ten years. The observations made thus far have been on small groups and without untreated control cases. The efficiency of hyperimmune human serum has been indicated only by the dramatic reduction of the fatality rate, especially in infants in the first six months of life.

In the prevention and treatment of whooping cough, as in other infectious diseases, there is advantage in using human serum, if possible, rather than animal serum in order to avoid sensitivity, especially in known allergic individuals. Human hyperimmune pertussis serum has not been observed to cause any severe local or general reaction. However, the preparation and use of immune rabbit serum has been tried by a number of investigators who feel that it may be used safely.

Bradford, Scherp and Brooks [15] used globulin fraction of antipertussis rabbit serum for prophylaxis in a group of 20 infants with familial exposure. Thirteen (65 per cent) were completely protected. Five of the 7 cases were mild and 2 were typical. One dose of 2 to 10 cc. of serum was used. It was stated that auxiliary tests of the serum seemed to indicate that the protective action was chiefly antibacterial rather than antitoxic. Bradford, Brooks and Katsampes [16] found either immune rabbit globulin, pertussis antitoxin or sulfadiazine alone to protect mice against experimental murine pertussis. However, they did not always obtain reproducible results, as was the case when sulfadiazine was combined with either of the two rabbit serums.

Some workers feel that the toxin is more important in pertussis infection than has been generally recognized and that therefore antitoxin should be used in prophylaxis and treatment. Strean, Lapointe and Dechene [17] and Lapointe and Strean [18] reported the use of rabbit antiendotoxic or antiendotoxic plus antibacterial serum for passive immunity in contacts and in treatment of the disease. They found that the antiendotoxin alone inhibits the disease or produces an aborted attack in most cases but feel that use of the combined serum is preferable in order to stimulate phagocytosis as well as to neutralize the toxin. Bullowa and Alterman [19] found that rabbit antitoxin prevents the disease even in continuous exposure if given early enough but is of little value in established cases.

Evidence from certain laboratory experiments with hyperimmune human serum seems to indicate that the protective action is antibacterial, although a small amount of antitoxin has been demonstrated. This antitoxin is probably the result of intensive repeated immunization with whole bacterial vaccine which has been shown to contain minute amounts of toxin.

The dosage schedule recommended for the hyperimmune serum was first made arbitrarily. It is now felt that in severe cases larger doses of serum than originally recommended should be used and that the intravenous route should be employed whenever possible. The importance of an additional dose of serum for prophylaxis in cases under long term exposure is stressed. The use of lyophiled serum facilitates administration and also insures against decreased antibody content on storage.

The National Institute of Health has authorized the preparation and distribution of hyperimmune pertussis serum. This agency recognizes no standard method of assay at this time. For three years the serum produced at the Philadelphia Serum Exchange has been tested by the agglutination technic described by Flosdorf, McGuinness, Kimball and Armstrong.[11] Hyperimmune pertussis serum also has been prepared by several other human serum centers in this country.

The studies reviewed in the paper indicate that in treatment it is possible to lower the mortality rate of whooping cough decidedly by the use of hyperimmune human pertussis serum given in adequate amounts. Significant passive protection has been obtained when the recommended dosage has been used.

14. Scheinblum, I. E., and Bullowa, J. G. M.: The Treatment of Pertussis with Lyophile Hyperimmune Human Pertussis Serum, J. Pediat. **25**: 49-55 (July) 1944.

15. Bradford, W. L.; Scherp, H. W., and Brooks, A. M.: Effect of Refined Antipertussis Rabbit Serum on the Humoral Antibody Titer in Pertussis, Am. J. Dis. Child. **62**: 492-498 (Sept.) 1941.

16. Bradford, W. L.; Brooks, A. M., and Katsampes, C.: The Therapeutic Effect of Sulfadiazine and Immune Rabbit Serum in Experimental Murine Pertussis, Yale J. Biol. & Med. **16**: 435-442 (May) 1944.

17. Strean, L. P.; Lapointe, D., and Dechene, E.: Clinical Studies in Immunity to Pertussis with the use of Pertussis Skin Testing Toxin and Antiendotoxin, Canad. M. A. J. **45**: 326-332 (Oct.) 1941.

18. Lapointe, D., and Strean, L. P.: Etude sur la sérothérapie de la coqueluche, Laval méd. **7**: 265-268 (May) 1942.

19. Bullowa, J. G. M., and Alterman, Janet: Pertussis Immunity with Toxin and Antitoxin, J. A. M. A. **120**: 886 890 (Nov. 21) 1942.

REPORT OF THE COUNCIL

The Council has authorized publication of the following statement. AUSTIN SMITH, M.D., *Secretary.*

ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The Council on Pharmacy and Chemistry of the American Medical Association convened at the Association headquarters, Oct. 13, 1944. Those in attendance were Drs. David P. Barr, H. N. Cole, Morris Fishbein, E. M. K. Geiling, Eugene M. Landis, James P. Leake, Stuart Mudd, E. M. Nelson, W. W. Palmer (Vice Chairman), Elmer L. Sevringhaus, Torald Sollmann (Chairman), Austin Smith and W. Barry Wood Jr. In addition to members of the headquarters staff there were present Dr. E. E. Irons, Secretary of the A. M. A. Board of Trustees, Dr. J. J. Moore, Treasurer of the A. M. A., Dr. Donald A. Wallace, Secretary of the Council on Dental Therapeutics, and Dr. Walton Van Winkle Jr. of the Federal Security Agency, Food and Drug Administration.

The following is an abstracted report of some of the more important discussions and actions:

Stability and Labeling of Phenarsine Preparations.—The Council discussed the question of stability of oxophenarsine hydrochloride (Mapharsen) and dichlorophenarsine hydrochloride, as specimens of the former had been received at the Council office showing variation from normal color. The Council voted that all claims of companies that changes in color of oxophenarsine and dichlorophenarsine have no significance must be deleted. Moreover, there should be a definite warning on the ampul that the contents of all ampuls which on dissolving in distilled water appear yellow to grayish or black should be discarded. Products fused in the tube should never be used. The Council also voted that all containers of individual ampuls should be dated in numerals of at least 8 point size in order to obviate difficulty in ascertaining their age; that informational material put out by the companies should stress the absolute necessity of keeping the compounds in the refrigerator, preferably at 0 to 5 C., and emphasize the necessity of using the earlier batches placed in the refrigerator, not the last ones.

Establishment of a Therapeutic Trials Committee.—The Council usually has considered drugs only after the evidence has been accumulated; it has not initiated clinical trials on substances fresh from the laboratory. However, it has watched and its members have participated in the activities of the Office of Scientific Research and Development and the National Research Council. It believes that the plan of cooperative clinical research which has been instituted during this war is valuable. It also believes that the British Therapeutic Trials Committee has proved its usefulness. Finally the Council believes that it should use its facilities and contacts toward furthering such work if it is necessary to supplement the work of the O. S. R. D. A committee known as the Therapeutic Trials Committee was formed to consider the project and to report to the Board of Trustees of the American Medical Association. This committee believes that the activities of such a group at the present time should take the form of mediating between manufacturers and clinics; that the work should be confined to new products of definite and outstanding promise on which adequate laboratory work is available; that the Committee should have full jurisdiction in the choice of products that it would sponsor; that the costs incurred in the actual trials should be the subject of contract between the manufacturer and the clinic conducting the trials.

Status of Thiouracil.—This drug, which has been the subject of considerable investigation in the medical control of hyperthyroidism, was considered and its status reviewed. It is not available at this time for general use.

Proprietary Names.—The question of accepting proprietary brands of drugs and of recognizing more than one proprietary name for one drug was reviewed. The Council voted that its procedure regarding names of products, which is explained in the official rules of the Council, should not be changed and that the Committee on Nomenclature should prepare a comprehensive and strong statement concerning the significance of names of products in relation to acceptance by the Council and the dangerous confusion that occurs when a single preparation is known under many names.

Principles of Cooperative Medical Advertising Bureau.—The operative principles of the Cooperative Medical Advertising Bureau were discussed and minor changes suggested.

Sale of Endocrine Preparations to the Public.—The Council discussed the sale of endocrine preparations, particularly cosmetics which contain estrogenic and other hormone substances. Such cosmetic preparations are frequently offered with claims that they will affect the physiology of the skin and bring about improvements in the texture and appearance of the skin. Some have stated that such drugs when used in small amounts cannot exert a local effect on the skin without having a general physiologic effect. Others have asserted that, if such preparations contain an adequate dosage to exert an effect on the human body, they may be dangerous; if they do not contain an adequate dosage, they are fraudulent. The Council voted to recommend that the referee review the subject and prepare a statement for publication.

Interpretation of "Nonofficial Constituents."—The Council voted to add the following statement to the paragraph on Nonofficial Constituents in Rule 1:

"Constituents that are not concerned in the pharmacologic action of the preparation need not be submitted in detail, but their nature and quantity must be disclosed to the Council so that it may be judged that they are inert. They must be declared on the label or package by such designations as will make their nature apparent."

Scope of Useful Drugs.—The scope of Useful Drugs was reviewed and it was decided that it should continue to be a book in which are described drugs that have a distinct and important field of usefulness not covered in a better manner by some other drug. It was also decided to include accepted proprietary names as synonyms.

Policy of Committee on Therapeutic Research.—The policies of the Council's Committee on Therapeutic Research were reviewed. The Council voted that the Chairman of the Committee on Therapeutic Research be authorized to ask for an increased annual budget.

Spanish and Portuguese Translations of N. N. R.—The Council has been requested to consider the issuance of Spanish and Portuguese translations of New and Nonofficial Remedies to be made available to the Latin American countries. The Council voted to explore the possibilities.

Digitalis and Purified Principles.—The Council voted that the dosage for purified digitalis principles in solid form should be stated by weight; in the case of injections, by weight and by U. S. P. unit equivalent; the Council further voted that it should acquire as soon as possible appropriate reference standards and that, when such standards are established, recommendations regarding declaration of dosage should be put into effect.

Nonproprietary Names.—The Council voted to request manufacturers to submit nonproprietary names for preparations which they offer under proprietary names, so that if a proprietary name is recognized there will be available at the same time, or soon after, a nonproprietary name in order to prevent the development and promotion of unsuitable nonproprietary names.

Advertising of Contraceptives to the Public.—The Council voted to adhere to its Rule 3 on the question of advertising of contraceptive products. Thus, such agents when advertised to the public are not eligible for consideration by the Council for inclusion in N. N. R.

Educational Activities.—The Council voted to continue its activities concerning projects of special interest to the general practitioner. At the same time it recommended preparation of a review of the status of oral vaccines for the prevention of "colds," this report to be published jointly with the Council on Industrial Health.

Advertising Brochures.—Because of the unnecessary length of many advertising brochures, the Council voted to prepare a statement for publication on the needlessness of such wastes of time and material.

Vitamins and Coenzymes and Sulfonamide Therapy.—The relation of vitamins and coenzymes to sulfonamide therapy was discussed; the Council will be especially alert to any developments in this field.

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SATURDAY, MAY 5, 1945

WAR AND INSECTICIDES

Shortly after our entry into the war, the need for means of control for a great majority of the medically important insects became imperative. The worldwide distribution of our troops and the crowding of civilian workers at home, together with the shortage of pyrethrum and rotenone, were aggravating factors. On the recommendation of the Committee on Medical Research, the Bureau of Entomology and Plant Quarantine initiated at Orlando, Florida, a series of experiments for the development of control methods to be used by the armed forces.

Three separate projects were organized: (1) body louse control, (2) repellents for mosquitoes and other flying and biting insects and for such parasites as mites, ticks and fleas, and (3) larvicides for the treatment of breeding places of Anopheles mosquitoes. On the basis of their early studies the Orlando investigators recommended a formula for the control of the body louse, the head louse and the crab louse consisting of 0.2 per cent of pyrethrins (using a 20 per cent pyrethrum concentrate), 2 per cent of N-isobutylundecyleneamide, 2 per cent of 2,4-dinitroanisole and 0.25 per cent of phenol S (antioxidant) in pyrophyllite. Details of the tests leading to the formulation of this powder and results of tests are discussed in a paper by Bushland and others.[1] This formula, designated as MYL, proved in comparative tests to be more effective against the body louse than other louse powders known to the investigators. It also proved effective in controlling the crab louse, Phthirus pubis (L.), and the head louse, Pediculus humanus humanus L. The repellents recommended are dimethyl phthalate, Rutgers 612 and indalone dimethyl phthalate. Dimethyl phthalate has been found effective against Aedes aegypti, chiggers and fleas.

A new synthetic organic product designated by the symbol DDT, which is derived from the generic name "dichlorodiphenyl-trichloroethane," in the meanwhile was being investigated for its insecticidal properties. Investigations made by Annand and his associates[2] of the Bureau of Entomology and Plant Quarantine have revealed that DDT powder is highly effective and longer lasting than any other lousicide in use. The powder is more effective than the MYL previously recommended by this bureau. The salient feature of DDT is its long lasting quality. It will provide almost complete protection against lice for three weeks and give effective control for a longer period. The most remarkable feature of DDT impregnated clothing is that the treatment kills lice even after the garments have been laundered several times.

A 5 per cent solution of DDT in crude kerosene was found to be the most satisfactory solution for the control of bedbugs, particularly under military conditions. The DDT was also found to be effective in the control of ticks, chiggers and house flies.

1. Bushland, R. C.; McAlister, L. C., Jr.; Eddy, G. W.; Jones, Howard A., and Knipling, E. F.: A Powder Treatment for the Control of Lice Attacking Man, 1943 (unpublished).

2. Annand, P. N., and others: Tests Conducted by the Bureau of Entomology and Plant Quarantine to Appraise the Usefulness of DDT as an Insecticide, J. Econ. Entomol. 37: 125 (June 1) 1944.

SURGERY IN THE RED ARMY MEDICAL CORPS

The American-British commission after its visit to the Soviet Union eighteen months ago commented that, on the whole, the Russian surgeons were abreast of the times. Our surgeons did not approve of everything they saw but felt that, as Sir Ernest Rock Carling put it, "the Russian soldier was safe in the hands of the Russian surgeons." During the first year of the present war the medical corps of the Soviet Union returned to the front lines 72 per cent of the wounded. By the end of the second year the number of wounded restored to active duty was 73.3 per cent. To this record is added the fact that the Red Army was entirely free from epidemic diseases.

Russia's authority on military medicine of the past century, Pirogov, stressed that good results in field surgery depend primarily on the correct solution of administrative and medical supply problems in the army and only secondarily on the quality of the medical work. On this precept the modern Russians built their system of military medical services. The effectiveness of the organization was stressed by the members of the Anglo-American mission and, in particular, by Loyal Davis,[1] who felt that we had much to learn from the Russians in this respect.

As pointed out by the surgeon general of the Russian army, Professor Smirnov,[2] the success has been possible because of a simple doctrine of war medicine under field conditions. This doctrine is based on the following principles: (*a*) a uniform conception of the origin,

1. Davis, Loyal: Organization of the Red Army Medical Corps, editorial, Surg., Gynec. & Obst. 79: 329 (Sept.) 1944.

2. Smirnov, Yefim: The Medical Corps in Red Army Operations: Its Tasks and Their Fulfilment, Brit. M. J. 1: 175 (Feb. 10) 1945.

development and progress of disease, and of the principles of surgical and therapeutic work in the field; (*b*) correct sequence in the treatment of sick and wounded at various stages during their evacuation; (*c*) the obligatory employment of brief, accurate and consistent medical documents, enabling the sick and wounded to be classified in a thorough manner and their treatment to be uniform at all stages of evacuation; (*d*) a single school of thought with uniformity in methods of prophylaxis and treatment of sick and wounded at the various stages of evacuation. The best results are obtained when wounds are treated within a few hours of their infliction. This fact, to a considerable extent, determines the organization and tactics of the medical corps in the field under various war conditions. The principle adopted is to bring the medical help to the wounded man rather than the wounded man to the doctor. Gunshot wounds are treated surgically as soon as possible; the army has organized field units in such a way that the wounded are removed from the battlefield even under enemy small arm and mortar fire and given skilled surgical treatment in the field medical units. The chief task of the forward medical units is to combat serious loss of blood and to give prophylactic treatment against infection of wounds. Another important principle is that of segregation of patients. Wounded who require specialized treatment for wounds of the skull, eyes, jaws, thorax, the long bones and the larger joints are cared for in all institutions, beginning with the mobile field hospitals operating in the zone of the army base. The treatment and evacuation of the slightly wounded and of medical cases are dealt with separately, beginning with the forward units. An important principle adopted by the medical corps is the treatment of wounded in stages of evacuation. At each stage the wounded are treated by specialists and are evacuated into the rear areas. Evacuation is not carried out mechanically from stage to stage but depends on the type of wound and the condition of the wounded and also on conditions at the front. Treatment given at the stages of evacuation is consistent and consecutive, progressing in scope and method as the distance from the forward medical station increases. Smirnov stresses particularly that the scope and methods of treatment, the organization and the speed of evacuation are determined more by the military situation than by purely medical considerations.

Success or failure of this system of treatment and evacuation, according to Smirnov, depends on the correct diagnosis of wounds and the proper classification of wounded, on the presence of a network of specialist hospitals, on precision work on the part of transport and the organization of clearing centers which insure the rapid dispatch of wounded to the next stage, and lastly on the maneuvering of available hospitals, transport and reserves in accordance with changes in the military or medical situation.

The complete freedom of the Red Army from epidemic diseases has been achieved by the simultaneous and correlated activity of all units concerned and is due to the fact that antiepidemic measures among the troops are not carried out by individual specialists but by the medical corps as a whole.

The surgeon general of the Red Army says that the Red Army medical service "does not stand still." Short courses for medical personnel are arranged to improve their knowledge of special branches, and numerous conferences of surgeons, physicians, epidemiologists and workers in other specialties are held at which the experiences of the most progressive specialists and institutions are studied, summarized and popularized.

SENATE DEBATE ON ELLENDER BILL

The Ellender bill, which provides for an adequate supply of premedical and medical students, was published in full in THE JOURNAL March 10, 1945. In the course of the Senate debate on the continuation of the Selective Service Act this bill was presented on the floor of the Senate by Senator Allen J. Ellender of Louisiana on Tuesday, April 24. He stated: "Mr. President, I consider the amendment a must measure. I think that it is absolutely necessary that provision be made now so that our medical colleges throughout the country may obtain students and train them properly in medicine and dentistry." In support of the measure Senator Ellender cited pertinent figures and read a strong supporting statement from the War Manpower Commission.

Mr. Ellender was questioned as to the reason for the Senate Committee on Military Affairs not having acted on this bill in the two months since its introduction into the Senate and its referral to that committee. In reply he stated that this delay was occasioned by the failure of the War and Navy departments to file a statement on the bill with the committee.

Senator Lister Hill of the Committee on Military Affairs stated that failure to hold hearings was "not because the Senator from Louisiana has not been diligent in pursuing the matter. I happen to know that he has been very diligent, but only this morning a letter came from the Navy Department in regard to this subject. . . . I happen to know that the Navy Department is opposed to the amendment. It was only yesterday that a letter came from the War Department. The War Department is also opposed to the amendment."

Senator Hill continued "I am not chairman of the Committee on Military Affaiirs, but as one member of that committee I say to the Senator that if he will withdraw his amendment I shall do everything I can to have the committee give him an expeditious hearing, expeditious consideration and expeditious action on the bill. I do not know what the action will be but certainly it

would seem to me that with a bill of this nature, with the interested departments reporting against it, if the Senator really wants to have his bill passed he will have to get the weight of the committee behind it."

Senator Ellender then withdrew his request for immediate Senate consideration of the bill after the following promise had been made by Senator Edwin C. Johnson of Colorado: "As acting chairman of the Senate Committee on Military Affairs until the return from Europe of the Senator from Utah, Mr. Thomas, I may say that if I am still acting chairman next Tuesday and the Senator from Louisiana is ready to have his bill considered by the Senate Committee on Military Affairs next Tuesday it will be called up."

Since the War and Navy departments have now replied to the Committee on Military Affairs, it would appear that there is no further justification for delay of serious consideration of the measure. Such consideration, and perhaps even favorable action, may have been taken by the time this goes to press.

Current Comment

EDITORIALS FOR EDITORS

The National Physicians Committee has recently begun publication, in several of the periodicals devoted to the interests of the press and to the journalistic profession, of a series of announcements that present the point of view of the medical profession in relation to social security and medical care. The first of these advertisements, entitled "Guardians of a Priceless Heritage," emphasizes the importance of preserving the sanctity of the human personality and the subordination of the state in the maintenance of democracy. It points out that the placing of medical care under the federal government would not necessarily regiment the medical profession but would quite certainly regiment the public as far as medical care is concerned. The second announcement, entitled "Social Security," urges editors to interpret for the people the meaning of the laws relating to social security. This announcement emphasizes that payments are made in cash under the present benefits of the Social Security Act but that it is always proposed that medical care be supplied in the form of service. The final paragraph of this section reads:

> No sane person can believe that any bureaucrat can direct the rendering of medical care without actual suicidal deterioration in the quality and effectiveness of the service that is provided. It is the ultimate in absurdities. The people should be told the facts. Editors should tell them.

The third announcement, "The Sentinel on the Wall," tells editors that the people depend on them for warnings when danger nears. The theme is the place of the physician in the rendering of medical service. Quoting again in part:

> . . . the basic factor responsible for the unequaled effectiveness of the practicing physician is that the whole of his effort always is concentrated on treating and curing the patient—the human being who is sick. . . . Bureaucratic direction would destroy the intangible, indefinable essence that is the secret of the American doctor's effectiveness.

The National Physicians Committee has rendered an excellent service in the field of public relations for American medicine by the publication of this series of advertisements addressed to the editors of the American press.

RATIONING OF PRIVATE DUTY NURSES

Elsewhere in this issue (Medicine and the War, page 36) is a plan which has been adopted by the Rochester (N. Y.) Hospital Council to regulate the employment of private duty nurses in member hospitals. The plan is designed to limit the utilization of nursing personnel on the basis of actual physical need as determined by the attending physician and a reference committee of the medical staff in which the hospital administration is also represented. It further provides that the services of private duty nurses may be transferred or extended to the care of other patients as conditions may demand. Hospitals in every part of the country should consider the development of a similar program so as to conserve nursing personnel and make possible a wider and more equitable distribution of nursing service in civilian hospitals. Even more important, however, is the fact that a voluntary program of this type will help to release additional graduate nurses to meet the urgent demands of the armed forces. If all hospitals will carefully limit their nursing service to actual minimum needs, many of the 24,000 private duty nurses now employed in nonfederal hospitals will no doubt become available for general hospital duty or military service. While it is recognized that special nursing is often required, the patient's ability to pay should not be the determining factor in the assignment of private duty nurses. Under present conditions there can be no justification for luxury care.

ASHESHOV SUGGESTION IN TUBERCULOSIS

In *Science* for Feb. 2, 1945 appeared an article by Igor N. Asheshov and Frieda Strelitz entitled "An Antibiotic Substance Active Against Mycobacterium Tuberculosis." In this article the authors report experiments performed at the University of Western Ontario, London, Canada, with a fungus known as Aspergillus fumigatus. Crude preparations with substances derived from the growth of this fungus indicate, according to the authors, that:

> (1) they possess a high degree of activity against staphylococci, preventing their growth in 1:700,000 of the dry crude substance; (2) their bacteriostatic activity against BCG appears to be higher, preventing growth in at least 1:1,400,000 dilution; (3) their bactericidal action against BCG is equal to or slightly lower than their antistaphylococci activity. . . . The active substance investigated may be similar to fumigacin or helvolic acid (Waksman [Waksman, S. A.: *Science* 99:220, 1944]; Chain et al. [Chain, E., et al.: *Brit. J. Exper. Path.* 24:108, 1943]), though some of its properties seem to indicate that the two antibiotics are not identical. Some other, as yet unidentified, molds were found to produce active substances against tubercle bacilli and are now under investigation.

Certainly this work is hardly sufficiently advanced even to suggest that any of these substances are effective in the treatment of tuberculosis in human beings. The experimentation would seem to be in an exceedingly early stage. Unfortunately the columnist Ed Sullivan, in his syndicated column not long ago, made this statement:

> To tuberculosis patients: Contact American Medical Journal on Dr. Asheshov's Western Ontario U. experiments.

The result has been a flood of letters addressed to the headquarters office of the American Medical Association by people who think that a remedy has been found. It is unfortunate that so many people will have to be told that the experiments of Asheshov are only indicative and that there is nothing that is immediately useful from them.

THE EVALUATION OF RESULTS IN THE TREATMENT OF INFANTILE PARALYSIS

Elsewhere in this issue of THE JOURNAL (page 21) appears a statement by a special committee appointed by the Scientific Advisory Board of the National Foundation for Infantile Paralysis to determine standards for the evaluation of the results of treatment of infantile paralysis. The committee emphasizes, and rightly, that the evaluation of various forms of treatment is of the utmost importance in determining the procedures to be recommended when an epidemic strikes. Already it is well established that the amount of damage done to the nervous system primarily and to the muscles secondarily in this disease varies from one epidemic to another. Certainly mortality rates vary in different epidemics. Even the portions of the body that are primarily affected seem to differ; respiratory paralysis is much more frequent during some outbreaks than during others. The ultimate damage seems to vary according to the methods of treatment followed, yet assessment of both the immediate and the ultimate disability is exceedingly difficult. The committee has indicated research which might be undertaken to determine uniform methods of evaluation.

PEPTIC ULCER MORTALITY IN BRITAIN

According to mortality studies based on the reports of the Register General for England and Wales [1] peptic ulcer ranks low as a cause of death. In the ten year period preceding the war, however, the mortality among men increased steadily; since the outbreak of the war this increase has been accelerated. A comparison of mortality rates for the years 1911-1920 and 1932-1934 shows that the mortality rate in men after age 35 has increased, the rise becoming greater with advancing years, so that mortality from peptic ulcer at ages 45-75 has almost doubled. With women the trend has been different, with a decline at all ages under 55 and a relatively small rise from ages 55-75. Indeed, this significant rise in ulcer mortality for man at 45-65 has contributed to the lack of improvement in the death rate from all diseases for men of these ages, whereas in women there has been a steady decline. Mortality in men from gastric and duodenal ulcer varies widely in different social classes. Up to age 55 mortality from gastric ulcer in men rises in a regular manner with a descent in the social scale. There are five times more deaths in the poorest class at ages 25-45 than in the wealthy and professional groups. But this is not true for duodenal ulcer. Up to age 55 there is little difference in mortality among social groups, but after age 65 duodenal ulcer mortality definitely increases in the wealthy and professional groups, so that at age 70 and over the duodenal ulcer mortality is more than two times greater in the wealthy than in the poor. In men between the ages of 35 and 70 the mortality rate is over 100 per cent higher in London than in the rural areas. The acute depression of the 1930s with unemployment led to a reduction in ulcer mortality, but when unemployment declined mortality rose sharply. Almost immediately the war produced a rise in the mortality from peptic ulcer. Despite distortion due to population changes, it appeared that the rising mortality shifted with changes in air attacks from London to other parts of England and Wales. The pattern of mortality has remained consistent from year to year. This survey asks more questions than it answers, but it reflects the multiplicity of factors concerned in the pathogenesis of and mortality from peptic ulcer.

1. Morris, J. N., and Titmuss, Richard M.: Epidemiology of Peptic Ulcer: Vital Statistics, Lancet 2: 841 (Dec. 30) 1944.

VOCATIONAL GUIDANCE PAMPHLETS

Two authoritative pamphlets on "The Outlook for Women in Occupations in the Medical Services" dealing with physical therapists and occupational therapists have just been published by the Women's Bureau of the U. S. Department of Labor.[1] The excellent material in both pamphlets is a source of information for those concerned with vocational guidance and is of inestimable value to all who plan to obtain training in these occupations. Prior to publication each pamphlet was reviewed by representatives of various agencies or organizations who are leaders in these fields. Emphasis has been placed on presenting a clear, concise picture of the scope of the occupation, employment before the war, changes that have occurred as a result of the war, earning power of these therapists, and future needs for workers who have had adequate training and experience. Additional pamphlets will be printed to present pertinent information on other occupations in the medical field. Some of these discussions of occupations will be printed separately because of the timeliness of this information, but the entire series will be published later together with a discussion of important "trends affecting the many women employed in these services so important to the nation whether at peace or at war." The series will be listed as required reading by vocational guidance counselors.

1. Published by the Women's Bureau of the United States Department of Labor, the pamphlets are available at 10 cents each by addressing the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. The writer should request Bulletin 203, numbers 1 and 2.

MEDICINE AND THE WAR

ARMY

CONSERVATION OF X-RAY FILM

Owing to the serious shortage of x-ray film for both military and civilian purposes, the Army Medical Department is making every effort consistent with the maintenance of high professional standards to conserve it, Major Gen. Norman T. Kirk, Surgeon General of the Army, recently announced.

The Army Medical Department has had a steadily increasing need for x-ray film as a result of the large number of battle casualties and the necessity of taking numerous x-ray pictures in connection with the treatment of these patients.

Detailed instructions have been issued to all army medical officers to conserve film. Although a medical case history will be prepared on every man involved in the redeployment of troops following VE day, chest x-rays will not be made of all because that was done prior to shipping the men overseas. Since that time the Army has kept a critical medical eye on the health of the troops for symptoms of tuberculosis or any other disease. However, if tuberculosis or any other chest disease is suspected, an x-ray examination will be made.

Prior to reassignment under the redeployment plans, whatever is necessary medically will be done to bring the men to the fullest possible point of physical and mental efficiency, General Kirk stated.

Largely as a result of the Medical Department's program of screening soldiers by chest x-rays on induction, the incidence of tuberculosis has been only one tenth as high in this war as it was in the last war.

Figures in other fields of medicine reflect the benefits that the American soldier is deriving from the intensive efforts made to safeguard his health. The death rate from pneumonia has been reduced from 24 per cent in the last war to 0.6 per cent in this war. The incidence of malaria is only one fourth what it was in the early stages of this war.

These standards of low disease incidence must be maintained or improved if possible, General Kirk pointed out, but every reasonable economy must be used to stretch out the critical supply of x-ray film for both military and civilian use.

SERVICE COMMAND CONSULTANTS IN MEDICINE TRANSFERRED

Col. Vern R. Mason, former consultant in medicine of the Ninth Service Command, is now on duty overseas as medical consultant of the Pacific Ocean Area.

Col. Irving S. Wright, former consultant in medicine, Sixth Service Command, is now consultant in medicine, Ninth Service Command; Col. Alexander Marble, former chief of medical service, Harmon General Hospital, is now medical consultant, Sixth Service Command, and Lieut. Col. Worth B. Daniels is now chief of medical service at Harmon General Hospital, Longview, Texas.

GENERAL ROGERS HONORED BY TWO ALLIES

Brig. Gen. John A. Rogers, surgeon of the First Army, was recently awarded the medal of Officer, Order of the British Empire, and the French Croix de Guerre with Palm in recognition of his contribution to the Allied victories on the western front.

DR. GEORGE E. BURCH APPOINTED CONSULTANT

Dr. George E. Burch, associate professor of experimental medicine, Tulane University of Louisiana School of Medicine, New Orleans, was recently appointed civilian consultant to the Surgeon General for diseases of peripheral blood vessels with particular emphasis on trench foot and allied conditions.

EDUCATIONAL OPPORTUNITIES FOR ARMY DOCTORS

Major Gen. George F. Lull, Deputy Surgeon General, recently reported that since the start of World War II over 6,000 selected medical officers have been graduated from short but intensive courses given by the Medical Department in some thirty critical medical and surgical specialties. In addition, refresher courses in general medicine and surgery provide medical officers with a chance to "brush up" before returning to professional assignments after other duty.

Many doctors also benefit while in service from working under key professional personnel in military hospitals. Other medical officers who have been on duty with combat troops in the field are given an opportunity to brush up on their specialty through the rotation policy.

General Lull reported that 350 doctors have been reassigned from field to hospital duty during the past year in the Mediterranean theater and "the merit of intratheater rotational plans has been pointed out to other theaters and is being encouraged in order that the maximum number of doctors might receive refresher training while they are still in military service."

In the postwar period, General Lull added, all doctors will be entitled to professional training, after their release from service, under the G. I. Bill of Rights, and those who remain in the Army will have the opportunity for refresher training at selected military hospitals and civilian schools.

ARMY X-RAY CONFERENCE

A three day conference was recently held at the Medical Department Equipment Laboratory, Carlisle, Pa., attended by representatives of the Army Service Forces, Army Ground Forces, Army Air Forces and U. S. Navy, together with representatives of industrial companies manufacturing x-ray equipment. Improvements in present x-ray equipment and requirements for future development were discussed. Captured German x-ray equipment also was demonstrated at the conference.

NURSES INTERVIEWED

The American Red Cross is conducting personal interviews with all nurses classified as "available" by the Procurement and Assignment Service. Physicians, hospitals and hospital boards, industries, health agencies and registries which have contact with "available" nurses should be urged to give opportunity to the interviewers from the Red Cross to consult with these nurses, since this is essential for recruitment.

NEW CONSULTANT IN DERMATOLOGY

Major Clarence S. Livingood was recently appointed consultant in dermatology to the Surgeon General. Major Livingood recently returned from overseas, where he had been stationed at a general hospital in the India-Burma Theater since 1942. While there he received the Legion of Merit for outstanding work in dermatology.

COLONEL COOK DIRECTOR OF OCCUPATIONAL HEALTH DIVISION

Lieut. Col. William L. Cook Jr. was recently assigned director of the Occupational Health Division, Preventive Medicine Service, Office of the Surgeon General, succeeding Col. Anthony J. Lanza, recently retired from active duty. Dr. Cook graduated from Columbia University College of Physicians and Surgeons, New York, in 1934 and entered the service May 7, 1942.

ARMY AWARDS AND COMMENDATIONS

Brigadier General James E. Baylis

The Legion of Merit was recently awarded to Brig. Gen. James E. Baylis, formerly of Cincinnati. The citation accompanying the award stated that "as surgeon of the Fourth Corps Area from Oct. 1, 1940 to Jan. 24, 1942 his energy, sound judgment and foresight contributed materially to the expansion, supply and operation of the Corps Area Medical Service and the initiation of preventive sanitary methods for reducing the sick rate. He planned and supervised the efficient evacuation of patients from the First and Third Army Maneuvers in 1941. As commanding general of the Medical Replacement Training Center, Camp Joseph T. Robinson, Arkansas, from Jan. 25, 1942 to Oct. 1, 1943 he organized and directed the activities of this installation with exceptional success, completing the training of more than 46,000 replacements. Utilizing the existing facilities provided, he transformed a standard military camp into the most important training installation in the Eighth Service Command. The detailed arrangements which he perfected for the field sanitation, administration and the motor and tactical training of his troops were unique in their effectiveness and attractiveness. He demonstrated unusual leadership and ingenuity in the development and application of training aids and expedients to provide shade and shelter for his troops during outdoor instruction. His work at this training center was a noteworthy contribution to the war effort." General Baylis graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1910 and has been in the service since May 28, 1912.

Colonel Alfred A. DeLorimier

Col. Alfred A. DeLorimier, formerly of Washington, D. C., was recently awarded the Legion of Merit for "service as director of the Department of Roentgenology, Army Medical School, Army Medical Center, Washington, D. C., from Sept. 8, 1939 to Oct. 1, 1942. He developed an easily transportable, complete and efficient field x-ray equipment for the Army which permits the location of bullets and shell fragments in the body of a wounded man and makes it possible for the surgeon to extract them. He tested all types of roentgenologic materials procured for the Army and formulated the specifications necessary for their purchase. He made extensive studies of the use of photoroentgenography and was instrumental in developing stereoroentgenography, which has a valuable use in induction centers and in mass surveys. By his initiative, original thinking and development work he has performed outstanding service and contributed materially to the war effort." Dr. DeLorimier graduated from the University of California Medical School, San Francisco, in 1927 and entered the service May 10, 1929.

Lieutenant Colonel George T. Colvard

Posthumous award of the Bronze Star Medal was recently made to Lieut. Col. George T. Colvard of Deming, N. M. The citation accompanying the award mentioned "service from Aug. 29 to Sept. 7, 1944. He served as medical officer of a prisoner of war camp and aboard a prison ship, caring for hundreds of men. While aboard ship he taxed his strength to the limit of physical endurance in caring for the weak and sick. He never paused to rest while on the ship as the men in the stifling hold often became unconscious as the result of the severe heat and lack of oxygen but ministered to them at the sacrifice of his own health. Colonel Colvard, who lost his life while serving his fellow men, demonstrated unremitting effort and devotion to duty." Dr. Colvard was reported killed in action Sept. 7, 1944 in the sinking of a Japanese prison ship off the Philippine Islands. He graduated from the Medical College of Virginia, Richmond, in 1924 and entered the service Jan. 6, 1941.

Major William E. Clark

Major William E. Clark, formerly of Mason, Mich., has been awarded the Bronze Star "for meritorious service in connection with military operations against the enemy of the United States in France, Luxembourg and Belgium during the period from Oct. 13, 1944 to Feb. 15, 1945. As division neuropsychiatrist he treated large groups of patients, as many as 127 on one occasion during one day. Through his untiring efforts and his professional ability he was instrumental in returning to duty a large number of men who otherwise might have been lost to the division." Dr. Clark graduated from the University of Michigan Medical School, Ann Arbor, in 1936 and entered the service July 25, 1942.

Major Elmer A. Kleefield

The Bronze Star was recently awarded to Major Elmer A. Kleefield, formerly of Forest Hills, N. Y., "for meritorious service in connection with military operations against an enemy of the United States from July 4, 1944 to Jan. 24, 1945. As radiologist of the 34th Evacuation Hospital, Major Kleefield distinguished himself by his outstanding performance of duty. Exhibiting the highest professional attainments and zealous devotion to duty, the accomplishments of Major Kleefield distinguish him as an outstanding officer and merit high commendation." Dr. Kleefield graduated from Long Island College of Medicine, Brooklyn, in 1930 and entered the service Nov. 3, 1942.

Captain Stanley E. Morgan

Capt. Stanley E. Morgan, formerly of New Orleans, was recently awarded the Bronze Star. The citation accompanying the award explained that, "learning of several wounded soldiers badly in need of medical care, Captain Morgan braved heavy enemy mortar and small arms fire to reach the forward position in which they were. When enemy attacks forced other men of the position to withdraw, Captain Morgan supervised the evacuation of less seriously injured and elected to remain with those casualties who were too dangerously injured to be moved, despite the risk of capture or death." Dr. Morgan was taken prisoner by the Germans Oct. 6, 1944. He graduated from Louisiana State University School of Medicine, New Orleans, in 1941 and entered the service in May 1942.

Captain Lemuel Bowden

Capt. Lemuel Bowden, formerly of Norfolk, Va., was recently awarded the Legion of Merit for "services at Fogo Island, Newfoundland, from Nov. 3, 1943 to Nov. 24, 1944. As platoon surgeon of the 685th Signal Aircraft Warning Station, he gave freely of his technical skill and ability by rendering services to the civilians of Fogo Island at great personal sacrifice. In addition to his duties as platoon surgeon he performed many major surgical operations under adverse conditions with little equipment and at places far removed from his base." Dr. Bowden graduated from Harvard Medical School, Boston, in 1939 and entered the service Jan. 15, 1943.

Captain William A. Pallone

The Air Medal was recently awarded to Capt. William A. Pallone, formerly of Flushing, N. Y. A letter received from the Commander Officer by his family recently stated, in part, "It was an award made in recognition of courageous service to his combat organization. He was cited for meritorious achievement while participating in aerial flights in the Southwest Pacific Area from Aug. 12, 1943 to June 1, 1944. He took part in sustained operational flight missions during which hostile contact was probable and expected. These flights included bombing missions against enemy installations, shipping and supply bases and aided considerably in the recent successes in this theater." Dr. Pallone graduated from the Royal University of Rome in 1936 and entered the service Sept. 22, 1942.

Captain Richard J. Ackart

Capt. Richard J. Ackart, formerly of New York, was recently awarded the Bronze Star for outstanding bravery on the field of battle. A member of a medical detachment of the 38th Infantry Regiment of the 2d Infantry Division of the First Army, Dr. Ackart is now in Germany, where he was awarded the medal by Major Gen. Walter M. Robertson, commanding general of the division. With this award Dr. Ackart has also received the Oak Leaf Cluster to his Bronze Star and the second Oak Leaf Cluster. According to the citation which accompanied the second cluster, "Company E was

fighting on the eastern outskirts of town and suffering many casualties from machine gun and aimed small arms fire. While working around the aid station, several men came to the aid station and told Captain Ackart that litter bearers were needed very badly in E company's sector. It was impossible to send out any more litter bearers because they were all with the assault companies. Noting the lack of litter bearers, Captain Ackart and one of his enlisted personnel grabbed a litter and went to Company E's sector. He was immediately stopped by the company commander and was told not to go any farther forward as the enemy had that sector under intense machine gun fire. Disregarding this advice, Captain Ackart and his helper went forward, creeping and crawling to a point less than 100 yards from the enemy tank machine gun fire. It was at this point that one of the officers of the battalion was mortally wounded, but despite this murderous fire about him Captain Ackart and his aid man unnecessarily exposed themselves to this fire from the enemy in order to evacuate this officer. Alone these two men, with but a slim chance of getting back to safety themselves, loaded this officer on the litter and miraculously got him back to the rear. Such gallantry, heroism and utter disregard for his personal safety reflect extreme credit on Captain Ackart and the military service." Dr. Ackart graduated from the University of Rochester School of Medicine and Dentistry in 1942 and entered the service in August 1943.

Captain Harold P. Sortman

The Silver Star was recently awarded to Capt. Harold P. Sortman, formerly of Wilmington, Del., "for gallantry in action in the vicinity of Lup, Sicily, July 12, 1943. Captain Sortman, with complete disregard for intense enemy artillery fire, left a sheltered area position and entered an area under bombardment so that he might better aid the wounded and supervise their evacuation. His noble and unselfish action reduced suffering and saved the lives of a number of men." Dr. Sortman graduated from Jefferson Medical College of Philadelphia in 1936 and entered the service in June 1942.

Lieut. Col. Edwin S. Wallace

Lieut. Col. Edwin S. Wallace, formerly of Lexington, Mo., was recently awarded the Bronze Star "for meritorious service in connection with military operations against an enemy of the United States in France, Germany and Luxembourg during the period Nov. 1, 1944 to January 6, 1945. As commanding officer of a medical battalion Lieutenant Colonel Wallace distinguished himself through continuous long hours of arduous work. In spite of most adverse conditions he efficiently planned and executed the treatment and evacuation of the sick and wounded in close support of combat elements. Lieutenant Colonel Wallace's outstanding devotion to duty and display of technical skill resulted in the reduction of trench foot and other diseases to an absolute minimum, thereby contributing substantially to the successful combat operations of the 10th Armored Division during the period. His ceaseless energy and enthusiasm were an inspiration to his fellow officers and men and are in keeping with the high traditions of the armed forces of the United States." Dr. Wallace graduated from Washington University School of Medicine, St. Louis, in 1935 and entered the service in November 1940.

Major Ronald A. Bettle

The Bronze Star was recently awarded to Major Ronald A. Bettle, formerly of Hattiesburg, Miss., "for meritorious service in Germany during the period Nov. 1, 1944 to Feb. 15, 1945 in connection with military operations against the enemy. As surgeon for his unit, Major Bettle was responsible for medical attention of an exceptionally large group of administrative, technical and reinforcement personnel dispersed over a wide area. By his ingenuity he provided outstanding medical care for the troops and won high praise from all concerned. His initiative and technical knowledge reflect great credit on himself and the military service." Dr. Bettle graduated from the College of Medical Evangelists, Los Angeles, in 1940 and entered the service Feb. 26, 1941.

MISCELLANEOUS

RATION PLAN FOR PRIVATE DUTY NURSES ADOPTED

The following plan for the employment of private duty nurses in Rochester hospitals was recently approved by the Rochester Hospital Council and endorsed by the six member hospitals. Effective March 1, the plan is intended to apportion available private duty nursing service on the basis of physical need of the patient rather than ability to pay. The plan provides that:

1. No private duty nurse be employed in any member hospital of the Rochester Hospital Council unless the attending physician attests in writing the need for her services in each individual case.

2. When, in the opinion of a physician, the service of a private duty nurse is necessary, he shall apply to the nursing department for the employment of private duty nursing service. Such application shall state the diagnosis and the reason why the physician considers private duty nursing essential. Such application may be made by telephone but must be substantiated promptly in writing.

3. In order to insure a fair allotment of nursing service and to provide a fair and impartial review of requests for private duty nursing service, there shall be in each hospital a reference committee consisting of representatives of the medical staff and the administration which shall have final decision on all matters relating to the employment of private duty nursing service for the duration of the emergency. (At the Rochester General Hospital this committee includes Drs. C. S. Lakeman, C. B. F. Gibbs, C. G. Parnall and F. C. Sutton.)

4. When private duty nurses have been employed for special patients they may be transferred to the care of other patients whose need is more urgent by the nursing department subject to the review of the reference committee.

It is suggested that, whenever conditions warrant, the services of a private duty nurse shall be made available for more than one patient.

USE OF DDT FOR MOSQUITO CONTROL IN THE UNITED STATES

A Joint Statement of Policy by the U. S. Army and the U. S. Public Health Service

Successful use of the new insecticide DDT to combat insect borne disease among our troops overseas has brought sudden renown and notoriety to this potent war developed insect killer. Dramatic reports of its large scale use to control epidemics, and especially the spraying of DDT from aircraft, have fired public imagination and fostered the hasty conclusion that DDT is a complete solution to all of our insect borne disease problems. However, it must be remembered that DDT distributed over the countryside not only destroys malaria carrying mosquitoes but also may kill other insects, many of which are beneficial. Much still must be learned about the effect of DDT on the balance of nature important to agriculture and wild life before general outdoor application of DDT can be safely employed in this country. It may be necessary to ignore these considerations in war areas where the health of our fighting men is at stake, but in the United States such considerations cannot be neglected.

Extensive investigations are now being carried out by authorized agencies to determine the usefulness and possible hazards in the large scale dissemination of DDT. Until more information has been obtained from such investigations and until it has been evaluated by all interested parties, plans to employ DDT indiscriminately for outdoor area control of insect disease vectors in this country are not to be encouraged.

Since the beginning of mobilization the Army has carried on an extensive antimosquito campaign inside military reservations, and the U. S. Public Health Service has maintained a cooperative program for the control of malaria in adjacent extramilitary areas. This joint effort has successfully prevented malaria from becoming a problem to troops in this country. To meet the hazard of possible spread of malaria

by troops returning from overseas, the Army's program in military areas has been intensified and the program of the Public Health Service has been extended to include certain additional selected areas in the South, where risk of transmission is greatest. Representatives of the Army and the Public Health Service have given full consideration to ways in which this mosquito control program might be strengthened by employing DDT. The following joint policy has been agreed on pending acquisition of further knowledge concerning the large scale outdoor application of DDT:

1. DDT will be used for residual spray application to houses and other buildings for the purpose of killing adult mosquitoes before they have opportunity to transmit malaria. The long lasting killing effect of DDT as a residual spray provides a highly effective means to prevent the spread of the malarial parasite. This method of use is safe and economical and, moreover, is welcomed by the householder because it provides freedom from insect annoyance.

2. The use of DDT as a mosquito larvicide will be limited to experimental investigations and to situations in which DDT has definite advantage over other larvicides in saving materials and manpower, and presents no hazard to fish and other wild life.

3. Distribution of DDT from aircraft for large scale area control of mosquitoes in military and adjacent areas in the United States will be limited to projects conducted with due regard to the possible effects of DDT on beneficial insects and all forms of plant and animal life and in accordance with safeguards established by the Surgeons General of the Army and the U. S. Public Health Service.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Illinois

Gardiner General Hospital, Chicago: Types of Diabetes Mellitus and Their Treatment, Dr. Arthur R. Colwell, May 9; Some Fundamentals in Psychotherapy, Dr. David Slight, May 16; Wound Healing and Tendon Surgery, Drs. Hilger P. Jenkins and Alfred Rasmussen, May 23.

Station Hospital, Fort Sheridan: Peptic Ulcer, Gallbladder and Liver Diseases, Drs. Walter L. Palmer and Lester R. Dragstedt, May 17; Thrombosis, Thrombophlebitis and Anticoagulants in Less Common Peripheral Vascular Diseases, Drs. Geza de Takats and Armand J. Quick, May 24.

Vaughan General Hospital, Hines: Presentation of Allergy Cases, Capt. W. H. Horwitz, May 11; Heart Disease and Allied Conditions, Drs. Newell C. Gilbert and George K. Fenn, May 16; Presentation of Medical Cases, Major R. N. Tindall, May 18; Bone and Joint Infections, Drs. C. H. Hatcher and David Markson, May 23; Intestinal Parasites, Capt. J. M. MacMillan and Capt. Nathan Brooks, May 25.

U. S. Naval Hospital, Great Lakes: Tumors of the Chest, Dr. Willard Van Hazel, May 15.

Mayo General Hospital, Galesburg. Chest Diseases, Drs. Paul H. Holinger and Henry C. Sweany, May 18; Low Back Pain, Drs. Adrien Verbrugghen and Fremont A. Chandler, May 23.

Station Hospital, Camp Ellis, Lewistown: Arterial Vascular Disease; Traumatic Lesions, Lieut. Col. Ford K. Hick and Lieut. Col. John H. Gibbon, May 16; Repair of Bone in Fractures and Diseases, Dr. James R. Regan, May 23.

Regional Hospital, Chanute Field. Dermatologic Diseases, Drs. James H. Mitchell and Francis E. Senear, May 16; Burns and Plastic Surgery, Drs. Wayne B. Slaughter and Volney B. Hyslop, May 23.

Indiana

Billings General Hospital, Fort Benjamin Harrison: Malignancies in the Army Age Group: Medical X-Ray and Surgical Diagnosis and Treatment, Dr. Danely P. Slaughter, May 16; Endocrinology, Drs. Willard O. Thompson and Carl P. Huber, May 23.

Wakeman General Hospital, Camp Atterbury: Virus and Rickettsial Diseases; Medical and Neurologic Diseases and Treatment, Dr. Jonas E. Salk, May 16; Psychosomatic Medicine, Dr. David Slight, May 23.

Kentucky

Fort Knox General Hospital, Louisville: Surgical Relief of Involuntary Movement, Dr. Paul C. Bucy, May 16; Some Common Problems Encountered in the Diagnosis and Treatment of Infections in the Genitourinary System, Dr. Norris J. Heckel, May 16; Digestive Disorders, Dr. Walter L. Palmer, May 30; The Support of the Circulation in Surgery, Dr. Dallas B. Phemister, May 30.

Nichols General Hospital, Louisville: Surgery Relief of Involuntary Movement, Dr. Paul C. Bucy, May 17; Some Common Problems Encountered in the Diagnosis and Treatment of Infections in the Genitourinary System, May 17; Digestive Disorders, Dr. Walter L. Palmer, May 31; The Support of the Circulation in Surgery, Dr. Dallas B. Phemister, May 31.

Nebraska

A. A. F. Station Hospital, McCook Army Air Field: Clinical Pathologic Discussion of Liver Diseases, Drs. Esley J. Kirk and Charles P. Baker, May 15.

West Virginia

Newton D. Baker General Hospital, Martinsburg: Chemotherapy in War Wounds, Dr. Frank L. Meleney, May 28.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, April 21, page 1061)

COLORADO

Colorado Psychopathic Hospital, Denver. Capacity, 78; admissions, 800. Dr. Charles A. Rymer, Acting Director (2 fellowships—psychiatry, September 1).

LOUISIANA

North Louisiana Sanitarium, Shreveport. Capacity, 132; admissions, 4,260. Mrs. Will Samford, R.N., Superintendent (intern).

MARYLAND

Johns Hopkins Hospital, Baltimore. Capacity, 1,034; admissions, 18,214. Dr. Winford H. Smith, Director (interns—otolaryngology, radiology, July 1).

MASSACHUSETTS

St. Anne's Hospital, Fall River. Capacity, 141; admissions, 3,740. Sister Marie Stanislas, Superior (resident—mixed service, July 1).

NEW HAMPSHIRE

Elliot Hospital, Manchester. Capacity, 159; admissions, 2,834. Mrs. Elizabeth M. McKay, R.N., Superintendent (resident—mixed, disqualified for military service).

NEW YORK

Auburn City Hospital, Auburn. Capacity, 255; admissions, 6,198. Mr. Jerome F. Peck Jr., Acting Superintendent (resident—mixed, disqualified for military service).

Jamaica Hospital, Jamaica. Capacity, 227; admissions, 5,279. Mr. Francis C. Leupold, Superintendent (interns).

St. Agnes Hospital, White Plains. Capacity, 177; admissions, 2,695. Sister M. Madeline, R.N., Superintendent (interns).

TENNESSEE

Nashville General Hospital, Nashville. Capacity, 337; admissions, 6,586. Mr. T. F. Connally, Administrator (resident—pathology, October 1).

TEXAS

Methodist Hospital, Dallas. Capacity, 225; admissions, 8,193. Dr. C. W. Sensenbach, Medical Director (interns, July 1).

VIRGINIA

University of Virginia Hospital, Charlottesville. Capacity, 571; admissions, 11,181. Dr. Carlisle S. Lentz, Administrator (assistant resident; graduate student, dermatology and syphilology, June 15, disqualified for military service).

Riverside Hospital, Newport News. Capacity, 233; admissions, 5,382. Dr. H. H. Towler, Superintendent (3 residents—mixed service, June 1).

Grace Hospital, Richmond. Capacity, 100; admissions, 4,135. Mr. R. H. Thomas, Managing Director (resident—mixed service, July 1, disqualified for military service).

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

April 28, 1945.

Ask Removal of Venereal Disease as War Disability

Congress and state legislatures have been asked to modify the Starnes Veteran Preference Act of 1944 to exclude venereal diseases as a war service connected disability allowing war veterans preferences in civil service appointments. The National Civil Service League, in a resolution, holds that enactment of Public Law 439 of 1944 entitles war veterans suffering from venereal diseases contracted in service to disability allowance. It claims that this puts a premium on misconduct and that such disability would be on a par with that paid men who lose arms, legs or eyes. The league contends that section 2 of an act of May 17, 1926 provided an amendment which said that "venereal disease shall not be presumed to be due to misconduct if the person in service complies with Army or Navy regulations requiring . . . treatment for such disease." The Starnes act automatically gives a veteran with service connected disability 10 points in Civil Service examinations. Venereal disease was not specified and under regulations, it is said, could easily apply as a disability for benefits.

The Problem of Illegitimate Children of Service Wives

The adoption Bureau of the District of Columbia Board of Public Welfare reports moral and legal problems in handling placements of illegitimate children of service wives, conceived after their husbands went overseas. Director Nina Trevett reports that of the 50 babies placed in permanent homes in the Capital during the past year, nearly all were illegitimate children of army, navy and marine corps wives. Typical of the boom in child adoptions throughout the country, Miss Trevett reports that the bureau has a waiting list of 114 would-be foster parents. War conditions, she said, have forced the bureau to abandon its prewar regulation requiring three months' study and observation of a child before it is placed with foster parents. The bureau has, in cases, sanctioned placement direct from hospitals. Customary procedure requires a three month study of a child to determine its mental and physical well being and a six month probationary period with the foster parents.

Seven Medical Leaders Elected to Academy of Sciences

Among thirty-five distinguished scientific leaders representing twelve general fields of science who were elected to the National Academy of Sciences at the annual meeting here were seven men in the field of medical science. They include Dr. Robert R. Williams, chemical director of the Bell Telephone Laboratories, who was the first to synthesize vitamin B_1; Dr. Clarence C. Little, managing director of the American Society for Cancer Control; Dr. Alfred Blalock, professor of surgery at Johns Hopkins University, who is noted for his studies of shock and, more recently, for finding that myasthenia gravis can be successfully treated in some cases by removal of the thymus gland in the chest; Dr. John R. Paul, professor of preventive medicine at Yale University, a disease fighter who has done much work in recent years in tracing infantile paralysis epidemics to learn more about how this disease spreads; Dr. Homer W. Smith, director of the physiologic laboratory at New York University, noted for his research on high blood pressure and kidney function; Dr. William C. Stadie, professor of the department of research medicine, University of Pennsylvania, and Dr. James L. Gamble, pediatrician, of the Harvard Medical School. Present at the annual meeting were 117 of the 350 members. This is the first time in the history of the academy that thirty Americans, the yearly limit permitted by its charter, were elected in one year. Also elected were five foreign associate members, among them Dr. Paul Karrer, Swiss, who shared the Nobel chemistry prize in 1937, for working out the chemical formula for vitamin A.

Senate Approves Bill for Capital Hospital Center

The Senate has passed without opposition a bill sponsored by Senator Tydings, Democrat of Maryland, to create a postwar 1,500 bed hospital center in Washington. It now goes to the House for consideration. The bill would authorize the Federal Works Administration to acquire a site immediately on termination of the war and provide two thirds of the cost of erecting and equipping buildings. The other third of the cost, estimated at 20 or 30 million dollars, would be borne by existing District hospitals, which would participate in establishment, maintenance and operation of the center. Hospitals which have indicated their interest in cooperating in the project are Garfield, Emergency and Episcopal Eye, Ear and Throat. The Senate bill would permit these hospitals to allocate their share of costs on agreement to repay them over a period of twenty years at 2 per cent interest. The center would include a nurses' school and home, parking areas and special laboratories, and the 1,500 bed hospital would be equipped with operating rooms, laundries, x-ray machines, heating plant and other necessary equipment.

Wisconsin Alumni Group Fights to Validate Vitamin D Patents

The Supreme Court has been asked by the Wisconsin Alumni Research Foundation to review a lower court decision holding invalid three patents relating to the use of vitamin D in treating rickets. The foundation filed a petition for a writ of certiorari in its suit charging Vitamin Technologists, Inc., with infringement of its patents. The appeal was made after the Ninth Circuit Court of Appeals ruled in June 1943 that the foundation's patents were void as against the public interest and lacking in invention. The patents were granted on discoveries made by Dr. Harry Steenbock, Wisconsin University professor, on producing vitamin D in foods and medicine by exposing them to ultraviolet rays. The circuit court decision reversed a Southern California federal district court ruling of 1941 which had held the patents valid and ruled that the vitamin firm had infringed on them. The foundation contended in its appeal to the Supreme Court that it was being denied relief against an infringer for refusing in the past to license oleomargarine manufacturers under the patents. "The patents in suit do not claim anything broader than Dr. Steenbock's inventions," said the petition. "The claims in all three patents are properly commensurate with the basic discovery or invention on which Dr. Steenbock made and the various species thereof. The claims are definite and clearly define the scope of the three inventions, having regard to the breadth and nature of the primary inventions."

District Venereal Disease Measure Awaits Approval

Endorsed by the U. S. Public Health Service and the Justice Department, legislation to tighten control of venereal disease in the District of Columbia has been drafted and is before the Budget Bureau for approval. District Corporation Counsel Richmond B. Keech has informed House District Committee Chairman Randolph, Democrat of West Virginia, that the

measure would be submitted to Congress soon, if expected approval is given. Representative Randolph previously had pointed out that the District Social Hygiene Society felt that existing health measures were "too indefinite and ineffective" for vigorous enforcement of venereal disease control measures.

Nation Supports Cancer Control Month Program

An encouraging response in National Cancer Control month is reported here. To facilitate contributions, Postmaster General Frank C. Walker reports that America's 43,000 post offices will receive envelops enclosing contributions which are simply addressed "Cancer" and will transmit them to a central point in each state. "The Postal Service welcomes the opportunity to throw its unusual resources into the fighting against cancer," Mr. Walker said. "It is perhaps true that our service is more familiar to the average citizen than any other governmental agency. The national campaign for the control of cancer, which is now under way, looks to the dissemination of information about the early symptoms of cancer, clinics for diagnosis and other health facilities available for its control. The press, radio and all other mediums are generously focusing public attention on the campaign now being conducted by the American Cancer Society and telling the public the easy way to mail contributions: 'Simply address it to Cancer, care of your local post office'."

Propose That Bethesda Hospital Be Named After Roosevelt

Naming Navy's Hospital Center at Bethesda in honor of Franklin D. Roosevelt is proposed by Representative Flood, Democrat of Pennsylvania, who says "There could be no more fitting tribute to the late beloved President, in the District area, than to name as a memorial to him the magnificent medical center at Bethesda. A great humanitarian, keenly responsive to pain and suffering in others because of his great heart as well as his own affliction, the late President also cherished the Navy and its fighting ships and brave men and women."

Community Attack on Venereal Disease Problem Proposed

A united community attack on the problems of sexual promiscuity and venereal disease is advocated by the National Women's Advisory Committee on Social Protection, reports Federal Security Administrator Paul V. McNutt. The committee conferred here with the Social Protection Division, Office of Community War Service, of the Federal Security Administration.

Capital Notes

Restrictions on production and distribution of physical therapy equipment established in limitation order L-259 have been removed, the War Labor Board reports. Also restrictions on shipments of medical x-ray equipment for civilian purposes by manufacturers have been eliminated.

In its request to citizens in this 176th week of the war, the government asked graduate registered nurses not available for military service to apply for a job in a Veterans Administration hospital, where 2,000 nurses are needed by June 30.

Señorita Anramarina Colmenares, one of Venezuela's first woman doctors, lauded American women who are aiding the medical profession and hospitals as nurses' aides. She is here as a guest of the Pan American Sanitary Bureau.

Negro physicians of Washington held a five day seminar at Howard University College of Medicine on current medical developments. The seminar was sponsored by the District of Columbia Tuberculosis Association, the District Medico-Chirurgical Society, the Social Hygiene Society and Howard College of Medicine.

Bureau of Information

ONE THIRD OF COUNTIES COMPLETE REPORTS

Ten states have completed and returned summary sheets for all their counties. Sixteen states have submitted partial returns and twenty-two states have not yet returned any material to the Bureau. The Rhode Island and the District of Columbia societies, however, are conducting local surveys and have indicated that the requested information will be forwarded to the Bureau as soon as these are completed. Word has been received that the Illinois summary sheets will be sent in shortly. Oregon has not been included in the table, since the necessary forms were mailed there only recently.

A tabulation of returns from state and county medical societies as of April 25 is presented herewith.

Returns from State and County Medical Societies

State	Number of Counties	Number of Counties Reported	Counties Unreported
County Returns Complete			
Arkansas	75	75	0
Connecticut	8	8	0
Iowa	99	99	0
Kentucky	120	120	0
Nevada	17	17	0
[illegible]	31	31	0
[illegible]	53	53	0
[illegible]	88	88	0
Utah	29	29	0
Wisconsin	71	71	0
Partial County Returns			
Alabama	67	62	5
Colorado	63	19	44
Florida	67	15	52
Idaho	44	4	40
Indiana	92	53	39
[illegible]	64	32	32
[illegible]	14	8	6
[illegible]	83	31	52
Montana	56	37	19
New Hampshire	10	8	2
New Jersey	21	7	14
[illegible]	62	3	59
[illegible]	46	23	23
[illegible]	95	57	38
West Virginia	55	34	21
Wyoming	23	13	10
No Returns Received			
Arizona	14	0	14
California	58	0	58
Delaware	3	0	3
District of Columbia	1	0	1
Georgia	159	0	159
Illinois	102	0	102
Kansas	105	0	105
Maine	16	0	16
[illegible]	24	0	24
[illegible]	87	0	87
[illegible]	82	0	82
Missouri	115	0	115
Nebraska	93	0	93
North Carolina	100	0	100
[illegible]	77	0	77
[illegible]	67	0	67
[illegible]	5	0	5
South Dakota	69	0	69
Texas	254	0	254
Vermont	14	0	14
Virginia	100	0	100
Washington	39	0	39
Total	3,037	997	2,040

Inquiries from medical officers or veterans are being received by the Bureau with increasing frequency. In order to be able to supply the requested information it is essential that county summary sheets be completed and returned promptly. Already veterans have asked for information about states which have not sent in any county forms at all.

Coming Medical Meetings

New Hampshire Medical Society, Manchester, May 15. Dr. Carleton R. Metcalf, 5 S. State St., Concord, Secretary.

Rhode Island Medical Society, Providence, May 16-17. Dr. William P. Buffum, 122 Waterman Street, Providence 3, Secretary.

Official Notes

DOCTORS LOOK AHEAD

During the next four weeks Doctors Look Ahead will present the following programs:

May 5. Bewildered Parents; about children who have got their parents down; speaker, Dr. George K. Anderson, Secretary of the A. M. A. Council on Foods and Nutrition.

May 12. National Hospital Day, a program broadcast direct from the Dora De Lee Amphitheater at Chicago Lying-in Hospital, commemorating the fiftieth anniversary of that institution and looking ahead to enlarged service and research in this and similar institutions; speaker, President Robert Maynard Hutchins of the University of Chicago.

May 19. Look Sharp, a program looking toward better vision for the American people.

May 26. Unfinished Business, a program looking ahead to progress toward unsolved or partly solved problems of medicine; speaker, Dr. Morris Fishbein, Editor of THE JOURNAL and of *Hygeia*.

Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting Company network each Saturday at 4 p. m. Eastern War Time (3 p. m. Central War Time). Some stations may record the program and broadcast it at a time which suits their schedule better. Local newspaper radio announcements should be consulted.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Selective Training and Service Act

Senator Ellender, April 24, offered his bill to provide for the deferment of premedical and predental students, S. 637, as an amendment to another bill that was being considered by the Senate, H. R. 2625, to extend the Selective Training and Service Act of 1940. After receiving assurances, however, of an early consideration of S. 637 by the Senate Committee on Military Affairs, Senator Ellender withdrew his amendment. A hearing on the Ellender bill has been scheduled by the committee for May 1.

The bill to insure adequate nursing care for the armed forces, H. R. 2277, has been reported favorably to the Senate by the Committee on Military Affairs, with amendments. One amendment excludes from the bill a person who has volunteered for religious service at home or abroad or who is taking theological training in order to consecrate her life to religious service. Consideration of the bill by the Senate is scheduled for the week beginning April 30.

Medical and Dental Corps

Representative May, Kentucky, has introduced a bill, H. R. 3070, providing that for the duration of the wars in which the United States is presently engaged and for six months thereafter the Secretary of War may, in his discretion, dispense with any part of the examination for promotion in the Regular Army of officers of the Medical, Dental and Veterinary Corps except those relating to physical examination. This bill will merely extend the provisions of a law enacted by the Seventy-Sixth Congress beyond the terminal date set forth in that law, May 15, 1945.

Senator Johnson, Colorado, proposes by S. 916 to remove the limitation on the right to command of officers of the Dental Corps of the Army. At the present time the right to command of dental officers is limited to the Dental Corps.

Representative Rivers, South Carolina, proposes by H. R. 2584 to provide more efficient dental care for the personnel of the United States Navy by requiring the Bureau of Medicine and Surgery to be reorganized so as to effectuate a greater integrity of the dental service. The dental functions of the bureau, it is proposed, shall be defined and prescribed to the end that the Dental Division will study, plan and direct all matters coming within the cognizance of the division. It will be specifically authorized to establish professional standards and policies for dental practice, to conduct inspections and surveys for maintenance of such standards, to initiate and recommend action pertaining to complements, appointments, advancement, training, assignment and transfer of dental personnel, and to serve as the advisory agency for the bureau on all matters relating directly to dentistry.

Physically Handicapped Persons

Senator Kilgore, West Virginia, has introduced S. J. Res. 58, providing that the first week in October of each year shall be designated as National Employ the Physically Handicapped Week. The President will be authorized and directed to issue a suitable proclamation, and governors of states, mayors of cities and heads of other instrumentalities of government, leaders of industry, educational and religious groups, labor, veterans, women, farm, scientific and professional, and all other organizations and individuals will be invited to participate in the program to enlist public support for and interest in the employment of otherwise qualified but physically handicapped workers.

Representative Randolph, West Virginia, has introduced H. R. 3067 to amend An Act to Regulate and Improve the Civil Service of the United States, by providing that no person shall be discriminated against in any case because of his or her total or partial blindness in examination, appointment, reappointment, reinstatement, reemployment, promotion, transfer, retransfer, demotion, removal or retirement, unless normal eyesight is absolutely indispensable in the doing of the physical acts to be performed.

Industrial Health

The House Committee on Labor has recently received testimony from representatives of labor organizations on the bill introduced by Representative Norton, New Jersey, H. R. 525, proposing an appropriation of $5,000,000 annually to enable the United States Department of Labor to cooperate with state agencies administering labor laws in establishing and maintaining safe and proper working conditions in industry and in the preparation, promulgation and enforcement of regulations to control industrial health hazards. Early action by the committee on this bill is anticipated.

Veterans Administration

Three recently introduced bills propose to facilitate the receipt of hospital treatment and domiciliary care by former members of the armed forces at institutions nearest their places of residence: S. 755, introduced by Senator Cordon, Oregon, H. R. 2989, introduced by Representative Huber, Ohio, and H. R. 2921, introduced by Representative Stigler, Oklahoma.

In a bill introduced by Senator Morse, Oregon, S. 850, it is proposed that the education and training provided for by the G. I. Bill of Rights shall be made available to veterans on an equal basis without regard to their age.

Miscellaneous

H. R. 2965, introduced by Representative Anderson, California, would permit the inclusion of land occupied by Dibble General Hospital within the corporate limits of the city of Menlo Park, Calif.

The name of the National Naval Medical Center at Bethesda, Md., would be changed to the Franklin D. Roosevelt Naval Medical Center under a bill introduced by Representative Flood, Pennsylvania, H. R. 2986, which is pending in the House Committee on Naval Affairs.

STATE LEGISLATION

Florida

Bills Introduced.—S. 228 and H. 309 propose to establish a college of medicine and dentistry as a part of the University of Florida. H. 276, to amend the workmen's compensation act, proposes, among other things, to require an employer to furnish to an injured workman such medical, surgical or other attendance or remedial treatment or supplies for such period as the nature of the injury or the process of recovery may require. Under the present law, apparently, the total charge against the employer for such services and supplies may not exceed $1,000.

S. 179 proposes that the responsibility for the enforcement of the laws relating to public health and to the practice of medicine, chiropractic, naturopathy, nursing and midwifery shall rest on all law enforcement officers of the state and the counties thereof and on the state board of health acting through its duly appointed agents.

Michigan

Bills Introduced.—S. 362 and H. 423 propose a system of compulsory health insurance.

New Mexico

Bill Introduced.—S. 263 proposes to authorize the public health department to work in cooperation with the Surgeon General of the United States Public Health Service and other federal agencies in connection with the survey of hospital facilities and needs of the state.

Pennsylvania

Bill Introduced.—H. 1163, to amend the law providing compensation for workmen acquiring stated occupational diseases during the course of their employment, proposes to add to the list of compensable occupational diseases infection or inflammation of the person due to bacterial or parasitic agents in any occupation involving direct contact with handling thereof or exposure to such agents, poisoning by sulfuric, hydrochloric or hydrofluoric acid, and any and all occupational diseases.

COMPULSORY HEALTH INSURANCE

Bills Considered in State Legislatures Jan. 1-April 15, 1945. Prepared by the Bureau of Legal Medicine and Legislation, American Medical Association, Chicago, April 25, 1945

A.

Bills to Provide Medical, Nursing, Laboratory, Dental and Hospital Services

State	Bill Number	Contribution	Status as of April 15
California	A. 449 (CIO Bill)	Employer, 1.5 per cent of wages; employee, same	Held in committee; probably dead
California	A. 800, S. 500 (governor's bill)	Employer, 1.5 per cent of first $4,000 paid each worker; employee, same	Held in committee; probably dead
California	A. 1200 (California Med. Assn. bill).	Varies for both worker and employer according to contract concerned	Held in committee; probably dead
California	A. 1414, A. 2129 (so-called Social Insurance Act)	Employer, 1 per cent of wages; employee, 1 per cent of wages; state, 1 per cent of wages	In committee; no other action
California	A. 1525	Employer, 1.5 per cent of wages; employee, same	In committee; no other action
California	A. 2097	Employer, 1 per cent of wages; employee, 1 per cent of wages; state, 1 per cent of wages	In committee; no other action
California	A. 2157 (so-called Optional Health Insurance Act)	Employer, 1 per cent of wages; employee, 1 per cent of wages up to $4,000	In committee; no other action
Connecticut	H. 601	Employer, 1 per cent of payroll; employee, none; state, 1 per cent of payroll	In committee; no other action
Michigan	S. 362, H. 423	Employer, 2 per cent of wages; employee, apparently none	In committee; no other action
New Mexico	H. 275	Employer, 1.5 per cent of wages; employee 1.5 per cent of wages up to $4,000	Dead
New York	A. 97	Copy of bill not available	Dead
New York	A. 141	Employer, 1 per cent of payroll; state, same; employee, none	Dead
New York	A. 260	Employer, 1 per cent of payroll; state, same; employee, none	Dead
New York	S. 336	Copy of bill not available	Dead
New York	S. 476	Employer, 1 per cent of payroll; state, 1 per cent of payroll; employee, none	Dead
Wisconsin	S. 412	Employer, 2 per cent of wages; employee, 2 per cent of wages	In committee; no other action

B.

Bills to Provide Cash Payments for Sickness—So-Called Cash Sickness Insurance

State	Bill Number	Amount of Benefits	Contributions	Status as of April 15
California	A. 1414, A. 2129	Same as unemployment compensation	Employer, 1 per cent of wages; employee, 1 per cent of wages; state, 1 per cent of wages	In committee; no other action
California	A. 1473	Same as unemployment compensation	Employer, 1.5 per cent of wages; employee, 1.5 per cent of wages	In committee; no other action
California	A. 2097	Same as unemployment compensation	Employer, 1 per cent of wages; employee, 1 per cent of wages; state, 1 per cent of wages	In committee; no other action
Colorado	S. 21	Copy of bill not available		Dead
Massachusetts	S. 86	$12-$28 per week	Employer, 1 per cent of wages; employee, 1 per cent of wages	In committee; no other action
Massachusetts	H. 372	Same as unemployment compensation	Employer, 1 per cent of first $3,000 paid employee; employee, 1 per cent of wages up to $3,000	
Massachusetts	H. 259	Same as unemployment compensation	Included in unemployment contributions	In committee; no other action
Massachusetts	H. 260	Same as unemployment compensation	Included in unemployment contributions	In committee; no other action
Massachusetts	H. 647	Copy of bill not available		In committee; no other action
Massachusetts	H. 949	Copy of bill not available		In committee; no other action
Massachusetts	H. 1410	Copy of bill not available		In committee; no other action
Minnesota	H. 786	$7-$20 weekly	Employee, 1 per cent of wages up to $3,000; employer, none	In committee; no other action
Montana	H. 301	Same as unemployment compensation	Employer, none; employee, 1 per cent of wages up to $3,000	Dead
Nevada	A. 172	$8-$18 weekly	Employee, 1 per cent of wages up to $3,000; employer, none	Dead
New Jersey	S. 27	Same as unemployment compensation	Included in unemployment contributions	Dead

C.

Bills to Authorize Study of Health Insurance System

State	Bill Number	Status as of April 15
California	A. Res. 83	Adopted 1/26/45
California	S. Con. Res. 43	In committee; no other action
Connecticut	S. 524	In committee; no other action
Maryland	H. J. Res. 13	Dead, but did pass house 3/27
West Virginia	H. Con. Res. 4	Adopted 2/15/45

D.

Bills Proposing Constitutional Amendment to Direct Enactment of So-Called Health Service System

State	Bill Number	Status as of April 15
California	S. Const. Amend. 15	In committee; no other action
California	A. Const. Amend. 29	In committee; no other action
California	A. Const. Amend. 30	In committee; no other action

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CONNECTICUT

Service Bureau for Returning Medical Officers.—The organization of a service bureau for returning medical officers is now under way under the auspices of the Connecticut State Medical Society. It will be located and administered in the offices of the state society at New Haven and the Procurement and Assignment Service. Discharged medical officers will have access through the service bureau to factual data concerning opportunities for general or special practice in urban or rural communities, information regarding full time institutional, public health and industrial employment, and detailed intelligence on the resumption or extension of education and training. Advice and guidance concerning problems of a local nature will be available to the physician veterans at all times. Connecticut physicians who have already returned from military service will be asked to serve the bureau in an advisory capacity in order that the benefit of their special knowledge and experience may be obtained.

DISTRICT OF COLUMBIA

Award in Chemistry.—Raymond M. Hann, Ph.D., of the National Institute of Health, U. S. Public Health Service, on March 8 was presented with the Hillebrand Prize for 1944 of the Washington section of the American Chemical Society for outstanding contribution to the science of chemistry during the three preceding years. Dr. Hann received the award in recognition of his work on the chemistry, structure and synthesis of methylene and benzylidene acetals of sugar alcohols, according to *Science*.

General Ireland Honored.—A citation for distinguished service to humanity and military medicine was awarded to Major Gen. Merritte W. Ireland, formerly Surgeon General of the U. S. Army, during special ceremonies at the Medical Society of the District of Columbia, April 19. Among the speakers were Major Gen. Norman T. Kirk, Surgeon General of the Army; Vice Admiral Ross T. McIntire, Surgeon General of the Navy, and Dr. Thomas Parran, Surgeon General of the Public Health Service. The presentation was made by Dr. William M. Ballinger, acting president of the district medical society.

ILLINOIS

Public Health Meeting.—The Illinois Public Health Association will meet at the Hotel LaSalle, Chicago, May 16, and at the Hotel Abraham Lincoln, Springfield, May 17. The following program will be presented at both sessions:

Dr. Erich M. Uhlmann, Chicago, Cancer as a Public Health Problem.
Dr. Conrad S. Sommer, Chicago, Rehabilitation Program for Mental Hygiene.
Clemons M. Roark, assistant regional representative, National Housing Agency, Chicago, Housing in Illinois.
Dr. Clifton F. Hall, Springfield, Tuberculosis Control Programs in Illinois.
Dr. James G. Townsend, Bethesda, Md., Integration of Industrial Health into the Total Health Program.
Ruth Fisher, R.N., New York, What's Ahead in Public Health Nursing?
Dr. George M. Wheatley, New York, Rheumatic Fever, a Growing Public Health Problem.
Frank Stafford, U. S. Office of Education, Washington, D. C., Health, the First Objective of Education.

Dr. Leonard M. Schuman, Springfield, assistant chief, division of local health administration, and Howard J. Shaughnessy, Ph.D., president-elect, Illinois Public Health Association, Chicago, will act as chairmen. At the dinner session, Dr. Sumner M. Miller, Peoria, president of the Illinois Public Health Association, will be chairman and the speakers will include Mr. Alden B. Mills, managing editor, Modern Hospital Publishing Company, Chicago, on "Coordination of Hospital, Medical and Public Health Activities" and Dr. Reginald M. Atwater, New York, "A System of Local Health Units for the Nation."

Chicago

The Ranson Lecture.—Dr. Owen H. Wangensteen, Minneapolis, delivered the Ranson Memorial Lecture at Thorne Hall, Northwestern University, April 26, on "Studies in Etiology and Surgical Management of Ulcer." The lecture is sponsored annually by Phi Beta Pi fraternity of Northwestern University.

Arthur Compton Goes to Washington University.—Arthur H. Compton, Sc.D., professor and chairman of the department of physics and dean of the division of physical sciences, University of Chicago, and winner of the Nobel Prize for physics in 1927, has been chosen chancellor of Washington University, St. Louis. Dr. Compton was professor of physics at Washington University from 1920 to 1923.

Portrait of Ludvig Hektoen.—The fellows of the Institute of Medicine of Chicago presented an oil portrait of Dr. Ludvig Hektoen to the institute during special ceremonies April 25. The work of Carl A. E. Tolpo, the oil portrait is now hanging in the rooms of the institute, where the special program was held with Dr. William C. Danforth, president of the institute, presiding. The presentation was made by Dr. Anton J. Carlson, Frank P. Hixon professor of physiology emeritus, University of Chicago School of Medicine, and Dr. William F. Petersen gave the speech of acceptance. Jens Christian Bay, librarian of the John Crerar Library, Dr. James B. Herrick and Dr. Hektoen also spoke.

Koessler Fellowship Available.—The Jessie Horton Koessler Fellowship of the Institute of Medicine of Chicago for the aid of research in biochemistry, physiology, bacteriology or pathology will be available on September 1. The stipend is $500 a year, with the possibility of renewal for one or two years. Only such applications will be considered as are approved by the head of a department in the fields mentioned or by the director of a research institute or laboratory in Chicago and which stipulate that the recipient of the fellowship shall be given adequate facilities for carrying out the proposed research, concerning which full information is required in the application. Applications will be received up to July 1 and should be sent to Dr. Paul R. Cannon, Chairman of the Committee on the Jessie Horton Koessler Fund, 950 East 59th Street, Chicago 37. Since there are no formal blanks, application should be made by letter.

Frank R. Lillie Honored.—The Frank R. Lillie room in the Hull zoological laboratory, University of Chicago, was dedicated April 12 in tribute to Frank R. Lillie, Ph.D., Andrew MacLeish distinguished service professor emeritus of embryology at the university. The dedication ceremony was carried out with Carl R. Moore, Ph.D., chairman of the department of zoology, officiating. A portrait of Dr. Lillie, the gift of friends and painted in 1935 by Charles Hopkinson, is a feature of the room, which will be used for seminars and social gatherings. On the walls of the room also are six decorative panels of scenes of Woods Hole, Mass., where Dr. Lillie developed the Marine Biological Laboratory. Dr. Lillie, the only man ever to hold simultaneously the position of president of the National Academy of Sciences and the chairmanship of the National Research Council, was on the midway as a fellow in 1892, the year the new University of Chicago was established. With the late Charles O. Whitman, Ph.D., who established the university's department of zoology at the request of the late President William Rainey Harper, Dr. Lillie was among the first of a long line of eminent zoologists at Chicago. He succeeded Dr. Whitman as chairman of the department in 1911; he was dean of the division of biological sciences from 1931 to 1935.

INDIANA

New Executive Secretary for Lake County.—Mr. Rollis Weesner, for about twenty years associated with the attendance department of the Hammond City Schools, has been appointed executive secretary of the Lake County Medical Society. He succeeds Rollen W. Waterson, who resigned to accept a similar position with the Alameda County Medical Society, Oakland, Calif. (THE JOURNAL, March 31, p. 865).

IOWA

Harry Smith Goes to Columbia University.—Dr. Harry P. Smith, professor of pathology, State University of Iowa College of Medicine, Iowa City, has been appointed professor of pathology and executive officer of the department of pathology at Columbia University College of Physicians and Surgeons, New York. Dr. Smith has been associated with Iowa since 1930. He graduated at the University of California Medical School, San Francisco, in 1921.

Nutrition Demonstration Clinic.—Dr. Walter E. Wilkins, detailed from the U. S. Public Health Service to the nutritions program branch, Office of Distribution, War Food Administration, held a nutrition demonstration clinic at Broadlawns Polk County Hospital, Des Moines, May 3, under the auspices of the state nutrition council, the Polk County Medi-

cal Society, the Iowa State Medical Society and the state department of health. The purpose of the clinic is to give professional and other workers a more adequate concept of good and poor nutrition.

MINNESOTA

Sentenced for Narcotic Theft.—Lloyd E. Gallagher, Minneapolis, was recently sentenced by Judge Guilford in the district court of Hennepin County to serve a sentence of not to exceed seven years at hard labor in the state prison at Stillwater, following his conviction by a jury for grand larceny in the second degree arising out of a theft by Gallagher January 30 of 787 grains of morphine sulfate from the Danielson Medical Arts Pharmacy, Inc. According to the Minnesota State Board of Medical Examiners, Gallagher has a long record of narcotic violations.

Physicians Honored.—Dr. William J. Cochrane, Lake City, was honored at a meeting, April 2, for his completion of fifty years in the practice of medicine and Dr. William F. Wilson, Lake City, for his completion of fifty years as secretary of the Wabasha County Medical Society. The joint honor was a feature of a meeting sponsored by the staff of Buena Vista Sanatorium, Wabasha, whose tuberculosis commission is served as president by Dr. Cochrane, and the Wabasha-Winona county medical societies. Among the speakers were Drs. Viktor O. Wilson, Minneapolis, on "Provisions of the Revised Maternity and Infant Care Program"; Roger L. J. Kennedy, Rochester, "Multiplex Plans Proposed for the Prepayment of Medical Services," and David O. N. Lindberg, Wabasha, "A Summary of Indications for Adjunctive Surgical Therapy in Pulmonary Tuberculosis."

NEW HAMPSHIRE

State Medical Meeting.—The one hundred and fifty-fourth annual meeting of the New Hampshire Medical Society will be held at the Hotel Carpenter, Manchester, May 15, under the presidency of Dr. Fred Fernald, Nottingham. Among the speakers will be:

Dr. Henry H. Amsden, Concord, Epistaxis.
Dr. John Milne, Hanover, Infectious Mononucleosis.
Dr. Joseph S. Lawrence, Washington, D. C., director (Washington office), Council on Medical Service and Public Relations, American Medical Association, How Can Physicians Help Lawmakers?
Russell S. Spaulding, Concord, executive secretary, Blue Cross, Report on Blue Shield.
Dr. Reginald H. Smithwick, Boston, Surgical Treatment of Hypertension.
Dr. Philip D. Wilson, New York, Reconstructive Surgery of the War Wounded.
Dr. Alfred L. Frechette, Concord, Medical Relief Problems in Africa.

A feature of the meeting will be the presentation of fifty year certificates to Drs. Anna M. Littlefield, New London; William H. Mitchell, Loudon, and Henry L. Stickney, Boston.

NEW YORK

Child Guidance Institute.—On May 19 the Mental Hygiene Association of Westchester County will conduct a child guidance institute at the Sarah Lawrence College, Bronxville. The speakers will be Lois B. Murphy, Ph.D., Bronxville, on "Who are the Children Who Need Psychiatric Guidance?" Dr. Lawson G. Lowrey, New York, "Consultation and Treatment Possibilities"; Dr. Irving Edward Liss, New York, "Teachers' Problems," and Alice Kelliher, director, Walden School, New York. The Mental Hygiene Association of Westchester County was organized February 13 and was originally known as the Committee for Mental Hygiene of the Westchester County Council of Social Agencies. Constance Warren, president of Sarah Lawrence College, is president and Mrs. Ruth R. Colegrove, room 709, County Office Building, White Plains, executive secretary. One of its first activities is to work for the establishment of six tax supported mental hygiene clinics in different sections of the county under the county health department, to provide consultation and treatment for children, veterans and their families. When this is accomplished, the society hopes to continue its assistance through an advisory clinic committee. The child guidance institute is one of the many activities planned in relation to community education.

New York City

The Harvey Lecture.—Francis O. Schmitt, Ph.D., head of the department of biology and biologic engineering, Massachusetts Institute of Technology, Cambridge, Mass., will deliver the eighth Harvey Society Lecture of the current series at New York Academy of Medicine, May 17. His subject will be "Ultrastructure and the Problem of Cellular Organization."

Grant for Hodgkin's Disease.—A $5,000 grant has been given by Martha W. Hoster of Columbus, Ohio, to St. Vincent's Hospital for the Laboratory of Cellular Physiology and Pathology to conduct studies on Hodgkin's disease with collaborators at New York University, Ohio State University, Columbus, Ohio, and Walter Reed General Hospital, Washington, D. C. This fund will be administered by Dr. Antonio Rottino of St. Vincent's Hospital and Mr. Constantine G. Grand of New York University.

Physical Education Teacher Arrested for Practicing Without a License.—William James O'Connor, a physical education teacher, was arrested April 10 on a charge of unlawfully practicing medicine. Newspapers reported that he had maintained offices in various midtown hotels and prescribed treatments for wealthy patients for fees ranging from $100 to $500. A warrant for O'Connor was issued nearly a year ago in Yorkville Court but O'Connor could not be located until a state medical inspector made an appointment with him by mail through a postoffice box number in Washington. The appointment was kept April 10 and the arrest followed. The inspector said O'Connor used a stethoscope and blood pressure gage for examining him.

Meeting on Rheumatism.—The annual meeting of the New York Rheumatism Association will be held at the New York Academy of Medicine, May 9, under the presidency of Dr. Russell L. Cecil. Among the speakers will be:

Dr. John Lansbury, Philadelphia, Dietary Deficiency in the Etiology of Interstitial Calcinosis (Calcium Gout).
Dr. James A. Coss Jr., Observations on Juvenile Rheumatoid Arthritis (Still's Disease).
Drs. Hugo A. Freund and Gabriel Steiner, Detroit, Polymyositis in Rheumatoid Arthritis.
Dr. Eugene F. Traut, Chicago, Bone Marrow Findings in Arthritis.
Lieut. Col. Philip S. Hench, M. C., and Major Edward W. Boland, M. C., Rheumatic Centers of the United States Army.
Major David M. Kydd, M. C., Capt. Joseph L. Hollander, M. C., Capt. Nathan R. Abrams, M. C., and Lieut. Charles W. Fogarty Jr., M. C., Acute Arthritis Resembling Reiter's Syndrome.
Dr. Abraham S. Gordon, Brooklyn, Transmission of Gold Salts to the Fetus Through the Placenta.

Dr. Edward F. Hartung is secretary-treasurer of the association.

Postgraduate Course in Cardiology.—A postgraduate course in cardiology will be offered at Montefiore Hospital for Chronic Diseases, 150 East Gun Hill Road, in affiliation with Columbia University College of Physicians and Surgeons, June 5-August 14. Among the instructors will be Drs. Abraham Jezer, Emanuel Goldberger, Harry Gross and Joseph Ballinger. The course is designed for the general practitioner, with chief emphasis on bedside teaching and demonstration of cases to small groups of students. It will include a demonstration of cardiac fluoroscopy, of measurements of venous pressure and circulation times and discussions on criteria of classification, on correlations with pathology and on principles of treatment. This course may be taken simultaneously with elementary electrocardiography and elementary cardiovascular roentgenology. Additional information may be obtained from Dr. Willard C. Rappleye, dean, Columbia University College of Physicians and Surgeons, 630 West 168th Street, New York 32.

Personal.—Dr. Thomas M. Rivers, medical director of the Hospital of the Rockefeller Institute for Medical Research, was recently elected to honorary membership in the Royal Medical Society of Edinburgh. Dr. Rivers is now out of the United States on official duty for the U. S. Navy.——Dr. George B. Dorff, Brooklyn, retiring president of the East New York Medical Society, was recently given a special citation for his work with the selective service system of the city.——Dr. George T. Pack was recently decorated by the Brazilian government as an Officer of the Southern Cross.——Dr. Carlisle S. Boyd was recently appointed senior consulting physician and physician-in-chief emeritus of the Hospital for Special Surgery, formerly known as the Hospital for the Ruptured and Crippled. On his retirement Dr. Boyd had concluded thirty year's service with the hospital as head of the department of medicine and pediatrics (THE JOURNAL, July 29, 1944, p. 921).——Dr. Adolph G. DeSanctis has been elected an honorary member of the Bolivian Pediatric Society.

Industrial Ophthalmology in Medical Schools.—A conference in industrial ophthalmology will be held at Columbia University College of Physicians and Surgeons in conjunction with the National Society for the Prevention of Blindness, May 7-11. The course has been inaugurated in support of the government program for better visual conditions in industry. The government program was initiated by the War

Production Board and the U. S. Public Health Service in cooperation with the National Society for the Prevention of Blindness and includes as cooperating agencies the U. S. Department of Labor (Division of Labor Standards), War Manpower Commission, the Office of Vocational Rehabilitation and the U. S. Civil Service Commission. The necessity for the course arises from the present limited number of ophthalmologists available for serving industry, particularly in respect to the problems peculiar to industrial visual conditions. Members of the faculties of other medical schools have been invited in the hope of stimulating similar programs. Dr. Willard C. Rappleye, dean of the Columbia University College of Physicians and Surgeons, will open the session, which will be conducted by:

Dr. Albert C. Snell, Rochester, N. Y., Industrial Challenge to Ophthalmology.
Charles P. Tolman, New York, industrial consulting engineer, Eyesight in Industry.
Gertrude Rand, Ph.D., New York, and W. G. Darley, Illumination from the Viewpoint of Ophthalmology and of Industry, respectively.
Dr. Hedwig S. Kuhn, Hammond, Ind., Prescriptions for Occupational Glasses.
Joseph Tiffin, Ph.D., Job Analysis for Visual Requirements.
Faber Birren, New York, Use of Color for Simplifying the Visual Task.
Lieut. Comdr. Walter E. Fleischer (MC), Welding Hazards.
Dr. Leon Holland Whitney, Brooklyn, Vision, Engineering and Management.
Dr. Charles F. Kutscher, Pittsburgh, Industrial Toxic Compounds, Hazards and Treatment.
Dr. James M. Carlisle, Rahway, N. J., Industrial First Aid in Chemical Injuries of the Eye.

The program will also include a symposium on screening methods for industrial visual characteristics by Drs. Conrad Berens, New York; Joseph Lo Presti, Brooklyn, and Le Grand H. Hardy, New York.

OHIO

Bureau of Industrial Hygiene Created.—The Cleveland Bureau of Industrial Hygiene has been set up by the local division of health to help reduce health hazards in industry. The research and educational facilities of Western Reserve University School of Medicine have been made available to the new bureau, which has established quarters in room 207 at the school of medicine building on the university campus, Cleveland. The bureau was established on an order of the Cleveland welfare director as a cooperative venture of labor, industry, the medical profession and the public. Herbert G. Dyktor, former chief engineer of the bureau of industrial hygiene of the Michigan Department of Health, has been appointed director (THE JOURNAL, Sept. 16, 1944, p. 181). In the immediate future Mr. Dyktor's staff will consist of two engineers, a chemist and a secretary. As a basis for the operation of the bureau the division of health made a survey of 160,000 individuals in Cleveland manufacturing plants to determine their health status and the state of their working environment. The results of the survey have not been tabulated, although some of the more serious industrial health and accident hazards have been found to exist in newer plants that have sprung up since the war, and it is in these plants having fewer than 500 employees where the first work of the bureau will be undertaken. The survey included as one phase the filling out of questionnaires by employees regarding such things as medical examinations to which they have submitted, whether they have been examined for tuberculosis and venereal diseases and whether they were examined by a physician before going to work in their present place of employment. It is expected that much of the work of the new bureau will be educational and advisory. It will help plants in obtaining the services of physicians and nurses and in installing proper safeguards. When necessary it will use police powers of the division of health to enforce proper standards, but emphasis will be placed on lectures, movies, pamphlets and other educational work. In a statement to the press, Dr. James A. Doull, professor of hygiene and public health at the medical school, said that medical students will profit by the bureau being situated at the school, and it is hoped that the director of the bureau and members of the staff of the city division of health will contribute to instruction of the students. The bureau of industrial hygiene is an outgrowth of the cooperative effort of the health subcommittee of the mayor's war production committee, the Anti-Tuberculosis League, the U. S. Public Health Service, the Cleveland Academy of Medicine and Western Reserve University with Dr. Harold J. Knapp, commissioner of health of Cleveland. The project will aid the application of medical science to select the right man for the right job psychologically and physically.

OKLAHOMA

Personal.—Dr. Paul T. Powell, McAlester, has been named in charge of the Kay County Health Department, succeeding Dr. Joseph H. Kinnaman, who resigned to become deputy commissioner of the Nassau County Health Department (THE JOURNAL, Dec. 30, 1944, p. 1159). Dr. Jacob R. Hinshaw, McAlester, has succeeded Dr. Powell as health officer in Pittsburgh County.

Physician Hijacked.—Dr. Andre B. Carney, Tulsa, was kidnapped as he was leaving Hillcrest Memorial Hospital, February 3, shortly after midnight, according to the *Journal of the Oklahoma State Medical Association.* He was taken to the Turkey Mountain area, where he was tied to a tree. His car and money were taken. The *Journal* stated that after several hours the physician was able to free himself and walk where he could notify the police. It also stated that within the week the police captured two army deserters who were proved to be the ones responsible for the robbery and kidnapping.

Spring Clinic.—The Moton Clinical Society will conduct a spring clinic at the Moton Memorial Hospital, Tulsa, May 9-11. Among the speakers will be:

Dr. Daniel T. Rolfe, Nashville, Tenn., Vitamin Therapy in General Practice.
Dr. Walter A. Younge, St. Louis, Cardiac Emergencies.
Dr. Theodore R. Mason Howard, Mound, Bayou, Miss., Prevalence of Goiter in the Negro Race.
Dr. Ivo A. Nelson, Tulsa, Office Laboratory Procedures.
Dr. Leo Lowbeer, Tulsa, Breast Tumors.
Dr. James B. Eskridge Jr., Oklahoma City, Prenatal Care.
Dr. Grider Penick, Oklahoma City, Endocrines in Gynecology.
Dr. John F. Burton, Oklahoma City, Minor Surgery as an Office Procedure.

Dr. Rolfe will address the banquet and alumni meeting Thursday, May 10.

RHODE ISLAND

State Medical Meeting.—The one hundred and thirty-fourth annual session of the Rhode Island Medical Society will be held at the Rhode Island Medical Library, Providence, May 16-17, under the presidency of Dr. Elihu S. Wing, Providence, who will speak on "Medical Care in Rhode Island." Among the speakers will be:

Dr. Stanley P. Reimann, Philadelphia, Discussion of the Causes of Cancer.
Dr. Carl A. L. Binger, New York, Psychosomatic Medicine.
Dr. Arthur J. Geiger, New Haven, Conn., Treatment of Bacterial Endocarditis with Penicillin.
Dr. Reginald H. Smithwick, Boston, Some Experiences with the Surgical Treatment of Hypertensive Cardiovascular Disease.
Dr. Roger I. Lee, Boston, President-Elect of the American Medical Association, Geriatrics.
Dr. Elliott P. Joslin, Boston, Newer Developments in the Etiology and Treatment of Diabetes.
Dr. Frederick C. Irving, Boston, Use and Abuse of Barbiturates.
Dr. Samuel A. Levine, Boston (with four others), Coronary Artery Disease.
Dr. William R. Ohler, Boston, Clinical Application of Laboratory Facilities.
Lieut. Comdr. Jacob Gershon-Cohen (MC), and Comdr. Edgar K. Houck (MC), Derangements of the Knee Joint.
Dr. John Homans, Boston, Surgery of the Veins of the Leg—Varicosity and Some Problems in Thrombosis.
Dr. Donald G. Anderson, Boston, Clinical Uses of Penicillin.

Dr. Francis G. Blake, dean and Sterling professor of medicine, Yale University School of Medicine, New Haven, will deliver the Charles V. Chapin Oration on "Some Recent Advances in the Control of Infectious Diseases."

WEST VIRGINIA

District Health Conferences.—District conferences are being arranged by the West Virginia Public Health Association in lieu of the annual state health conference, which was canceled on account of ODT travel restrictions. The northern district meeting will be held May 21 at the Stonewall Jackson Hotel, Clarksburg, and the southern district May 28 at the Frederick Hotel, Huntington. Three topics have been selected for discussion: "Résumé of the Health Department's New Legislation" followed by a roundtable discussion of the administration of the laws, "The Pure Food and Drug Law" and "Mental Hygiene." A bill passed recently by the legislature empowers the state health commissioner to establish a bureau of mental health and to conduct mental hygiene clinics over the state. The executive committee of the public health association has announced that meetings in the northern and southern districts will also be held next fall.

Legislative Interim Committee Created.—A legislative interim committee, created for the purpose of making an overall study of public health problems, including medical and hospital care, medical care at state institutions, medical educa-

tion and prepayment hospital and medical service plans, has been named by Arnold Vickers, president of the senate, and John E. Amos, speaker of the house of delegates. The senate committee is composed of W. Broughton Johnston, Princeton; Fred C. Allen, Marlinton; Glen Jackson, Logan; G. O. Young, Buckhannon, and H. S. Boreman, Parkersburg. The house members are J. Hornor Davis, Charleston; J. Harper Meredith, Fairmont; Rush D. Holt, Weston; Everett F. Moore, Moundsville, and O. C. Hathaway, Grantsville. Speaker Amos and President Vickers will serve as members and ex officio chairman and co-chairman, respectively. An advisory committee, of which five members will be physicians, will shortly be appointed by Governor Clarence W. Meadows to serve with the legislative interim committee in this study of public health problems.

Seminars in Psychiatry Studies.—A psychiatric committee appointed recently by the president of the West Virginia State Medical Association, Dr. Thomas L. Harris, Parkersburg, is now working out a plan to hold seminars in psychiatric studies in the councilor districts. Steps have been taken to ascertain what societies will sponsor a series of meetings for a study of psychiatry as it affects the general practitioner. It is proposed to present clinical material at these meetings as the best means of teaching general practitioners what to look for and how best to handle cases that might come to their attention in the future. A special meeting was held at Huntington by the committee April 15 at which Capt. John P. Lambert, M. C., stated that the goal of the committee should be to "agree upon the best method to present to the doctors of West Virginia a common sense point of view of the meaning of psychiatry as it relates to the general practice of medicine, and to demonstrate how an understanding of psychiatry can be of inestimable value to the physician in his daily practice." The committee, which will meet again in Huntington May 20, is composed of Dr. Oscar B. Biern, Huntington, chairman; James L. Wade, Parkersburg; Edward J. Van Liere, Morgantown; Edward F. Reaser, Huntington, and Archer A. Wilson, Charleston, in addition to Captain Lambert, a member ex officio.

GENERAL

William McNett Named Art Director.—William Brown McNett, Philadelphia, has been appointed art director of the medical and scientific division of the Blakiston Company, Philadelphia. Mr. McNett has in time past served as assistant in the department of art as applied to medicine, Johns Hopkins University School of Medicine, Baltimore, and director of the department of medical art, Temple University School of Medicine, Philadelphia.

Committee Named to Aid Leprosy Program.—Luther H. Hodges, New York, vice president, Marshall Field and Company, national chairman of the postwar antileprosy program of the American Mission to Lepers, has named a sponsoring committee to work with him in promoting the program and to raise $500,000 needed. Mrs. Harper Sibley, Rochester, N. Y., is chairman of the committee. Other members of the committee include prominent physicians throughout the country.

Report on Prevention of Blindness.—The National Society for the Prevention of Blindness expended $169,578 in 1944, allowing $16,341 of the $185,919 income to be transferred to the reserve fund, according to its recently released thirtieth annual report. During the year the society sponsored three hundred and fifty broadcasts by radio stations throughout the country, produced a documentary film entitled "Eyes for Tomorrow," which was shown about six hundred times in more than twenty states, and carried on other mediums of educational activity. One of the permanent developments in the conservation of eyesight in industry is the society's participation in the drive of the War Production Board to speed up production through improvement of visual conditions in war industries.

Squibb and Ciba Prizes Announced.—The Association for the Study of Internal Secretions has announced that the Squibb Award has been given to Edward C. Kendall, Ph.D., professor of biochemistry and head of the section, University of Minnesota Graduate School, Minneapolis-Rochester, for his fundamental contributions to endocrinology, in particular the isolation of thyroxine from the thyroid gland and his recent observations on the fractionation and functions of active principles of the adrenal cortex. Dr. Kendall was president of the Association for the Study of Internal Secretions in 1930. The Ciba Award, also announced through the Association for the Study of Internal Secretions, has been given to Jane Anne Russell (Mrs. Alfred E. Wilhelmi), Ph.D., instructor in physiologic chemistry, Yale University School of Medicine, New Haven, for her fundamental observations on the role of the anterior pituitary, adrenal and thyroid glands in the absorption and utilization of sugars and starches. One prize is made available by E. R. Squibb and Sons and the other by Ciba Pharmaceutical Products. Dr. Kendall received his Ph.D. at Columbia University, New York, in 1910 and Dr. Russell from the University of California, Berkeley, in 1937.

Academy of Sciences Receives Award.—The American Design Award, presented by Lord & Taylor and consisting of a certificate and a check for $25,000, was given to the National Academy of Sciences at a luncheon, April 19, in recognition of the collective achievements of American scientists "in supplying the arsenal of democracy with the greatest war weapons the world has ever seen," according to the New York *Times*. The award particularly honored six American scientists who composed the scientific "high command" for the various government created agencies established to mobilize American brain power for the creation of new weapons, new airplanes and vehicles, new medicines, new materials and countless other victory tools, many of them still secret, that have made victory possible. At the request of these six persons the award was presented to the academy as the body that represents all scientific endeavor in America. The six persons representing this "scientific high command," are:

Dr. Vannevar Bush, Sc.D., Washington, D. C., director, Office of Scientific Research and Development.

James Bryant Conant, LL.D., Cambridge, Mass., chairman, National Defense Research Committee (absent from the luncheon because of illness).

Karl T. Compton, Ph.D., Cambridge, chief of the field service for the National Defense Research Committee.

Dr. Alfred Newton Richards, chairman, Committee on Medical Research, Office of Scientific Research and Development.

Jerome C. Hunsaker, D.Sc., Boston, chairman, National Advisory Committee for Aeronautics.

Dr. Ross G. Harrison, chairman, National Research Council, Washington, D. C.

LATIN AMERICA

Health Activities in Latin America.—*Meeting on the Prevention of Blindness.*—The Asociacion para Evitar la Ceguera en México (Mexican Society for the Prevention of Blindness) is planning to meet in Mexico City, August 13-18. Among the speakers who will address the session will be Dr. Andrew Rados, Newark, N. J., on "Heredity Anomalies of the Lens Coupled with Systemic Disturbances."

Outbreak of Cerebrospinal Meningitis.—Barbados, B. W. I., health authorities are waging a vigorous campaign to check the epidemic of cerebrospinal meningitis, which flared up after the return of a thousand agricultural contract workers from the United States. Thirty cases, 5 of which resulted in death, have been detected on the island to date. The afflicted natives are being isolated on Pelican Island.

Society News.—Dr. Gonzalo E. Arostegui was recently elected president of the Sociedad Nacional de Cirugía of Havana. Other officers include Drs. Vicente Banet, vice president, José I. Tarafa, secretary, and José Lastra, treasurer.——New officers of the Sociedad Argentina de Tisiologia for 1945 include Drs. Ismael N. Hernandez, president, Oscar A. Vaccarezza, vice president, Alvaro E. Bence, secretary, and Oswaldo N. Garré, treasurer.

Visitors to the United States.—Dr. Edmundo Vasconcellos, chairman of the department of clinical surgery, Faculty of Medicine of the University of São Paulo, Brazil, went to the United States recently for a three months tour throughout the country as the guest of the Department of State. Dr. Joseph P. Buteau, Port au Prince, director of the Haitian Red Cross, is also a guest of the Department of State in the tour of certain centers in the country. Another guest is Dr. Hermán Posada González, director of the University of Antioquia, Medellín, Colombia. Dr. Desiderio Gross, Chile, has gone to New York to study heart ailments.

Traveling Health Exhibition.—The Colombian government has authorized the Cleveland Health Museum to duplicate seventy-three units of its exhibits to be used as a traveling health exhibition in Colombia. Among the group will be displays on preventive dentistry, tuberculosis, conservation of hearing and of eyesight, general biology of the human body and a complete duplicate of the nutrition exhibit "Food for Health." This nutrition exhibit was duplicated for the Mexican government in 1943. According to Dr. Ricardo Charria, Bogota, who visited the museum last year under the sponsorship of the Office of the Coordinator of Inter-American Affairs and who arranged for the exhibit, principal health hazards in Colombia are malaria, intestinal parasites and water borne diseases, tuberculosis, venereal diseases, yaws and smallpox.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 31, 1945.

The Scheme for a National Health Service: Negotiations with the Government

A year ago the government put forward proposals for a national health service which have been described in THE JOURNAL. The medical profession and particularly the British Medical Association were opposed to them. There was intense dislike of the suggestion that the work should be organized by a lay body and of any infringement of the right of private practice. A committee representing the British Medical Association, the colleges and other medical bodies was appointed for this purpose and since early in January has held nine meetings, of which eight have been attended by members of the Ministry of Health representing the government. The representatives of the profession contended that the national health service should be brought into being by stages, beginning with the development of the hospital and consultant services and with the extension of the nonhospital services on the basis of the present national health insurance system. No decision was reached on this and other points raised by the negotiating committee, which is now seeking the views of its constituents on a number of possible changes in the central and local administrative structure and other aspects of the White Paper. When the medical profession, the local authorities and the voluntary hospitals have completed this consultation with their members, the negotiations with the Ministry of Health will be resumed. Only then will the question arise of government decision on the proposals to be submitted to Parliament.

The Council of the British Medical Association has received the report of its negotiating committee and will make a full report with recommendations to a special representative meeting to be held on May 3 and 4. The report of the negotiating committee is a confidential document which cannot be published, but it has been sent to every member of the medical profession, whether a member of the British Medical Association or not. The council has also decided to request the divisions of the association to make arrangements for early meetings of the profession to discuss the report and instruct representatives. Statements have been made in the public press that the government has "surrendered to the doctors," but these are, to say the least, premature. All that can be said is that the government has not turned down the proposals made by the representatives of the profession. When it is clear that these have the support of the medical profession as a whole, the government will decide to what extent they are acceptable.

A Distinguished Medical Woman

Dr. Janet M. Vaughan, a well known hematologist, whose book "The Anemias" is in its second edition, has been appointed principal of Somerville College (a women's college), Oxford. Dr. Vaughan is medical officer in charge of the North West London Blood Supply Depot for the Medical Research Council. She was an undergraduate of Somerville College and took a first class in physiology in 1922 and her D.M. degree in 1930. She has been a Rockefeller fellow, a Beit memorial fellow and a Leverhulme fellow. She has held the post of assistant pathologist at University College Hospital, and the British Postgraduate Medical School. She was a member of the Interdepartmental Committee on Medical Schools and is a member of the Royal Commission on Equal Pay for Women and of the body appointed by the government to investigate public health in India.

PARIS

(From Our Regular Correspondent)

March 18, 1945.

Decrease of Incidence of Alcoholic Cirrhosis

Pasteur Vallery-Radot and his collaborators have recorded the number of cirrhoses of alcoholic origin admitted in the service of the medical clinic of the Bichat Hospital since 1938, when the consumption of wine and alcohols was not restricted, until 1944. The decrease between 1938 and 1944 is 87 per cent.

At the Société médicale des hôpitaux Heuyer pointed out that the number of cases of acute alcoholism, notably delirium tremens, increased suddenly in Paris during the first days of mobilization in 1939, again at the time of the German victory, during the invasion and at the exodus in May and June 1940. The maximum was observed on June 14, 1940, the day the Germans entered Paris. But during the weeks which preceded the liberation and during the days of street fighting at the end of which the Germans evacuated the capital, arrests for acute alcoholism were rare and not a single case was observed during August, the month of liberation. The psychoses in general and notably the alcoholic psychoses have greatly diminished in France during the course of the war.

Decourt and Phibet have made the same observations. Up to the outbreak of war in the pavilion for the mental cases in the Hospital of Saint Anthony 48 per cent were alcoholic. Since then the number of cases of alcoholic dementia has been reduced by 50 per cent.

Raynaud's Disease

De Fourmestraux reports 3 cases of pure Raynaud's syndrome in which he has obtained favorable results by repeated infiltrations of the stellate ganglion, of the cervical sympathetic chain and of the lumbar ganglions. From the rapid improvement of painful symptoms following ganglionic blockage he has concluded that functional disturbances are involved. If the initial lesions in Raynaud's disease were primarily arterial, the vasodilatation produced by the intervention would have had only a weak and temporary influence.

The removal of the stellate ganglion apparently should be reserved for the grave forms of Raynaud's disease, which are rare. The suppression of the stellate ganglion produces a Claude Bernard-Horner syndrome, which unfortunately remains permanent. It involves the disappearance of certain elements of the cervicothoracic chain: lacrimal, salivary and ocular and particularly coronary and pulmonary vasomotor fibers. Section of the splanchnic nerves and resection of the second lumbar present less inconvenience. It is advisable to consider the relative gravity of Raynaud's disease. Surgical intervention should not be resorted to until after repeated infiltrations, which will have the advantage of confirming the diagnosis and, at little expense, may lead to a cure, which may be complete.

Polyvalence of Bacterial Toxins

H. Vincent of the Académie des sciences states that the toxins secreted by pathogenic agents are usually considered specific in nature in spite of the diversity of symptoms which they cause. This view simplifies the concept of the infectious role of bacteria. The colon bacillus, for instance, secretes at least two toxins, one which becomes fixed to the intestine and another to the central nervous system. It is the same with the bacillus of typhoid, Vincent says; one of the toxins which it secretes, besides being labile, is toxic to the nervous system, and the other is a resistant enterotoxin capable of provoking in animals an acute adrenalism with renal inhibition. These toxins are further differentiated in that it is easy to produce immunization against the enterotoxin but not against the neurotoxin.

MOSCOW

(By Cable from the Soviet Scientists Antifascist Committee)

April 17, 1945.

Systematic Killing by Germans of the Mentally Deranged

Goldovsky, Colonel of Medical Service Red Army, and Pratonov, Colonel of Medical Service Red Army, have made the following report relative to a psychiatric hospital captured near Berlin:

Oberwalde Meseritz was the first psychiatric medical institution we found on the approaches to Berlin. In the buildings we found a comfortable receiving room, a splendid director's office and a number of rooms for administration with shelves full of case histories and daily reports. On the second floor were a gymnasium and a cinema. There were special x-ray rooms and laboratories. Buildings for patients contained bright wards, large and small separate rooms for one day patients, rest nooks and a dining room. Gardens were planted around some of the buildings and were surrounded by high stone walls. There were bars across the windows.

The life of the patients presented a sharp contrast to these comfortable surroundings. They wandered over the entire territory in groups and singly, carrying cups and plates, walking into kitchens in search of food and drink. They wandered from one building to another and to the offices of administration. Among them we saw neurasthenics and people suffering from Parkinson's disease, maniacs and schizophrenics. However, there were some who looked like perfectly healthy people. They helped us to bring order among the thousands of patients who had been left to the mercies of fate. There was no medical personnel. Doctors, nurses and orderlies had run away at the approach of our troops, fearing retribution for their crimes.

The first conversations revealed the mass organized destruction of patients or people considered by authorities as undesirable. We were detained in Oberwalde and saw for ourselves what had gone on in the hospital. People were questioned who had been confined to the hospital for antifascist statements and "incorrigible behavior," defiling the purity of Aryan blood. We examined the record book of patients and files of case histories. Finally we succeeded in questioning some of the culprits.

The Germans began to concentrate mentally deranged patients in Oberwalde in 1940, bringing them in groups of 100 to 300 by railroad from zones of action of allied aviation. There were times when the number of patients in the hospital reached 5,000. This flow of patients continued until January 1945, yet we found no more than 1,000. Where were the others?

A register of deaths during these years gives a detailed answer to the question. The last entry bears the number 18,232. Registered in the book for 1944 alone are the reception of 3,948 patients and the death of 3,814. If the capacity of the hospital was not overtaxed, it was due solely to this unheard of high death rate (97 per cent) in a medical institution. The files yielded copies of notices sent to relatives informing them of the death of patients and confirmed the figures precisely.

The entries showed that death resulted in the majority of cases from seven to ten days after the arrival of the patient. Causes of death are most commonly blood poisoning resulting from boils and exhaustion. Platonov, Colonel of the Medical Service, P. Shkarabsky, who is a forensic expert, and Major A. Marants, pathologic anatomist, worked to define the causes of the death in corpses exhumed. The burial ground itself was eloquent evidence. Under neat rows of gravestones creating a lyrical picture of "eternal peace" we found long pits in which four to five rows of naked bodies were piled. In rare cases pathologic anatomists found that the cause of death was tuberculosis, pneumonia or heart failure. All others were victims of "Aryan psychiatrists."

In the doctors' offices we found kilogram packages of medinal and veronal (both barbiturates) and large boxes of 100 ampules of scopolamine and morphine. Patients called these offices todzimmer (death rooms). In them systematic murder of the victims of Oberwalde was carried out.

We had our findings confirmed when we captured Rataichak, the head nurse of the women's department, in a neighboring city. Rataichak is a member of the Fascist party. With indescribable callousness she informed us: "I worked here almost twenty years. At the beginning of the war cases of killing of mentally deranged were rare. In 1941 when Walter Grabovsky was appointed director these killings became more and more frequent. True, Grabovsky was not a doctor, but he was a high official in the National Socialist Party. Head doctor Mooz, also prominent National Socialist, during his rounds would point out to the chief of the department those patients who were to be taken first to the office for treatment and then to the eighteenth department, from which corpses were taken to the graveyard. Some were buried on the premises; others were sent to Frankfort for cremation (construction of a crematorium had only been begun in Oberwalde). Poisoning in the women's department was carried out in the following manner: I took the patient to the office, took 3 tablespoons of veronal or medinal from a package and dissolved it in a glass of water. Some women had to be held by orderlies when they drank the mixture. If the patient resisted, we had to use a feeding tube. Sometimes this procedure made the patient's nose bleed. Particularly fractious patients were injected with scopolamine and morphine. Patients died quietly."

She admitted that she had personally poisoned between 1,000 and 1,500 people.

We also succeeded in finding and questioning an orderly named Gulke from the men's department. His work was to help doctor's assistant Weideman fill injection needles with a mixture of five ampules of scopolamine and five ampules of morphine and to hold the patient while this lethal dose was injected into him."

A dentist named Rosenberg, suffering from encephalitis, said "I managed to escape injection by sending for my dental equipment and treating staff and patients free."

The personal "villa" of Walter Grabovsky with secret office and personal laboratory, experimental animals, various poisons and dozens of urns of burned corpses is worthy of special detailed investigation. Everything in it confirms the stories told of him as a Fascist organizer of murder of many thousands of people. Clues led from this villa to the former place where Grabovsky worked in Kalisz. He brought with him from there a copy of the register of thousands of deaths of mentally deranged patients who had died in institutions he headed.

Marriages

JAMES A. JACKSON, Madison, Wis., to Miss Thelma Klemm of Platteville in Chicago, February 10.

ALVIN BEYER Jr., Houston, Texas, to Miss Mary Tom Luton of Grand Prairie, January 27.

GEORGE J. MALOOF to Miss Elizabeth Mary Rowley, both of Madison, Wis., December 30.

WILLIAM JAMES FINK to Miss Kay Kerlin, both of Washington, D. C., March 5.

MARIO V. BISORDI to Miss Nina Stucky, both of Mount Vernon, N. Y., April 8.

MARTIN FISHKIN to Miss Jewel Rosenthal, both of Chicago, March 10.

Deaths

Thomas Ellwood Buckman ⊕ Jacksonville, Fla.; Harvard Medical School, Boston, 1917; specialist certified by the American Board of Pediatrics, Inc.; member of the American Pediatric Society, American Academy of Pediatrics and American Society for Clinical Investigation; was chairman of the public relations committee, Florida Medical Association, in 1934 and of the health committee of the Duval County Council Agencies *from 1935 to 1937*; member of the American Commission on Standardization of Biological Stains from 1922 to 1926 and in 1930 member of the section on hematology, White House Conference on Child Health and Development; president of the Duval County Medical Society in 1939; assistant in medicine from 1920 to 1922, assistant in pediatrics from 1922 to 1925 and instructor 1924-1925 at his alma mater; since 1926 director of infant welfare stations, city board of health; member of the Duval County Welfare Board; served during World War I; from 1922 to 1925 assistant physician, Huntington Memorial Hospital, Harvard University; from 1922 to 1925 director of the blood research laboratory and visiting pediatrician at the Boston City Hospital, where he was assistant at the Thorndike Memorial Laboratory in 1924-1925; visiting physician at the Massachusetts State Infirmary and director of laboratories at the Robert Brigham Hospital, Boston, 1924-1925; president of staff, Riverside Hospital, 1933-1934; member of the board of directors of the Hope Haven Hospital; since 1939 director of the King Edward Nursery; consultant in contagious diseases, Brewster Hospital; secretary of the staff, Duval County Hospital; visiting pediatrician at St. Vincent's Hospital, where he died March 26, aged 53, of virus infection of the intestinal tract.

Sidney Jonas Wolfermann ⊕ Fort Smith, Ark.; Northwestern University Medical School, Chicago, 1911; Army Medical School, 1918; member of the House of Delegates of the American Medical Association in 1944; president of the Arkansas Medical Society, 1938-1939, councilor of the society from 1932 to 1938 and chairman of the council in 1936-1937; served as president of the Sebastian County Medical Society; councilor of the Southern Medical Association from 1939 to 1944; fellow of the American College of Surgeons; director of the Arkansas Tuberculosis Association; director and past president of the Sebastian County Tuberculosis Association; past president of the Sebastian County Crippled Children's Society; during World War I served in the medical corps of the U. S. Army; interned at St. Louis City Hospital in St. Louis; an organizer of the Cooper Clinic at Fort Smith and associated with it since its inception in 1920; director of the Hospital for Crippled Adults, Memphis, Tenn.; on the staff of St. Edward's Mercy Hospital; past president of the Fort Smith Rotary Club; died February 18, aged 56, of coronary disease.

Marcellus A. Walker, Paris, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1901; member of the American Medical Association; held all the offices of the Lamar County Medical Society at various times; formerly president of the North Texas District Medical Society; health officer of Paris from 1905 to 1913; served as physician in charge of the clinic operated by the Lamar County Tuberculosis Association from the time of its establishment until his death; member of the staff of the Lamar County Hospital, serving as president of the board of managers from the time of its organization until 1931; a charter member of the Lions Club; member and past president of the staff of St. Joseph Hospital, where he died January 23, aged 67, of cerebral hemorrhage.

Georg Barkan, *Brookline,* Mass.; Ludwig-Maximilians-Universität Medizinische Fakultät, Munich, Bavaria, 1917; assistant professor of biochemistry at Boston University School of Medicine; served as a surgeon in the German army during World War I; after a period of teaching and research appointments with the Universities of Munich, Würzburg and Frankfort-on-the-Main, he was appointed professor of pharmacology and director of the Pharmacologic Institute at the University of Tartu (Dorpat) in Estonia, remaining there until 1937; came to this country in 1938; contributed extensively to the European and American literature on pharmacology and biochemistry particularly in relation to the nonhemoglobin iron compounds of the blood; died March 7, aged 55.

Frederick McGregor Hartsock ⊕ Colonel, U. S. Army, retired, Washington, D. C.; Columbian University Medical Department, Washington, 1897; entered the U. S. Army as an assistant surgeon in July 1898; promoted through the various ranks to that of colonel; retired on May 31, 1939; veteran of the Spanish-American War; served in the Philippines during the insurrection and was attached to the American Embassy at Peking, China; served during World War I; at one time on the staff of the United States Soldiers' Home Hospital; fellow of the American College of Surgeons; died March 7, aged 69, of biliary cirrhosis and pneumonia.

John Carl Grill ⊕ Milwaukee; Medizinische Fakultät der Universität Wien, Vienna, Austria, 1921; professor and director department of pathology at the Marquette University School of Medicine; specialist certified by the American Board of Pathology, Inc.; member of the American Association of Pathologists and Bacteriologists and the American Society of Clinical Pathologists; fellow of the American College of Physicians; director of the pathologic laboratories, Milwaukee County Hospital, Wauwatosa; pathologist on the staffs of St. Joseph's and St. Mary's hospitals; died March 17, aged 52, of cerebral hemorrhage.

Frank V. Brownell, Canajoharie, N. Y.; Albany Medical College, Albany, 1882; member of the American Medical Association; in 1906 president of the Montgomery County Medical Society, which in 1934 gave a dinner in his honor celebrating his completion of fifty years of medical practice; at one time city health officer of Schenectady, where he had been on the staff of the Ellis Hospital; for many years a member of the board of education of Canajoharie; served as physician for the New York Central Railroad and for the Beech-Nut Packing Company; died March 4, aged 88, of pulmonary congestion.

Thomas Willett ⊕ West Allis, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1903; served overseas during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; formerly associated with the U. S. Public Health Service Reserve; at one time lecturer in histology and embryology at his alma mater; associate, American College of Physicians; member of the American Heart Association and the American Association for the Advancement of Science; a director of the Milwaukee County Bank at West Allis; died February 25, aged 67, of myocardial fibrosis.

George Henry Steinle ⊕ Burlington, Iowa; St. Louis University School of Medicine, 1917; member of the American Urological Association; served during World War I; began active duty as a captain in the medical reserve corps of the U. S. Army on Dec. 12, 1940, serving as chief of the urologic section of the Station Hospital, Camp Joseph T. Robinson, Ark.; relieved from active duty on July 31, 1941; on the staffs of the Burlington Hospital, St. Francis Hospital and the Mercy Hospital, where he died February 11, aged 52, of cardiorenal disease.

William Elmer Bannister ⊕ Lexington, Ky.; Kentucky School of Medicine, Louisville, 1892; past president of the Fayette County Medical Society; interned at the St. Joseph Infirmary in Louisville; member and past president of the staff of St. Joseph Hospital; member of the staff of the Good Samaritan Hospital, where he died March 1, aged 74, of angina pectoris.

Tom Randolph Barry ⊕ Knoxville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1915; past president of the Tennessee State Medical Association; member of the American Urological Association; fellow of the American College of Surgeons; specialist certified by the American Board of Urology, Inc.; served overseas during World War I; interned at Bellevue Hospital in New York; urologist at the Knoxville General, St. Mary's Memorial and Fort Sanders hospitals; died March 5, aged 57, of coronary occlusion.

Adelheid C. Bedal, St. Louis; Woman's Medical College of Pennsylvania, Philadelphia, 1891; member of the American Medical Association; died in the Jewish Hospital March 20, aged 84, of heart disease.

William Hurlburt Bennett, Norwell, Mass.; Baltimore University School of Medicine, 1892; member of the American Medical Association; died in Boston March 5, aged 76, of acute dilatation of the heart and diabetes mellitus.

Harvey Allen Berkey ⊕ Elmhurst, Ill.; Chicago College of Medicine and Surgery, 1913; member of the American Urological Association; past president of the Chicago Urological Society; served during World War I; formerly on the staff of the Oak Park Hospital, Oak Park; died March 25, aged 72, of acute pulmonary edema.

Lewis Elmer Bratt, Akron, N. Y.; Chicago College of Medicine and Surgery, 1911; health officer of the village of Akron and town of Newstead; died in the Lockport City Hospital, Lockport, March 23, aged 63, of coronary occlusion.

Ephraim Mays Brevard, Tallahassee, Fla.; University of Maryland School of Medicine, Baltimore, 1894; member of the American Medical Association; veteran of the Spanish-American War; died February 26, aged 74, of cerebral hemorrhage, diabetes mellitus and mitral regurgitation.

Charles Franklin Brown ⊕ Salisbury, Md.; Maryland Medical College, Baltimore, 1912; died suddenly March 25, aged 62, of coronary thrombosis.

John Henderson Burlingame, Evanston, Ill.; Rush Medical College, Chicago, 1878; Civil War veteran; practiced in Cherokee, Iowa, for forty-seven years and served ten years as mayor; died March 10, aged 97, of heart failure.

John Edward Butler, Taunton, Mass.; Harvard Medical School, Boston, 1891; member of the American Medical Association; died March 9, aged 81, of arteriosclerosis.

Stephen A. Cambourn, Chicago; Northwestern University Medical School, Chicago, 1897; member of the American Medical Association; died March 8, aged 73, of obstruction of the bowel with perforation and general peritonitis.

Carl James Cannon, Cleveland; Cleveland Homeopathic Medical College, 1899; member of the American Medical Association; on the staff of the Huron Road Hospital, East Cleveland, where he died March 7, aged 69, of cardiac failure.

Sumner Coolidge, Middleboro, Mass.; Harvard Medical School, Boston, 1900; from 1905 to 1908 colonel in the army, serving as executive officer for the chief sanitation engineer for the Panama Canal; for many years medical superintendent of the Lakeville State Sanatorium; died in St. Luke's Hospital March 10, aged 85, of coronary occlusion, bronchopneumonia and cerebral embolism.

Thomas Francis Cotter ⊕ East Chicago, Ind.; Medical College of Indiana, Indianapolis, 1902; fellow of the American College of Physicians; served as an acting assistant surgeon in the U. S. Public Health Service; on the staff of St. Catherine's Hospital; died in St. Luke's Hospital, Chicago, March 12, aged 67, of pneumonia.

William Henry Crothers, Campbell, Calif.; Cooper Medical College, San Francisco, 1895; died in Saratoga February 21, aged 79, of cerebral hemorrhage.

William Parish Curtis, St. Louis; Howard University College of Medicine, Washington, D. C., 1891; on the staffs of the Homer G. Phillips' Hospital, St. Mary's Infirmary and the Peoples Hospital, where he died February 23, aged 78, of hypertension.

Joseph Henry Davis, Macomb, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1901; member of the American Medical Association; on the staffs of the Phelps Hospital and St. Francis Hospital, where he died March 4, aged 69, of sclerosis of the liver.

Lavinia R. Davis, Pulaski, N. Y.; Syracuse University College of Medicine, 1896; member of the American Medical Association; practiced in Oneida for many years; died February 8, aged 81, of cerebral hemorrhage.

Claus Gilbert Delfs, Geneva, Neb.; John A. Creighton Medical College, Omaha, 1913; on the staff of the Lutheran Hospital, York, where he died February 1, aged 51, of coronary sclerosis.

Samuel DeRamus, Cincinnati; Meharry Medical College, Nashville, Tenn., 1918; died March 8, aged 54, of heart failure and pulmonary edema.

Francis Albert Bennett Donlan, Metuchen, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1912; member of the American Medical Association; on the staff of St. Peter's Hospital, New Brunswick, where he died February 6, aged 58, of neoplasm of the mediastinum.

James Lafayette Donnan, Ware Shoals, S. C.; University of Georgia Medical Department, Augusta, 1891; member of the American Medical Association; died February 1, aged 77, of hemiplegia.

Godlove Grover Eckhart ⊕ Marion, Ind.; Jefferson Medical College of Philadelphia, 1907; died in the Marion General Hospital February 26, aged 62, of chronic glomerular nephritis and diabetes mellitus.

Robert Hite Egbert ⊕ Martinsville, Ind.; Indiana University School of Medicine, Indianapolis, 1909; served as president of the Morgan County Medical Society; medical director of the Home Lawn Mineral Springs; died March 22, aged 60, of carcinoma of the pancreas.

Laurens Enos, Jerseyville, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1891; served during World War I; died February 19, aged 82, of senility.

Eugene William Erler ⊕ South Orange, N. J.; Columbia University College of Physicians and Surgeons, New York, 1907; served on the staffs of the Presbyterian Hospital in Newark, East Orange Hospital, East Orange, and the Orange Memorial Hospital, Orange, where he died March 17, aged 62, of coronary occlusion.

Charles Cornelius Fenstermacher, Three Rivers, Mich.; College of Physicians and Surgeons of Chicago, 1893; on the staff of the Three Rivers Hospital; died March 5, aged 75, of uremia following a prostatectomy.

Edmund R. Gaddie, New Albany, Ind.; Louisville National Medical College, Medical Department State University, Louisville, Ky., 1892; died March 11, aged 74, of cerebral hemorrhage.

Louis Harrington Gibbs, Scranton, Pa.; Bellevue Hospital Medical College, New York, 1873; member of the American Medical Association; died in the West Side Hospital February 9, aged 98, of fracture of the left humerus and left femur incurred in a fall.

Clark Hutchinson Gordon ⊕ Trenton, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; died February 24, aged 72, of coronary occlusion.

Wilbur Clarence Gordon, Los Angeles; Howard University College of Medicine, Washington, D. C., 1904; died February 1, aged 64, of coronary occlusion.

Elias Bush Guile, Utica, N. Y.; Homeopathic Hospital College, Cleveland, 1888; member of the American Medical Association; president of the Oneida County Historical Society; member of the city board of education; on the staff of the Utica Memorial Hospital, where he died March 28, aged 78, of cardiorenal syndrome.

Edward Humes Harris, Snow Shoe, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1900; member of the American Medical Association; surgeon for the Pennsylvania and New York Central railroads and various coal companies; died in the Bellefonte Hospital, Bellefonte, March 29, aged 70, of myocarditis.

Maxwell Herschleder ⊕ Gary, Ind.; Illinois Medical College, Chicago, 1910; owner of the Lincoln Hospital; on the staffs of the Methodist and St. Mary's Mercy hospitals; killed March 9, aged 60, when his automobile was struck by a train.

Ralph Ward James ⊕ Winfield, Kan.; Northwestern University Medical School, Chicago, 1905; fellow of the American College of Surgeons; served during World War I; visiting physician at the William Newton Memorial Hospital and St. Mary's Hospital, where he died February 2, aged 64, of cerebral hemorrhage.

Howard H. Johnson, St. Albans, Vt.; University of Vermont College of Medicine, Burlington, 1906; member of the American Medical Association; president of the staff of St. Albans Hospital; died December 23, aged 70, of injuries received in an automobile accident.

Louis Jordy, York, Pa.; Jefferson Medical College of Philadelphia, 1892; died in the York Hospital February 5, aged 76, of chronic nephritis.

Leon Lamont Kelley, Middleville, N. Y.; Syracuse University Medical College, New York, 1918; member of the American Medical Association; health officer of five communities in Herkimer County; president of the school board and the Middleville Bank; served on the staff of the Hospital of the Good Shepherd, Syracuse University and the Herkimer Memorial Hospital in Herkimer; died February 16, aged 51, of heart disease and arthritis.

Albert James Maris, Long Beach, Calif.; Medical College of Indiana, Indianapolis, 1892; died in a local hospital February 22, aged 77.

Bernard Joseph McEntee, Wilmington, Del.; University of Pennsylvania School of Medicine, Philadelphia, 1911; member of the American Medical Association; served overseas during World War I; chief of staff at St. Francis Hospital; died in St. Joseph's Hospital, Lancaster, Pa., February 24, aged 58, of bronchiectasis.

Evelyn Mae Gruhlke McLane ⊕ Jackson, Minn.; Rush Medical College, Chicago, 1930; on the staff of the Minnesota Colony, Cambridge; died February 16, aged 42.

Roy Clark Meals, Oil City, Pa.; University of the South Medical Department, Sewanee, Tenn., 1904; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; formerly associated with the U. S. Veterans Bureau; died December 17, aged 65, of heart disease.

Otto Ernest Meyer, Chicago; Illinois Medical College, Chicago, 1905; member of the American Medical Association; died February 19, aged 76, of mitral regurgitation.

Andrew G. Minnick, Lock Springs, Mo.; University Medical College of Kansas City, 1900; served as mayor and member of the school board; formerly county coroner; local surgeon for the Rock Island Railroad; died February 14, aged 74, of angina pectoris.

Andrew Francis Moynihan, Sauk Centre, Minn.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1903; served as a captain in the medical corps of the U. S. Army in France during World War I; city physician of Sauk Centre and deputy coroner of Stearns County at the time of his death; died April 11, aged 71, of cerebral hemorrhage.

John Alexander Neil, Chicago; Chicago College of Medicine and Surgery, 1910; died in Tampa, Fla., January 30, aged 65, of coronary thrombosis.

Henry Waldo Power, Conrad, Mont.; Northwestern University Medical School, Chicago, 1903; member of the American Medical Association; fellow of the American College of Surgeons; interned at the Mercy Hospital in Chicago; founded the first hospital in Conrad, which was expanded into the present St. Mary's Hospital, where he was the chief surgeon; died April 3, aged 65, of bronchogenic carcinoma.

Charles Corwin Rowley, Thompsonville, Ill.; Denver Homeopathic College, 1904; member of the American Psychiatric Association; formerly on the staffs of the Anna State Hospital in Anna and the Dixon State Hospital in Dixon; at one time prison physician at Menard; died February 23, aged 62, of cerebral hemorrhage.

William H. Shelton, Guin, Ala.; Memphis (Tenn.) Hospital Medical College, 1901; died February 1, aged 76, of carcinoma.

James Evart Derreckson Silcox, Keyport, N. J.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; for many years medical examiner in the Keyport schools; died February 1, aged 74, of coronary occlusion.

John William Smith, Branchville, Va.; University of Maryland School of Medicine, Baltimore, 1906; member of the American Medical Association, surgeon for the Seaboard Air Line Railway; died in Norlina, N. C., February 25, aged 73, of coronary disease (cardiorenal).

Joseph Smith ⊕ Brooklyn; Jefferson Medical College of Philadelphia, 1904; member of the American Psychoanalytic Association and the American Psychiatric Association; served as president of the Brooklyn Neurological Society; specialist certified by the American Board of Psychiatry and Neurology; on the staffs of the Jamaica Hospital, Jamaica, Kings County and Unity hospitals; died in the New York Post-Graduate Hospital, New York, February 26, aged 67, of carcinoma of the intestine.

Carl John Snitkay ⊕ Belle Plaine, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1901; fellow of the American College of Surgeons; served during World War I; on the staff of the Corn Belt Hospital; died February 5, aged 70, of uremia.

Jesse Batts Sory, Fredonia, Ky.; University of Nashville (Tenn.) Medical Department, 1901; also a druggist; served during World War I; died in St. Thomas Hospital, Nashville, Tenn., February 16, aged 67, of Hodgkin's disease and bronchopneumonia.

Franklin Leroy Sterling ⊕ Bowling Green, Ohio; Ohio State University College of Medicine, Columbus, 1914; active member of the staff of Community Hospital; died in the Flower Hospital, Toledo, February 14, aged 59, of coronary occlusion.

Joseph E. Strobel, Waterford, Conn.; Temple University School of Medicine, Philadelphia, 1909; served as superintendent of the Cedarcrest Sanatorium in Hartford from March 1918 to January 1920; had been in charge of tuberculosis treatment at Grasslands Hospital, Valhalla, N. Y.; assistant superintendent of the Seaside, where he died January 30, aged 63, of coronary thrombosis.

Earl Delaskia Tanquary, Fort Scott, Kan.; College of Physicians and Surgeons, Medical Department of Kansas City University, 1901; member of the American Medical Association; served during World War I; died January 31, aged 72, of coronary occlusion.

James Edgar Woods, Atlanta, Ga.; Atlanta Medical College, 1894; served as surgeon for the Southern Railway in Jackson; died February 3, aged 76, of arteriosclerosis.

DIED IN MILITARY SERVICE

Everett Benjamin Archer, Jackson, Tenn.; University of Tennessee College of Medicine, Memphis, 1920; member of the American Medical Association; interned at St. Joseph's Hospital in Memphis; served as resident physician at the Episcopal Eye, Ear and Throat Hospital, Washington, D. C.; formerly associated with the U. S. Public Health Service; at one time on the staffs of the Davis Hospital in Statesville, N. C., McCall Hospital in Rome, Ga., the Trinity Hospital in Little Rock, Ark., and the Veterans Administration Facility in Amarillo, Texas; commissioned a major in the medical corps, Army of the United States, on Feb. 5, 1943; died in the Netherlands January 18, aged 49, of heart disease.

Hira Christopher Baker Jr., Garfield, Ark.; University of Arkansas School of Medicine, Little Rock, 1942; interned at the Pierce County Hospital in Tacoma, Wash.; appointed ensign in the U. S. Naval Reserve on March 24, 1942 and on Dec. 22, 1942 an assistant surgeon with the rank of lieutenant (jg); began active duty on July 10, 1943; on Nov. 1, 1944 appointed lieutenant in the U. S. Naval Reserve for temporary service; died Dec. 18, 1944, aged 28, when his ship, the destroyer U. S. S. *Hull*, foundered in a typhoon.

DeForest Windsor Buckmaster ⊕ Jamestown, N. Y.; University of Michigan Medical School, Ann Arbor, 1921; fellow of the American College of Surgeons; interned at Lutheran Hospital, Fort Wayne, Ind.; chairman of staff, Woman's Christian Association Hospital; member of staff, Jamestown General Hospital; commissioned a major in the medical corps, Army of the United States, on Aug. 20, 1942; died in the Walter Reed General Hospital, Washington, D. C., February 3, aged 47, of carcinoma of the urinary bladder.

William Lyman Fox, Shaker Heights, Ohio; Ohio State University College of Homeopathic Medicine, Columbus, 1917; member of the American Medical Association; served during World War I; commissioned a captain in the medical reserve corps of the U. S. Army on May 27, 1919; later promoted through the ranks to colonel; began active duty on March 1, 1941; recently assigned commanding officer of the regional army hospital at Fort Bragg, N. C.; served as commanding officer of the hospital at Camp McCain, Miss., since his return from the South Pacific; contracted dengue fever in New Guinea, where he was commanding officer of the 134th General Hospital; past president of the Reserve Officers Association of Cleveland; died in Anniston, Ala., February 27, aged 50, of cerebral hemorrhage.

Brooks Collins Grant ⊕ Colonel, M. C., U. S. Army, San Antonio, Texas; Chicago College of Medicine and Surgery, 1915; Army Medical School in Washington in 1920; fellow of the American College of Physicians; served during World War I; appointed a first lieutenant in the medical corps of the U. S. Army Oct. 4, 1919; promoted through the various ranks to that of lieutenant colonel in 1937; later promoted to colonel; had the usual variety of service including a tour of five years (1924-1929) in the Walter Reed General Hospital; in the mobilization prior to the current war was assigned to the command of the 34th Evacuation Hospital at Camp Barkeley, Texas, where he served from July 1941 to January 1942, when he was transferred to the post of Corps Surgeon, 13th Corps, at Providence, R. I., serving until June 1943; went to the European theater in August 1944 but was sent back to Walter Reed Hospital two months later when he became ill; died January 1, aged 54.

Kent Nelson ⊕ Colonel, U. S. Army, retired, Minneapolis; University of Minnesota College of Medicine and Surgery, 1900; Army Medical School in 1901; entered the U. S. Army as an assistant surgeon in 1901; rose through the ranks to that of colonel on June 29, 1927; retired Aug. 31, 1940 but returned to active duty in the same year, when he was reappointed as associate professor of military sciences and tactics and medical ROTC officer at the University of Minnesota, where in 1925 he had been medical ROTC officer and assistant professor of military sciences, serving until 1930; veteran of the Spanish-American War; served in France during World War I; formerly Seventh Corps area surgeon in Omaha; died Nov. 11, 1944, aged 68, of heart disease.

Bureau of Investigation

SECRETS FROM INDIA—VIA DENVER

Victor Croley Plays an Old Game—and Loses

India is a word full of magic. Savants refer frequently to its ancient philosophies and cults; charlatans often pretend that their "secrets" are derived from its lore. They cry their wares with hocus-pocus and mystery.

One Victor A. Croley of Denver, "Consulting Psychologist," also beguiled his fellow humans with such impressive titles as the "Hindu Company" and "Basic Science Fellowship."

Most of the self-anointed "mystics," though supposedly dwelling in a rarer atmosphere than the rest of us, promptly become alert at the mere clink of a coin. Their esoteric existence may be out of this world, but, when necessary, they can be of the earth, earthy. Otherwise Mr. Croley might never have reached the public eye.

Mr. Croley, perhaps no less astute than others who pioneered before him in the field, hit on the idea of "sex rejuvenation." Why not help the longing octogenarian to happiness and fulfilment of desire? Besides, there was money in it. The senile are ready purchasers of promised rejuvenation, with the added aura of Hindu mystery. Ordinary sex books go begging at ten cents or a quarter. A title like "The Hindu Secrets of Virility and Rejuvenation" seems to have been sure fire.

One fine day—according to accounts it was in 1939—Mr. Croley, with perhaps a few associates, who are vaguely hinted at in reports, established himself in the lucrative business of representing to restore to his fellow citizens their "Vim, Vigor and Vitality." Was he not introducing "one of Nature's great secrets"? His books "The Hindu Secrets of Virility and Rejuvenation" and "Feel Vitally Fit," said to be almost identical, were the materials of his business. What hitherto hopeless male, feeling a drab old age creeping on, could resist this appeal in Croley's advertising:

"Men! You can feel years younger. Full of new pep, vim and youthful vigor. Amazing Hindu Secrets stimulate entire system, wipe away the years, restoring former strength and health in many cases. No drugs. No operations. . . ."

"Wipe away the years" carries a stimulating picture. Boy, a towel—and presto! But wait—something still more moving follows. As if further to point a moral and adorn a tale, Croley quotes from an erotic writer of another era, "Frank Harris . . . on Impotency." "If you have tears prepare to shed them now!"—Shakespeare. Mr. Harris, reviewing the moment when he realized his own impotency, thus poured forth his bitter soul:

"Better death than such barrenness of outlook, such a dreadful, monotonous desert. Suddenly some lines came to me:

"'Dear as remembered kisses after death,
Dear as true love and wild with all regret.
Oh death in life! The days that are no more!'"

Here is a form letter from Croley, an astounding albeit depressing revelation of occidental decadence:

"Whereas, among most Americans, impotence and loss of virility is commonplace about age 40, among the Hindus such a condition is unthinkable. Men of 70, 80, 90 and even older retain all the ardor, appetite, strength and lusty vigor of young manhood."

Then why all the ads about impotency in the India press? Mr. Croley continues:

"There are no medicines, no diets. There are no operations; no strange meditative devotions. You do not change your life in any way in using these Hindu secrets, except to include a few daily practices, so simple that after the first two or three days they become a natural part of your daily routine. Furthermore, they exhilarate you from the very first day."

A mere $3.95 and these precious secrets may be yours! You paid your money; in due time the books arrived. The "secrets"—not written in Sanskrit, either—were something of an anticlimax: no esoteric lore here from the ancient Vedas—no references to the occult Upanishads—just a simple set of physical exercises that involve various bending positions of the body in which a tensing and relaxing of the muscles are effected, along with cold baths, certain diets and other elemental hygienic instructions!

No wonder the hard-headed Post Office Department at Washington, which has seen a succession of rosy mail-order promises unfulfilled, was moved to cast a skeptical eye and to undertake an investigation. In due time Mr. Croley was summoned to a hearing at Washington. Why should his little game not be classed as a scheme to defraud and be debarred from the mails? There came a Senior Medical Officer for the Food and Drug Administration to testify for the government and discuss the general classifications of sexual impotence and their causes. Apparently unimpressed by any glamorous claims, he declared that Croley's exercises, similar to ordinary calisthenics, plus Croley's diet and other "hygienic" suggestions, would not restore sexual vigor, overcome psychic factors involved in sexual impotence or provide any means whereby the course of life in the aged can be reversed or the individual restored to the functions of youth. In fact, he attested, to follow Croley's instructions might be harmful or even deadly in some circumstances.

Croley's contention was that the exercises or "movements" described in his book "effect a mild stimulation of the glands, particularly those located in the pelvic girdle, somewhat as a rubber band can be stretched and relaxed," which stimulation, he claimed, "re-activates and restores the glands and so exerts a beneficial effect on the entire system." The medical testimony showed that, though the exercises outlined would produce a general systemic stimulation similar to other calisthenics, they could not accomplish the results that Croley claimed in his advertising.

Instead of a pot of gold at the end of this rainbow, the Post Office Department found only a scheme to obtain money by fraud. An order was entered debarring from the mails the Hindu Company, the Basic Science Fellowship, the Basic Methods Company, "Victor A. Croley, Consulting Psychologist" and plain Victor A. Croley. Too bad, Mr. Croley; it would seem to be a good time to gaze again into the crystal ball!

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Allan's Gland Capsules.—Allan & Co., Inc., St. Louis, and John G. Ayars. Shipped between Sept. 18 and Oct. 1, 1941. Composition: essentially extracts of nux vomica and some organic material, with small amounts of arsenic and iodine compounds and zinc phosphide. Adulterated because below standard represented, since it did not contain zinc sulfide. Misbranded because falsely represented as a sexual stimulant and because labeling did not adequately warn against use in cases in which it would be dangerous to health.—[*D. D. N. J., F. D. C. 855; May 1944.*]

Medical Compound for Women.—Primrose R. Devore, trading as Drug Products Company, Columbus, Ohio. Shipped June 18 and Sept. 4, 1941. Composition: essentially extracts of plant drugs, including an alkaloid-bearing drug, sugar and water, preserved with benzoic acid. Misbranded because name falsely represented the product as being efficacious in the cure, mitigation, treatment or prevention of diseases of women.—[*D. D. N. J., F. D. C. 884; May 1944.*]

Mrs. Price's Special Prepared Boric Acid.—Mrs. W. T. Price, trading as Price Compound Company, Minneapolis. Shipped Sept. 16, 1942. Composition not reported. Misbranded because sold under a name recognized in the United States Pharmacopeia, and because purporting to be, and represented as, an antiseptic, and because label failed to give adequate directions for use.—[*D. D. N. J., F. D. C. 857; May 1944.*] Also misbranded under provisions of the law applicable to foods, as reported in *F. N. J. 4489.*

Valtiva.—Harlow B. and Charles E. Boyle, trading as Boyle & Co., Los Angeles. Shipped Nov. 15 and Dec. 9, 1940, and May 12, 1941. Composition not reported. Misbranded because of misleading label representations that product was rich in essential health-building vitamins, and that nervous disorders, skin troubles, loss of appetite and weight, indigestion, constipation, general weakness and ill health are commonly caused by lack of vitamins A, B_1, G and D, which this product contains.—[*D. D. N. J., F. D. C. 762; May 1944.*]

Correspondence

NOMENCLATURE OF EPILEPSY

To the Editor:—A question in Queries and Minor Notes leads me to offer the following points:

The primary manifestations of epilepsy are grand mal, petit mal and psychomotor. These may occur alone or in combination. If the possible combinations are named, four additional diagnoses would be required: grand and petit mal, grand mal and psychomotor, petit mal and psychomotor, and finally grand mal, petit mal and psychomotor. An alternate term for psychomotor is psychic equivalent, which is objectionable because of the implication that this form of seizure is not epilepsy but something like it. The same objection applies to the use of pyknolepsy as an alternate for petit mal. Like narcolepsy and catalepsy, the term pyknolepsy connotes something distinct from epilepsy. This objection is met by using the word pykno epilepsy which also appears in medical dictionaries.

To many physicians and neurologists petit mal means a small or mild seizure of any sort. A separate diagnosis for any disease condition should, however, be based on a difference in character or kind and not simply on a difference of size or degree. A mild scarlet fever is still scarlet fever, a mild grand mal is still grand mal and a mild psychomotor seizure is just that. Petit mal is different from either of these, a transient lapse of consciousness (usually only five to ten seconds long) either without accompanying muscular movements or with only rhythmic jerking (at the rate of three per second) of facial muscles. These minor episodes recur with great frequency (hence the word "pykno," "aggregated"), are relatively innocuous, are most frequent in childhood and adolescence and tend to disappear spontaneously as the person becomes adult. This is exactly what English authors have called pyknolepsy and is better called pykno epilepsy. To avoid present confusion, either the conception of petit mal as a mild seizure of any sort should be abandoned or the term petit mal itself should be dropped and the synonym pykno epilepsy adopted. On electroencephalographic as well as on clinical evidence petit mal is distinct from the two other forms of epilepsy. The pattern made by an alternate sharp dart and smooth dome, recurring approximately three per second, which always accompanies petit mal, is distinctive, probably diagnostic, of this variety of epileptic seizure. This form of seizure discharge is rarely encountered in so-called symptomatic (acquired) epilepsy.

Petit mal (pykno epilepsy) is the purest and most frequent expression of essential (genetic) epilepsy.

WILLIAM G. LENNOX, M.D., Boston.

ORAL PENICILLIN

To the Editor:—The view is generally held that penicillin is inactivated by the acid of the stomach (Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* **22**:425 [May] 1943) and that the drug cannot be effectively administered by the oral route unless it is given in combination with buffers (György, Paul; Vandegrift, H. N.; Elias, William; Colio, L. G.; Barry, F. M., and Pilcher, J. D.: Administration of Penicillin by Mouth, THE JOURNAL, March 17, p. 639) or in peanut oil (Libby, R. L.: Oral Administration of Penicillin in Oil, *Science* **101**:178 [Feb. 16] 1945). A simple and, as judged by clinical response, effective method of administering penicillin by mouth in my experience has been to make up 100,000 units in only 5 cc. of saline solution and then give 20,000 or 40,000 units as an oral dose of 1 or 2 cc. The administration of the dose in the relatively small volume is not irritating and apparently permits absorption of the drug in the mouth, pharynx and esophagus without the possibility of inactivation by the acid gastric juice.

CAMPBELL MOSES, M.D.
University of Pittsburgh School of Medicine.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Regulation Requiring Applicant to Present Transcript of School Record Unreasonable as Applied to Graduate of German School.—So far as is here material, the Illinois medical practice act provides that an applicant for examination for a license to practice medicine in all its branches, if a graduate of a medical college prior to June 3, 1923, must (1) have graduated from a medical college that as a prerequisite to graduation required a four year course of instruction of not less than nine months each and that was reputable and in good standing in the judgment of the Department of Registration and Education and (2) have completed a four year course of instruction in high school or its equivalent. (Ill. Rev. Stat. 1943, ch. 91, sec. 4.) Before being examined an applicant must submit evidence under oath to that effect satisfactory to the department (*ibid.*, sec. 2). The department by regulation requires applicants "to submit complete transcripts of medical and premedical records with applications." Schutz, a naturalized citizen of German birth, after preliminary studies in various secondary schools in Germany, pursued medical studies in several German universities from April 1906 to Jan. 15, 1912, graduating from the University of Munich on the latter date. After examination he was licensed as a physician in Germany, March 19, 1913. He was awarded an M.D. degree by the University of Breslau in 1917. In 1938 he was deprived of his license to practice in Germany solely, he alleged, "because he was a non-Aryan" and emigrated to the United States. Subsequently he sought a license to practice medicine in Illinois. Apparently while it was admitted that the schools attended and the studies pursued in Germany by Schutz were sufficient in quality and quantity to comply with the minimum requirements of the Illinois act, he was denied the right to be examined for a license because he could not comply with the rule of the department requiring the presentation of complete transcripts of medical and premedical school records. Apparently when Schutz emigrated from Germany the transcripts of his grades were confiscated by the Gestapo and it was impossible for him to secure copies of them because of that fact and because of the further fact that at the time of the application Germany was an enemy country and in any event would not permit the furnishing of any such copy of records for a non-Aryan. Schutz instituted mandamus proceedings against the director of the Department of Registration and Examination and against its superintendent to compel them to examine him. From an adverse judgment the departmental officials noted appealed to the appellate court of Illinois, first district, second division.

The question here presented, said the appellate court, is whether or not, in the light of the circumstances stated, the regulation of the department requiring applicants to submit transcripts of medical and premedical records is reasonable in its general terms and intent and, if not, whether or not mandamus will lie to compel the department to consider other competent evidence of the applicant's qualifications to be admitted to the examination. The rule is well settled that courts may review the regulations of the department of registration and education to determine whether they are fair, reasonable and impartial. The medical practice act as it relates to the appli-

cation of Schutz, who graduated from a medical school prior to June 3, 1923, provides that at the time of graduation the medical college from which he graduated must have required as a prerequisite to graduation a four year course of instruction and that the college must have been reputable and in good standing in the judgment of the department. The medical practice act specifies the number of months' school attendance required and the minimum time of the school course and prescribes minimum standards of professional education to be enforced by the department. A rule of the department provides that proof of the completion of a course of studies in a medical school and graduation therefrom shall be evidenced by a diploma which shall be submitted to the department by the applicant. Schutz completed studies at medical colleges and high schools for periods in excess of those required by the act and received diplomas which he delivered to the department. The act further requires that the applicant must be a graduate of a medical school which is reputable and in good standing in the judgment of the department. From the record before us it must be assumed that the colleges attended by Schutz were reputable and in good standing in the judgment of the department. The rule of the department provides that a diploma from such college shall evidence the fact of graduation. Thus, Schutz complied with the statutory provisions and with the rule of the department prescribing what might serve to evidence the fact of graduation. The appellants conceded that "the court may take judicial notice of the facts of current history"; that, "due to the tragic convulsions of Europe, many exiles from that unhappy continent have found asylum within the shores of the United States," and that "undoubtedly many of these refugees possess professional or other technological skill which could be exploited to the advantage of the people of the state of Illinois." Nevertheless the appellants contended that, since there are others whose lack of qualifications is such that to permit them to hold licenses to practice medicine would be highly dangerous, the department has long insisted that all candidates to practice must present certain specific credentials, which include a showing of the courses pursued in the institutions of higher learning, to be certified and authenticated by the institutions themselves and not otherwise. But, answered the appellate court, the primary purpose of the medical practice act is to safeguard the public health by prescribing standards for those who shall be permitted to treat human ailments, and the department was created to determine in the first instance whether the applicant has submitted satisfactory evidence that "he has the preliminary and professional education required by this act" (medical practice act, sec. 4) and, if so, to admit him to the examination and issue a license if he passes successfully. The proof required by the departmental regulation under discussion goes to the form rather than to the substance of the evidence submitted by the applicant as to his educational qualifications, and, if an applicant can satisfy the department as to his qualifications by other satisfactory evidence, the department should be required to consider it and not arbitrarily insist on documents which admittedly cannot be produced. Under the "best evidence rule" the highest degree of proof of which the case from its nature is susceptible must, if accessible, be produced; but where the evidence offered, while not of the highest degree or of the most satisfactory kind, is otherwise competent and is the best evidence which under the circumstances can be produced, and the absence of evidence of a higher degree or of a more conclusive character is not attributable to the fault of the party seeking to prove the fact in controversy, then the requirements of the best evidence rule are complied with and the evidence is admissible. *32* C. J. S., Evidence, sec. *777*, 779, p. 701 et seq. For the department to insist on a regulation, without regard to the circumstances, which is more exacting than the commonly accepted rules of evidence under which courts operate daily is an arbitrary and unreasonable requirement.

The judgment in favor of Schutz was accordingly affirmed.—*People ex rel. Schutz v. Thompson, 59 N. E. (2d) 494 (Ill., 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, April 28, page 1148.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA:* Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS:* *Eclectic.* Little Rock, June 7. Sec., Dr. C. H. Young, 1415 Main St., Little Rock. *Medical.* Little Rock, June 7-8. Sec., Dr. D. L. Owens, 701 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, May 20. *Written.* San Francisco, July 9-12. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO:* Denver, July 3-7. Final date for filing application is June 18. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT:* *Homeopathic.* New Haven, July 10-11. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical. Examination.* New Haven, July 10-11. *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, June 11. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA:* Jacksonville, June 25-26. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

IDAHO: Boise, July 10. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 26-28. Superintendent of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Kansas City, June 28-29. Sec., Board of Medical Registration & Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

KENTUCKY: Louisville, June 18-20. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville 2.

LOUISIANA: June. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MARYLAND: *Medical.* Baltimore, June 19-22. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 19-20. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 10-13. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F. State House, Boston.

MICHIGAN:* Detroit, June 26-28. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA:* Minneapolis, June 19-21. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MISSOURI: St. Louis, June 7-9. Sec., State Board of Health, Miss Erma E. Nixon, State Capitol Bldg., Jefferson City.

MONTANA: Helena. Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEVADA: Carson City, May 7. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, June 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July. *Examination.* Columbus, June 18-21. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA:* Oklahoma City, June 14-16. Sec., Dr. J. D. Osborn, Jr., Frederick.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blandina St., Columbia.

SOUTH DAKOTA:* Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Galveston, June 4-6. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA:* Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON:* Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

WEST VIRGINIA: Charleston, July 5-7. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN:* Milwaukee, June 26-28. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, June 4-5. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, June 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: June 9. Address State Board of Healing Arts, 250 Church St., New Haven 10.

FLORIDA: DeLand, June 1. Final date for filing application is May 17. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

MICHIGAN: Ann Arbor and Detroit, May 11-12. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEW MEXICO: Santa Fe. May 6-7. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

OREGON: Portland, July 7. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, May 16. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Yankton, June 19. Sec., Dr. G. M. Evans, Yankton.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Ophthalmology, Cincinnati

28:123-242 (Feb.) 1945. Partial Index

Rubeosis Iridis Diabetica. F. B. Fralick.—p. 123.
Ophthalmoscopy and Diagnosis of Human Illness. A. J. Bedell.—p. 139.
Discussion of Ocular Malingering in Armed Services. A. C. Unsworth.—p. 148.
Patron Saints of Eyes: Outline. F. L. P. Koch.—p. 160.
Ocular Therapy with Penicillin Used Topically, Intraocularly and Systemically. C. A. Mietus.—p. 173.
Serologic Studies in Acute Eye Diseases. C. C. Gray and W. A. Moor.—p. 180.
Intraocular Injection of Penicillin in Ocular Infections. V. La Rocca.—p. 183.
*Congenital Cataract Following Rubella in Mother. C. A. Perera.—p. 186.
Chemotherapy in Treatment of Sympathetic Ophthalmia. A. E. Long.—p. 187.
Trichoepithelioma of Eyelid. J. E. L. Keyes.—p. 189.
Endophthalmitis Subsiding After Treatment with Penicillin. M. I. Green.—p. 191.
Luxation of Lens with Voluntary Control. O. R. Wolfe.—p. 193.
Report of Eye Injured By Lightning. L. B. Sheppard.—p. 195.

Congenital Cataract Following Rubella in Mother.—Perera directs attention to the occurrence of congenital cataract and other congenital anomalies in children born of mothers who have rubella during the first three months of pregnancy. A girl aged 4½ months was referred to him in April 1944 because of a white pupil of the right eye. The baby was born at term but at the age of 8 weeks weighed no more than at birth (6¼ pounds, or 2,840 Gm.). She had rickets and scurvy, and a spontaneous hemorrhage into her left knee joint, with subsequent abscess formation. Her parents and her 5 year old sister had "German measles" when her mother was in her second month of pregnancy. Physical examination revealed a dense central cataract of the right eye, a congenital cardiac condition (probably patent ductus arteriosus) and malnutrition.

Archives of Otolaryngology, Chicago

41:99-160 (Feb.) 1945

Osteoma of Frontal Sinus: Report of 5 Cases. J. R. Dowling.—p. 99.
Penicillin in Acute Otitis Media and Mastoiditis: Report of Case. S. Ball.—p. 109.
Ménière's Disease. R. F. Mogan and C. J. Baumgartner.—p. 113.
Thrombophlebitis of Lateral Sinus. H. Rosenwasser.—p. 117.
*Local Use of Sulfonamide Compounds in Surgical Treatment of Ear. F. W. Merica.—p. 133.
Rational Therapy in Acute Otitis Media. J. P. Rigg.—p. 137.
Importance of Pathologic Conditions of Nasopharnx to Otolaryngologist. O. R. Kline.—p. 140.
Diabetic Gangrene Involving Sinuses. B. R. Dysart.—p. 143.
Chronic Progressive Deafness, Including Otosclerosis and Diseases of Inner Ear. G. E. Shambaugh Jr. and M. H. Cutler.—p. 147.

Local Use of Sulfonamides in Surgery of Ear.—Merica thinks that the downward trend of disease of the mastoid process requiring mastoidectomy apparently can be attributed to the systemic use of chemotherapy in combating acute infections. A survey of the records in three Cleveland hospitals showed that there were 153 cases in 1937 in which mastoidectomy was performed, 134 in 1938, 121 in 1939, 79 in 1940, 82 in 1941, 65 in 1942 and 35 in 1943. Thus cases in which mastoiditis required surgical intervention have been reduced to almost one fifth in six years. Sulfanilamide powder lightly insufflated into the auditory canal after myringotomy shortens the period of drainage and helps to prevent local irritation of the canal. Chronic furunculosis of the auditory canal responds rapidly to the local use of a 5 or 10 per cent sulfathiazole ointment. During the last two and a half years the author has made it a routine practice to use sulfanilamide powder locally in ears with chronic otitis media. The type and the location of the perforation of the tympanic membrane influence the results. In the ears most amenable to treatment there usually is a large, centrally situated perforation. Ears in which there is a marginal or an attic perforation, usually small, with a foul thin purulent discharge and evidence of cholesteatomatous or other débris are much more resistant to treatment. The local use of sulfonamide compounds has greatly shortened the postoperative course after simple mastoidectomy. The author believes that it is justifiable to close a simple mastoidectomy wound completely after local use of sulfanilamide. The action of the drug and the purpose for which it is used are frustrated if a drain is used. If there is no sudden unexplained rise in temperature, the dressing should be left four to six days without changing. Contamination in such wounds is always introduced from the outside. There is some difference of opinion as to the best drug to use, but sulfanilamide is probably preferable among those now available.

Journal of Clinical Investigation, Boston

24:1-126 (Jan.) 1945. Partial Index

Nature of Mechanism of Shock Produced by Injection of Trypsin and Thrombin. H. J. Tagnon.—p. 1.
Plasma Volume and "Extravascular Thiocyanate Space" in Pneumococcus Pneumonia. D. D. Rutstein, K. J. Thomson, D. M. Tolmach, W. H. Walker and R. J. Floody.—p. 11.
Studies on Creatinuria Due to Methylated Steroids. L. Wilkins and W. Fleischmann.—p. 21.
Cold Hemagglutination and Cold Hemolysis: Hemolysis Produced by Shaking Cold Agglutinated Erythrocytes. D. Stats.—p. 33.
Plasma Fibrinogen Increasing Factor Obtained from Sterile Abscesses in Dogs. F. Homburger.—p. 43.
Electrophoretic Analysis of Maternal and Fetal Plasmas and Serums. L. G. Longsworth, R. M. Curtis and R. H. Pembroke Jr.—p. 46.
Traumatic Shock: IX. Pressor Therapy: Effect of Paredrine (P-Hydroxy-A-Methylphenylethylamine Hydrobromide) on Circulation in Hemorrhagic Shock in Dogs. H. A. Frank, M. D. Altschule and N. Zamcheck.—p. 54.
Renal Humoral Pressor Mechanism in Man. L. Dexter, Florence W. Haynes and W. C. Bridges.—p. 62.
Plasma Protein and Hemoglobin in Protein Deficient Rat: Three Dimensional Study. J. Metcoff, C. B. Favour and F. J. Stare.—p. 82.
Absence of Clinical Disease in Spite of High Incidence of Carriers of Group Hemolytic Streptococci of Single Type: Failure of Tyrothricin to Influence Carrier Rate. G. Hartley Jr., J. F. Enders, J. H. Mueller and E. B. Schoenbach.—p. 92.
Effect of Biliary Fistula on Bromsulphalein Retention, Serum Phosphatase and Bile Phosphatase. V. A. Drill, J. A. Annegers, E. F. Snapp and A. C. Ivy.—p. 97.
Measurement of Cardiac Output in Man Using Technic of Catheterization of Right Auricle or Ventricle. A. Cournand, R. L. Riley, E. S. Breed, E. deF. Baldwin and D. W. Richards Jr., with technical assistance of M. S. Lester and M. Jones.—p. 106.
Probable Errors in Simultaneous Measurement of Separate Kidney Functions. C. Klopp, N. F. Young and H. C. Taylor Jr.—p. 117.
Importance of Rh Inhibitor Substance in Anti-Rh Serums. L. K. Diamond and N. M. Abelson.—p. 122.

Journal of Experimental Medicine, New York

81:151-232 (Feb.) 1945

Anaerobic Glycolysis of Brain in Experimental Poliomyelitis. H. G. Wood, I. I. Rusoff and J. M. Reiner.—p. 151.
*Virus Neutralizing Action of Serum from Mice Infected with Poliomyelitis Virus. G. C. Brown and T. Francis Jr.—p. 161.
Eck Fistula Liver Subnormal in Producing Hemoglobin and Plasma Proteins on Diets Rich in Liver and Iron. G. H. Whipple, Frieda S. Robscheit-Robbins and W. B. Hawkins.—p. 171.
Preparation and Properties of Influenza Virus Vaccines Concentrated and Purified by Differential Centrifugation. W. M. Stanley.—p. 193.
Blood Vessels in Fat Tissue: Relation to Problems of Gas Exchange. I. Gersh and Mary A. Still.—p. 219.

Virus Neutralizing Action of Serum from Mice Infected with Poliomyelitis Virus.—Brown and Francis present evidence that the serum of mice paralyzed with the Lansing strain of poliomyelitis virus possesses the capacity to protect normal mice against the same virus when mixtures of virus and serum are inoculated intracerebrally. The virus neutralizing action was present mainly in mice paralyzed between the third and sixth days following inoculation and was rarely demonstrable in the serum of mice developing paralysis more than ten days after inoculation. Serum from nonparalyzed mice had approximately the same neutralizing capacity when obtained during the same period following inoculation in which serum from paralyzed mice showed the greatest effect. Neutralization of the virus was not obtained with serum from normal mice or from mice inoculated with normal nervous tissue.

Journal of Immunology, Baltimore

50:1-60 (Jan.) 1945

Electrophoretic, Ultracentrifugal and Immunochemical Studies on Wassermann Antibody. B. D. Davis, D. H. Moore, E. A. Kabat and A. Harris.—p. 1.
Drying by Sublimation. E. W. Flosdorf, L. W. Hull and S. Mudd.—p. 21.
Serologic Agglutination of Virus-Coated Bacterial Cells: Technic of B. A. Method. E. C. Roberts.—p. 55.

Journal of Nervous and Mental Disease, New York

101:99-204 (Feb.) 1945

Neuro-Optic Myelitis: Clinicopathologic Study of 2 Related Cases. H. Kohut and R. B. Richter.—p. 99.
Question of Shorter Courses of Electroshock Therapy in Depressions. N. Savitsky and S. Tarachow.—p. 115.
Definition of Psychopathic Personality. H. F. Darling.—p. 121.
Psychosomatic Aspects of Stuttering. B. C. Meyer.—p. 127.
Five Psychotic Sisters. L. A. Osborn.—p. 158.

Kansas Medical Society Journal, Topeka

46:1-36 (Jan.) 1945

Primary Atypical Pneumonia: Report of 25 Cases, with Discussion of Pathogenesis. J. W. Cooch.—p. 1.
Cancer Education for Layman. C. C. Nesselrode.—p. 7.

46:37-72 (Feb.) 1945

*Diagnosis and Treatment of Tumors of Testis. C. A. Hellwig.—p. 37.
Aspiration Pneumonia with Beginning Lung Abscess Treated with Penicillin. R. R. Snook.—p. 40.
Tuberculous Gingivitis, with Report of Case. E. W. Johnson Jr.—p. 42.

Tumors of Testis.—Hellwig states that of 254 specimens received at his laboratory with the clinical diagnosis tumor of the testis 50 proved to be of a malignant nature. He thinks that any noninflammatory mass of the testis should be considered as a malignant neoplasm until proved otherwise. The preoperative diagnosis of malignant tumors of the testis is often impossible. Aspiration biopsy is uncertain and diagnostic palpation of the tumor should be done as gently as possible. The diagnostic value of the Aschheim-Zondek test is limited. A positive test may be the only evidence of the disease; a negative test does not rule out cancer. The value of preoperative x-ray treatment has not been established and the effect of postoperative irradiation is not sensational. The most important factor in determining the prognosis is the absence or presence of metastasis at the time of orchiectomy. As long as the tumor is confined to the testis itself there is an excellent chance of complete cure.

Maine Medical Association Journal, Portland

36:19-36 (Feb.) 1945

Recent Developments in Treatment of War Casualties. D. W. Lyon.—p. 19.
According to Their Lights: Annual Oration—Portland Medical Club. W. E. Tobie.—p. 23.

Medical Annals of District of Columbia, Washington

14:1-48 (Jan.) 1945

National Program for Physical Fitness. L. G. Rowntree.—p. 1.
Physical Rehabilitation of Veterans. C. R. Brooke.—p. 6.
Reconditioning in Civilian Hospitals. H. B. Gwynn.—p. 12.
Aviation Preventive Medicine. D. N. W. Grant.—p. 18.

14:49-102 (Feb.) 1945

Some Medical Aspects of Inflammatory Lesions of Lower Gastrointestinal Tract. J. T. Howard.—p. 49.
Future of Our Coronaries. H. M. Odel.—p. 57.
*Diabetes Tomorrow. E. P. Joslin, H. F. Root, Priscilla White, E. P. Sheridan and C. C. Bailey.—p. 63.
Electric Convulsive Therapy in Psychoneuroses. L. B. Kalinowsky.—p. 70.
Maxillofacial Injuries. G. W. Christiansen.—p. 76.

Diabetes Tomorrow.—Joslin and his associates think that a consideration of the future for diabetes must be based on the startling increase in the number of persons with diabetes in the population. Three causative factors are evident: (1) more intensive search for and discovery of cases by better methods, (2) the aging of the population and (3) the prolongation of diabetic lives as the result of better treatment. Formerly diabetes beginning before the age of 15 years was fatal in less than two years. Now with insulin such patients live long. Actually among 1,657 children seen and treatment begun since the discovery of insulin in 1922 only 137 have died. In the first seven years of this period 82 per cent of the deaths were due to diabetic coma, whereas the incidence of deaths in the last few years has fallen to only 18 per cent. Diabetic coma is preventable, but it continues to be a major cause of death. An analysis of 601 coma cases treated at the New England Deaconess Hospital between 1923 and 1944 has convinced the authors that it is the amount of insulin given in the first three hours of treatment which is of primary importance in determining the recovery or the death of the patient. Among 478 patients in coma treated from 1923 to 1940, 12 per cent died. When the insulin given in the first three hours of treatment was increased from 83 units to an average of 216 units among 123 consecutive cases treated between August 1940 and May 1, 1944 the mortality was only 1.6 per cent. Important aids in treatment are (*a*) the use of isotonic solution of sodium chloride intravenously or subcutaneously (4,000 cc.) or, when necessary to overcome shock and impending anuria, up to 10 per cent or even 15 per cent of body weight and (*b*) gastric lavage. The administration of glucose is harmful in diabetic coma. There has been improvement in the treatment of juvenile and pregnant diabetic patients.

Military Surgeon, Washington, D. C.

96:121-208 (Feb.) 1945

Problem of Morale. G. B. Chisholm.—p. 121.
Prevention of Malaria in U. S. Army. J. S. Simmons.—p. 123.
Treatment of Gonorrhea and Syphilis in United States Army. H. J. Morgan.—p. 127.
Civil Public Health in Overseas Theaters of Operations. T. B. Turner and G. W. McDonald.—p. 131.
Relationships of Neuropsychiatry to General Medicine and Surgery in Army. W. C. Menninger.—p. 134.
Burns. F. L. Conklin.—p. 139.
North African-Italian Theater. E. W. Cowan.—p. 142.
Rehabilitation by Army Dental Corps. J. C. Brauer.—p. 145.
Observations on Coccidioidin Skin Test. G. Cheney and E. J. Denenholz.—p. 148.
Acute Appendicitis in Middle East. N. J. Kirk.—p. 156.
Duty Status Treatment of Acute Gonorrhea. D. W. Atcheson.—p. 159.
Inspection of Fish of Pacific Northwest. E. W. Bloomquist.—p. 164.
*Treatment of Sprains with Ethyl Chloride Spray. R. Bingham.—p. 170.
Diagnosis of Fractures of the Ribs, Scapula, Sternum and Mandible. J. W. Lewis.—p. 175.
Gait and Soldier: Importance of Gait in Prevention and Cure of Foot Strain and in Treatment of Symptomatic Flat Feet. J. Hartley.—p. 177.

Treatment of Sprains with Ethyl Chloride Spray.—Treatment of sprains and minor injuries in which the skin is not broken, by means of surface anesthesia combined with active motion, is an effective method of therapy. The ethyl chloride spray is more advantageous than injection of procaine hydrochloride. The technic is simpler and requires no special instruments, sterilization or special surgical skill. There are no systemic after-effects and no danger of introducing infection into the injured area from the needle or skin. Large painful areas can be treated. The one possible complication is frostbite, which can be prevented by application of camphor liniment to the skin after spraying. A mild reactive hyperemia seems to improve the local circulation and is followed by a decrease in the swelling of the joint. The patients secure symptomatic relief and a return of useful function to the injured part. The immediate recovery varies from 60 to 90 per cent, depending on the severity and duration of the injury. Disability averages less than three days. No strapping with adhesive tape or the application of plaster casts is required. The treatment will not mask fractures, severe deep tissue injury or disease. In this respect it is superior to the injection of a local anesthetic. The treatment is simple and not expensive, and disability and hospitalization are reduced.

New Jersey Medical Society Journal, Trenton

42:1-36 (Jan.) 1945

Acute Septicemia with Adrenal Hemorrhage (Waterhouse-Friderichsen Syndrome): Report of 4 Cases with 2 Recoveries. G. Ginsberg and W. P. Braunstein.—p. 7.
Venereal Diseases Among Migrant Farm Laborers of New Jersey. G. S. Usher and H. Cowan.—p. 11.
Reduction in Total Skin Flora by Daily Use of Soap Containing Dihydroxy Hexachloro Diphenyl Methane. H. J. Udinsky.—p. 15.
Psychiatry in Postwar Era. J. G. Sutton.—p. 18.

New Orleans Medical and Surgical Journal

97:335-382 (Feb.) 1945

Syphilis: The Great Masquerader. J. A. Kolmer.—p. 335.
Important Considerations in Cataract Surgery. G. M. Haik.—p. 345.
Sinus Disease Producing Monocular Proptosis, with Case Reports and with Special Reference to Mucocele (Pyocele). L. W. Alexander. —p. 351.
*Rocky Mountain Spotted Fever: Differentiation from Typhus Fever and Report of Case. R. L. Pullen, W. A. Sodeman and G. Felknor. —p. 359.
Food Poisoning. G. H. Hauser.—p. 362.

Rocky Mountain Spotted Fever.—According to Pullen and his associates 145 cases of endemic (murine) typhus were observed in a ten year period at Charity Hospital in New Orleans and only 1 case of Rocky Mountain spotted fever. The pathologic changes in the two diseases are essentially the same, consisting of an acute endangiitis of the small blood vessels throughout the body, particularly in the brain and skin. In Rocky Mountain spotted fever there is usually a more severe lesion in the vessels and a greater enlargement of the spleen, as well as a greater tendency to gangrene. In spotted fever the rickettsias invade the smooth muscles of the media of the blood vessels, in typhus the endothelium. Hence thrombotic lesions in spotted fever are generally more severe than in typhus fever, and necrosis of fingers, toes, face, ears, scrotum and vulva may occur. The rash of spotted fever appears earlier in the illness, often within twenty-four to forty-eight hours after the onset, and it is usually more hemorrhagic and purpuric in nature. The rash of spotted fever tends to appear first on the back, wrist and ankles, with early involvement of the palms of the hands and soles of the feet. Later the forehead, arms, legs, chest and abdomen are affected. In endemic typhus the rash usually appears first on the chest and upper part of the abdomen, and involvement of the face, wrists, ankles, palms and soles rarely occurs. Neither the nature of the lesions nor their localization can be relied on absolutely for differentiation. The diagnosis must be based on laboratory evidence, such as the specific complement fixation test, skin biopsies, animal inoculations and cross immunity tests, and protection tests. It is not unlikely that more instances of this disease will be found if the disease is considered in the differential diagnosis of acute infectious diseases with exanthematous manifestations, and specimens of blood are sent to diagnostic centers for study.

Public Health Reports, Washington, D. C.

60:85-116 (Jan. 26) 1945

Free plasma for North Dakotans. M. E. Koons.—p. 85.
Wartime Nursing Care in Representative General Hospitals. M. E. Altenderfer.—p. 90.

60:117-144 (Feb. 2) 1945

Mass X-Ray Survey in San Antonio. D. M. Gould.—p. 117.
Inactivation of Malaria Parasites by X-Rays. B. E. Bennison and G. R. Coatney.—p. 127.
Outward Opening, Combination Storm and Screen Door. R. E. Dorer. —p. 132.

60:145-172 (Feb. 9) 1945

Sickness Absenteeism Among Industrial Workers, Third Quarter of 1944. W. M. Gafafer.—p. 145.
*Production of an Antibiotic Substance Similar to Penicillin by Pathogenic Fungi (Dermatophytes). S. M. Peck and W. L. Hewitt.—p. 148.

60:173-200 (Feb. 16) 1945

Location and Movement of Physicians, 1923 and 1938—Changes in Urban and Rural Totals for Established Physicians. J. W. Mountin, E. H. Pennell and G. S. Brockett.—p. 173.
Inoculation of Chick Embryos with Sporozoites of Plasmodium Gallinaceum by Inducing Mosquitoes to Feed Through Shell Membrane. V. H. Haas and F. M. Ewing.—p. 185.

60:201-228 (Feb. 23) 1945

Cultivation of Mumps Virus in Developing Chick Embryo and Its Application to Studies of Immunity to Mumps in Man. K. Habel. —p. 201

Antibiotic Substance Similar to Penicillin in Pathogenic Fungi.—Peck and Hewitt state that the occurrence of antibiotic substances has been noted previously in only one species of pathogenic fungi, namely Aspergillus fumigatus. They investigated a number of fungi for the existence of antibiotic substances. A strain of Trichophyton mentagrophytes which was isolated from the arm of a patient presenting a clinical case of dermatophytosis was found to produce an antibiotic substance. This fungus was used for most of the experiments. A survey was made to determine how uniformly the ability to produce an antibiotic factor occurred among other dermatophytes. Several members of the group of fungi occurring in clinical lesions of dermatophytosis were found to elaborate a factor antagonistic to certain other micro-organisms. This factor appeared to be similar to penicillin in the following respects: (*a*) enhanced production on mediums containing corn-steep liquor, (*b*) spectrum of activity and behavior toward penicillin resistant organisms, (*c*) sensitivity to p_H and temperature and (*d*) destruction by clarase.

Surgery, Gynecology and Obstetrics, Chicago

80:113-224 (Feb.) 1945

*Endometriosis of Bladder and Ureter. V. J. O'Conor and J. P. Greenhill.—p. 113.
Rapid Repair of Defect of Femur by Massive Bone Grafts After Resection for Tumors. D. B. Phemister.—p. 120.
*Androgen Control Therapy in 130 Cases of Carcinoma of Prostate. C. C. Herger and H. R. Sauer.—p. 128.
Vitamin Studies in Abortions. W. E. King.—p. 139.
Effect of Sulfanilamide and Sulfathiazole on Human Tissue. J. L. Posch, M. E. Maun, M. A. Pilling and J. W. Hirshfeld.—p. 143.
Pancreaticoduodenectomy for Primary Carcinoma of Duodenum. T. G. Orr and G. A. Walker.—p. 149.
Congenital Anomalies in Region of Umbilicus. H. L. Trimingham and J. R. McDonald.—p. 152.
Surgery in Obstinate Megacolon: Radical One Stage Resection and Ileosigmoidostomy. K. S. Grimson, H. N. Vandergrift and H. M. Dratz. —p. 164.
Skin Bacteria: Their Location with Reference to Skin Sterilization. D. L. Lovell.—p. 174.
Influence of Thyroid Principle on Prothrombinopenic Action of Dicumarol. K. G. Wakim, K. K. Chen and W. D. Gatch.—p. 178.
*Hemorrhagic Shock: Relative Effect of Amino Acids, Amigen and Gelatin in Dogs. R. J. Nicholl, W. F. Boucher and R. W. Prince. —p. 181.
Use of Red Cells in Transfusion Therapy. A. P. Falkenstein.—p. 187.
Hepaticoduodenal Intubation with Hepatoduodenostomy for Traumatic Stricture of Hepatic Duct. R. Colp.—p. 190.
Use of Identifying T Tube in Common Bile Duct in Gastric Resection for Duodenal Ulcer Adherent to Bile Ducts. F. H. Lahey.—p. 197.
Aseptic Necrosis of Capital Femoral Epiphysis Following Adolescent Epiphyseolysis. R. D. Moore.—p. 199.
Hodgkin's Disease of Breast. F. E. Adair, L. F. Craver and Julian B. Herrmann.—p. 205.
Pregnancy Associated with Carcinoma of Large Intestine. E. A. Banner, A. B. Hunt and C. F. Dixon.—p. 211.

Endometriosis of Bladder and Ureter.—A review of the subject of endometrial invasion of the bladder and ureter by O'Conor and Greenhill suggests that, while these cases are probably rare, they are more common than the literature would indicate. Vesical endometriosis seems to be always secondary to pelvic endometriosis that has extended into the bladder from affected contiguous organs. Only 58 authentic instances have been recorded. The authors report 2 cases that they observed. Subjective bladder symptoms are variable. Cyclic disturbance was recorded in only two thirds of the patients. The most constant symptom seems to be a sense of pressure or weighty discomfort in the vesicovaginal region. The cystoscopic appearance of endometriosis of the bladder may or may not be similar to the appearance of a "chocolate cyst" of the ovary. In many instances the mucosal changes have been reported as cyclic in character. In other instances the appearance is not unlike that of a chronic inflammatory lesion or an early area of infiltrating carcinoma. In the described case with vesical endometriosis the cystoscopic appearance of the lesion was so typical as to leave no doubt as to the cellular nature of the invasion. Removal of the ovaries or the arrest of their function usually causes an abrupt ending of the disease. Occasionally removal of the ovaries does not arrest the disease. In younger women, in whom one should make an effort to preserve as much ovarian tissue as possible, localized excisions of involved areas should be practiced. Unfortunately, in these patients recurrences are not uncommon and further surgery may be necessary. The second case reported here is noteworthy because it was one of intraureteral endometriosis, only 1 other case of this type having been reported before. The patient, a woman aged 50, recovered

following removal of the ureter and kidney. The authors emphasize the importance of recognizing vesical and ureteral endometriosis in the differential consideration of tumors of the bladder and ureter.

Androgen Control in Carcinoma of Prostate.—Herger and Sauer employed castration singly or in combination with diethylstilbestrol medication in treating patients with demonstrable metastasis or with rapidly progressing lesions. Exclusive administration of diethylstilbestrol, usually in doses of 1 mg. daily, was reserved for patients with low grade malignant tumors with no demonstrable metastasis, in whom little progression was anticipated. Diethylstilbestrol alone was given also to patients who refused or who were unsuitable for orchiectomy. Obstructive symptoms were treated by the usual methods, such as the indwelling catheter, suprapubic cystostomy or transurethral resection. Orchiectomy alone was carried out on 26 patients, 19 of whom had metastasis. In 48 other patients, 35 of whom had metastasis, castration was either preceded or followed by administration of diethylstilbestrol. The remaining 56 patients received exclusive diethylstilbestrol medication; metastasis was found in 11 of these cases. Analyzing the results obtained in their 130 cases, the authors say that favorable response was accomplished in numerous instances. Prolonged observation revealed that in a considerable number initial improvement developed into delayed failures. Even the most spectacular improvement has to be viewed with skepticism as to the ultimate outcome. Androgen control treatment has prolonged the lives of patients with far advanced or metastatic disease. The response to this treatment is much more impressive than the poor results accomplished by external or interstitial irradiation. Although improvement is of temporary duration, the simplicity of the method and the low surgical risk involved justify its use in combination with the usual methods in the treatment of high grade urinary obstruction. The results were most favorable in cases of metastatic lymph node involvement. Spread or local extension of bone metastasis is not arrested by androgen control treatment. Furthermore, this treatment does not protect the patient with nonmetastatic cancer of the prostate from developing metastasis at a future time. In spite of the apparent ineffectiveness of androgen control therapy on the bone metastasis, it cannot be denied that many of these patients derive temporary benefit, such as disappearance or improvement of pain, gain in weight and increase in well-being. Androgen control treatment, and particularly orchiectomy, should not be carried out indiscriminately in all cases of carcinoma of the prostate. Castration should be reserved for patients with metastatic disease, patients in whom metastasis is suspected or patients with rapid enlargement of the primary lesion.

Hemorrhagic Shock: Effect of Amino Acids, Amigen and Gelatin in Dogs.—A comparison of the values of saline solution, red blood cell saline suspension and heparinized plasma in the treatment of hemorrhagic shock in dogs produced by an easily standardized method has been recently reported from the laboratory of Nicholl and his collaborators, who report a continuation of the work with comparative tests of pure crystalline amino acids, an enzymatic hydrolysate of casein (amigen) and bone gelatin. They stress the following points: 1. Under the conditions of these experiments an amino acid (10 per cent) solution and a solution (10 per cent) of a hydrolysate of casein and pork pancreas (amigen) were found to be ineffective in overcoming shock produced by a severe acute hemorrhage in each of 7 dogs. 2. Under the same conditions suspensions of red cells in solutions of amino acids and amigen proved more effective than amino acid or amigen solutions without red cells and less effective than the gelatin used in treating this type of hemorrhagic shock. 3. Under similar conditions 3 per cent solutions of bovine bone gelatin which had previously been autoclaved twenty minutes and one hundred and eighty minutes proved 100 per cent effective in overcoming hemorrhagic shock in 15 dogs. 4. The apparent ability of this gelatin to maintain circulatory volume without untoward reaction supports its careful trial in the emergency treatment of hemorrhagic shock in human beings.

Tennessee State Medical Assn. Journal, Nashville

38:1-28 (Jan.) 1945

Gerontology, Geriatrics and Gerontotherapy. W. E. Howell.—p. 1.
Amebiasis. E. L. Turner.—p. 7.
Implications of Importation of Malaria by Personnel of Armed Forces. R. B. Watson.—p. 13.

38:29-59 (Feb.) 1945

How Should Cancer of the Prostate Be Treated? B. W. Wright.—p. 35.

Texas State Journal of Medicine, Fort Worth

40:459-508 (Jan.) 1945

*New Method of Treatment of Infiltrating Carcinoma of Urinary Bladder. T. B. Wayman and Ester C. Marting.—p. 463.
Diagnosis of Acute Appendicitis. H. C. Fisher.—p. 469.
Surgical Closure of Patent Ductus Arteriosus. J. W. Nixon.—p. 473.
Study of Rectal and Axillary Temperatures in Infants. J. P. Gibson. —p. 478.
Application of Chick Embryo to Virus and Rickettsial Disease Problems. M. Pollard.—p. 480.
Cause and Treatment of Rhinopharyngeal Hemorrhages. R. E. Windham.—p. 484.
Uveitis and Its Relation to Focal Infections and Allergy: Some Observations Concerning Diagnosis, Prognosis and Treatment of Several Clinical Types. W. D. Gill.—p. 488.

Treatment of Infiltrating Carcinoma of Urinary Bladder.—Wayman and Marting present a new method of interstitial irradiation for carcinoma of the bladder which they believe offers a technic by which sterilizing doses of radiation may be applied to bladder tumors without injury to the surrounding tissues. In employing this method it is important to determine whether the tumor mass is situated in the base of the bladder or at some other location so that the proper exposure of the bladder may be utilized. If the tumor is located on the trigone and can be palpated through the vagina or rectum the bladder is exposed by using the vaginal or the perineal approach. If the tumor is located in a position other than the trigone the suprapubic approach is employed. The authors describe and illustrate these different methods of approach. The total dose of radium applied by the authors with this interstitial method of treatment was 4,341 to 7,320 millicurie hours. They show that if the needles are placed approximately 1 cm. apart throughout the entire tumor-bearing area all of the malignant cells will receive the minimum lethal dose. The needles should be placed parallel to one another so that they do not crisscross and produce overconcentration of radiation at any single point. This method is applicable in inoperable as well as in operable bladder tumors.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

53:1-34 (Jan.) 1945

Eosinophilic Granuloma of Skull. J. Raaf.—p. 1.
Varicose Veins of Female Pelvis. A. N. Webb.—p. 5.
Recent Advances in Medical Gynecology. R. N. Rutherford.—p. 11.
Phenylmercuric Acetate Jelly. L. H. Biskind.—p. 18.
Diabetes Mellitus and Pregnancy: Survey of 49 Deliveries. J. L. Gaspar.—p. 21.

53:35-64 (Feb.) 1945

Current Concepts of Vaginitis and Vulvar Irritations in Infants and Children. G. C. Schauffler and Caroline Schauffler.—p. 35.
Acute Hemorrhagic Pancreatitis: Case Report. L. J. Gariepy.—p. 45.
So-Called Endometrioma Interstitiale, with Report of 3 Possible Cases. D. W. DeCarle.—p. 48.
Use of Splanchnic Block for Operations in Upper Abdomen. H. McCorkle, H. Silvani and W. Brock.—p. 51.
Rupture of Uterus in Labor. D. G. Tollefson.—p. 54.

Wisconsin Medical Journal, Madison

43:1193-1300 (Dec.) 1944

Sulfonamide Anuria Treated by Unilateral Renal Decapsulation. J. P. Skibba.—p. 1215.
Anuria: Report of 4 Cases, 3 Treated by Kidney Decapsulation. C. R. Marquardt, H. E. Cook and A. J. Frederick.—p. 1218.
Will Returned-Soldier Malaria Menace Wisconsin? H. Beckman.—p. 1222.
Medical Care of Mentally Ill in County Asylums in Wisconsin. H. H. Christofferson.—p. 1229.
Postwar Planning for Medical Services. M. Fishbein.—p. 1243.

44:1-188 (Jan.) 1945

The G. I. Bill of Rights. J. W. Holloway Jr.—p. 116.
The Bureau of Information: Its Functions and Operation. H. C. Lueth. —p. 119.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Rheumatic Diseases, London

4:29-49 (Dec.) 1944

Sciatica: Anatomic and Mechanical Study of Lumbosacral Region. N. Capener.—p. 29.
*Experimental Transmission of Rheumatic Fever. W. S. C. Copeman. —p. 37.
Microdetermination of Gold in Biologic Fluids and Tissues. W. D. Block.—p. 39.
Determination of Blood Level of Vitamin C in Chronic Rheumatic Disease. E. A. M. Bradford.—p. 43.
Fibrositis and Reality. M. Kelly.—p. 46.

Experimental Transmission of Rheumatic Fever.—Copeman obtained adult volunteers for an experiment on transmission of rheumatic fever. From a patient who had a typical attack of rheumatic fever he obtained blood on the fourth day of his illness and transferred it to 5 volunteers. The blood of 2 who showed a rheumatic reaction was then taken and injected into a further group of volunteers, and so on. It was only in the fourth "generation" of volunteers that no further reaction of any sort was noted. The author thinks that it might be surmised from this experiment (1) that rheumatic fever can be transmitted in the blood of an active sufferer and (2) that the syndrome of rheumatic fever may be a synthesis of two elements: (*a*) a febrile nonspecific element and (*b*) a specific fibrotoxic (and cardiotoxic) element, since it seemed that there was some clinical evidence of these two elements developing independently in certain of the volunteers.

Australian J. Exper. Biol. and M. Science, Adelaide

22:223-310 (Dec.) 1944. Partial Index

*Antibacterial Substances Produced by Molds: 6. Production of Crystalline Penicidin. Nancy Atkinson, R. A. W. Sheppard, N. F. Stanley and P. Melvin.—p. 223.
Id.: 7. Activity of Further Group of Australian Strains of Penicillium and Aspergillus. Nancy Atkinson, R. A. W. Sheppard, N. F. Stanley and K. Mary Rainsford.—p. 227.
Detoxication of Diphtheria Toxin. Mary H. Petherick and E. Singer. —p. 285.
Kinetics of Fermentation of d-Fructofuranose by Yeast. A. Gottschalk. —p. 291.
Lack of Increase in Antibody After Second Injection of Influenza Virus in Man. W. I. B. Beveridge.—p. 301.
Suppression of Antigenicity of Influenza Virus by Admixture with Homologous Antiserum. W. I. B. Beveridge, Joyce D. Stone and Patricia E. Lind.—p. 307.

Crystalline Penicidin.—Atkinson and her collaborators state that, as a result of further work on production and purification, penicidin has now been prepared in crystalline form. A method resembling that described by Birkinstraw and his associates was adopted for the extraction of penicidin. The final yield of crystalline penicidin was disappointingly small. Penicidin was actively antiluminescent; it shared this characteristic with other antibacterial substances produced by molds, notably aspergillic acid. Jones et al. found the antiluminescence titration satisfactory for assaying solutions of aspergillic acid; the authors have found it useful in estimating the concentration of penicidin in crude and partially purified preparations. So far only biologic methods have been successful in detecting and estimating penicidin, and of the available methods the antiluminescence titration provides results in the shortest time.

British Journal of Experimental Pathology, London

25:193-256 (Dec.) 1944. Partial Index

Routine Examination of Urine for *Mycobacterium Tuberculosis*. H. J. Peppler and J. T. Hill.—p. 193.
Pharmacology of Patulin. W. A. Broom, E. Bulbring, C. J. Chapman, J. W. F. Hampton, A. M. Thomson, J. Ungar, R. Wien and G. Woolfe. —p. 195.
Blood Group A Antigen Prepared from an A Hapten of Human Origin. W. T. J. Morgan and W. M. Watkins.—p. 221.
Effect of Penicillin on Treponema Pallidum Infection in Rabbits. F. R. Selbie and R. D. Simon.—p. 229.
Thymol Turbidity Test as Indicator of Liver Dysfunction. N. F. Maclagan.—p. 234.
Oxygen-Stable Hemolysin of Group A *Hemolytic Streptococci* (Streptolysin S). D. Herbert and E. W. Todd.—p. 242.

British Journal of Radiology, London

18:33-64 (Feb.) 1945

Pulmonary Disease in Graphic Workers. L. Dunner.—p. 33.
Photographic Methods Applied to Dosimetric Problems. G. Spiegler. —p. 36.
Calculation of Dosage and Additional Distribution Rule for Cylindric "Volume" Implantations with Radium. W. J. Meredith and S. K. Stephenson.—p. 45.
Recent Scandinavian Literature on Radiotherapy. F. Ellis.—p. 48.

Pulmonary Disease in Graphite Workers.—The observations reported by Dunner were made during routine examinations of 5 men who had been working with graphite for many years. The graphite when removed from its containers gives rise to a dust which is inhaled for many hours daily. The men had handled graphite for from seventeen to thirty-four years. Physical examination by percussion and auscultation revealed slight changes, but the mild symptoms and few physical signs are in striking contrast to the x-ray appearances. The first patient, a man aged 56 who had worked with graphite for twenty years, had had cough and sputum for many years and recently pains in the chest. The x-rays revealed patchy infiltration throughout the right lung. Nodular opacities could be distinguished. The infiltration became more homogeneous at the base. There was slight patchy infiltration at the left base. The second patient had cough and sputum but felt well. Another patient was troubled with bronchitis, which caused him to be absent from work occasionally. The 2 other men had no complaints. The chest roentgenograms of all 5 showed opacities, reticulation, nodulation and other changes. The author concludes that graphite dust can produce pneumonoconiosis. The symptoms are mild even in advanced cases, and diagnosis must be based on x-ray examination.

British Medical Journal, London

1:35-70 (Jan. 13) 1945

Evolution of Modern Therapeutics. W. Langdon-Brown.—p. 35.
*Scabies Prophylaxis Using "Tetmosol" Soap. K. Mellanby.—p. 38.
Artificial Insemination. Mary Barton, K. Walker and B. P. Wiesner. —p. 40.
Methyl Bromide Poisoning: Effects on Nervous System. A. B. Carter. —p. 43.
Hypoproteinemia During Recovery from Severe Anemia. T. Davies. —p. 45.

1:71-106 (Jan. 20) 1945

Aerial Infection. M. Mitman.—p. 71.
Nature of Injectable Liver Extracts: Discussion on Standards of Potency and Purification. W. B. Emery and W. J. Hurran.—p. 75.
Prophylaxis of Rickets by Single Massive Doses of Vitamin D. D. Krestin.—p. 78.
Prophylaxis of Respiratory Tract Infections with Sulfanilamide Lozenges. A. F. Hayden.—p. 81.
Recovery from Diabetic Coma of Abrupt Onset with Extreme Hyperglycemia. C. Elkes.—p. 82.

Scabies Prophylaxis Using "Tetmosol" Soap.—A soap has been produced which contains 10 per cent of "tetmosol" (tetraethylthiuram monosulfide). The use of this soap has been shown to kill Sarcoptes and thus to cure scabies, though as a therapeutic agent at a treatment center it is less efficient than benzyl benzoate. It is, however, so simple to use that it seemed possible that its general issue to an infected population would prevent further transmission of the disease. Patients in a mental hospital used tetmosol soap for a period of eleven weeks. Scabies, which was very prevalent at the start of the experiment, was almost entirely eliminated. Most cases were cured, and the spread of the disease was prevented.

1:107-140 (Jan. 27) 1945

*Action of Penicillin on Bacteria. L. P. Garrod.—p. 107.
Penicillin in Gonorrhea and Syphilis, with Notes on 2 Cases of Dual Infection. F. L. Lydon and W. R. Scott.—p. 110.
*Temporary Character of "Fastness" of *Staphylococci* to Penicillin. E. W. Todd and G. S. Turner.—p. 111.
Weil's Disease in Normandy: Its Treatment with Penicillin. E. Bulmer. —p. 113.
Local Penicillin Therapy in Ophthalmia Neonatorum. A. Sorsby and Elizabeth Hoffa.—p. 114.
Preparation of Purified Penicillin. F. M. Berger.—p. 116.
Thyroid Hyperplasia After Prolonged Excessive Dosage with Thiouracil. J. B. Donald and D. M. Dunlop.—p. 117.

Action of Penicillin on Bacteria.—Garrod says that penicillin is fairly rapidly lethal to susceptible bacteria. All commercial penicillins tested were less active in high than in low concentrations. Impurities which presumably cause this and

other anomalies present a serious problem. Nothing is likely to be gained by using high concentrations, particularly for local treatment. A concentration of 1 unit per cubic centimeter is not only just as effective as one of 1,000 units but often more so. The only good reason for using strong solutions in local treatment is to ensure that loss by escape, dilution or absorption shall not permit the concentration to fall below the minimum level for full effect, which may be about 0.1 unit per cubic centimeter. The factors controlling this loss vary almost infinitely, from good retention in a closed space to the impossibility of retention and the dilution by copious exudate which characterizes some open wounds. The optimum strength of solution must therefore vary, but the standard probably need not exceed 250 units per cubic centimeter. These experiments also have some practical bearing in relation to Bigger's proposal that systemic penicillin treatment should be intermittent. His argument is that penicillin kills only dividing cells and that a small proportion of dormant nondividing cells, which he terms "persisters," are liable to survive; these must be permitted to grow by interrupting treatment if sterilization is to be complete. Studies of the effect of temperature and particularly of reproductive activity on susceptibility to penicillin demonstrate behavior which seems to differ in no qualitative sense from that of other disinfectants.

Temporary "Fastness" of Staphylococci to Penicillin.—Two strains of coagulase positive staphylococci were made penicillin "fast" by cultivation in increasing quantities of penicillin. They were then subcultured daily in broth without penicillin and, contrary to expectations, a rapid fall in resistance to penicillin was noted. It therefore appears that "fastness" of staphylococci to penicillin is not a permanent characteristic but that staphylococci which have become resistant to penicillin in vivo might similarly revert to the penicillin sensitive state on withdrawal of the drug. Indeed, it seems possible that the reversion might be more rapid in vivo than in vitro.

Lancet, London

1:71-102 (Jan. 20) 1945

Management of Hospitals in Peace and War. S Hastings.—p. 71.
*Bacteriolytic Action of Penicillin. E. W. Todd.—p 74.
*Pneumococcal Lobar Pneumonia Treated with Sulfamezathine: Further Study. W. A. Ramsay, P. Steiner, R. W. Luxton and G. S. Smith. —p. 78.
Spread of Infective Hepatitis. R. Kirk.—p. 80.
Significance of Mites and Their Eggs in Human Feces. P. Manson-Bahr and W. J. Muggleton.—p. 81.
New Technic of Spinal Anesthesia. A. R. Hunter.—p. 82.
Creams for Testing Sensitivity of Organisms to Bacteriostatics. H. B. May and D. Stern.—p. 83.
Metazoan Immunity. D. B. Blacklock.—p. 84.

Bacteriolytic Action of Penicillin.—Todd investigated a number of organisms for their susceptibility to bacteriolysis by penicillin. He found that all the penicillin sensitive organisms tested were susceptible to bacteriolysis by penicillin. Penicillin insensitive organisms, such as Escherichia coli and Pseudomonas aeruginosa, were not lysed by penicillin. The question arises whether the bacteriostatic action of penicillin is separate from the bacteriolytic action or whether they are different manifestations of the same process. There can be no doubt that penicillin is capable of killing micro-organisms without lysis, and it seems probable that multiplications, death and lysis may all occur independently at the same time in a culture containing penicillin. This was observed in a culture in which during the first two hours of incubation turbidity increased with a diminishing colony count, presumably owing to rapid multiplication accompanied by a still more rapid death rate but without correspondingly rapid lysis. After this initial period, progressive lysis and a steadily falling colony count proceeded to complete lysis and complete sterilization. When the potential rate of multiplication is increased by the addition of serum, bacteriolysis begins within an hour without preliminary increase of turbidity or other evidence of multiplication. It is, however, possible that in this case multiplication is not detectable because both the death rate and the rate of lysis exceed the rate of multiplication. It seems to be a general rule that the rate of bacteriolysis by penicillin depends on the actual or potential rate of multiplication of the organisms. Staphylococci which are not actively dividing survive in penicillin, while the actively multiplying organisms are killed. It may be that the real reason why penicillin is so effective is that young cultures in the stage of active multiplication are more susceptible to the bacteriolytic action of penicillin than older cultures. It is therefore fortunate that the organisms which are in such a state that they could readily invade the human body are in just the state in which they are most susceptible to the bacteriolytic action of penicillin.

Sulfamezathine in Pneumococcic Pneumonia.—Ramsay and his associates report that sulfamezathine has been used in the treatment of a further 287 cases of pneumococcic lobar pneumonia with a case fatality rate of 8.4 per cent. Of the 24 patients who died, 22 were over 50 years of age. It is confirmed that the drug is relatively nontoxic and that the number of complications is not high. An analysis of the deaths in this and in the previous series suggests the following points as an aid in reducing still further the mortality of lobar pneumonia: Steps must be taken to ensure an adequate drug concentration in the blood in the first twenty-four hours in severely toxic cases and in those coming for treatment after the seventh day of the disease. In older patients the heart condition should be assessed and adequate convalescence allowed. Abdominal symptoms should be regarded as a sign of toxemia and receive early treatment. An undetected empyema may be one of the reasons for the development of pneumococcic endocarditis.

1:103-134 (Jan. 27) 1945

Hemothorax: Notes and Observations. N. R. Barrett.—p. 103.
*Louse Borne Typhus Fever: Trial of Serum Treatment. R. S. Stevens. —p. 106.
Effect of Temperature on Isoagglutination in Blood Grouping. J. H. Nelson.—p. 109.
Radiotherapy in Osteoblastoma. G. Hilton.—p. 110.
Meningitis Due to Pseudomonas Pyocyanea: Penetrating Wounds of Head. E. H. Botterell and D. Magner.—p. 112.
Infection from Spinal Analgesia: Warning. F. T. Evans.—p. 115.
Venous Thrombosis Following Pentothal Anesthesia. D. Hewspear. —p. 116.

Louse Borne Typhus Fever.—Stevens says that, during the first six months of 1943, 21 cases of louse borne typhus fever were admitted to a military hospital in the Middle East. Seven of them were treated with hyperimmune rabbit serum prepared by the Lederle Laboratories of New York and supplied by the U. S. Army medical services. Six patients were given large doses of serum as soon as clinical diagnosis was established and all recovered. A seventh patient, given a smaller dose, died. No attempt is made to draw conclusions from so small a series. The serum apparently has a beneficial effect by modifying the severity of the course and reducing the toxemia. Emphasis is placed on giving the serum as early as possible and in adequate dosage.

Proceedings of Royal Society of Medicine, London

38:51-96 (Dec.) 1944. Partial Index

Medical Aspects of Coal Mining. S. W. Fisher.—p. 59.
Congenital Pseudarthrosis of Tibia Treated by Twin Grafts. S. A. S. Malkin.—p. 71.
*Excision of Proximal Row of Carpus. T. T. Stamm.—p. 74.
Certain Observations on Normandy Casualties. D. Trevor.—p. 76.
Some Methods of Nonskeletal Traction. M. C. Wilkinson.—p. 78.

Excision of Proximal Row of Carpus.—Stamm states that the object of treatment must be to restore a free range of movement, throughout which no structures are submitted to excessive stretching or impaction. The essential step in any arthroplasty is to provide a gap whose closure will relax the surrounding structures and so relieve the tissues from stress. The removal of one bone or part of one bone from the proximal row of the carpus does not affect this relaxation. Excision of the whole of the proximal row of the carpus offers a possible solution. It not only provides a good joint gap but also results in the substitution of a simple ball and socket joint between the os capitatum and the radius for the normal complicated link-joint mechanism. The operation requires care so as not to damage the radius or other carpal bones. The after-treatment is all important. The final result cannot be expected in less than four months. The average result is a wrist with 50 to 70 per cent of the normal range of movement, slight weakness of grip and occasionally some degree of pain on forced radial deviation of the wrist. Even if arthrodesis should ultimately prove necessary, it will have been greatly facilitated by the removal of the proximal row of the carpus.

Arch. Urug. de Med., Cir. y Especialid., Montevideo

25:1-466 (Oct.) 1944. Partial Index

Acute Suppurative Meningitis: Two Cases Cured by Penicillin. A. Schroeder and J. B. Gomensoro.—p. 361.
*Amphetamine Sulfate Therapy of Barbiturate Intoxication. F. Herrera Ramos.—p. 376.

Amphetamine Sulfate Therapy of Barbiturate Poisoning.—Herrera Ramos treated successfully 8 out of 9 cases of barbiturate poisoning with amphetamine. The drug was injected intravenously in a solution containing 0.5 mg. of amphetamine sulfate for each gram of the barbituric preparation ingested. This was followed thirty minutes later by an intramuscular injection of the same dose of amphetamine. Intramuscular injections of 1 mg. of amphetamine sulfate for each gram of the ingested barbiturate were repeated every forty-five minutes until the patient recovered from coma. Subcutaneous injection of a solution containing 0.2 mg. of amphetamine sulfate for each gram of the barbiturate ingested was kept up hourly for three hours and every three hours for six hours. Amphetamine sulfate was then given by mouth in doses of 2 mg. every eight hours for twenty-four or forty-eight hours. Determination of the barbiturate level in the blood served as an index to the course of the poisoning and the effect of treatment.

Medicina Española, Madrid

12:223-338 (Sept.) 1944. Partial Index

*Cystic Ganglioneuroma of Cerebral Lobe: Histopatologic and Neurosurgic Study. L. Barraquer, E. Tolosa and J. Sard.—p. 225.

Cystic Ganglioneuroma.—Barraquer and his collaborators report a case of cystic ganglioneuroma of the frontal lobe. The proper diagnosis was made from the results of a ventriculography. The operation consisted in frontal osteoplastic craneotomy, elimination of 50 cc. of the cystic fluid through central puncture of the frontal lobe, resection of an area of the cortex 5 cm. in diameter and surgical removal of the tumor. The latter weighed 16 Gm. The histologic diagnosis was ganglioneuroma. The normal cells about the tumor and the walls of the cyst showed that there was neither penetration nor infiltration of tumoral cells to the normal nervous tissues. The operation was successful. The good results have continued five months after postoperative recovery of the patient.

Medizinische Klinik, Berlin

39:541-570 (Aug. 6) 1943. Partial Index

Results of Investigations and Progress of Science of Healing of Diseases of Ear, Nose and Throat. E. Wirth.—p. 541.
Exhaustion. Ickert.—p. 545.
Drug Therapy in the Front Line. K. Soehring.—p. 548.
*Leukemia and Diseases of Nervous System. R. Stodtmeister and H. Weicker.—p. 551.
Clinical Aspect and Therapy of Tuberculous Pulmonary Hemorrhage from the Point of View of the Practitioner. A. Sattler.—p. 554.
Case of Syphilis of Stomach: Gastroscopic and Anatomic Findings. K. A. Koelsch.—p. 556.
Case of Thallium Poisoning with Trophic Disturbances of Nails. G. Dell' Acqua.—p. 558.

Leukemia and Nervous Complications.—Stodtmeister and Weicker analyzed 300 cases of leukemia from the literature and found that the nervous system is much more frequently involved in a leukemic process than was generally assumed. Hemorrhages, infiltrations and degenerative processes are responsible for the leukemic changes in the nervous system. None of the varieties of leukemia display any predilection for certain areas, tracts or systems in the brain, the spinal cord or the peripheral nervous system. Cerebral hemorrhages can be demonstrated in the majority of the cases in the white substance. Hemorrhages were mainly associated with the periodic appearance of myeloblasts in the peripheral blood in chronic myelogenous leukemia and in the so-called classic myeloblastic leukemia. These processes, however, do not represent a genuine leukemic event but are rather to be considered manifestations of a more or less acute decompensation of the bone marrow function. Disturbances of thrombopoiesis play the main part in the etiology of hemorrhages. Variants of the so-called myeloblastic leukemia, characterized by the presence of tumor-like masses (chloroma), may be responsible for pressure symptoms in the brain or the spinal cord. This type of "myeloblastic syndrome" belongs to the group of true leukemias. Chronic leukemias, particularly those of lymphogenous type, have a tendency to form infiltrations, although hemorrhages may likewise be present. Herpes zoster was observed exclusively in chronic cases, predominantly in those of the lymphogenous type of leukemia. In the absence of signs due to hemorrhage, neurologic symptoms seem to depend on purely degenerative changes. Circulatory disturbances could not be demonstrated. No specific relationship could be established between funicular disease of the spinal cord and the leukemias.

Acta medica Scandinavica, Stockholm

Supplement 144:1-107 (April) 1943

*An Investigation Into a Yeastlike Fungus Isolated from Patients Suffering from or Suspected of Pulmonary Tuberculosis. E. Hollström.—p. 5.

Fungi in Tuberculosis.—The material for Hollström's investigation consisted of five strains of fungus of yeast type, two of which were obtained from the sputum of patients with pulmonary tuberculosis while three strains were isolated from the gastric lavage of patients under observation for suspected tuberculosis. The fungus isolated from these 5 patients was of the yeast-oidium type and was able to produce acid fast rods. When the fungus had been cultivated over twelve months, single cell cultures were obtained by using Chambers' micromanipulator with inverted microscope. Irrespective of their varying capacity to produce acid fast rods, the strains showed varying but the same cultural, tinctorial and biochemical properties. On ordinary slanted agar the fungus grew in colonies which corresponded to the R and S forms of the bacteria, of which the latter was the one most commonly seen. Two types of growth could be distinguished in glycerin bouillon cultures. The staining of the fungus varied to a high degree, so that the acid fastness with the Hallberg stain and the general staining diminished with increasing age of the culture. The acid fast rods may originate from an amorphous mass in the fungus cells, which via non-acid fast granules and filaments differentiate into acid fast elements. Sometimes the outlines of the fungus cells seem to disappear first after this development; sometimes the fungus cells seem to disintegrate before its contents have been differentiated into acid fast elements. Intravenous inoculation into rabbits of agar and glycerin bouillon cultures of the fungus resulted in important variations of temperature, often considerable loss of weight, disturbances of equilibrium, pareses and ocular and other organic changes. The changes in the internal organs were more pronounced shortly after the inoculation than later, with the exception of the eyes. In one rabbit there occurred tuberculoid changes in the lungs, liver and spleen, and from the liver and spleen acid fast rods of Koch's bacillus type were obtained in pure culture. Acid fast rods were further encountered once in renal abscesses and twice in eye abscesses. In nine rabbits fungus cells could be demonstrated in eye abscesses and in three in the central nervous system. No other changes were obtained from inoculation into rabbits and guinea pigs of cultures containing both fungus cells and acid fast rods except such as could be seen after the inoculation with only fungus elements. Animal passage was carried out with material from the rabbit which presented tuberculoid changes in the lung, liver and spleen, and organic changes were produced which in the second passage resembled those of tuberculosis. In the foci there were numerous acid fast rods resembling tubercle bacilli, partly disseminated, partly in small accumulations, some of them phagocytosed and some in large clumps. Inoculation into guinea pigs never produced generalized tuberculous changes. Five of the animals inoculated with material containing acid fast rods were tested with tuberculin with negative results, which was also the case with rabbits inoculated with the fungus strains. From some of the animals cultures were made on Löwenstein's medium, when the acid fast rods grew in a two weeks period into yellowish colonies of twice the size of a pinhead which after recultivation and animal passage presented a changed appearance. The acid fast rods could not be cultivated at living room temperature or at a temperature of 113 F. or on any medium unsuitable for tubercle bacilli.

Book Notices

Treatment by Manipulation in General and Consulting Practice. By A. G. Timbrell Fisher, M.C., M.B., Ch B., Orthopædic Surgeon to the St. John Clinic and Institute of Physical Medicine and to the Arthritic Unit, St. Stephen's Hospital, London. Fourth edition of "Manipulative Surgery." Cloth. Price, $4.75. Pp. 224, with 84 illustrations. New York: Paul B. Hoeber, Inc., 1944.

The art of manipulation in the treatment of orthopedic conditions has been deprecated by many of our best known physicians and surgeons of the past and present generations. The chiropractors and the osteopaths have built for themselves a certain amount of prestige and prominence in the mind of a considerable number of American people by applying the principle of manipulation in spite of the fact that in most instances these practitioners were not qualified to make a correct diagnosis of the condition which they were attempting to treat. The value of careful and skilled manipulation in the treatment of conditions in which there is restricted movement within joints of the extremities resulting from adhesions between muscles, tendons and bursae has been demonstrated by eminent physicians through the centuries. This book is timely and deserves careful consideration on the part of all doctors who are concerned with the treatment of chronic rheumatic diseases or of other conditions which affect the muscles, tendons or joints. The indications for treatment by this method and the technic of manipulation for various conditions has been well described. The book is well worth consideration.

The Amino Acid Composition of Proteins and Foods: Analytical Methods and Results. By Richard J. Bloch, Ph.D., Associate in the Department of Physiology and Biochemistry, New York Medical College, New York, and Diana Bolling, B.S. Cloth. Price, $6.50. Pp. 396, with 5 illustrations. Springfield, Illinois: Charles C Thomas, 1945.

It has been recognized for many years that the nutritive value of protein foods depends on their content of certain indispensable amino acids. Such amino acids cannot be synthesized in the animal body and must therefore be supplied in adequate quantities in the diet. For this reason, as the authors point out in the preface, "a reasonably accurate knowledge of the amino acid composition of a protein permits an approximation of its nutritive value and, more important, allows the choosing of different proteins so that they became mutually supplementary." In this book the authors describe in detail most of the important analytical methods which have been devised for the determination, with some degree of accuracy, of the amounts of the various amino acids commonly found in proteins. In addition they have prepared a large number of tables showing the amino acid composition of a great many nutritionally valuable food proteins of plant and animal origin. The result is a book which will be found invaluable not only by the biochemist interested in the quantitative determination of some particular amino acid but also by the clinician and the dietitian interested in formulating diets which include all of the essential amino acids in adequate amounts. It will also be found extremely useful in helping to select dietary proteins which are rich in some particular amino acid to be included in the diet for therapeutic purposes.

An Invitation to Portuguese. By Margarita Madrigal and Henriqueta Chamberlain. Cloth. Price, $1.75. Pp. 208, with illustrations. New York: Simon and Schuster, 1944.

As contacts with the medical profession of Brazil become more frequent, more physicians will be interested in developing at least a sufficient knowledge of Portuguese to enable them to get about successfully when visiting that country. This manual is designed particularly for those who want to learn such a minimum amount of Portuguese rapidly.

My Second Life. By Thomas Hall Shastid, A.M., M.D., LL.D. Cloth. Price, $10; Ragston permanent paper edition, $12. Pp. 1,174, with illustrations. Ann Arbor, Michigan: George Wahr, 1944.

In 4 pounds 12 ounces of war-scarce materials comprising 1,174 pages, this volume stands 3⅝ inches thick. It is the author's second autobiography. It is an almost incredible collection of reminiscences without apparent organization.

American Medical Practice in the Perspectives of a Century. By Bernhard J. Stern, Ph.D., Visiting Professor of Sociology, Yale University, New Haven. Cloth. Price, $1.50. Pp. 156. New York: Commonwealth Fund; London: Oxford University Press, 1945.

This is one of a series of monographs to be offered by the Committee on Medicine and the Changing Order of the New York Academy of Medicine. It contains much interesting information but at the same time offers statements which may be attacked vehemently by those who have been closer than the author to the prevention, diagnosis and treatment of illness. While the book seems to be a plea for "socialized medicine," it actually makes no such plea directly.

Here is a strange comparison from the chapter on "The Expanding Horizons of Medicine":

> A comparison of the records of 2 patients with heart disease, 1 admitted to the hospital about twenty-five years ago and another admitted to the same hospital in 1938, yields interesting results. The first patient was cared for by a visiting physician, an intern and one specialist, the pathologist, bacteriologist, and the completed record covered two and one-half pages. The second patient was observed and described by three visiting physicians, two residents, three interns, ten specialists and fourteen technicians, a total of thirty-two individuals, and though the record of the case was still incomplete, it already covered twenty-nine pages.

This example, which, according to the author, was taken from G. Canby Robinson's The Patient as a Person, is not typical of the changes in the practice of medicine. Any one familiar with hospitals and modern treatment of disease is aware that the average patient is not seen by a variety of experts. A patient will be visited by an intern and a resident physician, as this is part of their duties. The attending physician will have full charge of the average case and he will call in a consultant only when necessary. If laboratory work is needed it will be provided. Yet the author claims, on page 53, "Considered from the viewpoint of the patient, specialization has complicated medical care in manifold ways and increased costs tremendously."

On page 54 the author claims that "there is little doubt but that the specialist tends to confine his observation of the causes of illness to the narrow field of vision with which he is most familiar. His special training and experience bring certain symptoms into focus, while his lack of experience in other fields dims his appreciation of the meaning of equally important symptoms. He fails as a rule to consider the patient as a whole, either physiologically or psychologically. Moreover, as patients, for the most part, come to the specialist only after their diseases are well advanced, the specialist's approach tends to be almost exclusively curative and only incidentally preventive." Then, he states, "it is one of the disparities of modern medicine that, while developments in the field of the deficiency diseases, endocrinology, psychiatry and psychosomatic medicine have led to the consideration of the patient in the context of his life history, the trend of diagnostic specialties is to ignore as irrelevant anything but the particular matter under scrutiny."

Apparently Stern believes that physicians do not yet receive adequate education, as he writes "The education of the physician not merely as a technician, but as a cultured person equipped with insights into human relationships and sensitized by an appreciation of the social sciences and the liberal arts, will do much to humanize the patient-doctor relationship, whatever other factors may tend to formalize such a relationship."

Somehow the author has the idea that practice in an office rather than in one's home is not conducive to establishing good patient-doctor relations: "The doctor formerly met his patients in a room set aside in his home, and the neighbors, when ill, came to see him and were received somewhat in the manner of guests. When his office is removed from the neighborhood to the center of town the contact is more impersonal and it is further formalized when receptionists and nurses take records. The further shift of diagnosis and treatment from the home to the hospital also reduces the physician's opportunity to acquire first-hand knowledge of the family setting and economic background of his patients."

Increasing interest is being shown in the family background of his patients by most physicians, general practitioners or specialists because they realize that there may be hidden in this background factors which may influence the mental and physical condition of the patient. Thus one cannot agree entirely with the statement "It is because pediatricians have intimate contacts with families in their homes that they have more affectionate relations with their patients than do other specialists whose

home visits are relatively infrequent." Apparently one of the most important human driving forces has been overlooked, namely the love that parents have for their children and the personal sacrifices that they will make to insure the welfare of a child. While they may not be particularly concerned about their own health or be especially interested in having their personal problems adjusted, they usually will abide unquestionably by suggestions from a physician when it has to do with their children.

There are other passages needing comment but there is not sufficient space. Unfortunately so much time was apparently devoted obtaining statistics concerning medical practice that the interpretations seem to be unsupported by known facts. Figures alone will not tell the whole story. Statistics must be properly evaluated; adequate evaluation can be made only by one familiar with the practical aspects of the problem.

A Method of Anatomy: Descriptive and Deductive. By J. C. Boileau Grant, M.C., M.B., Ch.B., Professor of Anatomy in the University of Toronto. Third edition. Fabrikoid. Price, $6. Pp. 822, with 729 illustrations. Baltimore: Williams and Wilkins Company, 1944.

In this edition fifty-five illustrations have been added to the original list; about seventy have been redrawn and relabeled. The initial section deals in general fashion with the several bodily systems. The osseous structure is considered microscopically; vascular foramens, elevations, facets, foveas and other gross features are discussed. Muscles are described on the basis of fascicular architecture; the physiologic mechanism of contractions is described in simple terms. The vascular system is considered from the standpoints of blood volume, character of arteriovenous anastomoses and nature of sinusoids, arteries and cavernous tissues. Many helpful facts are recorded regarding vascular patterns in such special areas as the nail bed, lip, cerebrum, spleen and erectile bodies; topographically different parts are thus brought together on the basis of peculiarity in blood supply. By this means the student is introduced to a rationalizing scheme of study. The nervous, digestive, respiratory, urinary and reproductive systems are similarly treated in this preliminary section. The regional accounts follow, a section being devoted to each of the major subdivisions of the body. A closing section covers the autonomic nervous system, body types and the separate elements of the skeleton. In all of these sections anatomic detail is handled ingeniously through the employment of simple mechanical principles; familiar physical notions are abundantly cited in order to render structural facts mentally manageable. For example, the inguinal canal is likened to a channel whose roof consists of three arcades contributed by a trilaminar wall; the liver is described as resembling an oblong block; the space of the femoral triangle, with its continuation as adductor canal, is likened to a funnel with a long spout. The section on thoracic anatomy, in addition to dealing with the regular segregated items, discusses such varied general topics as posture, alteration in form of the bronchial tree, development of the heart and great arteries. The section on the anatomy of the head and neck is, like the preceding sections, replete with diagrammatic figures.

The Method of Anatomy resembles a manual more closely than it does any other type of treatise, but it differs from the standard manual in presenting concepts superabundantly. It is not a textbook of the regular systematic order, since it is arranged chiefly on a regional basis. It is not a substitute for an atlas, since the drawings are diagrammatic. The book is unique in its attempt to teach anatomy in such a way that underlying principles, rather than mere facts, are made its chief content. Only a gifted teacher could formulate as many valuable notions as Professor Grant has included in his volume. His experience has allowed him to furnish some of the cleverest bits of description yet encountered in anatomic writings.

While Professor Grant's provocative volume could not replace the regular books in a student's anatomic library, it could most profitably be added to such a library. For the advanced student its content is inspiring; the surgical anatomist will find it useful as a source book for lecture material; and the novitiate in gross anatomy who places partial dependence on its ingenious text and pictures will be carried glowingly through those beginning years which, customarily, are far too didactic.

Health Practice Indices 1943: A Collection of Charts Showing the Range of Accomplishments in Various Fields of Community Health Service. Compiled from the Evaluation Schedules Submitted for the Year 1943. Prepared by the Subcommittee on Manual of Practice and Appraisal of Local Health Work for the Committee on Administrative Practice of the American Public Health Association. Paper. Pp. 116, with illustrations. New York, [n. d.].

This is a useful publication for the health officer who is serious about measuring the work of his health department or of the total health effort in his community against standardized practices in the field. The American Public Health Association has based most of its appraisal work comparisons with what is actually being done in various phases of public health work. Thus it becomes possible to compare the work in a given city not with a theoretical ideal but with the best work, or the worst, or the mediocre actually being accomplished. In the course of some twenty years since the first efforts at objective appraisal were made, a large volume of information has been built. Against this the health officer in any community can measure the health work done in that jurisdiction. So also can any interested group of citizens, professional or lay.

This collection of charts deals with health department personnel, general hospital beds, communicable disease control, tuberculosis, syphilis, gonorrhea, maternal health, infant health, preschool health, school health, accidental death, sanitation, public health expenditures and a list of health departments reporting and a table of summaries which gives the range of performances, the medians and other pertinent factors involved in interpreting the several tables. A typical section is that on communicable diseases, which contains nine charts preceded by a general summary in which each chart is briefly explained in a paragraph. The first chart deals with cases of smallpox reported over a five year period, the second chart with whooping cough, the third with diphtheria cases per hundred thousand of population in a five year period. The next chart deals with diphtheria deaths and the next two deal with typhoid cases and deaths respectively. The seventh chart gives a record of the percentage of cases of typhoid and paratyphoid investigated in the five year period, and the eighth the percentage of sources found. Chart 9 records cases of malaria reported per hundred thousand of population in a five year period.

Only a few charts indicate universally satisfactory accomplishment. Under sanitation, for example, the chart showing the rural school population percentage served with approved water supplies shows less than half of the upper quartile at 100, the rest of the reports in this quartile ranging to just above 90. As these graphs are constructed, satisfactory accomplishment would indicate the extension of the horizontal bars from the left as close to the right as possible. In other words, a practically solid chart of bars approaching 100 per cent would indicate a high level of accomplishment. Actually, most of the charts have large white spaces indicating by that just so much failure of public health practice to live up to the best standards of actual performance reported entirely aside from any comparison which might be made between the best standards attained and theoretically acceptable standards of performance. These charts indicate that there is so much to be done to bring accepted standard public health practices to an acceptable state of performance that there is little or no justification for attempting to load onto health departments the burden of administering medical care, as contemplated by the recent declaration by the American Public Health Association.

Lectures on Diseases of Children. By Sir Robert Hutchison, Bart., M.D., LL.D., F.R.C.P., Consulting Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond Street, and Alan Moncrieff, M.D., F.R.C.P., Physician to the Children's Department, Middlesex Hospital, London. Ninth edition. Cloth. Price, $6.75. Pp. 478, with 108 illustrations. Baltimore: William Wood & Company, 1944.

The fact that this little volume has reached the ninth edition is convincing evidence of its popularity. The authors of these Lectures on Diseases of Children make no effort to cover the field of pediatrics, nor do they undertake a comprehensive coverage of the subjects which they discuss. The material is distinctly clinical and thoroughly practical. The lectures offer easy and instructive reading for the medical student, the general practitioner and the pediatrician.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

IMMUNIZATION WITH MULTIPLE ANTIGENS

To the Editor:—The multiplicity of immunizations currently used by the U. S. Army has led to the question of the possibility of using mixtures of vaccines, particularly those of typhoid-paratyphoid, cholera and typhus. We have used such mixtures on several thousand men with no untoward results. The benefits included an increase in the accuracy of dosage and in economy of time, equipment and personnel. There were no known disadvantages. The consensus among both medical officers and those receiving the immunizations was that there were many advantages, not the least of which (to the patient) were the fewer skin punctures required, with corresponding decrease in the possibility of injection: The mixture used was:

Vaccine	Manufacturer	Volume
Cholera, (8 billion killed vibrios per cc.)	Eli Lilly & Co.....	1 cc.
Typhus (from yolk sacs of chick embryos)	E. R. Squibb & Sons.....	1 cc.
Triple typhoid	Army Medical School.....	0.5 cc.

Is there any evidence that such mixtures are not as effective if given in one mixed injection as if they are injected simultaneously at different sites? Are there any other possible disadvantages?

Major, M. C., A. U. S.

[This inquiry was referred to two authorities, whose respective replies follow.—EDITOR.]

ANSWER.—Combinations of several antigens have long been employed in immunization of man, some of them in the first world war. There is no important evidence to indicate that the vaccines are less effective given in one mixed injection than when the components are injected simultaneously at different sites. In the United States at present a combination of triple typhoid vaccine with diphtheria toxoid and tetanus toxoid has been proposed as well as a combination of pertussis vaccine with the two toxoids. The full activity of the several antigens is probably preserved in these combinations. The combination mentioned (cholera, typhus and triple typhoid) does not appear to have been the subject of published reports but might be expected to yield whatever results could be reasonably anticipated from the administration of the several vaccines separately.

ANSWER.—The use of multiple antigens has become a well established practice. Blood titrations on persons receiving combined diphtheria and tetanus toxoids show antitoxin levels of the same value as when these antigens are used separately. The addition of pertussis vaccine to diphtheria toxoid does not cause greater reaction or less evidence of immunity than when used separately. The Canadian army uses triple typhoid vaccine combined with tetanus toxoid. The resulting typhoid antibody level is at least equal to that of vaccine alone, whereas the tetanus antitoxin level is definitely higher. The French in Africa have combined smallpox and yellow fever vaccine into a single inoculation by scarification. They report no lessening of the immunity level for each. The reaction to be expected from combined antigens is approximately the sum of the individual reactions, which in the combination mentioned in this query would be that of triple typhoid vaccine since the other two rarely produce constitutional reactions. There are three problems to be solved in selecting the antigens to be combined: 1. Are the individual antigens compatible? Yellow fever vaccine, being a live virus and delicate, could not be mixed with any of the killed antigens. 2. What combination of antigens is needed for the persons to be immunized? A combination such as typhus vaccine and diphtheria toxoid would never be required, whereas triple typhoid vaccine and tetanus toxoid is a good one for military purposes and would not be objectionable in civilian life. 3. Occupation, age, social status and geographic location are factors which will influence the combinations that will be useful. Likewise the rate of immunity development, the age when immunity is particularly needed and the duration of immunity are factors of importance.

IONIZATION THERAPY IN OPHTHALMOLOGY

To the Editor:—Will you please let me know the status of ionization therapy in diseases of the eye?

M.D., Michigan.

ANSWER.—The simplest answer to this question is that ionization in disease of the eye is still in the experimental stage. There have been few reports of the clinical use of drugs by ionization in the literature in recent years. Von Sallman recently reported the iontophoretic introduction of atropine and scopolamine into the rabbit's eye. He used a Birkhauser electrode, which fits on the cornea like a contact lens. Using a 45 volt dry cell battery delivering 2 milliamperes for two minutes, he found that six to nine times as much atropine was found in the aqueous with this procedure as with an ordinary corneal bath used for the same length of time. Also he determined that with a transscleral electrode the delivery of atropine into the aqueous was not nearly as good. Since the outbreak of war a clinical report by Fleming has described the electrical device and gives a few case reports. He recommends iontophoresis in lid conditions, especially to break up adhesions in the iris. An excellent review of the entire subject appeared in *Ophthalmologica* in 1939. The author, Karbowski, lists the anions and cations which may be used and indicates in what disease conditions of the eyes each is of value. In the American literature Erlanger, who did most of his work in Germany, attempted to stimulate interest. The obvious conclusion would seem to be that electrical therapy is seldom needed in the treatment of the majority of eye diseases.

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OBSCURE FEBRILE ILLNESS

To the Editor:—A man aged 34, weighing 138 pounds (63 Kg.), 5 feet 8 inches (173 cm.) tall, has been in the Army since July 1942 on full field duty. The early history is essentially normal; he had the usual childhood diseases. In 1942 he had an attack of streptococcic sore throat from which an uneventful recovery was made. He was sent to the China-Burma-India theater of operations doing full field duty from August 1943 until October 1944, spending most of this time in China and Burma. In 1943 he was hospitalized for bacillary dysentery and later sent back to duty as cured. In 1944 a laboratory diagnosis of relapsing fever was made and the usual arsenical treatment was given. About this time a tumor, diagnosed as a synovioma of the usual grade of malignancy, was removed from his right foot and he was returned to duty. A few months later he was sent to a hospital, where a diagnosis of malaria (Plasmodium vivax) was made and a course of treatment given. Symptoms of headache, joint aches and pains, 45 pounds (20 Kg.) loss of weight, weakness, nervousness, anxiety, anorexia, insomnia, generalized abdominal soreness and vague chest pains persisted and he was sent to another hospital with a diagnosis of possible undulant fever because of a persistent low grade undulating type of fever (99 to 101 F.). Agglutination tests at this time showed a positive reaction for paratyphoid B. Various sulfonamide compounds were administered, but symptoms persisted. Examination of the stools gave a negative reaction for typhoid and amebic dysentery. He was finally sent to a general hospital with a diagnosis of paratyphoid B and traumatic arthritis of the right foot due to repeated trauma. He was later sent to a general hospital in the United States with a diagnosis of febricula and a mild anxiety state. Fever and other symptoms have persisted for almost seven months. Agglutination and skin tests have given normal reactions. Blood cholesterol and sedimentation rates have been up and down and are now within normal limits. The heart, lungs, kidneys, prostate, eyes, ears, nose and throat have been cleared and no other foci of infection have been found; however, the patient's general condition remains unchanged. Would one be justified in considering the possibility of there still being present an undiagnosed undulant fever? What impressions, suggestions and comments can be made on the basis of this history?

Captain, M. C., A. U. S.

ANSWER.—None of the various diagnoses with the possible exception of undulant fever could account for the persisting symptoms. The tentative diagnosis of chronic brucellosis is still justified despite the negative intradermal tests and the absence of specific serum agglutinins. The history suggests a recrudescence of brucellosis which was probably acquired many years ago, possibly in childhood, and which may have been either frank and undiagnosed or wholly subclinical at that time. A more detailed history of infantile and childhood behavior and complaints, places of residence, sources of dairy products, with similar information about parents and siblings might provide supportive evidence. The unlikely, but possible, event of infection with Leptospira canicola could probably be excluded by an agglutination test with the patient's serum against this strain of Leptospira. Opsonocytophagic tests, and repetition of agglutination tests against Brucella, ultimately followed by repetition of intradermal tests with brucellergen, are indicated. If all tests remain persistently negative it would be justifiable to employ the therapeutic test with Brucella vaccine, administering small amounts of highly diluted vaccine over a period of several months.

TOXICITY OF HIGH OCTANE GASOLINE

To the Editor:—I should like information on the toxicity of inhaling fumes from high octane gasoline as used in airplanes. Is there danger of lead poisoning? Are there any toxic effects of direct contact with this type of gasoline?

Captain, M. C., A. U. S.

ANSWER.—The dangers of respiratory exposure to the hydrocarbons and their derivatives found in high octane aviation gasoline depend on the concentration of these vapors and the duration of the exposure. Generally speaking, prolonged inhalation of the vapors of ordinary gasoline is harmless, provided the concentration in air does not exceed 1,000 parts per million. Perhaps some decrease in the accuracy of cerebration and of fine muscular coordination may result from such exposure, but these effects are generally slight and disappear promptly after discontinuance of the exposure. High octane gasolines usually contain hydrocarbons not found in ordinary gasoline, and some of these are much more toxic than those that characterize ordinary gasoline. Accordingly the concentration of vapors of high octane gasoline should not exceed 500 parts per million for comparatively short periods of exposure. It is probable that this concentration is too high for regularly repeated prolonged exposures (hours), and it is certain that concentrations of this order of magnitude should not be permitted to occur for more than fleeting periods within aircraft because of the effect on the efficiency of operating crews The acute effects of exposure to high concentrations of all gasoline vapors are much the same. Intoxications and varying degrees of narcosis occur promptly. Recovery following removal from exposure or following resuscitation is usually complete but not always prompt. There is little risk of serious exposure except under conditions of excessive spillage or evaporation within enclosed or poorly ventilated spaces.

Significant lead absorption from inhalation of the vapors of leaded gasoline occurs only from prolonged and frequently repeated exposure under conditions of excessive spillage and evaporation of gasoline within poorly ventilated spaces. The avoidance of spillage, leakage and especially a fine spray of gasoline, and the control of the hazards of fire and explosion in a manner consistent with the accepted practices employed in the commercial distribution and handling of gasoline will suffice to prevent any significant hazard of lead absorption.

There is no danger of lead poisoning as the result of cutaneous contact with this type of gasoline. The local effects of skin contact with this or any other gasoline, under suitable circumstances, are burning and blistering of the skin, defatting of the skin followed by drying and fissuring and perhaps secondary infection or parasitic infestation, and occasionally, following frequently recurring contact, a dermatitis of varying severity. These effects are produced by the hydrocarbons.

VITAMIN P

To the Editor:—A woman aged 40 says that she needs vitamin P (hesperidin). What are the symptoms of lack of this particular vitamin? Where may vitamin P be obtained?

Thomas van Urk, M.D., Kalamazoo, Mich.

ANSWER.—The occurrence of a disease entity resulting from lack of vitamin P (hesperidin) is undecided. There is clinical evidence that administration of vitamin P preparations favorably affects the lowered capillary resistance or spontaneous petechial hemorrhage associated with multiple vitamin deficiencies and found in certain diseases. Large doses of vitamin C promptly alleviate the gross hemorrhage manifestations of scurvy, but neither vitamin C nor vitamins A, B_1 or D appear to raise the lowered capillary resistance which can be corrected by vitamin P. On the other hand this vitamin cannot substitute for vitamin C. A vitamin P deficiency showing spontaneous petechial hemorrhage has been postulated as differing from the spontaneous gross hemorrhage of scurvy.

There have been a number of reports on the use of vitamin P in hemorrhagic purpuras associated with blood dyscrasias or toxic agents in which symptomatic improvement has been obtained. These relate to the purpura found in allergy and in infection and that resulting from antisyphilitic therapy as well as in situations characterized by vascular rupture in mucous membranes of the mouth, the gastrointestinal tract and the renal tract. Improvement in psoriasis has been reported from the use of vitamin P.

This vitamin is found in significant concentration in orange or, better, in lemon peel. The vitamin P content is approximately 1.75 mg. per gram of whole lemon. It is readily extracted by boiling the sliced whole fruit in water for ten minutes. The solution should then be strained and sweetened to taste. An empirical dosage of 20 mg. of vitamin P twice daily has been suggested, since the therapeutic requirement is not known. The purified vitamin is not available commercially at the present time.

ICHTHYOSIS

To the Editor:—A boy aged 3 years has ichthyosis, chiefly on the arms and legs, with a little on the back along the spinal column. I have been giving him 100,000 units of vitamin A daily, and improvement has been great; aside from the liberal use of lanolin on the affected areas, no other therapy has been given. 1. Is this amount of vitamin A likely to produce any unfavorable symptoms if continued over an indefinite period? 2. I have been advised to give the child ½ grain (32 mg.) of thyroid daily; is this dose harmful to a child 3 years of age? The ichthyosis has improved considerably without this therapy already. 3. Is the use of soap and water to be avoided? I have encountered contradictory advice in this regard.

M.D., Texas.

ANSWER.—1. Mild ichthyosis is often alleviated considerably by the administration of vitamin A in fairly large doses. Many patients do well in the summer anyway, so that it seems advisable to use the vitamin A only in the cold weather. No unfavorable symptoms have been reported from the administration of vitamin A, but intermittent use is advised on general principles.

2. In a case like that mentioned thyroid would not seem necessary, although it is occasionally of help.

3. In general, the less soap and water the better in mild ichthyosis; many patients need some oil or grease, especially in cold weather, to make them more comfortable.

MYELOCYTES AND NORMOBLASTS IN SPINAL FLUID

To the Editor:—What condition will produce myelocytes and normoblasts in the spinal fluid, the peripheral blood being negative for these forms? This is a case of apparent infectious meningitis, but no organisms have been isolated. The humerus shows several punched out areas. There are no other abnormalities.

M.D., South Carolina.

ANSWER.—There is apparently no recognized condition in which myelocytes and normoblasts are found in the spinal fluid. It is theoretically possible that, with a destructive lesion of the skull or vertebrae, bone marrow cells might migrate directly into the spinal fluid. Also a focus of extramedullary hemopoiesis could be associated with this phenomenon.

Myelocytes have been found in the spinal fluid of patients with chronic myelocytic leukemia. However, in this condition they are present also in the peripheral blood.

TREATMENT OF TYPHOID CARRIERS

To the Editor:—May I amplify the reply to the query regarding treatment of typhoid carriers as published in The Journal, Feb. 17, 1945, page 428 from two sources of information? First, the *Annals of Surgery* (105:791 [May] 1937) contains an article entitled Surgical Treatment of Chronic Biliary Typhoid Carriers, by Dr. F. A. Coller, University Hospital, Ann Arbor, Mich., and Dr. F. C. Forsbeck, Michigan State Department of Health. They report the removal of the gallbladder from 18 typhoid carriers. Sixteen were cured, as evidenced when specimens of feces at monthly intervals for twelve months showed no typhoid organisms. Second, a report to the Detroit Department of Health was made in 1936, which reads in part as follows: "The typhoid carrier is a person who harbors, for an indefinite period, typhoid organisms. When the opportunity arises, typhoid fever may develop among contact persons. Sometimes the carrier has suffered from the disease, and at other times he does not recall having had typhoid fever. The site of infection is usually the gallbladder or the urinary bladder. It is sometimes found in discharging sinuses, and at other times the primary focus is in the intestinal tract—perhaps the appendix. The typhoid organism is often found in the appendix when it is present in the gallbladder. In the literature there are many series of typhoid carriers reported in which the gallbladder has been removed with the result that 70 per cent or more recovered from the typhoid carrier state. Sinuses which contain typhoid organisms, when treated surgically and closed, are cured at once. Urinary typhoid carriers are often treated successfully with urinary antiseptics. Gallbladder surgery on children and those over 50 years of age is often not desirable. Provision for the education of these children and provision of means for earning a livelihood for older carriers is often a difficult problem. Several states have supplied funds which will provide for the medical care and for the support of carriers who are deprived of their livelihood because of their carrier state." An interesting instance of a child typhoid carrier being cured by cholecystectomy is hereby reported: The child was born in 1929 and had typhoid in 1935. Numerous cultures from her feces up to 1940 contained typhoid organisms. Apparently her uncle developed typhoid from her and died. A neighbor's child, a playmate, developed typhoid. The child carrier was deprived of schooling. She was called to the attention of Dr. Grover C. Penberthy, who placed her in the Children's Hospital and removed her gallbladder. After three weeks repeated specimens of feces were examined and no typhoid organisms were found. She returned to school within a year. The observation has been made that sometimes the surgeon is interested only in the removal of the gallbladder and cuts the cystic duct some distance from the common duct, thus making a pocket of the cystic duct in which typhoid organisms can multiply. Such an operation might not cure the typhoid carrier. It therefore seems important when removing the gallbladder from typhoid carriers to cut the cystic duct near the common duct, so that a pocket at the side of the common duct will not be formed.

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THIOURACIL IN THE TREATMENT OF THYROTOXICOSIS

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AND
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BOSTON

There have been several reports [1] of the use of thiouracil in the treatment of thyrotoxicosis since Astwood's [2] important discovery of the value of this drug, but most of these have dealt with only small series of cases. Now, however, we report on the use of this drug in the treatment of 152 patients with hyperthyroidism. The age of the patients varied from 5 to 72 years, and the thyrotoxicosis had existed for from three weeks to twenty-two years. One or more subtotal thyroidectomies had been performed in 17, and 29 had taken iodide until less than a month before thiouracil therapy was begun. In 7 instances iodide therapy had been discontinued because of the development of an associated rash. While most of the patients had diffusely hypertrophied thyroid glands, many had nodular goiters. In 23 cases there were clearcut symptoms of myocardial insufficiency with cardiac dilatation and hypertrophy, and in 5 there was pronounced congestive heart failure. Thirteen had varying degrees of thyrotropic ophthalmopathy or malignant exophthalmos, and 2 had thyrotoxic myopathy. Two patients were treated during the last month of pregnancy and 1 for the first eight months of pregnancy.

Before beginning thiouracil [3] treatment the patient's general condition was evaluated, particular attention being paid to the degree of thyrotoxicity, the condition of the orbital structures and the characteristics of the thyroid gland. Determinations were made of the pulse rate, weight, basal metabolic rate and sometimes the protein bound iodine of the plasma. Most of the first 20 patients were hospitalized and were studied from various points of view. However, few of the patients subsequently treated were hospitalized for more than one day, if at all.

TREATMENT

It is important to choose the optimum dosage of thiouracil, since excessive amounts will increase the incidence of the toxic effects from the drug and may increase the size of the goiter as well as accentuate the manifestations of malignant exophthalmos. On the other hand, it is desirable to use a sufficient quantity to cause a remission within a few weeks. Having used many different dosages, we prefer in most cases to administer 0.5 or 0.6 Gm. daily for the first two weeks, then 0.3 or 0.4 Gm. daily until the basal metabolic rate has become normal, and then 0.1 Gm. twice daily. After two or three months the dosage can be reduced to 0.1 Gm. daily. Since thiouracil is rapidly absorbed from the gastrointestinal tract, rapidly destroyed in the body and rapidly excreted,[4] it would seem desirable to administer the drug at frequent intervals throughout the day. Although we have tried this it has not been possible clinically to demonstrate that it is ever necessary to give more than three doses daily.

Desiccated thyroid has been used to decrease the size of the thyroid gland in 10 patients and to antagonize the effects of thyrotropic ophthalmopathy in 6. It was administered in daily dosages of 32 to 96 mg. for several weeks.

Roentgenotherapy was applied to the thyroid gland in 6 cases. In each case there was diffuse hyperplasia of the thyroid, and a remission of the thyrotoxicity had been induced with thiouracil treatment. To each lobe of the thyroid was applied 200 roentgens at weekly intervals for four to eight weeks in order to decrease the size of the thyroid gland. Thiouracil treatment was continued as usual in all cases.

Subtotal thyroidectomy has been performed in 59 cases. The basis for choosing this treatment rather than prolonged treatment with thiouracil was (*a*) the existence of a very large goiter, (*b*) the development of urticaria or agranulocytosis during therapy, (*c*) factors interfering with careful observations of the patient —business obligations, ignorance, uncooperative attitude, temperamental reactions, psychoneurosis or distant residence—and (*d*) request by the patient for thyroidectomy.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1945.

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School, and from the Department of Surgery, Boston University School of Medicine and the Massachusetts Memorial Hospitals.

1. Williams, R. H., and Bissell, G. W.: Thiouracil in the Treatment of Thyrotoxicosis, New England J. Med. **229**: 97 (July 15) 1943. Palmer, V.: Hyperthyroidism and Thiouracil: A Preliminary Report, Bull. School Med. Univ. Maryland **28**: 125 (Jan.) 1944. Gabrilove, J. L., and Kert, M. J.: Sensitivity to Thiouracil, J. A. M. A. **124**: 504 (Feb. 19) 1944. Rawson, R. W.; Evans, R. D.; Means, J. H.; Peacock, W. C.; Lerman, J., and Cortell, R. E.: The Action of Thiouracil on the Thyroid Gland in Graves' Disease, J. Clin. Endocrinol. **4**: 1 (Jan.) 1944. Bartels, E. C.: Thiouracil in Severe Hyperthyroidism, J. A. M. A. **125**: 24 (May 6) 1944. Williams, R. H., and Clute, H. M.: Thiouracil in Thyrotoxicosis: Treatment of Seventy-Two Cases, New England J. Med., to be published.

2. Astwood, E. B.: Treatment of Hyperthyroidism with Thiourea and Thiouracil, J. A. M. A. **122**: 78 (May 8) 1943.

3. Thiouracil in this investigation was supplied through the generosity of the Lederle Laboratories, Inc., under the trade name "Deracil."

4. Williams, R. H.; Kay, G. A., and Jandorf, B. J.: Thiouracil: Its Absorption, Distribution and Excretion, J. Clin. Investigation, to be published.

Thiamine was commonly prescribed, as were sedatives. Recently, brewers' yeast has been administered routinely with the hope of protecting against agranulocytosis. Most of the patients were permitted to continue with their regular work; in fact, many never missed a single day of work. They were examined every one

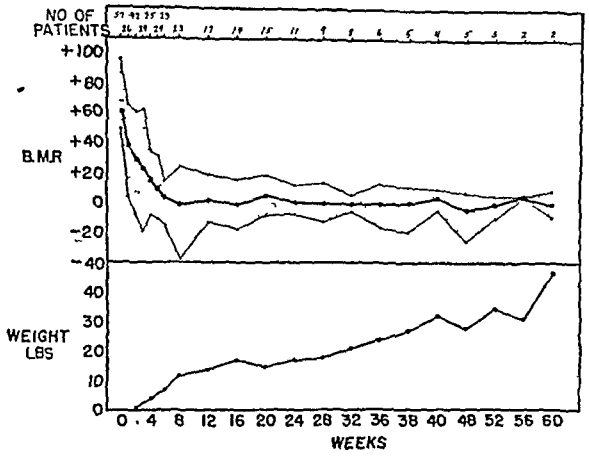


Fig 1.—The average response to thiouracil treatment of the basal metabolic rate and weight of 57 patients with moderately severe or severe thyrotoxicosis. The shaded area is formed by plotting the highest and lowest values for basal metabolic rate at the time intervals indicated. Note the progressive fall to normal in the basal metabolism, requiring six weeks, and its maintenance at this level. Although there was no average gain in weight in the first two weeks, there was a progressive and well defined gain thereafter.

to two weeks for the first six weeks, at monthly intervals for about the next four months and at six to eight week periods thereafter. All were instructed to consult one of us in the case of fever, symptoms of "the grip," sore throat, or any infection—disturbances suggesting agranulocytosis.

RESULTS OF TREATMENT

Thiouracil Without Thyroidectomy.—Improvement in the thyrotoxicity began within a very few days after commencing thiouracil, and within three to seven weeks there was a disappearance of nervousness, tremulousness, tachycardia, hyperpyrexia, diarrhea and hyperhidrosis. Within the first two weeks there was but little gain in weight, but it occurred rapidly thereafter. Almost all of the patients with malignant exophthalmos experienced an exacerbation in the orbital changes, but patients with nonmalignant exophthalmos exhibited a decided

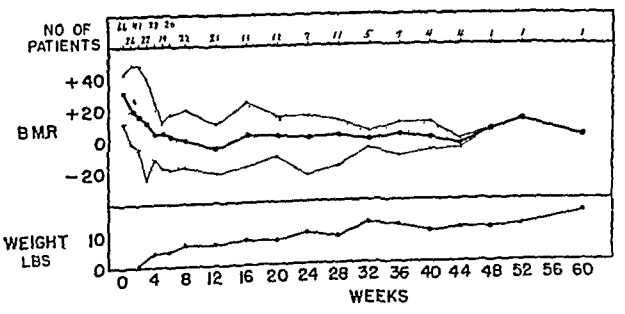


Fig 2.—The average response to thiouracil treatment of the basal metabolic rate and weight of 66 patients with mild thyrotoxicosis. Except for less magnitude, the changes are the same as in figure 1.

improvement or disappearance of this disturbance. The thyroid gland in most subjects showed little change; in some it became smaller and in a few it became larger and firmer. In most patients the bruit disappeared. The basal metabolic rate became normal within two to seven weeks, the average time being six weeks in the severer cases (fig. 1) and four weeks in the less toxic ones (fig. 2). The protein bound iodine of the plasma became normal[4] sooner than the basal metabolic rate (fig. 3).

With the continuation of thiouracil treatment the clinical remission has been maintained in all cases. Ten patients have been treated continuously for more than a year, 36 for more than eight months and 52 for more than four months. Since the first month or two all have remained essentially free of thyrotoxic symptoms and signs and have maintained a normal basal metabolic rate. In 4 cases with thiouracil continued for approximately a year and in 1 treated for six months the drug was omitted to determine its further need. One subject has maintained a normal status for six months, and 4 have remained normal for two to three months (fig. 4). However, 1 had a relapse after two months. Two other patients have discontinued therapy of their own accord on three separate occasions after they had been in a remission for about three months. Each time a recurrence of thyrotoxicosis appeared in about a month, and it required another month to gain a remission. However, patients treated for only a few weeks experienced a recurrence within two or three weeks.

With the aid of roentgenotherapy in 6 patients or treatment with desiccated thyroid in 10, in almost all of the 152 persons treated with thiouracil for more than four months there has been a reduction in the size of the thyroid. In 23 patients the thyroid gland was two to four times normal in size before treatment, but after prolonged treatment it was only one to one and a half times normal.

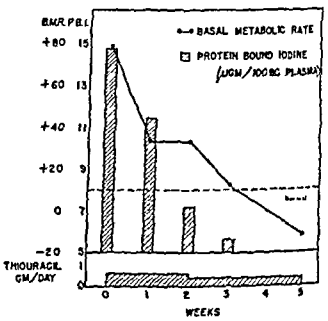


Fig 3.—Response to thiouracil treatment of the basal metabolic rate and protein bound iodine of the plasma in a patient with severe thyrotoxicosis. In this case, as in others, the iodine was found to return to a normal range (4 to 8 micrograms per hundred cubic centimeters) sooner than the basal metabolism.

Although most patients with malignant exophthalmos experienced an exacerbation soon after taking thiouracil, with the institution of desiccated thyroid each showed improvement, which was pronounced in some cases.

The 29 patients who had had iodide until less than four weeks before beginning treatment with thiouracil improved more slowly than described in the previous paragraphs (compare figure 5 with figures 1 and 2). During the first two or three weeks of thiouracil therapy there was commonly no improvement in patients who had had iodide and, in fact, not infrequently there was an increase in the thyrotoxicity. It has been found that an exacerbation did not occur if the iodide therapy was continued in very small and gradually reduced doses during the first two weeks of thiouracil treatment. Nevertheless the patients previously treated with iodide required an average of about four weeks longer to obtain a remission of their disease than did patients treated with only thiouracil. Occasionally the response was as good as in the cases in which thiouracil was administered and no iodide.

In 5 cases, owing to the development of toxic reactions from thiouracil, iodide therapy was instituted. It seemed to have but little effect in 2 cases, even after several weeks of treatment, but was satisfactory in the other 3.

Thiouracil with Thyroidectomy.—Of the 59 thyroidectomized patients 29 had never had any iodide, 14 had had iodide for varying intervals before thiouracil was used, 12 received iodide and thiouracil simultaneously and 4 had had thiouracil replaced with iodide. The last group consisted of patients who developed toxic reactions to thiouracil and were then treated with iodide and thyroidectomy. Their course was essentially as though no thiouracil had been given and needs no further consideration. The preoperative response of the patients who received no iodide until after thiouracil therapy was started was similar to the response obtained in subjects treated with thiouracil alone.

Thyrotoxic manifestations during thyroidectomy were distinctly less severe in the cases treated with thiouracil than in a comparable group treated with iodide. A good state of anesthesia was readily secured with cyclopropane. During the operation the maximal pulse rate of the thiouracil treated patients varied from 79 to 155 and averaged 113 (fig. 6). The maximal systolic blood pressure varied from 65 to 165, while the maximal diastolic pressure varied from 65 to 130, averaging 93. The thyroid gland tended to be more friable and to ooze more than in patients prepared with iodide, and occasionally adhesions extended from the thyroid capsule to surrounding structures.

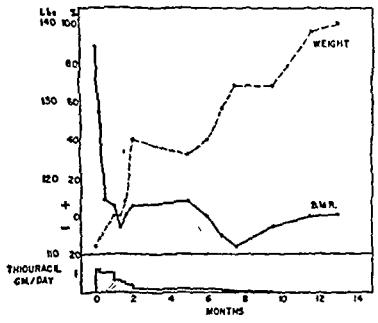


Fig. 4.—Response of the basal metabolic rate and weight of a severely thyrotoxic patient treated with thiouracil continuously for nine and one-half months. A remission has been maintained for three and one-half months after discontinuation of therapy. The plasma protein bound iodine preceding treatment was 12 micrograms per hundred cubic centimeters.

The postoperative course was definitely smoother than in patients treated with iodide. The patients were calmer and had less cardiorespiratory distress. The maximal pulse rate postoperatively varied from 88 to 140, averaging 109. Excepting in 2 cases the pulse never exceeded 125. The average maximum temperature was 100.6 F. and the temperature never exceeded 102 except in 1 case. One patient who had had a smooth course until three hours after operation suddenly experienced respiratory distress and died within five minutes, apparently from embolism.

Preceding thyroidectomy the patients were treated with thiouracil for from eight to two hundred and forty days, averaging forty-two days. It soon became apparent that patients who were treated until the basal metabolic rate became normal, requiring an average of about five weeks, exhibited less reaction to the operation than ones operated on earlier. Since no patients have been found to become refractory to thiouracil and since most of them can continue with their work during the period of preparation for thyroidectomy, it is desirable to take time for satisfactory preparation.

We have recently attempted to reduce the amount of bleeding and friability of the thyroid gland by preparing the patients with iodide and thiouracil. Five patients who had received iodide were also given thiouracil. Seven patients not previously treated with iodide were given thiouracil for five or six weeks, during the last two or three of which iodide also was given. It was found that a remission of the thyrotoxicity could be obtained as readily as though only thiouracil was used, yet there tended to be somewhat less bleeding and friability of the gland. Occasionally the prothrombin time has been slightly increased, but this probably was a rare cause of bleeding.

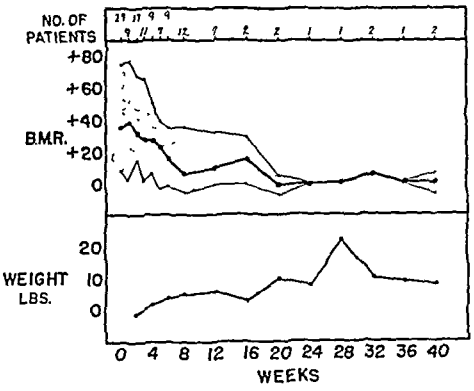


Fig. 5.—Response to thiouracil treatment of the basal metabolic rate and weight of 29 patients who had received iodide therapy for several weeks or more before thiouracil treatment was started. The delayed response in this group can be appreciated on comparing the changes with those in figures 1 and 2.

In the 59 cases treated by thyroidectomy, thiouracil was discontinued within about five days after the operation and most of the patients were permitted to go home two days later. Follow-up studies of all patients have shown that 1 developed myxedema and 2 had a recurrence of thyrotoxicity.

Anatomic and Chemical Changes in the Thyroid Gland.—The thyroid glands of the patients treated with thiouracil differed strikingly from those of patients treated with iodide. The histologic changes in the thiouracil treated glands varied somewhat, but there were rarely involutionary changes. There were usually considerable hyperplasia (fig. 7) of the acinar cells and many papillary projections. The colloid was scant and pale. Many acini contained no colloid, and occasionally none could be found in an entire microscopic section. Aggregations of collapsed acini appeared as solid sheets of cells. There was a slight increase in interstitial tissue. Lymph follicles with active germinal centers were not infrequently seen. The glands of 10 patients had colloid adenomas, and 5 had noncolloid adenomas. There was not much difference in the appearance of the thyroid glands of patients treated for several months and those treated for only three or four weeks. There was no correlation of the operative and postoperative course with the histologic changes in the gland other than that the more the hyperplasia, the greater was the tendency for bleeding.

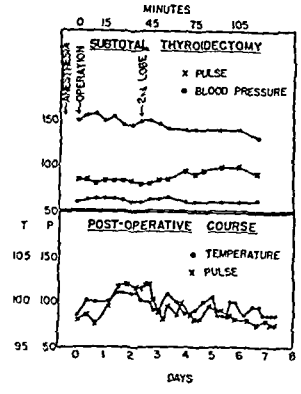


Fig. 6.—Operative and postoperative course of a patient who, as a result of thiouracil therapy, was in a remission from severe thyrotoxicosis. The thyroidectomy was one of the longest and most difficult technically of any of the 59 patients operated on and yet the patient's course was relatively smooth.

When iodide therapy was given before or during thiouracil treatment, usually more colloid and less hyperplasia was observed.

Determinations of the thyroxin content of the thyroid glands of patients treated with thiouracil, without iodide, showed that only small amounts were present. Thus the potentialities for a thyroid storm would appear to be reduced.

The content of thiouracil in the thyroid gland, determined in 37 cases, ranged from 5 to 29 mg. per hundred grams dry weight of thyroid and averaged 14. No relationship was observed between the concentration of thiouracil in the thyroid gland and (*a*) the preoperative, operative or postoperative course of the patients or (*b*) the histologic changes in the thyroid gland. Moreover, the concentration was not found to be proportional to the preoperative dosage. The administration of potassium iodide to patients receiving thiouracil did not seem to affect the concentration of thiouracil in the thyroid gland.

TOXIC REACTIONS TO THIOURACIL

Of the 152 patients treated 16 have developed untoward reactions to thiouracil, almost all of which have appeared during the first five weeks of treatment.

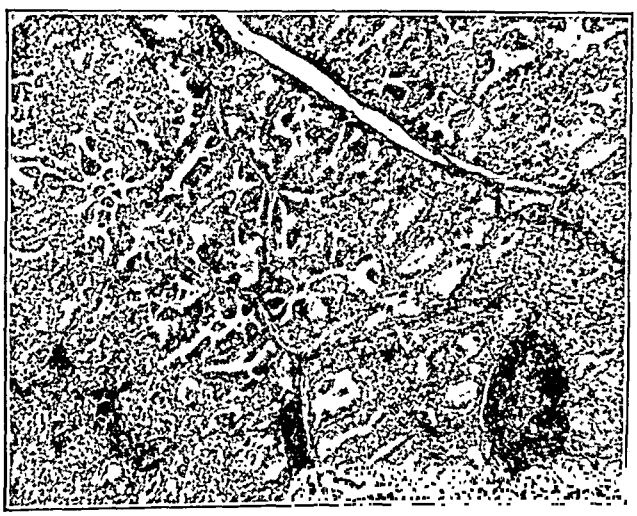


Fig. 7.—Section of a thyroid gland of a thyrotoxic patient who was treated with thiouracil for five weeks. The basal metabolic rate preceding treatment was plus 42 per cent of normal and at the time of thyroidectomy it was plus 4. Note the pronounced hyperplasia of the acinar cells, the very small amount of colloid present and the collapse of the acini. Nests of lymphocytes and one germinal center are present. Slightly reduced from a photomicrograph with a magnification of 80 diameters.

Two patients developed agranulocytosis, 6 edema of the legs, 5 urticaria, 4 morbilliform rash, 2 allergic arthritis, 2 vomiting, 2 fever, 1 diarrhea, 1 enlargement of the submaxillary salivary glands and 1 leukopenia without agranulocytosis. It is of interest to note that of the last 100 cases treated reactions have occurred in only 4, the difference being due in part to the use of dosages smaller than the ones used earlier. The only complication worthy of great concern is agranulocytosis. Both of our patients recovered after being seriously ill for several days. The patients with edema, rash, vomiting, diarrhea and enlarged submaxillary salivary glands were permitted to continue treatment with a reduction in the dosage of thiouracil. The other patients were either operated on soon after the appearance of the complications or were treated with iodide and thyroidectomy.

CONCLUSIONS

Thiouracil has been used in the treatment of 152 patients with thyrotoxicosis. It is highly effective in producing and maintaining a remission of the disease. Patients prepared for thyroidectomy with thiouracil experience less thyrotoxic manifestations before, during and after the operation than do patients prepared with iodide, but their thyroid glands sometimes bleed more. Supplementation of thiouracil with iodide therapy tends to decrease some of the technical difficulties of thyroidectomy. The only serious complication encountered is agranulocytosis, the actual frequency of which remains to be determined.

ABSTRACT OF DISCUSSION

DR. W. O. THOMPSON, Chicago: Three developments have occurred in the treatment of toxic goiter within the last few years. One is the demonstration of the interrelation of the pituitary and thyroid, and the dependence of thyroid function on pituitary function. I have recently applied that observation clinically and have been able to cure some cases of exophthalmic goiter by irradiation of the pituitary. Two other lines of attack have come forth. One is the administration of radioactive iodine and the other drugs like thiouracil and thiourea. Radioactive iodine and thiouracil attack the thyroid gland itself, just as surgical measures do. They probably do not attack the fundamental cause of toxic goiter, which many of us believe may reside outside the thyroid gland. Ultimately the method of treating toxic goiter may be an attack on its cause. That is why we were interested in the attack on the pituitary. Thiouracil does not have an important role as a method of preoperative preparation of the patient. With iodine and other measures we have been able to get the mortality rate in better clinics down to 1 per cent or less, and I doubt if it could be made much lower with the addition of thiouracil. About the only preoperative use is for patients in whom the disease cannot be controlled with usual measures. In such patients thiouracil may be a life-saving measure. The most interesting thing about thiouracil is the question Will it replace surgical procedures? It will take two or three years to determine what the precise status of this drug is. It will take that length of time to determine how serious the toxic reactions really are and in how large a percentage of cases the remission remains permanent after the drug has been discontinued. It would appear that a new day is dawning in the treatment of toxic goiter and that the days of the surgeon appear to be numbered. It may be that we shall not treat toxic goiter indefinitely with thiouracil or with these other measures that I have outlined, but we are on the way, and I am happy to see that the disease shows signs of being placed where it really should be placed, namely with the internists.

DR. ELMER C. BARTELS, Boston: The average person with hyperthyroidism responds well to iodine treatment, and operation can be done with little risk. There remains the severely toxic patient who even after ten to fourteen days of iodine treatment is a serious surgical risk. For these patients thiouracil is a most helpful drug. Studies at the Lahey Clinic have shown that thiouracil will reduce the basal metabolic rate to normal levels. Those patients who have had iodine before the administration of thiouracil have had a prolonged course. However, if treatment with thiouracil is continued, a normal basal metabolic rate will be reached. The dose of thiouracil used was 0.6 Gm. a day. The thyroid gland in the 25 patients observed did not decrease in size. The bruit and thrill persisted, and the gland remained in a hyperplastic state. The length of time required to obtain complete control of symptoms seems to be in direct relation to the elevation of the basal metabolic rate. In other words, it takes about one day for each degree of elevation in the basal metabolic rate. If thiouracil is used as a preoperative measure, it is essential that the drug be continued until a normal basal rate is obtained before operation is performed, since a reaction under treatment with thiouracil at a basal rate of + 40 is identical to that under treatment with iodine at a similar basal rate. However, if a normal basal metabolic rate is obtained, a normal anesthesia and postoperative course will follow. All our patients underwent subtotal thyroidectomy without the slightest anesthesia or postoperative reaction. The technical difficulty which the surgeon encounters

in removing the thyroid glands of patients who have received thiouracil is extremely great. On opening the skin, excessive bleeding occurs and the gland is found to be extremely soft and friable. It is difficult to isolate the recurrent laryngeal nerves and the parathyroid glands which our surgeons wish to see. We have been able to overcome this difficulty by giving iodine to the patients after the thiouracil has produced a nearly normal basal rate. Iodine involutes the gland so that three weeks after its administration subtotal thyroidectomy can be done without difficulty. Our pathologist, Dr. Shields Warren, has shown that the thyroid glands of patients treated with thiouracil are involuted with iodine treatment. We have had only two toxic reactions, which were manifested by fever. Since thiouracil produces hyperplasia, as does primary hyperthyroidism, the possibility of obtaining a cure from this agent seems to be unlikely. It was for this reason that we took a conservative attitude toward thiouracil, using it only as a preoperative measure. I should like to have Dr. Williams give his opinion as to this matter, since I fear the idea is developing that thiouracil has unquestionably curative properties.

DR. KARL E. PASCHKIS, Philadelphia: My experience in a series of about 30 cases is about the same as that of Dr. Williams; that, after effective and prolonged treatment, one can produce a clinical cure. Whether or not the drug will be a real cure is premature to tell. I agree with Dr. Thompson that it will take several years to solve that problem. The question whether the drug has any definite indication, aside from our curiosity to gain more experience, I would answer in the affirmative. I have had several cases in which I felt that this drug was needed and I would have been at a loss as to what to do without it. One group comprised cases in which the surgeons themselves felt that for one reason or another it was not safe to operate at all. Another group of cases in which there is a definite use consists of those which have been treated for a long time with iodine. Every one of us has seen cases which have been treated for months or for a year with iodine, apparently at one time or another with good response. Then the practitioner has continued giving them iodine, and they have come to the hospital with a high basal metabolic rate, with full-fledged thyrotoxicosis and utterly irresponsive to further iodine. These cases have responded slowly but safely to thiouracil, and we were then able to subject them to surgery or to continue medical treatment. In such cases I believe that there is already today a definite place. I have observed toxic reactions in 4 out of 30 cases. There was no serious toxic reaction. There was no agranulocytosis. The reactions consisted of fever, drug rash, swelling of the joints and, in 1 case, a transient jaundice. All of these, including the jaundice, disappeared twenty-four hours after treatment was discontinued. At least 3 out of the 4 were in some way sensitized, so that with renewed attempts to treat them they reacted with toxic manifestations to minimal doses. It was necessary to discontinue treatment. One of the problems is to find a way of desensitizing such patients. The other problem is of a chemical nature, whether a similar compound might be found which is less toxic. I am rather skeptical, because these toxic reactions apparently are a question of drug sensitivity, and in any active drug we shall always find cases which are sensitive.

DR. RULON W. RAWSON, Boston: At the Massachusetts General Hospital we have used thiouracil primarily to prepare thyrotoxic patients for thyroidectomy. Like Drs. Williams and Clute, we have observed the drug to be an effective agent in causing a fall in the basal metabolic rates and clinical improvement of thyrotoxic patients who have previously had no iodine. Previously iodine treated patients responded to the drug, but at a much lower rate. Likewise patients with toxic nodular goiters respond slowly. We think that this is due to the nature of the drug's action. By determining the ability of thiouracil-ized thyroids to collect radioactive iodine, we have demonstrated that the drug acts by blocking the iodination of the thyroid hormone. Ergo no fall in the rate of metabolism is evident until the stored hormone has been used. We feel that the advantages of thiouracil over iodine in preparing thyrotoxic patients for thyroidectomy are (1) that if the drug is administered long enough the rate of metabolism can be lowered to normal or lower, thus giving the surgeon a nontoxic goiter to ablate and (2) that the postoperative course of patients prepared for thyroidectomy with thiouracil is much milder than that observed in comparable patients prepared with iodine. In 10 per cent of our cases the vascularity of the gland has proved to be a surgical hazard. Patients prepared with thiouracil and then treated with added potassium iodide have been observed to have less vascular and less hyperplastic thyroids, which as such have been less difficult for the surgeon to remove. I am in disagreement with Dr. Williams's statement that these glands become smaller. We have observed that the thyroids of patients treated with thiouracil become softer. As such they might give an erroneous impression of being smaller. Indeed by determining the thyroid mean cell height of biopsy specimens taken from thyroids of 5 patients before administering thiouracil with similar examinations of the operatively removed thyroids after preparation with this agent, we have demonstrated that the exhibition of this drug does cause an increase in thyroid hyperplasia. We have been concerned by the number of toxic reactions observed in patients receiving thiouracil. We have seen toxic reactions in 15 per cent of our cases. Some of the toxic effects that we have observed have been diffuse lymphadenopathy, morbilliform rash, drug fever and leukopenia. We have not observed agranulocytosis. A few of the cases of agranulocytosis observed by other groups have been fatal. A number of our patients have had dental abscesses develop or become activated while taking the drug. It is my impression that this drug is more effective than iodine in preparing thyrotoxic patients for thyroidectomy. I do not believe that the evidence is adequate to conclude that thiouracil is a medical cure for thyrotoxicosis. A medical cure for thyrotoxicosis will, I think, have to attack the primary pathologic physiology of the disease. I do not believe that thiouracil does that any more than surgical removal of the thyroid does. However, studies of the disease made possible with this new agent have thrown considerable light on the normal and abnormal physiology of the thyroid and may thus contribute to the discovery of a physiologic cure of this malady.

DR. ROBERT H. WILLIAMS, Boston: In the use of this drug, as with thyroidectomy, we are not getting at the basic difficulty of thyrotoxicosis. I agree with Dr. Bartels that it is important to take time in getting the patient well prepared for thyroidectomy. Thus far we have no evidence of "thiouracil escape" or thiouracil resistance. In fact, a large proportion of our patients were permitted to perform their regular activities of life, and therefore the prolongation of treatment did not cause a handicap. Dr. Bartels asked that I express an opinion in regard to the possibility of medical cure, using thiouracil. I do not feel as though we have enough scientific evidence really to venture a guess in that regard. In reply to Dr. Rawson's comment about the discrepancy of his results and ours, concerning a decrease in the size of the thyroid gland, the statement which I made dealt with patients who were treated for more than four months with thiouracil and, if I recall correctly, most of his cases have been treated for less than this period of time.

Vicarious Expression in the Neuroses.—Every neurosis is more or less of a flight from reality. Whenever the stress of life is too strong one may find refuge in fantasy. The conflict between the inner emotions and the crushing realities of life often finds vicarious expression in the neuroses. The process is unconscious and, therefore, is not amenable to reason or logic. One cannot convince or be convinced. The emotions involved are too primitive. One may rationalize one's behavior, one may give reasons which seem to explain, but, in reality, they do not touch the root of the problem. But the neurosis serves a useful purpose. It acts as a safety valve for the emotions. True, it is an infantile way out of a difficulty, but it is none the less an attempt at an adjustment to reality.—Wechsler, I. S.: The Neurologist's Point of View, New York, L. B. Fischer, 1945.

THE MANAGEMENT OF EXTENSIVE SCALP DEFECTS IN CRANIO-CEREBRAL INJURIES

MAJOR S. G. BALKIN
MAJOR C. E. DOWMAN
AND
CAPTAIN W. W. KLEMPERER
MEDICAL CORPS, ARMY OF THE UNITED STATES

Craniocerebral injuries present themselves, at times, as both a neurosurgical and a plastic problem the solution of which should be accomplished at the initial operation. Intracranial injuries not infrequently are accompanied by partial evulsion and devitalization of the scalp. Probably more scalp tissue is excised during the débridement than is lost by evulsion; however,

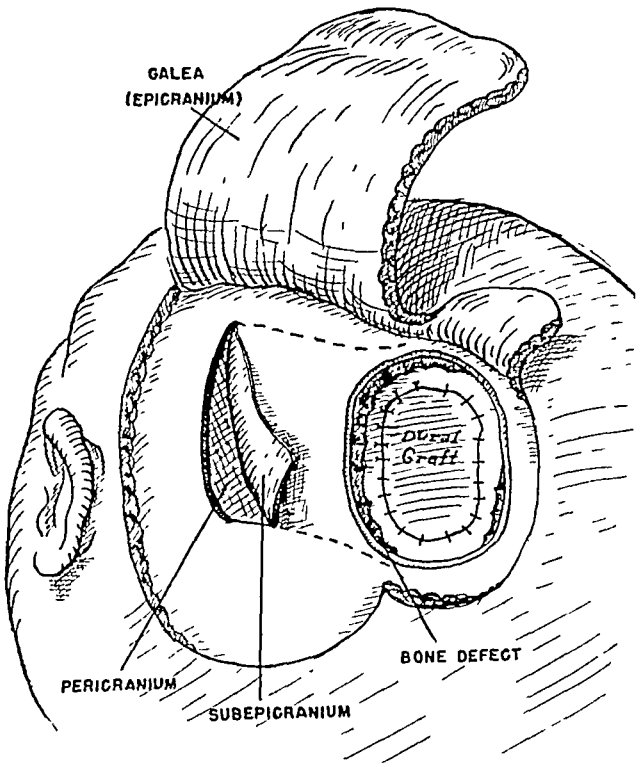


Fig. 1 (case 3).—Elevation of scalp flap. Subepicranial hinge flap outlined and being raised. Dural graft has been sutured into position.

despite the notorious viability powers of the scalp one can compromise but little when dealing with partially or completely devitalized scalp tissue. The size of the resultant scalp defect ceases to influence the thorough débridement when rather simple plastic procedures are available.

The inelastic character of the scalp is due to the short fibrous septums, which form an inelastic subcutaneous layer and which bind the skin firmly to the galea. However, beneath the galea, the subepicranial space is filled with loose connective tissue. Any form of relaxing incision in the scalp which reaches only as deep as the galeal layer can be of no use, yet even those which penetrate into the subepicranial space allow at best only slight mobility of the surrounding scalp. This is especially true over the occipital and parietal regions; however, over the frontal and temporal areas the scalp is less firmly attached, and small defects may be closed by direct approximation of the skin edges, utilizing relaxing incisions, tripod and the like. Further, owing to the pull of the occipitofrontalis muscle, defects closed in an anteroposterior direction can be brought together with less tension than similar ones closed in the opposite plane.

However, extensive scalp defects are best repaired by sliding flaps obtained from the borders of the defect; nothing can be gained by undercutting and stretching the scalp. Usually one single pedicle flap of sufficient size can be obtained to cover the defect adequately. Occasionally it may be necessary to rotate two single pedicle flaps when availability of scalp tissue is limited. If, for any reason, the blood supply to the scalp is questionable or it is not feasible to make the base of the flap of sufficient width, in order not to jeopardize the result a double pedicle flap should be utilized. Often the scalp lacerations will extend beyond the borders of the defect, and these will in no small way influence the size, shape and number of flaps to be used.

The covering flap, or flaps, should be so designed as to fill the defect without tension and should extend beyond the borders of the bony defect for a considerable distance. The flap can be outlined and quickly raised by blunt dissecting through the subepicranial space with little bleeding encountered in this space. The bleeders above the galea are caught as usual, but those on the flaps are not coagulated nor are ties applied. There is little tendency for the flap to bleed once it has been raised.

At this point, with the scalp flap raised, subepicranial tissue becomes available lateral to the bony defect. A sufficiently large flap of this tissue may be outlined with the base at the margin of the defect and tipped over to cover it (fig. 1).

The scalp flap is now sutured into the defect, covering the subepicranial graft, a two layer closure being used. The drain necessary to prevent the collection of blood or cerebrospinal fluid beneath the flap is placed preferably through a stab wound at some distance from the suture line.

The puckering of the inelastic scalp which occurs at the point of rotation of the flap is unavoidable and in time "irons" out quite well.

The donor site of the flap with its large surface of subepicranium exposed is now covered with a split skin graft carefully sutured into position, the suture ends being left long and to be used as ties later. Accurately fitted over this free graft are several thicknesses of petrolatum gauze and layers of dry gauze, which extend considerably above the surface of the scalp. The long suture ends are now tied over the gauze with moderate tension (fig. 2). This produces, to all intents and purposes, a stent with sufficient pressure over the graft (fig. 3). No additional pressure dressing is necessary. As a result, the dressings which cover the flap and drain can be removed daily if necessary without disturbing the graft. All sutures and the stent are removed on the fifth or sixth postoperative day. At first removal the area covered by the split graft appears as a deep hole, but with contracture of the skin this will gradually fill up (fig. 4).

REPORT OF CASES

CASE 1.—*History*—The wound, received before 1 p m on Nov. 29, 1943, was caused by a high explosive artillery shell fragment, which avulsed the right frontal scalp and drove bone fragments into the right frontal lobe (fig. 5 *A*). The patient was seen at the collecting station at 1 o'clock, where his wound was dusted with sulfanilamide and dressed and a unit of plasma injected. He reached the clearing station at 2·40, the evacuation hospital at 3 o'clock.

Examination—On admission to this evacuation hospital he was comatose, the pulse rate was 140, the blood pressure was 100/78, he was in moderate shock and bleeding moderately from his wound He was quite uncooperative, but gross neurologic testing revealed no other abnormalities Five hundred cc. of plasma slowed the pulse to 100, the blood pressure was 120/74, and 500 cc. of blood improved him so that he could be x-rayed and operated on X-ray examination showed a large defect in the right frontal bone with fractures involving most of the skull, and bone fragments driven into the frontal lobe

Operations (C. E D)—From 11 p m of the 29th till 2 a. m of the 30th under pentothal sodium and local anesthesia the scalp was debrided narrowly, the loose bone fragments were removed, and the remaining bone edges were smoothed. Several radiating fracture lines were noted About 75 Gm of damaged brain plus indriven bone and hair was sucked away and the clean bed was checked for complete hemostasis The only tissues available for closure were the temporal muscle, the pericranium and some subepicranium. These structures were approximated, with the intent of doing a plastic closure later (fig 5 *B*) Sulfanilamide crystals and petrolatum gauze dressing were applied By the next morning the closure had broken down with cerebrospinal fluid leakage The patient was still confused, and movements of the left arm were definitely weaker.

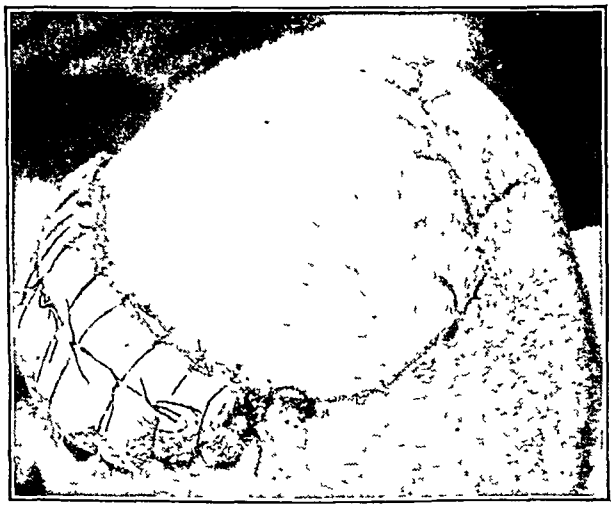


Fig. 2 (case 3)—Six days after operation, showing scalp flap healed and stent over skin graft maintaining pressure tied over by sutures

Twenty-four hours later, between 1 and 2 30 a m. of December 1, as it was felt that covering of the exposed brain was necessary, a local anesthetic was given and a large double pedicle scalp flap was outlined posterior to the defect It was undercut and raised but could not be slid forward sufficiently to reach the anterior edge of the wound (fig. 5 *C*). In view of the scalp laceration, which extended posteriorly from the defect and traversed approximately one third of the way across this flap, it was felt that the use of two single pedicle flaps would be more advisable, utilizing this laceration (fig. 5 *D*). These two flaps were raised by dissecting through the subepicranial space and rotated forward They were sutured into position in two layers, and the drain was placed through a stab wound anterior to the defect (fig. 5 *E*). The exposed donor site of the flap was covered with a split skin graft, pressure for the graft being obtained by tying the long suture ends over a petrolatum and dry gauze stent.

Postoperative Course.—By December 6 all sutures were removed, the flaps had healed well and the skin graft had taken However, the patient was still confused and incontinent, the postoperative course being rather stormy. He went downhill rapidly and died December 11. The cause of death was a purulent meningitis.



Fig 3 (case 3)—Stent after removal

CASE 2—*History*—On Dec 8, 1943 at 4 p m. high explosive artillery shell fragments inflicted a large lacerated wound over the bridge of the nose, extending upward with an avulsion of the skin over the left side of the forehead (fig. 6 *A*). The patient reached the aid station at 4 15, where he was dressed and given a half-grain (0 032 Gm) dose of morphine; he passed through the collecting station at 5.10 and the clearing station at 6·45, where he was given 2 units of plasma.

Examination—On admission to the evacuation hospital at 8 45 he was mentally confused. A small amount of damaged brain oozed from the wound There were no gross neurologic signs. His blood pressure was 104/70, pulse rate 64 He was quite cold from exposure and was given 500 cc of blood and 500 cc. of plasma preoperatively. X-ray examination showed a compound comminuted fracture of the left supraorbital area with bony fragments displaced back and to the right; there were several foreign bodies of the left frontal and orbital areas



Fig 4 (case 3)—Entire defect covered six days after operation

Operation (C E. D.).—This was performed under pentothal and local anesthesia between 3 and 6.15 a m December 9. The patient was given 1½ grains (0 1 Gm) of phenobarbital

at 9:30 p. m. and ⅛ grain (0.01 Gm.) of morphine and 1/150 grain (0.0004 Gm.) of atropine at 2 a. m. December 9. The skin and galea were radically debrided, and the loose bone fragments of the orbital rim and the roof and mucosa of the frontal sinus were removed. The loose left nasal bone was left in situ. The nasal mucosa exposed on removal of the mesial bone chips was unruptured and was not disturbed. The first branch of the trigeminal nerve lay in the wound and was injected with procaine hydrochloride. A small dural tear over the convexity of the frontal pole was enlarged, and about 10 Gm. of damaged brain was sucked out, bleeding being controlled by the electrocautery. The dura was closed with interrupted 000 silk sutures. Five Gm. of sulfanilamide powder was now sprinkled into the wound and a half-inch petrolatum gauze pack laid into the space between the dura and the remaining frontal bone, being led out through a lateral stab wound.

Operation (S. G. B.).—A large scalp flap, 8 by 8 cm., was raised posterior to the defect, with its base on the right side (fig. 6*B*). The flap was rotated forward into the frontal defect and sutured in two layers. A drain was placed through a stab wound lateral to the suture line (fig. 6*C*). The

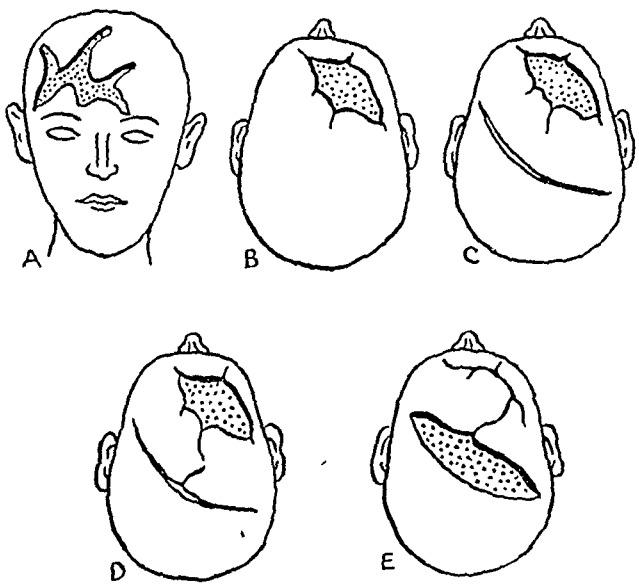


Fig. 5 (case 1).—*A*, outline of scalp defect before débridement. On this as on all subsequent figures, with the exception of figure 1, the outline of the bony defect is omitted for purposes of simplification. However, it extended beyond the borders of the undebrided scalp wounds in all 3 cases. *B*, scalp defect debrided, and partial closure of defect. *C*, double pedicle flap outlined and raised. *D*, two single pedicle flaps outlined, long posterior laceration being utilized. *E*, rotation of flaps forward. Flap donor site ready for split skin graft.

donor site of a flap was covered with a split skin graft in the manner as described previously.

Postoperative Course.—The drain was removed December 10 and all sutures were removed by the sixth postoperative day. The patient made an uneventful recovery and was evacuated to the rear in excellent condition.

CASE 3.—*History.*—A gutter wound involving the scalp and underlying bone in the left anterior superior parietal area was inflicted by a high explosive shell fragment, 2 p. m., April 19, 1944. Brain was herniating through the defect and was bleeding freely. The wound was dusted with sulfanilamide powder and dressed at the aid station at 4:25 p. m. The patient passed the clearing station at 5:30 and arrived in fairly good condition at this evacuation hospital at 7:30, almost six hours after the injury.

Examination.—The patient was aphasic but tried to cooperate. The blood pressure was 118/44, pulse rate 76, respiratory rate 20. He had a complete right flaccid hemiplegia, absent superficial reflexes, normal deep reflexes on the left and diminished deep reflexes on the right side. Plantar response was normal on the left, suggestive extensor on the right. The patient's head wound was located just left of the midline in the anterior superior parietal region. The scalp defect was about 8 by 10 cm. in size, covered by a bluish torn and partially devitalized scalp flap. Devitalized bleeding brain herniated through the underlying bone defect measuring about 6 by 6 cm. X-ray

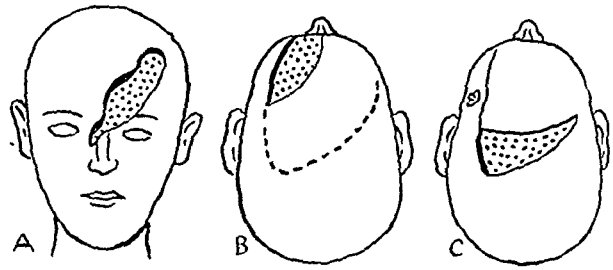


Fig. 6 (case 2).—*A*, debrided scalp defect. *B*, single pedicle flap outlined. *C*, pedicle flap rotated forward with drain through stab wound. Flap donor site ready for split skin graft.

examination showed a gutter type of cranial defect measuring 6 by 12 cm. in the frontoparietal region just left of the sagittal suture line.

Operation (W. W. K.).—Preoperative medication consisted of ⅙ grain of morphine and 1/150 grain of atropine at 12:30 a. m. April 20. The operation was performed with pentothal and local anesthesia between 12:50 and 4:50 a. m. The scalp wound was completely debrided, all devitalized or "doubtful" scalp being removed (fig. 7*A*). The underlying bone defect was smoothed out and enlarged until the frayed dural edges presented. Devitalized cerebrum containing hair and bone fragments was washed and sucked out. A good number of severe bleeders from the medial aspect of the wound were controlled with the electrocautery. The resulting cerebral defect was about 6 by 6 by 4 cm. in size. Following hemostasis and repeated lavage of the entire field, 2 Gm. of sulfanilamide was dusted into the cerebral defect. The large dural defect was closed with a free subepicranial graft.

Operation (S. G. B.).—A large scalp flap, about 7 by 9 cm., was raised over the left temporoparietal region, with the base anterior (fig. 7*B*). The bony defect was then covered by raising a flap of the exposed subepicranium bordering the bony defect, hinged over this and sutured into position (fig. 1). The scalp flap was now rotated over the smaller sealing flap and sutured into position in two layers (fig. 7*C*). A drain

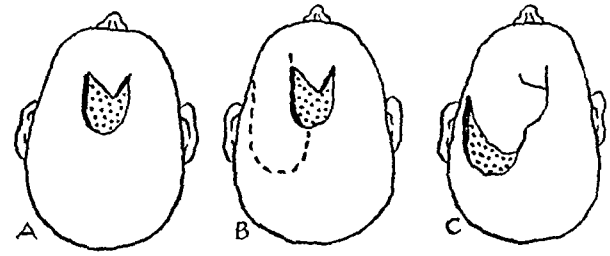


Fig. 7 (case 3).—*A*, debrided scalp defect. *B*, single pedicle flap outlined. *C*, scalp flap rotated medially and donor defect ready for covering with split graft.

was placed in this instance through the suture line. The large defect caused by raising the flap was covered by a split skin graft in the manner described.

Postoperative Course.—The drain was removed within forty-eight hours, and all sutures were removed on the sixth postoperative day. The flap had healed well and the skin had taken (figs. 2, 3 and 4). The patient made an uneventful recovery and was evacuated to the rear in good condition, though still hemiplegic and just starting to regain his speech.

COMPLICATIONS IN THE SURGICAL TREATMENT OF CARCINOMA OF THE LARGE BOWEL

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AND
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In 712 operations for colonic cancer we have found such operative complications as atelectasis, pneumonia, parotitis, coronary occlusion, pulmonary thrombosis and phlebitis infrequent, or at least not relatively increased. Using spinal anesthesia with associated infusion or transfusion and oxygen inhalation, shock has been rare and in no case of such intensity as to prevent the completion of the operation. No serious anesthetic or diabetic complication has occurred. In the postoperative period one elderly man twice developed precordial oppression when 180 cc. of 5 per cent glucose solution had been given; the second time permanent cardiac arrest occurred suddenly when 220 cc. had been given.

TABLE 1.—*Relation of Age to Location of Tumor in 480 Consecutive Cases of Cancer of the Large Bowel*

	Anus and Rectum	Rectosigmoid	Sigmoid	Splenic Flexure	Descending Colon	Transverse Colon	Hepatic Flexure	Cecum	Total	Per Cent
Under 20 years...	0	0	0	0	0	0	0	0	0	0
21 to 30.....	7	0	2	0	0	0	0	0	9	1.9
31 to 40.....	22	4	4	1	0	0	2	3	36	7.5
41 to 50.....	50	25	24	5	4	2	3	6	119	24.8
51 to 60.....	54	40	34	9	1	10	2	7	157	32.7
61 to 70.....	34	32	27	5	3	4	3	10	118	24.6
71 to 80.....	11	12	11	0	1	1	1	2	39	8.1
85 and over.....	1	0	0	0	0	1	0	0	2	0.4
Total.....	179	113	102	20	9	18	11	28	480	
Per cent.....	37.3	25.5	21.3	4.1	1.9	3.7	2.3	5.9		

OPERATIONS

In our series the operations used have undergone considerable evolution. Patients with such advanced peritoneal involvement that resection is out of the question are closed with layer sutures of alloy steel wire and encouraged to be out of bed two or three days after the operation and to return home within a week. For other patients with advanced ineradicable cancer palliative permanent colostomy has largely been replaced by a palliative one stage resection of the diseased segment of bowel and restoration of intestinal continuity, either by end to end anastomosis or a pull through type of operation using a perineal outlet, if possible with utilization of the anal sphincters. This has pleased the patient and his family and has reduced our hospital morbidity and mortality, although it has increased the total mortality of our primary resections. Formerly the patient with advanced local and metastatic growths had a "palliative" colostomy and then was considered such a burden by his relatives that often they refused to remove him from the hospital, where he remained until he died. Now most patients, even with very advanced growths in the liver, are treated by means of resection and are able to leave the hospital within two weeks. As a rule they look and feel much improved after the resection, are able to care for themselves and may be able to do considerable work. From observing these patients it is apparent that the majority suffer more from the toxic necrosis, ulceration and hemorrhage in the bowel than from the metastases in the liver. Even after a previous palliative colostomy, decided improvement may follow the radical operation. A woman, left with a colostomy after two futile attempts at excision of the rectum, was active for three years after removal of the rectosigmoid and transfer of the colostomy to the perineum. If the carcinoma has been of the obstructive type the obstruction rarely returns in complete form at the point of anastomosis during the lifetime of the patient. Duration of life with secondary carcinoma of the liver is variable but not infrequently may continue two or three years, throughout most of which time the patient may consider himself in good or fair health.

TABLE 2.—*Results in 150 Consecutive Operations for Carcinoma of the Colon* *

Operability 96%	Cases	Deaths	Total Mortality, %	Corrected Mortality, %
Exploratory.....	6	0	0	0
End to end single clamp aseptic resection	61	7	11.4	3.3
Abdominoperineal proctosigmoidectomy	55	5	9.09	5.4
Perineal proctosigmoidectomy.....	21	3	14.3	0
Mikulicz-Paul stage resections.....	7	1	14.3	0
Palliative or permanent colostomy.....	0	0	0	0
Total.....	150	16	11.0	6.0

* Corrected by elimination of deaths following radical operation for advanced and ineradicable carcinoma.

WOUND COMPLICATIONS

Abdominal wound infection and dehiscence are especially to be feared after operations for cancer of the colon. We have found oblique muscle-splitting incisions of great advantage. They may be used for carcinoma of any part of the large bowel. For the sigmoid and rectum the incision is placed about 3 cm. above and parallel to the left inguinal ligament. The external oblique is split, and the internal oblique and transversalis muscles are partly divided. If more room

TABLE 3.—*Complications in the Last 150 Operations for Carcinoma of Colon* *

	Cases	Mortality
Diffuse peritoneal involvement, exploration only.....	6	0
Associated resection of stomach.....	1	0
Associated resection of ileum.....	8	2
Associated resection of bladder, ileum and colon.....	3	2
Associated resection of bladder.....	4	0
Associated resection of ureter and hysterectomy.....	1	0
Associated resection of bladder, sigmoid and ureter.....	1	0
Associated hysterectomy.....	9	0
Associated anastomosis of ureter and hysterectomy.....	1	0
Secondary ileus, enterostomy.....	8	2
Large abscess of abdominal wall.....	1	0
	43	6

* This does not include 1 patient referred for ureterovaginal and ileoperineal fistulas that had followed proctosigmoidectomy, for which ureterovesical anastomosis and resection of the ileum with end to end anastomosis were followed by recovery.

From the Surgical and Proctologic Departments of Temple University School of Medicine.

Read before the Section on Gastro-Enterology and Proctology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

is required the incision is extended to the right through the rectus sheath and, if necessary, the rectus and pyramidalis muscles. For the cecum or the ascending or descending colon an incision is made from the tip of the eleventh rib to a point about 4 cm. below the navel; for the colon and its flexures, from the ninth rib to a point about 3 cm. above the umbilicus on the side of the lesion. Usually the anterior and posterior sheaths of the rectus are divided and the rectus muscle is retracted, the fibers of the external oblique being split. If the cancer is attached to the abdominal wall, infiltrated portions are freely resected and removed with the tumor. If there is a medial scar from a previous abdominal operation, this is excised to avoid the formation of a second scar. For twelve years alloy steel wire sutures have been used, and to a large degree fine alloy steel ligatures, for the abdominal wall.

No eventration has occurred in our series, and unless an infected area has been entered during the operation, primary union and very satisfactory scars are the rule. In case of contamination one or more sump drains are used in the peritoneal cavity, and the outer layers of the wound are drained. After adoption of our suggestion to use wire sutures instead of catgut for the abdominal closure, Dr. Thomas Jones of the Cleveland Clinic reported a reduction in wound infections from 27 per cent to under 1 per cent.[1] With the onset of postoperative infection the wound is laid freely open, and frequently renewed gauze dressings wet with 1:500 to 1:1,000 bromine solution are applied. This also is a useful dressing in spreading pyoderma and is an excellent deodorant for necrotic wounds and fecal or urinary fistulas. It does not discolor bed linen as does potassium permanganate. From invasion of septic areas we have had very virulent peritoneal and abdominal wound infections occur despite the free local use of sulfonamides.

SEPTIC PERITONITIS

Septic peritonitis from an ulcerating, necrotic carcinoma of the colon is one of the great hazards in its operative removal. The brittle, infiltrated bowel may break open or pull in two during attempts at liberation. The stomach, urinary bladder, small intestine or gallbladder may contain feces and pus from a fistula, or there may be a communicating abscess in the peritoneum or abdominal wall. To expect sterilization by daily irrigation through a defunction-producing colostomy is chimerical, although it may greatly reduce the gross contamination. Like others we have found increase in operative difficulties and mortality from stage procedures. The preoperative administration of succinylsulfathiazole or phthalylsulfathiazole by mouth at present seems of value. We have attempted to sterilize intestinal contents and mucous surfaces about rectal carcinoma locally before operation by irrigation and packing with gauze wet with germicides, using mercurial, strong hypochlorite solutions or tincture of iodine. Of these we prefer a 3.5 per cent tincture of iodine. If an abscess has formed, an attempt is made to remove it intact with the attached section of colon, which usually is feasible if the abscess involves the abdominal wall. With a fistula into a hollow viscus an aseptic *en bloc* removal is preferred. Adherent perforated loops of bowel, bladder and stomach are resected if possible by cautery between clamps. Eight to twelve clamps may be used, and it is desirable to have various sizes of clamps without handles, of the modified de Martel type, available. With them we have found it possible to do a complicated resection without leakage or soiling, using what one of us has previously described as the single clamp method for each final anastomosis.[2]

DRAINAGE

During operation leakage is to be feared, especially from an advanced carcinoma, because of the ulcerated, thinned and brittle intestinal wall, which may perforate, or from outlying areas of infection in lymphatic and other tissues which may be entered in the liberation of the diseased bowel. By avoiding traction on adjacent bowel but applying it rather to peritoneal or mesenteric folds beyond the growth, the danger is reduced. An empty bowel is much safer than one obstructed and distended. Free drainage, however, plays a very important part in the prevention of peritonitis. During the first three days after resection of the large bowel there usually is an exudate of 300 to 800 cc. of blood and serum into the cavity. This is a culture medium so often contaminated as to constitute, if not removed, a great hazard. Our earlier operations with inadequate drainage had a mortality of 16 per cent or more. The present low mortality of the Miles operation we consider largely dependent on the massive drain of rubber and gauze or other material introduced through the perineal wound. The mortality of our pull through type of proctosigmoidectomy fell from about 16 to around 6 per cent with the use of large curved perforated glass or rustless steel tubular drains introduced along the sacrum. If free dependent drainage is not used we introduce through the abdominal wound or a separate suprapubic stab one or more perforated tubular drains of rustless steel, 8 mm. in diameter, with an inner continuously acting suction tube. Beginning with nearly pure blood, the material removed gradually becomes more serous and finally after a number of days may cease to drain, when it is removed. Differing from rubber and plastic drains, which provoke encasing adhesions, this type drains the general peritoneal cavity for four or more days and gives early evidence of hemorrhage, of leakage or of the onset or subsidence of an ileus. Ileus is characterized by a sudden great increase in the amount of serum aspirated from the peritoneum. In several cases in which fecal leakage has occurred after anastomosis these drains have prevented diffusion in the cavity and led to the formation of a narrow fistulous tract which has closed spontaneously.

COLOSTOMY OR APPENDICOSTOMY

Colostomy or appendicostomy is useful for the relief of obstruction due to a carcinoma of the left colon or as a complemental operation in resection of the bowel. The Devine defunctioning procedure may be dangerous when the transverse colon is tense and thinned from distention by fecal material. It then is difficult to suture the arms of the loop together without tearing or puncturing the bowel or to exteriorize the ends of the divided bowel without contaminating the subcutaneous fat. The clamps devised may not be suitable for the individual patient; sinuses or fistulas may persist from the two segments of bowel left implanted

1. Jones, T. E., and others: The Use of Alloy Steel Wire in Closure of Abdominal Wounds, Surg., Gynec. & Obst. 72: 1056, 1941.

2. Babcock, W. W.: Single Clamp Aseptic Gastrointestinal Anastomosis, Surg., Gynec. & Obst. 75: 485, 1942.

in the abdominal wall, and the final closure may greatly prolong the patient's hospitalization. As a rule we prefer a simple appendicostomy or cecostomy. The appendix and mesoappendix are pulled through a small stab wound at McBurney's point and a 14 or, preferably, a 16 F. rubber catheter passed into the cecum and tied in. The mesoappendix remains attached to nourish the portion of the appendix within the abdominal wall. The catheter should be tied in with two ligatures, anchored by tying them over dental cotton rolls, and then tested by irrigation to prove its position within the cecum. Unless carefully anchored and viable, the section of appendix may slip back into the abdomen. For decompression the colon may be frequently irrigated with 1:10 solution of hydrogen peroxide. After the appendix has adhered in the wound it may be dilated by the daily introduction of catheters of increasing size until, if desired, a 26 or 28 F. is in place.

If the appendix is absent or stenosed, a cone of cecum is pulled through the stab wound and anchored by forceps. Two concentric purse-string sutures are inserted, within which a catheter is introduced, tied in the cecum and the cone of cecum securely anchored by tying the ends of the purse-string sutures over dental cotton rolls.

THE ANAL ORIFICE

In the pull through operation a functional anal orifice is desirable. Our experience has shown that the following features are important to avoid complications:

1. The carcinoma should be at least 5 cm. (2 inches) above the anal ring and without involvement of the pelvic floor. We are indebted to Gilchrist and David, Coller, Kay and McIntyre—as well as Grinnel—for showing that the lymphatic spread of rectal and sigmoid cancer is upward and not toward the perineum and that rarely is there microscopic evidence of malignant cells more than 3 cm. below the growth.[3] With carcinoma of the anus the lymphatic spread is around the inner side of the groin to the medial inguinal lymph nodes, which should be excised.

2. The portion of sigmoid brought to the perineum should have adequate blood supply. This is proved in the abdominal part of the operation by the pulsation of arteries, or, if the blood pressure is low and the vessels are covered by fat, by incising vessels on the bowel after interrupting the blood supply from the anal side.

3. The sphincters always should be divided on one side and the sigmoid should lie so loosely in the anal canal that the finger can be introduced beside it. In every case in which we have brought the sigmoid through a dilated or divulsed sphincteric ring the muscles have contracted, cutting off the circulation, with resulting gangrene of the sigmoid. In such a case, if the anus is not promptly and freely opened, fetid exudate accumulates in the pelvis, with dangerous infection.

4. An end to end anastomosis by suture between the end of sigmoid and the perineal skin or the anorectal mucosa should not be attempted, nor should sutures be used to unite the sigmoid with surrounding perineal structures. The incidence of destructive infection with loss of sphincters and necrosis and retraction of sigmoid were so high in experiences before 1930 that we have since allowed the sigmoid to lie loosely in the perineal opening and projecting from 6 to 9 cm. A 26 or 28 F. rectal tube is tied into the projecting sigmoid, with two heavy ligatures. Several times secondary hemorrhages have occurred from the end of the sigmoid, necessitating an additional ligature. We mention this, as interns usually think the bleeding comes from the perineal wound, which they may tear open and pack unnecessarily. About the sixth day the rectal tube sloughs out at a time when the wound, protected from contamination, has soundly healed. A day or two later the protruding bowel may be removed by a tonsil snare or even with the perineum.

Our first method was to withdraw and exteriorize the large loop of liberated rectum and sigmoid through a median incision running from the margin of the anus to the right side of the base of the coccyx. Dressings were then applied, the purse-string suture removed from the anus, and the loop of bowel cut away and rectal tubes tied in the rectal and sigmoid ends. Later the partitions between the anus and rectal end and the rectal end and sigmoid were divided. For a few patients a later plastic reconstruction was made to form an anal ring. But about 85 per cent of the patients found they could go without a protective pad most of the time, provided they took a quickly acting laxative or enema every second or third day, and felt that a further operation was unnecessary. About 10 per cent without the aid of sphincters are not troubled by soiling provided a nonobstructing opening is maintained. It was necessary to open the perineal wound freely if infection developed. The technic was later changed to a posterior medial perineal incision, the rectum being divided above the sphincters, which were split posteriorly, the protruding sigmoid laid in the anal groove and a large glass drain introduced along the sacrum. The projecting sigmoid was burned off flush with the perineum about one week after the operation. This gave a fairly satisfactory result, but infection in the perineal wound had too high an incidence. A recent modification has been to depend on careful packing of the rectum with 3.5 per cent tincture of iodine gauze, and the preoperative use of succinylsulfathiazole for sterility; to divide the rectal mucosa just above the sphincters, to place the withdrawn sigmoid in the split anal ring, and to close the deep pelvic floor and skin very loosely about the bowel with deep and superficial wire sutures. For drainage an 8 mm. sump drain is introduced through the abdominal incision or a stab wound to the pelvic floor, with continuous night and day aspiration, as long as appreciable quantities of blood and serum are withdrawn. With this method a normal appearing functional anus has been obtained with the fewest urinary or sexual complications. With carcinoma of the anus, this and the pelvic floor are freely excised.

For advanced lesions with infected areas invaded during the liberation, very free open drainage should be employed.

In the last 250 consecutive operations for cancer of the large intestine the operability rate has been high, 96 per cent. No palliative colostomy has been used. Forty-one patients (4 with lymphopathia) have

3. Coller, F. A.; Kay, E. B., and McIntyre, R. S.: Regional Lymphatic Metastases of Carcinoma of Stomach, Arch. Surg. **43**: 748 (Nov.) 1941. David, V. C., and Gilchrist, R. K.: Lymphatic Spread of Carcinoma, Ann. Surg. **108**: 621, 1938. Grunel, R. F.: Grading and Prognosis of Carcinoma of Colon and Rectum, Ann. Surg. **109**: 500, 1939.

had a permanent colostomy usually made by another surgeon transferred to the perineum or eliminated by excision, intestinal resection and end to end anastomosis. The use of end to end anastomosis has been extended to carcinoma of the sigmoid and upper two thirds of the rectum. By leaving an intact pelvic floor and anus, the bladder and sexual complications incident to the Miles or other abdominoperineal resections are largely avoided. Advanced hepatic metastasis and localized visceral invasion have not contraindicated radical measures, and with single stage procedures the patient usually is able to be out of bed by the seventh or eighth day and to return home by the fourteenth day after operation.

COMPLICATIONS

The Mikulicz, Block or Paul operation has complications which should be understood clearly. It is performed in stages, the completion of which usually requires several months. Even if the patient returns to his home between stages the total period of hospitalization is longer than required with other methods. It usually leaves a weak abdominal scar or hernia. Wound contamination from the exteriorized bowel is fairly frequent. It is chiefly used for removal of the sigmoid but is the least radical of the methods of sigmoidectomy and more subject to local recurrence in the bowel, abdominal wall or mesentery than any other operation. In the loop of bowel to be liberated and exteriorized, 5 to 8 cm. of the arms of the loop left within the abdomen are sutured together to form a spur or partition, 2 to 8 cm. to reach through the abdominal wall and 4 to 8 cm. to project above the surface of the skin. Thus a total of 22 cm. in a thin patient to 48 cm. of bowel and attached mesentery in an obese person may be required for the proper exteriorization of the loop of cancerous bowel, all of which additional bowel and omentum could be removed in a resection with end to end anastomosis. These limitations explain the frequency of recurrences of carcinoma in the abdominal wall, arms of the loop or the underlying mesentery. We have treated these recurrences by a wide *en bloc* excision of the arms of the loop, mesentery and overlying attached abdominal wall, but often the disease had then spread beyond the range of complete operative extirpation. In attempting to remove more of the distal sigmoid or rectum we have exteriorized the lower segment under tension in the grasp of a clamp. In several cases the bowel sloughed loose from the clamp and slipped back into the pelvis, for which free drainage is necessary, a defunctioning transversostomy desirable, to be followed by additional procedures to establish the continuity of the bowel. If the mesenteric sides of the arms of the loop are apposed, the clamp placed on the spur may then cut off the blood supply, with necrosis and perforation. Tubes of glass or rubber introduced through the abdominal wall also may produce necrosis and perforation. We have had glass angle tubes made with bulbous ends to be tied into the bowel and rest above the surface of the wound to avoid the perforation within the abdomen, which may occur with a Paul or Mixter tube. When the arms of the loop have not been sufficiently united by suture, a loop of small bowel may slip within the jaws of the crushing clamp, and a secondary small intestinal fistula may follow. For this the wound should be reopened promptly, and the intestinal orifice closed by suture. This occurred once in our series, following a Mikulicz resection of the transverse colon, with recovery. At present, because of these various objections, we employ the more radical and much more satisfactory single stage resection with aseptic end to end anastomosis for all carcinomas of the large bowel above the midrectum and have discarded the Mikulicz-Paul operation except to terminate quickly an operation with gross contamination.

APPENDICITIS

Acute appendicitis rarely complicates an operation for carcinoma of the large bowel. If left without removal, serious complications may follow such as nearly cost the life of one of our younger patients. Evidence of a subacute or chronic appendicitis now leads us to do a simple appendicostomy, the appendix and mesoappendix being pulled through a small stab wound at McBurney's point.

REMOVAL OF GALLSTONES

Gallstones usually are removed to prevent a cholecystic attack during convalescence. Guided by the hand within the abdomen, a visceral forceps is passed through a short transverse incision, the apex of the gallbladder is exteriorized and aspirated, and the stones are removed by curet, forceps or "milking" and a drainage tube tied into the gallbladder. In an obese patient with a small gallbladder, the skin and fat may be more widely divided to the external oblique, beyond which it may not be possible to exteriorize and anchor the organ. There has been no complication from 7 or 8 of these added operations.

PERMANENT OR PALLIATIVE COLOSTOMY

Fourteen years ago one of us reached the conclusion that a permanent colostomy was not essential in the operative treatment of cancer of the intestine. In 480 consecutive operations for cancer of the large bowel performed since that time a permanent colostomy has not been used. In 3 patients, however, or less than 1 per cent, operative complications have left the patient with a colostomy which, because of evidence of cancer developing in the pelvis, was not closed.

For years palliative operation for ineradicable carcinoma of the large bowel has been a term synonymous with colostomy. Except in the presence of intestinal obstruction, to call colostomy a palliative or relief-giving procedure is an ironic misuse of terms. Colostomy brings gloom and disgust to the unfortunate patient with advanced carcinoma, and a new dependence on others. If the family cannot afford nursing aid, often it refuses to remove him from the hospital until, a constant burden, his demise gives relief to all concerned. As a result, our highest operative mortality for intestinal cancer has followed palliative colostomy. At present our preferred palliative operation is resection of the cancerous segment and end to end anastomosis. This eliminates the loss of blood, the diarrhea or obstruction, the suppuration and septic necrosis of the primary tumor. Even with residual large multiple growths in both lobes of the liver the patient may then show appreciable improvement in appearance, spirits and strength. Such a patient, who had lost 75 pounds (34 Kg.) in weight and had been bedfast for several months, became ambulant in eight days and returned home 300 miles away fifteen days after resection and end to end anastomosis. If the metastatic growths in the liver are small the patient may live

in apparently good health for from two to four years. One considered herself in good health for seven years after the radical resection. Even patients classed as inoperable and treated by a palliative colostomy occasionally may be restored to a period of comfort by elimination of both colostomy and tumor. A physician with metastasis in pelvis and liver, incapacitated for the six months following colostomy, rapidly improved and was able to resume practice for seven months after an end to end resection with removal of the colostomy. Another patient was incapacitated by a very troublesome intestinal prolapse eleven years after a Miles operation. The colostomy was moved from the abdominal wall to the perineum and, although small, slowly growing masses of colloid carcinoma were found in the pelvic floor, the patient became free from fecal leakage. During the seven years which have since elapsed the man has continued to be active; the local growth has again been partly resected but continues to grow slowly, with relatively little inconvenience.

Complications of a perineal colostomy are due largely to sloughing of the terminal bowel and the formation of a stenotic cicatricial opening, which may give the patient much distress. If the anal canal has been removed, every effort should be made to maintain a large perineal opening. With any suggestion of contraction the patient should be supplied with dilators (as a set of test tubes) to be used twice daily until an opening of adequate size is established, after which the dilators should be used every week or month, or whenever there is a tendency to contraction. As with an abdominal colostomy, 85 per cent of the patients need to empty the colon completely by irrigation or by quickly acting saline cathartic every second or third day.

SUMMARY

The adoption of radical excision instead of colostomy for patients with advanced secondary lesions from cancer of the large bowel has increased our rate of operability to over 96 per cent and also our mortality from resection but is considered well worth while. In the last 250 cases 16 (6.3 per cent) were considered inoperable. In the last 150 cases 5 were considered inoperable; 96.7 per cent had radical operations. Sixteen (10.6 per cent) died in the hospital. Deducting 11 with far advanced or ineradicable disease, the mortality was 3.6 per cent. Of the last consecutive 45 patients all had succinylsulfathiazole; 44 had radical resections with 1 death (2.2 per cent), a patient with advanced carcinoma of the liver who had an abdominal end to end anastomosis 5 cm. above the sphincters.

There were 24 end to end aseptic resections over a single clamp, 13 abdominoperineal resections with retention of a functional anus, 3 perineal resections for cancer of the anus and 3 eliminations of a colostomy left by other surgeons. No Mikulicz operation or colostomy was performed. Our tendency therefore is toward a wider use of end to end resection, the preservation of the uninvolved anus and the elimination of the Mikulicz operation except when serious peritoneal contamination renders a rapid termination of the intra-abdominal procedure desirable. In the past 480 operations there were 78 Mikulicz resections with 14 deaths, or a mortality of 17.9 per cent largely the result of serious complications.

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CUTANEOUS MANIFESTATIONS OF THE FUNGI CAUSING DERMATOPHYTOSIS AND ONYCHOMYCOSIS

AND THEIR TREATMENT

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With the demobilization of men and women following World War II, one can expect an increase in the incidence of dermatophytosis, or "athlete's foot," as this common ringworm infection of the feet is popularly known. Between 1940 and 1943 the Navy hospitalized 14,068 patients for fungous infections of the skin,[1] the large majority of them involving the groin and the feet. These patients lost 251,418 days from active service, representing 17.1 per cent of sick days lost for all skin diseases. The incidence of infection not requiring hospitalization is much higher. Since, even in normal times, from 50 to 90 per cent of the young adult population are affected at some period, it is important for the physician in general practice to be able to recognize the cutaneous manifestations of this common fungous infection. Early recognition of the causative fungus and proper therapy will aid materially in shortening the duration of the disease.

Though a ringworm infection of the palm was first observed in 1870 by Tilbury Fox[2] and later, in 1888, Pellizzari[3] reported 7 cases on the palms and soles, it was not until 1892 that a careful and systematic study of 25 cases was made by Djelaleddin-Moukhtar.[4] He was the first to make cultures from scales and vesicular fluid from the hands and feet. Later reports were made in 1908 by Whitfield[5] and in 1910 by Sabouraud.[6] The first in the United States to report cases of dermatophytosis were Montgomery and Culver, Hartzell and Lane. Ormsby and Mitchell[7] in 1916 were the first to make a comprehensive report on the disease. Their paper, which is still one of the best on the subject, covered 65 cases.

Whitfield[8] classified the disease according to its clinical manifestations into three main types, which were the acute vesiculobullous, the chronic intertriginous of the toes and the chronic hyperkeratotic of the palms and soles. The causative organism was generally not known. Ormsby and Mitchell, in their early report, recognized the fact that the invading organism probably was related to the subsequent clinical developments.

It is our purpose in this paper to correlate the cutaneous manifestations of ringworm of the feet and nails with the invading fungi.

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Read before the Section on Miscellaneous Topics, Sessions for the General Practitioner, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Sulzberger, M. B.: Personal communication to the authors.
2. Fox, T.: Tinea Circinata of the Hand, Brit. M. J. **2**: 116 (July 30) 1870.
3. Pellizzari, C.: Richerche sul Trychophyton tonsurans, Gior. ital. d. mal. ven. **23**: 8, 1888.
4. Djeladeddin-Moukhtar: De la trichophytie des régions palmaire et plantaire, Ann. de dermat. et syph. **3**: 885, 1892.
5. Whitfield, A.: A Note on Some Unusual Cases of Trichophytic Infection, Lancet **2**: 237 (July 25) 1908.
6. Sabouraud, R.: Sur l'existence fréquente d'un soi-disant eczema des doigts et des orteils, du a l'epidermophyton inguinale, Ann. de dermat. et syph. **1**: 289, 1910.
7. Ormsby, O. S., and Mitchell, J. H.: Ringworm of the Hands and Feet, J. A. M. A. **67**: 711 (Sept. 2) 1916.
8. Whitfield, A., and Sabouraud, R.: Eczematoid Ringworm of the Extremities and Groin, Brit. J. Dermat. **23**: 375 (Dec.) 1911.

At the New York Skin and Cancer Unit tabulation was made of the causative organisms in cases of dermatophytosis between 1935 and 1943 (table 1). Positive cultures from the feet showed that 65.4 per cent were caused by Trichophyton gypseum, 15.7 per cent by Trichophyton purpureum, 13.5 per cent by Monilia albicans and 2.8 by Epidermophyton inguinale. These account for 97.4 per cent of the cases. The remainder were due to unidentified organisms of the trichophyton type or other fungi. Thus four fungi cause practically all the cases of dermatophytosis found in New York and probably throughout the United States. However, the incidence of infection with these fungi varies in different localities; for instance, E. inguinale is more prevalent in France and England.[9]

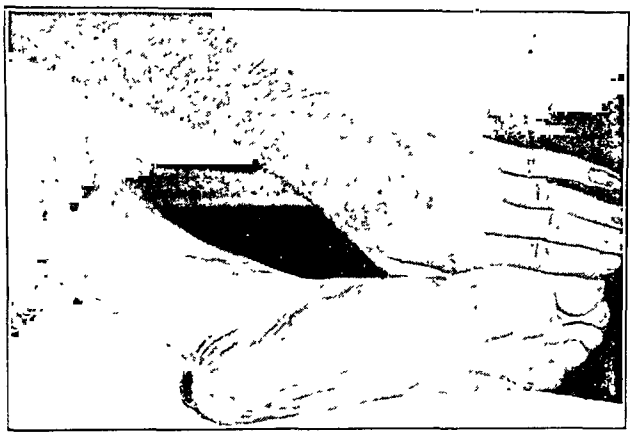


Fig. 1.—Dermatophytosis of the foot caused by Trichophyton gypseum with dermatophytid on the hand. Note vesicles on foot and hand.

TABLE 1.—*Incidence of Positive Cultures in Dermatophytosis of the Feet and Hands at New York Skin and Cancer Unit, 1935 to 1943*

	Feet		Hands	
	Number	Per Cent	Number	Per Cent
T. gypseum	1,016	65.4	36	12.2
T. purpureum	247	15.7	85	28.7
M. albicans	210	13.5	163	55.1
E. inguinale	44	2.8	6	2.0
Others	40	2.6	6	2.0
T. unidentified	(32)	....	(2)	....
T. niveum	(8)	....	..	....
A. schoenleini	..	....	(3)	....
M. fulvum	..	....	(1)	....
Total	1,557	100.0	296	100.0

In a majority of the infections by a particular organism, certain features predominate so it is possible in most cases to predict the invading fungus without culturing. This is also true of ringworm of the nail, which will be discussed later.

Laboratory examination, both microscopic and cultural, should be carried out to verify the diagnosis.[10]

TRICHOPHYTON GYPSEUM

Trichophyton gypseum, which is responsible for the largest number of infections, causes an acute inflammatory type of dermatophytosis in which vesiculation is the main feature. It may be preceded by slight scaling, maceration or fissuring between the toes for months or even years. In the macerated areas, minute vesicles are present. The infection of the interdigital webs may be irritated or aggravated by local medication, by friction from a shoe, by scratching or by heat, resulting in an acute vesicular or bullous eruption. The vesicles are usually limited to the sole or to the sides of the foot or the bulbs of the toes. More rarely they occur on the dorsum of the foot. The vesicles at first are deeply seated and contain a viscid fluid with very little erythema surrounding them. Later they may become pustular. In the early stage the vesicles appear singly and soon are found in groups. At times, groups of the vesicles coalesce to form extensive patches. The vesicular areas spread at the margin, dry up, scale and clear centrally. An overhanging serpiginous border may remain. Vesicles may reappear in a centrally healed area.

As the vesiclular fluid is absorbed, the vesicles become brown macules and later desquamate. The domes of the vesicles and the scales contain many elements of the fungi and thus are infectious. These vesicles may be secondarily infected with staphylococci or streptococci, causing an acute pustular eruption of the feet, cellulitis or lymphangitis. Even erysipelas or septicemia may result in the rare case.



Fig. 2.—Trichophyton purpureum infection, showing fine branny scales.

The presence of hyperhidrosis is frequently found with this type of dermatophytosis. The sweat produced, especially between the toes, where it is of a higher p_H, acts as a good culture medium for fungi and thus aids in the spread of the disease. Itching may be pronounced. Walking is frequently difficult in extensive cases.

9. Weidman, F. D.: Laboratory Aspects of Epidermophytosis, Arch. Dermat. & Syph. **15**: 415 (April) 1927.
10. Lewis, G. M., and Hopper, M. E.: An Introduction to Medical Mycology, Chicago, Year Book Publishers, Inc., 1943.

TRICHOPHYTON PURPUREUM

In the noninflammatory type of dermatophytosis Trichophyton purpureum is the usual causative fungus.[11] The plantar surface is the common site of infection, although it may involve the side or dorsa of the feet, toes and toe nails. Any part of the hands may also

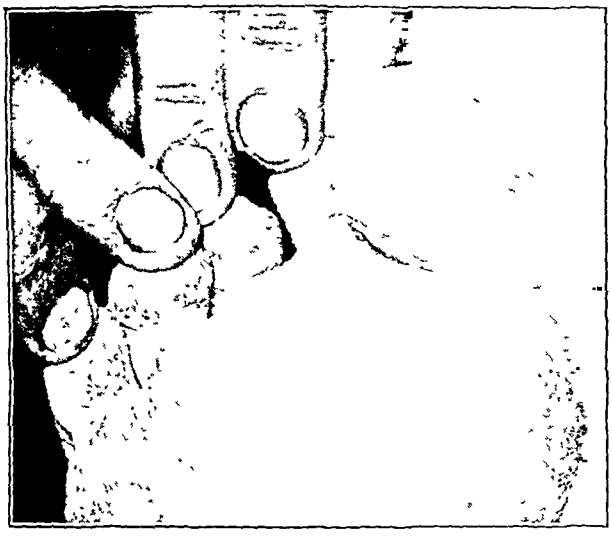


Fig 3.—Monilia albicans invasion, with maceration in all interdigital webs.

be involved. The entire sole or any part may be the site of infection. When extensive, the infected area spreads up the sides of the foot and heel. This makes a sharply marginated erythematous border, giving a "moccasin" effect to the foot. The infected skin is dull red and slightly thickened. The scaling, which is constant, is usually fine and branny. The absence of visible vesiculation in the presence of itching is a persistent feature. The infected sole is drier than usual. Irregular erythematous scaly patches may be found on the dorsa of the feet and toes. The degree of erythema may vary within a single patch, giving a mottled appearance. There is no tendency to central clearing.

The infection on the under surface of the toes is clinically similar to the plantar infection. Moisture will cause a small degree of maceration in the interdigital areas. If the entire toe is involved, the skin is thickened and dry with fissuring about the dorsal side of the joints. This noninflammatory type of dermatophytosis is more apt to be bilateral and symmetrical than the acute type caused by T. gypseum.

MONILIA (CANDIDA) ALBICANS

Infection of the foot with Monilia albicans, mycologically speaking, is not dermatophytosis because the organism is not a dermatophyte but a "yeastlike" organism. "Moniliasis" is the term used for infections by this organism.[12] It is a common cause of intertriginous infections. This organism is the cause of thrush, pruritus ani, perlèche and intertriginous infections of fingers, toes and other locations. It is included in this paper because it does cause a type of "athlete's foot" which is rather acute and difficult to cure. Diabetes may be a complicating factor in this infection.

When the feet are infected, the characteristic manifestation usually limits itself to the interdigital webs. The skin between the toes is bright red, weeping and fissured at the base. Exfoliated and macerated skin is present at the borders of these denuded or red areas and overhangs it. This infection usually involves both feet, and all interdigital webs. Occasionally it extends on to the dorsum of the foot, where the skin may be red and glazed or acutely inflamed. Occasionally vesicles are present on the plantar surfaces, from which this organism may be cultured.

EPIDERMOPHYTON INGUINALE

Epidermophyton inguinale, a cause of ringworm of the groin, also invades the feet. Sabouraud's first report [6] of E. inguinale infection of the feet includes an excellent clinical description. · Eight out of 10 cases of intertrigo of the toes he found [8] were caused by E. inguinale. The original site of infection is the base of the interdigital webs, but it ultimately reaches the folds of the flexor surface of the toes. Maceration and severe scaling are characteristic of the infection in the interdigital webs. As the infection spreads on the sole the skin is decidedly scaly with the scales larger and flakier than those found in a T. purpureum infection. Vesiculation may be present, but usually it is not very acute. The vesicles are rather dry and are interspersed in the scaling. As they mature they become small brown macules, which can be easily lifted off. The sole, in some cases, is erythematous. The usual infection limits itself to the toe area, though the entire sole may be involved. Often a concomitant infection of the groin with the same organism occurs.

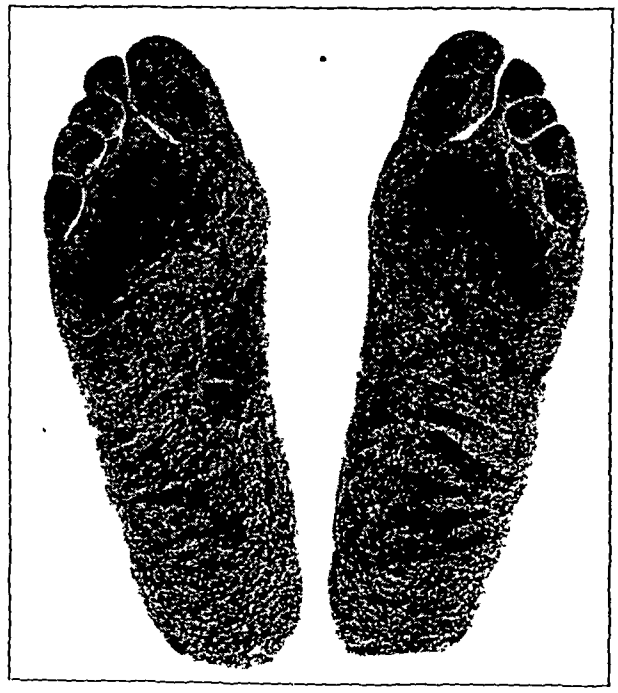


Fig 4.—Epidermophyton inguinale infection, with scattered vesicles and flaky scaling.

Hand infections may be caused by the same four fungi (table 1). The most frequent causative agent is M. albicans. This organism has been isolated in 55.1 per cent of our cases from the hands. The infection is usually limited to the interdigital webs, where it is known as "erosio interdigitalis blastomycetica." The infection is similar in appearance to that occurring between the toes.

11. Lewis, G. M.; Montgomery, R. M., and Hopper, M. E.: Cutaneous Manifestations of Trichophyton Purpureum (Bang), Arch. Dermat. & Syph. 37: 823 (May) 1938.
12. Hopkins, J. G.: Moniliasis and Monilids, Arch. Dermat. & Syph. 25: 599 (April) 1932.

The other organisms also give a similar clinical appearance on the hands as on the feet. As this paper deals with infections of the feet only, hand infections will not be discussed. A detailed report on fungous infections of the hands has been made by Epstein.[13]

Dermatophytid [14] is an allergic response of the skin to fungi or their toxins. It manifests itself by vesicles

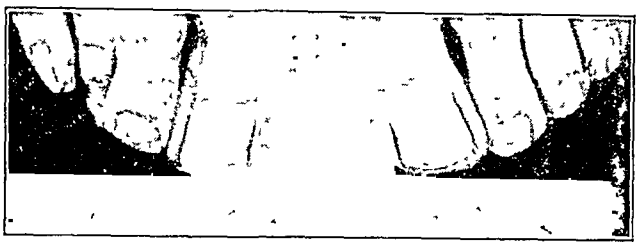


Fig. 5.—Leukonychia trichophytica, showing superficial white patches on many nails caused by Trichophyton gypseum.

on the palm and fingers and is usually more pronounced in cases of an acute fungous infection of the feet. For further information there are many excellent articles.[10]

NAILS

Favus of the nails, a type of ringworm, was first described in 1829 by Mahon,[3] which was ten years before Schoenlein described the causative fungus, Achorion. Baum and Meissner in 1853 described molds in the nails.[15] Others mentioned these lesions before the original reports by Fox, Pellizzari and Djelaleddin-Moukhtar on hand and foot infections. Whitfield's first case [5] of onychomycosis of the toe nails was caused by E. inguinale. This is of interest, because this fungus has not been isolated from the nails in any of the cases at the New York Skin and Cancer Unit.

The clinical manifestations of onychomycosis are more constantly similar for the individual organism than for their manifestations on the skin of the feet. The fungi most commonly seen in onychomycosis are Trichophyton gypseum, Trichophyton purpureum and Monilia albicans. Table 2 shows the incidence of causative fungi found in toe nail and finger nail infections at the New York Skin and Cancer Unit.

In the toe nail infections, T. gypseum was found in 63.5 per cent of the cases which were culturally positive, T. purpureum in 25.3 per cent and M. albicans in 5.6 per cent. The remaining 5.6 per cent were caused by unidentified trichophytons, T. niveum and 1 case by Achorion schoenleini (favus).[16]

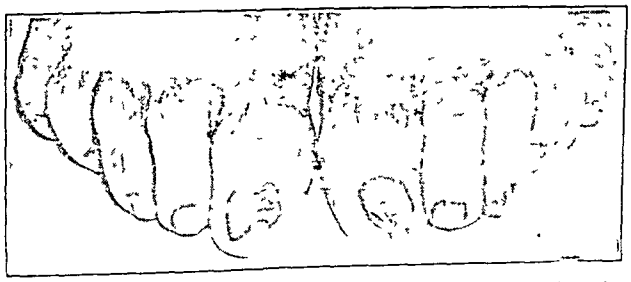


Fig. 6.—Trichophyton purpureum infection, showing big toe nails undermined and broken off.

In the most common type, that caused by T. gypseum, the infection is usually superficial. Superficial scaling is present. It often starts under the overhanging cuticle. It rarely invades the entire nail plate. There is one type of nail infection with this organism which is very typical, leukonychia trichophytica.[17] In this type small chalky white areas are present on the surface or in the substance of the nail plate. They may be single or multiple and may be irregularly shaped. They may or may not advance toward the distal end of the nail as it grows. This depends on their depth in the nail plate. The ease with which it can be shaved off shows its superficial nature. In long standing cases the infection may penetrate the entire nail plate. However, this is the exception. There is no paronychial inflammation present.

In nails infected with T. purpureum [11] the infection is deeper. The onset and progress are slow and insidious. There is little or no reaction in the subungual and paronychial tissues. The infection usually begins under the free border or along the lateral margins of the nail. Yellowish streaks appear under the nail plate from these locations. They gradually enlarge and the entire nail plate may be involved. The nail plate is loosely attached to the bed above the yellow discolored areas. The nail becomes brittle, dystrophic and loosened from the nail bed. It frequently becomes broken off and it is common to see a nail which is only one half present, the remaining portion of the nail being undermined and appearing both black and yellow from the débris and fungi accumulated there. This appearance is typical of both finger nails and toe nails. Concomitant infection of the toes or sole is usually present.

TABLE 2.—*Incidence of Causative Fungi in Onychomycosis of Toe and Finger Nails at New York Skin and Cancer Unit, 1935 to 1943*

	Toe Nails		Finger Nails	
	Number	Per Cent	Number	Per Cent
T. gypseum	158	63.5	13	2.0
T. purpureum	63	25.3	53	8.1
M. albicans	14	5.6	586	89.2
E. inguinale	0	0	0	0
Others	14	5.6	5	0.7
T. unidentified	(9)	....	(2)	...
T. niveum	(4)	....	..	...
T. violaceum	..	....	(1)	...
A. schoenleini	(1)	....	(1)	...
M. lanosum	..	..	(1)	...
Total.	249	100.0	657	100.0

In nails infected with Monilia (candida) albicans the infection usually starts in the lateral nail groove, causing a slightly red paronychial swelling. Thin pus may be discharged from beneath the nail fold. The nail on its lateral border becomes dystrophic, and transverse ridges appear. The nail becomes dark because of débris accumulated under the loosened border. Later the entire nail may become involved. The nail plate in this infection does not become friable, yellow or white, as in Trichophyton infections. It is usually hard and as glossy as a normal nail plate. In toe nail involvement there is usually an infection of the toes. Finger nail infections with Monilia albicans are more common than toe nail infections. However, clinically they are similar Finger nail infection is common in housewives, dish-

13. Epstein, E.: Dermatophytosis of the Hands, Arch. Dermat. & Syph. **45**: 1113 (June) 1942.
14. Williams, C. M.: The Diagnosis of Some Eruptions of the Hands and Feet, Arch. Dermat. & Syph. **5**: 161 (Feb.) 1922.
15. Heller, J.: Die Krankheiten der Nagel, in Jadassohn, J.: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1927, vol. 13, pt. 2, p. 173.
16. Montgomery, R. M.; Hopper, M. E., and Lewis, G. M.: Favus Involving a Toe Nail: Report of a Case, Arch. Dermat. & Syph. **38**: 856 (Dec.) 1938.
17. Sulzberger, M. B., and Lewis, G. M.: Leukonychia Trichophytica: Report of a Case, M. Rec. **146**: 305 (Oct. 6) 1937.

washers, bakers and persons with similar occupations. Diabetes may also be a complicating factor.

Associated paronychia is a characteristic feature of this, and only of this, mycotic nail infection.

TREATMENT

There are many effective methods of treating dermatophytosis.[18] Intelligent therapy depends on the proper use of drugs in relation to the clinical appearance and identity of the causative organism. Most of the old drugs are still most effective. Variations in the treatment are mainly in cases in which T. purpureum and M. albicans are found or suspected to be the causative fungi.

In T. purpureum infections stronger fungicidal remedies are indicated. Double strength ointment of benzoic and salicylic acid (Whitfield's ointment), consisting of 12 per cent salicylic acid and 24 per cent benzoic acid in petrolatum, tincture of iodine 2 per cent and chrysarobin 3 per cent in petrolatum are all good fungicides and very helpful in these cases. Some cases fail to respond to these medications but respond with the use of stronger applications. Roentgen therapy does not give favorable results in this type of infection.

In M. albicans infection certain drugs are more efficacious than others. For local applications 3 per cent aqueous solution of gentian violet or brilliant green, 5 per cent aqueous solution of silver nitrate and

TABLE 3.—*Mild Fungicidal Ointment*

		Gm. or Cc.
℞	Salicylic acid	1
	Ointment of zinc oxide	15
	Ointment of ammoniated mercury (10%), q. s. ad	30

ammoniated mercury ointment 5 per cent are the drugs of choice. Silver nitrate can also be used in wet dressings in acute cases in 1:5,000 or 1:10,000 dilutions. The aniline dyes or silver nitrate solution tend to dry down the intertriginous eruptions due to M. albicans faster than other drugs. If diabetes is a concomitant condition it must be brought under control.

In cases caused by T. gypseum or E. inguinale the treatment must be varied according to the clinical manifestations.

If there is an acute inflammatory reaction, regardless of cause, soothing remedies should be used. The vesicles or bullae should be drained and wet dressings applied. There are a variety of solutions that may be used. All should be used warm. One may choose from saturated solution of boric acid, Burow's solution 1:20, potassium permanganate 1:2,000 or 1:4,000 and silver nitrate 1:5,000 or 1:10,000. If the infection is very pustular the latter gives the best results. If elevation of the foot is necessary, wet applications are applied; otherwise a foot bath is used.

When using wet dressings intermittently, paste of zinc oxide with 1 or 2 per cent phenol may be used between soakings. In the acute case 1 to 2 per cent aqueous gentian violet or brilliant green may be applied locally.

Indiscriminate use of proprietary remedies may precipitate an acute dermatitis. Many contain a high percentage of salicylic acid, some are alkaline in reaction and others contain a complex organic compound which has a high sensitizing index. The newly popularized phenol-camphor solution has caused many ulcerations. Generally speaking, it is safer to use standard drugs such as those in the National Formulary or the United States Pharmacopeia.

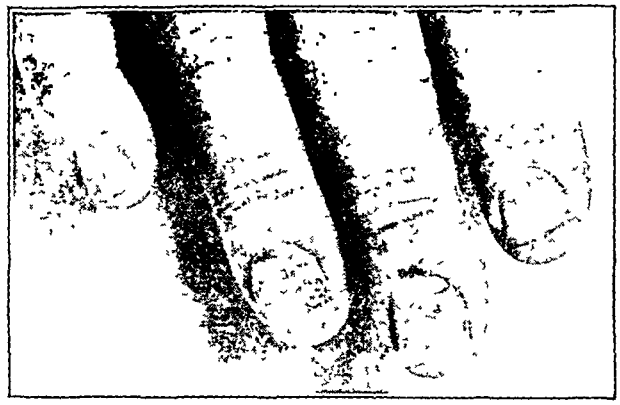


Fig. 7.—Monilia albicans infection, with paronychia and dystrophy of the sides of the nail plate.

As the acute phase subsides, fungicidal remedies may be used. They should not be used in the acute case. This is one of the common mistakes made in the treatment of dermatophytosis. Mild fungicides, such as



Fig. 8.—Severe burn from the application of 50 per cent phenol and camphor solution for "athlete's foot."

gentian violet, brilliant green or one-third strength Whitfield's ointment, may be used twice daily on the affected areas. The ointment given in table 3 is frequently of value as a mild fungicide to tide a case over between the acute and more chronic lesions.

Later stronger fungicidal remedies are indicated. Whitfield's ointment one-half to full strength is helpful. Tincture of iodine 0.5 to 1 per cent may be used. One to three per cent chrysarobin ointment is also helpful.

18. Epstein, E.; Lewis, G. M.; Loveman, A. B., Pillsbury, D. M.; Schoch, A. G.; Shelmire, B., Smith, D. C., Swartz, J. H., and Weider, L. M. Symposium on the Practical Management of Eczematous Ringworm of the Hands and Feet (Athlete's [illegible] and Dermatophytids), J. Invest. Dermat. 3: [illegible], M. R. Fungous Infections of the Foot, J. A. M. A. 124: 751 (March 18) 1944.

After the case is clinically cured it is advisable to use a mild fungicide such as one-third strength Whitfield's ointment or the powder mentioned in table 4 a few times a week to prevent recurrences. Sterilization of shoes by means of solution of formaldehyde (U. S. P. XII) and boiling the socks are important.

Prophylactic treatment following a day at the beach or a swim in a pool is advisable. This should be any mild fungicide such as the fungicidal powder.

TREATMENT OF NAILS

It is most important to cure ringworm of the toe nails, for it is a focus of reinfection.

In the treatment of nails there is a wide variety of opinion as to the most efficacious method to be used. Some advise surgical evulsion of the nail. This is a rather radical procedure. The more conservative methods of treatment will accomplish the same result with less pain and discomfort.

It is important in all types of nail infections to remove mechanically as much of the infected portion of the nail as possible. With this procedure the medications applied will be more effective.

In the superficial nail infections the scaly surface of the nail should be shaved off with a scalpel. The white chalky areas may be removed in a similar manner; however, shaving has to be a little deeper. The shaving

TABLE 4.—*Fungicidal Powder*

		Gm. or Cc.
℞	Salicylic acid	2.4
	Tannic acid	8
	Boric acid	36
	Purified talc, q. s.	ad 120

is continued until normal nail plate remains. With this completed, mild tincture of iodine is applied daily to the nail. Other strong fungicides may be applied, but this method is a simple one.

In the deeper nail infections caused by T. purpureum, treatment is more difficult and more tedious. The removal of the infected portions of the nails must be painstaking. For this work a pair of clippers, a scalpel and a small nail chisel are needed. As much of the infected nail as possible must be removed, especially the lateral portion, which may lie deep in the nail groove. Forty per cent salicylic acid plaster is applied to the exposed nail bed and the adjacent nail. A 60 per cent salicylic acid in white ointment (U. S. P. XII) may be spread on the medicated side of the 40 per cent plaster to reinforce its strength, thus making it more keratolytic. The medicated plaster is held in place by adhesive. These applications are changed once weekly following the complete removal of macerated tissue and undermined nail. This procedure is carried out until the nail plate is firmly attached to the nail bed. This will take from four to six weeks. Following this, strong fungicides are applied to the nail. Mild tincture of iodine, 20 per cent silver nitrate solution or 3 per cent chrysarobin ointment may be used. This procedure must be done at each visit to insure a normal nail. With T. purpureum infection, treatment has to continue from four to six months and sometimes longer. However, the interval between treatments can be spaced from two to four weeks after discontinuing the salicylic acid treatment. Roentgen therapy for this type of nail infection has been disappointing.

In Monilia albicans infection of the nails the treatment must be varied. First, mechanical removal of as much of the infected and undermined nail as possible is important. Roentgen rays help in reducing the paronychial swelling. The application in the office of a 10 to 20 per cent silver nitrate solution aids. For daily home applications 3 per cent alcoholic solution of gentian violet or brilliant green or a 5 per cent ammoniated mercury ointment is helpful. In addition, daily scraping with a glass slide of the lateral portions of the nail will aid in removing the infected nail plate. In cases in which pain is present and pus exuding, wet dressings of warm saturated boric acid solution are helpful.

Treatment of concomitant infections of the toes and sole is most important in all cases of ringworm of the toe nails.

SUMMARY

Dermatophytosis is a prevalent mycotic infection. In New York the majority of the cases are caused by Trichophyton gypseum, with Trichophyton purpureum, Monilia albicans and Epidermophyton inguinale causing the rest

Trichophyton gypseum causes an acute inflammatory type of dermatophytosis in which vesiculation is the main feature. Its infection of the nail plate is usually superficial and is manifested by scaling or small irregular white areas.

Trichophyton purpureum produces a noninflammatory dermatophytosis characterized by fine branny scaling and an absence of vesiculation. In nail infections this fungus invades the under portion of the nail, causing yellow undermined areas. The nail plate may be broken off or destroyed.

Monilia albicans infections of the feet are characterized by red and macerated areas usually involving all the interdigital webs. Nails show a paronychial swelling, with the lateral borders of the nail plate ridged and undermined.

Epidermophyton inguinale infection of the feet shows maceration and severe scaling on the toe webs and flaky scales on the sole. Nail infections have not been observed by us.

The basic principle of treatment in dermatophytosis of the feet is the use of soothing wet dressings or pastes in the vesicular stage and of fungicidal remedies after the acute phase has subsided. In the case of infections with Trichophyton purpureum, strong fungicides must be used. In invasions with Monilia albicans, mercurials, silver nitrate or gentian violet is preferred. In onychomychosis it is important to remove all infected nail tissue mechanically before applying fungicides.

CONCLUSIONS

In the majority of cases the invading fungus causes characteristic cutaneous manifestations by which it can be suspected.

Dermatophytosis and onychomycosis should be classified according to the etiologic agent rather than by clinical manifestations.

Early recognition of the invading fungus and intelligent treatment shorten the duration of the disease.

57 West Fifty-Seventh Street—301 East Nineteenth Street.

ABSTRACT OF DISCUSSION

DR. JOHN H. LAMB, Oklahoma City: With the great numbers of American soldiers living in tropical climates with their intense humidity, the treatment of fungous disorders of the feet has been a major problem. The authors have stressed the value of knowing the type of fungus which one is treating. Many physicians have adopted the routine use of the various dye products, gentian violet and brilliant green for all types of dermatophytosis. This is satisfactory in Monilia albicans infection but it will not be curative in the more recalcitrant Trichophyton purpureum. There is no stock prescription for dermatophytosis. All medications revolve on the phases of the infection, whether acute, subacute or chronic, and on the variations of the skin reactions to the fungous toxin. The portion of the paper on nail infections was most correct and practical. In these days of working too fast we find it impossible to take the time necessary for curetting and shaving off the nail from the nail bed. I have been using a very cheap and extremely useful motor driven burr, which in a few minutes will remove almost all of the diseased nail. Locally in some stubborn cases I have found a paste to be efficacious which is composed of chrysarobin powder mixed in a base of pure saponated solution of cresol which has been saturated with salicylic acid. This is applied to the nail bed once every two weeks. The skin and periungual areas are protected by a bland salve.

DR. ARTHUR C. CURTIS, Ann Arbor, Mich.: Dr. Montgomery has described the four fungous infections that comprise almost 98 per cent of the causes of tinea pedis in New York City. In all probability that percentage holds for the University Hospital in Ann Arbor. To one who is not entirely familiar with mycologic terminology and mycologic characteristics the names of these fungi will soon be forgotten. Would it not be better to remember these fungi by the type of reaction that they produce rather than by their generic names and to divide the fungous infections into the acute or inflammatory types, the subacute types and the chronic types? Too often, after the diagnosis of tinea pedis is made, the desire to destroy the fungus takes precedence over the treatment of the reaction that the fungus has produced. The result is that many of these patients will develop a severe dermatitis venenata. Severe types of dermatophytosis frequently are secondarily infected and cellulitis, lymphangitis or erysipelas may be a complicating factor. Again, in many of these cases the etiologic fungus must be forgotten until the secondary infection is controlled. Monilia infections can be of minor importance or they can be very serious; some cases may be fatal. The treatment outlined for monilial infections by Dr. Montgomery is most efficacious. On the other hand, one should not forget that, experimentally and also clinically, monilia infections have been associated with definite riboflavin deficiencies, and in some of these cases that do not respond to satisfactory treatment one should also introduce into the therapy vitamin B complex or riboflavin. Chronic tinea infections of the feet are best illustrated by Trichophyton purpureum and, in my hands, at least, have been extremely refractory to treatment, even with such a remedy as double strength Whitfield's ointment. I should like to ask Dr. Montgomery whether or not, in many of his cases, he actually cures these cases or just arrests the disease temporarily and then at a later date has the patient back on his hands again.

DR. ROYAL M. MONTGOMERY, New York: In answer to Dr. Curtis's question about Trichophyton purpureum infection, it is certainly difficult to cure. In the majority of extensive cases I believe that they are arrested and not cured. Maybe Dr. Lamb can report in another fifteen years how his infection is progressing. As far as nail infections are concerned, it is most important to remove mechanically as much of the infected portion of the nail as possible. Dr. Lamb uses a burr, which is most effective; otherwise one can use a scalpel. But it is always important to remove the undermined portion of the nail and then apply a fungicidal remedy. The remark that Dr. Curtis made about Monilia albicans infection associated with riboflavin deficiency is interesting. We have seen patients with moniliasis at the New York Skin and Cancer Unit who also have a vitamin C deficiency. Probably there is hypovitaminosis in many of these infections.

ORAL ADMINISTRATION OF PENICILLIN

A PRELIMINARY REPORT

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SIDNEY ROSS, M.D.
WASHINGTON, D. C.
AND
LIEUTENANT CLIFTON STRAUSS
M C S, U.S.N.R.

During the early clinical trials, Abraham, Florey and their associates,[1] investigating the various routes of administration of penicillin, tried the oral route and found that the substance was rapidly destroyed by the hydrochloric acid of the stomach. Their attempts to raise the p_H of the gastric contents by the use of sodium bicarbonate were not particularly successful. While they failed to obtain adequate concentrations in the blood after administering solutions of penicillin orally, they were able to recover satisfactory antibacterial amounts in the urine and by this means successfully treated a urinary tract infection in a 6 month old infant. They suggested the use of capsules, but after unsuccessful attempts with phenyl salicylate coated vehicles, abandoned this method. Rammelkamp and Keefer[2] corroborated the previous work of Florey and others[1] in demonstrating the inactivation of penicillin by hydrochloric acid. These investigators administered penicillin by the oral, duodenal and rectal routes. For these experiments they used a solution of 200 cc. of tap water containing 10,000 and 20,000 units of penicillin. Three subjects were given this solution by mouth after fasting for twelve hours. One of the subjects received 4 Gm. of sodium bicarbonate ten minutes prior to the ingestion of the penicillin solution. They concluded that the absorption following oral administration was poor, as demonstrated by the low concentrations in the blood. They also noted that absorption following intraduodenal administration was more efficient than the oral or rectal routes, the serum concentration levels approximating those obtained after intramuscular injection. Rectal administration was found to be unsatisfactory, probably on the basis of the inactivating influence of Escherichia coli.[3]

In 1943 Rammelkamp and Helm[4] reported the results of the oral administration of a penicillin solution containing 1,000 Oxford units per cubic centimeter, giving a total of 20,000 units to 2 patients who had achlorhydria associated with pernicious anemia. The curve of the blood concentrations was greater than that observed in normal subjects and was not unlike that obtained after intramuscular or intraduodenal adminis-

From the Children's Hospital.
Dr. Burke is a Teaching Fellow, George Washington University, Department of Pediatrics.
Miss Betty Porter, bacteriologist, and Howard Madigan and George Porter, externs, gave technical assistance.
Drs. Joseph S. Wall, E. Clarence Rice and P. A. McLendon of the Medical Research Committee of Children's Hospital, Washington, D. C., gave helpful suggestions and advice.
This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Abraham, E. P.; Florey, H. W.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G., and Jennings, M. A.: Further Observations on Penicillin, Lancet **2**: 177 (Aug. 16) 1941.
2. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, J. Clin. Investigation **22**: 425 (May) 1943.
3. Abraham, E. P., and Chain, E.: An Enzyme from Bacteria Able to Destroy Penicillin, Nature, London **146**: 837 (Dec. 28) 1940.
4. Rammelkamp, C. H., and Helm, J. C., Jr.: Studies on the Absorption of Penicillin from the Stomach, Proc. Soc. Exper. Biol. & Med. **54**: 324 (Dec.) 1943.

tration. They also noted that saliva, bile and succus entericus did not exhibit any inactivating influence on penicillin.

The necessity of frequent doses in the parenteral administration of penicillin is obligatory in order to maintain adequate antibacterial levels in the blood.[5] At the present time it is customary to administer penicillin parenterally at least every three hours in order to maintain therapeutic blood concentrations. Even with this regimen there frequently occurs a hiatus of from one-half to one hour between injections, during which time effective blood levels are not demonstrable. Continuous intravenous administration provides more constant concentration, but the incidence of thromboses is great enough to make the intramuscular route preferable.[6] Continuous intramuscular administration has been found to produce considerable discomfort. The disadvantages of such regimens to the patient and to the hospital personnel are manifest. Furthermore, hospitalization is mandatory for these methods of administration.

These inconveniences have stimulated investigation of a simplified method for prolongation of satisfactory blood levels. Romansky[7] has recently shown that single injections of penicillin combined with beeswax and peanut oil will produce and maintain efficient concentrations in the blood for six to ten hours. Chilling of the deltoid region before and after injection, thus producing vasoconstriction as a means of prolonging absorption of penicillin, has been recently recommended.[8] Diodrast[9] or para-amino hippuric acid[10] has been given simultaneously with penicillin, and it has been found that the serum concentrations reached greater heights with prolongation, probably the result of a depression of the excretion of penicillin from the kidneys.

The advantages of the oral route are self evident and require little elaboration. By this method a certain percentage of patients may be treated at home, thus obviating the necessity for hospitalizing every case as is the current practice when penicillin is indicated. Further, the administration of penicillin orally is considerably more convenient and precludes the need for frequent injections. In the past few months commercial production of penicillin has been so accelerated that its greater availability now permits more widespread application. A result of this increased production permits a reevaluation of the feasibility of oral administration.

The present report represents an attempt to ascertain whether or not therapeutic blood levels of penicillin could be obtained by this method of administration.

METHODS AND MATERIALS

It is clear that, to avoid inactivation, penicillin must be protected from the destructive action of hydrochloric acid in the stomach. In addition, penicillin must be absorbed from the small intestine before meeting the inhibitory influence of Escherichia coli. For the purposes of the experiments reported here it was decided to use capsules as a mechanical protection for the penicillin in its passage through the stomach after ingestion.

In preliminary experiments plain gelatin capsules were found to disintegrate promptly when immersed in gastric contents aspirated from normal subjects. Immersion in tap water and saline solution also resulted in the rapid loss of integrity. Because of this the powdered form of penicillin instead of solutions in water or saline solution was used. A method for protecting the integrity of the capsule was devised and consisted in a preliminary hardening by the use of solution of formaldehyde and alcohol immersion. Capsules treated in this manner were stable for one to two hours in aspirated gastric contents. This in vitro experiment does not take into consideration the probably mechanical pressure that is brought to bear on the capsule by peristalsis in the stomach; in vivo, this force could conceivably hasten disintegration. Additional protection was given the penicillin by the use of a double capsule. The contents of an ampule containing 100,000 units of powdered sodium penicillin were transferred to a gelatin capsule (No. 1), which was moistened and sealed and in turn placed in a second capsule of the next larger size (No. 0). It was then placed in solution of formaldehyde U. S. P. diluted 1:20 for five seconds, followed by immersion in 95 per cent alcohol for five minutes. One hundred thousand units of sodium penicillin in the powdered form was adequately accommodated in a No. 1 capsule. Physical transfer of the penicillin involved the loss of a small quantity of the substance; the exact amount was not known, but probably represented about 5,000 units.

In view of the inactivating influence of gastric acidity on penicillin, it was reasoned that neutralization of the hydrochloric acid would reduce this hazard. For this reason, aluminum hydroxide[11] was used, having been selected in preference to sodium bicarbonate, since the latter is known to have a rebound action in producing further stimulation of hydrochloric acid after initial neutralization. In our experiments two aluminum hydroxide tablets, which in preliminary tests were found to neutralize gastric contents within fifteen minutes after ingestion, were swallowed one-half hour prior to taking the penicillin capsules.

It was thought desirable to determine the relation of meals to the oral administration of penicillin, and toward this end four experiments were conducted before meals and six after meals.

The subjects selected were normal men weighing between 165 and 200 pounds (75-91 Kg.). Samples of venous blood were taken at the end of one-half hour, one hour and at hourly intervals thereafter and assayed for penicillin concentrations according to the method of Rammelkamp,[12] using B hemolytic streptococcus 203 as the indicator organism. In one experiment urine samples were similarly collected and assayed.

COMMENT

In our studies a characteristic common in all instances of penicillin given by mouth was the rapid absorption from the duodenum, as indicated by the initial rapid rise within the first half hour; the highest level obtained in all the curves occurred within one-half hour after the capsule was ingested.

In the two experiments when 200,000 units of penicillin was ingested (chart 1), initial levels at the end

5. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the Treatment of Infections: A Report of Five Hundred Cases, J. A. M. A. **122**: 1217 (Aug. 28) 1943.
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11. Creamalin (Winthrop Chemical Company, Inc., 170 Varick Street, New York).
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of a half hour were 9.984 Florey units and 2.496 Florey units. In the instance of the higher level of these two curves, penicillin was taken two hours before dinner. In the second case the capsule was taken one-half hour after dinner. The subsequent levels taken at hourly intervals show a moderately rapid fall closely paralleling each other in these 2 cases. As will be noted, a therapeutic level was present after five and one-half hours in one instance and after four hours in the other.

A similar initial rapid rise during the first half hour was found in the 6 graphs representing the ingestion of 100,000 units of penicillin (charts 2 and 3). In one instance a level of 9.984 Florey units was achieved, in another 2.946 Florey units, in 2 cases 1.248 Florey units, another 0.624 Florey unit and in 1 case 0.156 Florey unit. Therapeutic levels of penicillin were assayable at the end of two hours in all cases. In 3 of these cases it was present in adequate concentrations at the end of three hours and in 1 case at the end of four hours. The appearance of sizable amounts of penicillin in the urine (chart 4) indicates rapid excretion from the kidneys after oral administration.

In two other experiments in which 100,000 units of penicillin was ingested there was no assayable level detected at the end of one hour. The reason for these

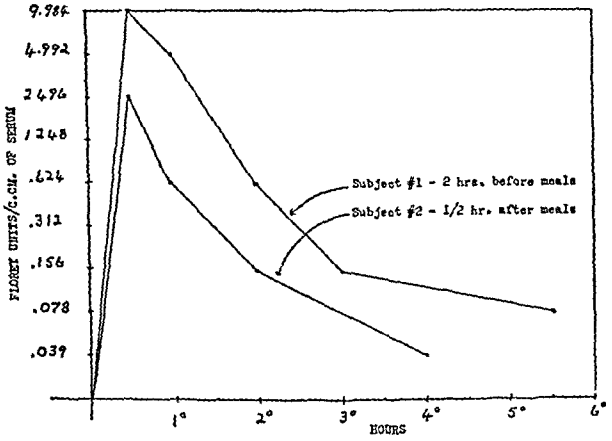


Chart 1.—Penicillin blood levels after oral administration of 200,000 units in a single dose.

two failures is not clear but may represent a premature inactivation of the penicillin in the stomach by hydrochloric acid. It should be noted that in both of these instances the penicillin was taken shortly after meals.

The relationship of meals to the absorption of penicillin must be evaluated, as the prolonged stay of the penicillin capsule in the stomach invites the inactivating influence of hydrochloric acid if the protective capsule is dissolved. As previously noted in a pilot experiment, the formaldehyde-alcohol prepared capsules retained their integrity only for one to two hours in the aspirated stomach contents. Therefore the necessity for the capsules to reach the duodenum within this hiatus is manifest. As already noted, six of our experiments were conducted after meals and the remaining four before meals. No categorical statement can be made on the basis of these experiments, but the impression is that slightly higher penicillin levels were obtained when the capsules were taken on an empty stomach. This is probably accountable on the basis of a more precipitous passage of the capsule into the small intestine from the stomach when the latter is empty. From these preliminary experiments it would seem advisable to administer penicillin orally at suitable intervals before meals. It is further suggested that a diet low in fat content, with high fluid intake, would guard against prolonged exposure to the inactivating influence of the gastric juice. The antacid used in these experiments, aluminum hydroxide, was employed empirically, and the importance of its role cannot be evaluated until further experimentation.

It is interesting to contrast the penicillin levels obtained after oral administration with the levels

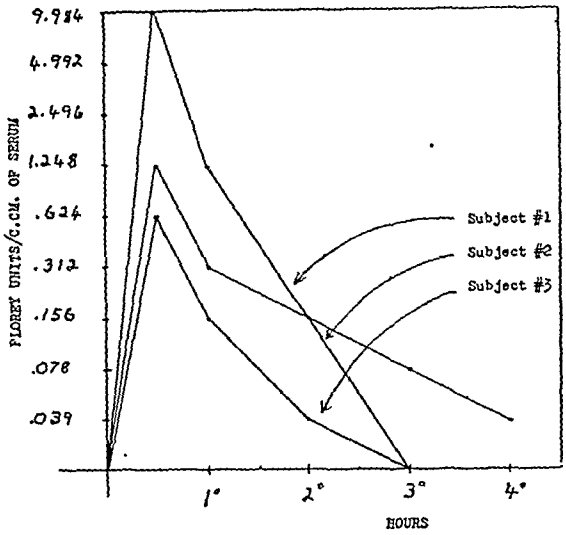


Chart 2.—Penicillin blood levels after oral administration of 100,000 units (one hour before meals) in a single dose.

reported after parenteral injection. The rapid appearance of large amounts of penicillin within the first half hour is common to all three modes of administration (chart 5). After intravenous administration of 40,000 units of penicillin, Rammelkamp [2] noted a very rapid rise in the blood level, the highest point being achieved within the first ten to fifteen minutes, followed shortly thereafter by a rather precipitous fall during the first hour, with only a trace of penicillin detectable after two hours. When 45,000 units was injected intramuscularly [7] the highest level was usually attained in

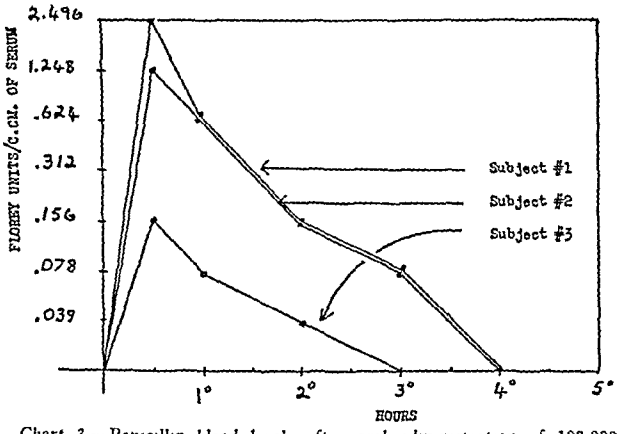


Chart 3.—Penicillin blood levels after oral administration of 100,000 units in a single dose (after meals).

about one-half hour, the rise, as one would expect, being less striking than when given intravenously, and then proceeded to drop more slowly, with detectable levels present at two to three hours. In the present experiments, when 100,000 units was given orally it was somewhat surprising to note the high initial levels after a half hour, indicating a rapid passage of the capsule into the small bowel. Reference to chart 5 shows the

average curve obtained after the ingestion of this amount. The highest level was achieved in about one-half hour, followed by a moderately rapid fall, with assayable levels still present after three or four hours. It is probably fair to conclude that levels obtained when employing the oral route exceeded both in concentration and in prolongation those levels

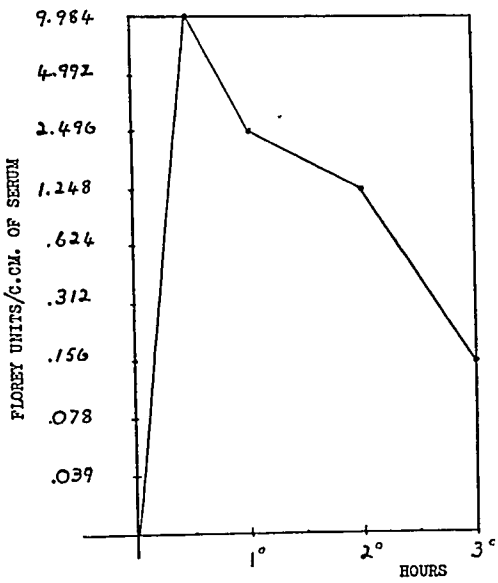


Chart 4.—Penicillin levels in the urine after oral administration of 100,000 units in a single dose.

obtained by parenteral administration when approximately twice as much penicillin is given. It would not seem unreasonable to expect that if comparable doses of penicillin had been used in these experiments the levels would rival those obtained after parenteral administration. Amounts of 100,000 and 200,000 units were used in these experiments rather than smaller doses which might well have been similarly efficacious. It should be noted that no objective or subjective toxic symptoms were produced when these large amounts were ingested. Division of the powdered material into smaller quantities was not feasible in our laboratory because of the physical error associated with the transfer of smaller amounts, due principally to the hygroscopic character of the sodium salt. However, experiments should be performed to test the efficiency of smaller doses with 25,000 and 50,000 unit capsules.

In view of the greater availability of penicillin today, with the consequent reduction in cost, it would not be an important deterrant if somewhat larger amounts of penicillin are required when the oral route is used. This is especially true when one takes cognizance of the incontestable advantages and convenience afforded by the oral route of administration.

When 200,000 units of penicillin was employed (chart 1) it will be noted that the levels were higher, with therapeutic concentration being maintained for one to two hours longer than when 100,000 units was taken, suggesting that the concentration and prolongation of penicillin the blood is more or less directly proportional to the oral dose employed.

The oral administration of 100,000 units of penicillin every three hours in the manner outlined would insure adequate levels in the blood for most susceptible infections. Rammelkamp and Keefer [13] found that the degree of antibacterial action was directly related to the concentration of penicillin in the serum and found the maximum effects against Streptococcus hemolyticus to be in concentrations of from 0.019 to 0.156 Florey unit per cubic centimeter of serum. Against Staphylococcus aureus, slightly higher levels were necessary, at least 0.156 Florey unit being required for a maximum effect

The feature of a rapid appearance of large amounts of penicillin in the circulating blood was common to oral and parenteral methods of administration. While no harmful effects from relatively high levels have been reported, it is questionable whether concentrations above 0.312 Florey unit per cubic centimeter have any added antibacterial value. It would be distinctly advantageous to secure an absorption curve that would guarantee therapeutic amounts in the serum over a longer period of time. One method of obtaining prolongation would be to administer larger doses by mouth, as evidenced by chart 1, when 200,000 was ingested; therapeutic levels were obtained in these cases for four to five and one-half hours. However, this dosage seems unpractical at the present time. A more plausible method would be one employing an inert vehicle that would slow down absorption from the small intestine and provide a plateau type of concentration curve with prolongation. Romansky has recently obtained therapeutic blood levels for six to ten hours by the intramuscular injection of 100,000 units of penicillin combined with 3 per cent beeswax in peanut oil.[7] We contemplate further experiments to determine whether prolongation can be achieved by the ingestion of penicillin in capsules using an inert vehicle as the solvent If this can be accomplished, obviously less frequent doses would be necessary. Furthermore, in cases when combined sulfonamide-penicillin therapy is indicated, both drugs could probably be given on a four to six hour dosage schedule.

The limitations of the administration of penicillin by the oral route are few. It would not be practical to employ this method for patients who have persistent vomiting or who are comatose. Also it is evident that

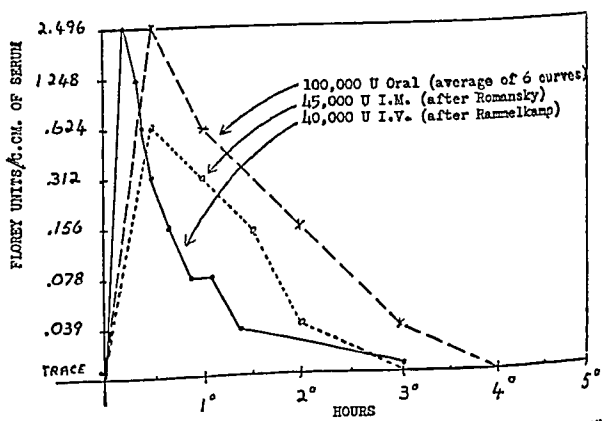


Chart 5.—Comparison of penicillin blood levels after oral and parenteral administration.

ingestion of penicillin capsules would not be satisfactory for infants and very young children, owing to their inability to swallow them with facility.

CONCLUSIONS

1. Adequate penicillin blood levels were obtained by oral administration when the drug was protected from the inactivating action of hydrochloric acid in the stomach.

13. Rammelkamp, C. H., and Keefer, C. S.: Penicillin: Its Antibacterial Effect in Whole Blood and Serum for the Hemolytic Streptococcus and Staphylococcus Aureus, J. Clin. Investigation 22: 649 (Sept.) 1943.

2. Penicillin concentrations determined after ingestion of 100,000 units compared favorably and in some respects surpassed those obtained after administration of 40,000 units parenterally. When 200,000 units was ingested, higher and longer sustained levels were observed, suggesting that prolongation and blood concentrations are directly proportional to the dosage employed.

3. No objective or subjective symptoms of toxicity were observed after single doses of 100,000 and 200,000 units of penicillin orally.

THE OVERWEIGHT OBSTETRIC PATIENT

LIEUTENANT (jg) LESTER D ODELL, U. S. NAVY
AND
WILLIAM F. MENGERT, M.D.
DALLAS, TEXAS

Because of a clinical impression that considerable numbers of obese women pass through the obstetric division of the Department of Obstetrics and Gynecology at the University of Iowa College of Medicine, it was decided to review the case histories of all women weighing 200 or more pounds (91 Kg.) at or before birth of a potentially viable baby (1,500 Gm. or more). No record was included in which the child weighed less than 1,500 Gm.

PATIENTS

Seven hundred and sixty records were found and included 641 obese women, of whom 542 were delivered once and 99 two to six times.

During the same period, Jan. 1, 1926 to Dec. 31, 1942 inclusive, 16,644 deliveries took place. The incidence of obese women was therefore 3.85 per cent, or 1:26 (641 obese women), and the incidence of deliveries among obese women was 4.57 per cent, or 1:22 (760 deliveries). These figures represent a greater incidence of obesity than that reported (1:30) by Matthews and Der Brucke.[1]

Fourteen sets of twins, an incidence of 1:54, occurred, making a total of 774 babies born to these obese women during the period of observation. This incidence of twinning is considerably above that generally reported. It may be that the weight of the second twin was sufficient to include a few women in the series when otherwise the antepartum weight would just have failed to reach 200 pounds.

The age, the weight at the time of delivery and the number of previous pregnancies are recorded in tables 1, 2 and 3. It will be seen that the average age at the time of delivery was less than 30 years, the average weight was 224 pounds (101 Kg.) and that only 16.9 per cent of these patients were primigravidas. In other words, these women tended to be relatively young and fertile, since the number of multigravidas was almost five times that of primigravidas.

From the Department of Obstetrics and Gynecology, State University of Iowa College of Medicine.
Read before the Section on Obstetrics and Gynecology at the Ninety Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.
This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Matthews, H. B., and Der Brucke, M. G.: "Normal Expectancy" in the Extremely Obese Pregnant Woman, J. A. M. A. **110**: 554-559 (Feb. 19) 1938. Zollei, C. M.: Geburtsverlauf und Wochenbett bei übergewichtigen Frauen, Monatschr. f. Geburtsh. u. Gynak. **113**: 25-56, 1942.

ANTEPARTUM COMPLICATIONS

Antepartum complications are recorded in table 4. Toxemia of pregnancy was noted 239 times, or 31.4 per cent, a figure in agreement with previous observations. The next most frequent finding was glycosuria. Only 1 woman suffered from diabetes mellitus and another developed it later. Although glycosuria was recorded only when discovered on at least 2 occasions, the presence of sugar in the urine seemed to possess little clinical significance during the period of study. It is possible that glycosuria in these patients merely represented repeated overindulgent ingestion of carbohydrate. The association of hypertensive disease and glycosuria in 53 patients could probably be accounted for on the basis that relatively a large group of these women suffered from the former.

LABOR

Although attention has repeatedly been called to the excessive frequency of abnormal presentation in the obese woman, the experience of this series (table 5) does not confirm the observation. It will be noted that breech alone presents a slightly elevated incidence. Occiput posterior was diagnosed at the end of labor and therefore was not as frequently recorded as it might have been if noted at the onset. Perhaps the greatest difficulty caused by obesity with regard to presentation and position lies in the difficulty of diagnosis. With normal landmarks obscured by intervening layers of adipose tissue, it is difficult for the obstetrician to be certain of any palpatory findings.

There has been considerable discussion of the relation of obesity to length of labor. Eight and one-tenth per cent of the labors of this series lasted less than three and 95.0 per cent less than thirty hours. On the other hand, prolonged labor, thirty or more hours, occurred 38 times (5.0 per cent), a second stage of two or more hours 31 times (4.1 per cent) and a third stage, of thirty or more minutes, 32 times (4.2 per cent).

Postpartum hemorrhage, 600 cc. or more, was noted in 54 patients (7.1 per cent) and necessitated the Credé maneuver in 7 and manual removal of the placenta in 3 patients. Usually accepted incidences of postpartum hemorrhage vary between 5 and 6 per cent.

OPERATIONS

The operative incidence (table 6) is approximately twice the usual clinic incidence. This figure is not as high as others[1] previously reported. Two of the 8 versions and extractions were performed electively on the second twin. Almost half of the operations were low forceps necessitated by prolongation of the second stage of labor.

One of the more serious complications of labor occurred in G. H., aged 35, octigravida, septipara, weighing 240 pounds (109 Kg.). At the end of a prolonged labor an unsuccessful midforceps operation followed by version and extraction resulted in a complete uterine tear 7 cm. long but not involving the cervix. Her course following subtotal hysterectomy was febrile, but she was discharged on the nineteenth day. The child, which was hydrocephalic with a meningomyelocele, was stillborn and macerated.

THE CHILD

The average birth weight was 3,580 Gm. (table 7), confirming the general opinion that obese women tend to give birth to large babies. Approximately 57 per cent of the infants weighed more than 3,500 Gm. at

birth. Thirty-five of the infants died, a mortality rate of 4.5 per cent. This figure is only slightly more than infant mortality rates for 1942 for the country at large. Table 8 gives the cause and time of death. Twenty-six were stillborn and 9 died during the neonatal period. Of the 26 stillborn babies, 15 died before the onset and

TABLE 1.—*Age*

	Patients	
	Number	Per Cent
Less than 20 years	59	7.8
20 to 24 years	195	25.6
25 to 29 years	193	25.4
30 to 34 years	137	18.0
35 to 39 years	116	15.3
40 to 44 years	56	7.4
45 years and over	4	0.5
Total	760	

Average age at the time of labor, 29.1.
Median age at the time of labor, 28.3.

11 during the course of labor. A relatively high proportion of intrauterine death (43 per cent) is evident and probably related, at least in part, to the increased incidence of hypertensive disease. There is a strikingly low incidence of death from immaturity, another expression of the general tendency of these babies to be large at birth. Of the live born children 60.8 per cent were wholly and 25.1 partially breast fed, while 14.1 per cent were artificially fed.

PUERPERIUM

Puerperal complications, chiefly sepsis, occurred in 96 women, a morbidity incidence of 12.6 per cent. Nonfatal embolus and thrombophlebitis each occurred in 1 patient.

There were 4 maternal deaths, 0.53 per cent, a figure twice as great as the maternal mortality rate for 1942 for the country at large. However, it should be remembered that the time interval of the present series dates to Jan. 1, 1927 and that comparison with mortality rates of 1942 is not necessarily accurate. Brief histories of each of these fatalities follow:

1. L. G., a sextigravida, quadripara aged 40, was admitted Jan. 22, 1933 in labor at term with a temperature of 102 F.,

TABLE 2.—*Weight*

	Patients	
	Number	Per Cent
220 to 224 pounds	497	65.1
225 to 249 pounds	174	22.9
250 to 274 pounds	61	8.1
275 to 299 pounds	24	3.2
300 pounds and over	4	0.5
Total	760	

Average weight at time of labor, 224.6 pounds.
Median weight at time of labor, 219.1 pounds.

cough, hemoptysis and cyanosis. Death ensued twenty-seven hours after a brief labor and was thought to have been caused by influenzal pneumonia.

2. M. B., a tertigravida, secundipara aged 26, was delivered spontaneously on March 30, 1936 of a normal child. Immediately post partum a preexisting third degree tear was repaired. The patient developed sepsis and clinical signs of peritonitis and died on the seventh postpartum day.

3. E. G., a primigravida aged 27, developed sepsis after a normal, spontaneous labor. Autopsy on the fourteenth postpartum day revealed generalized peritonitis, acute endometritis, myometritis and bronchopneumonia. The causative organism was a hemolytic streptococcus.

4. R. H., a septigravida, sextipara aged 40, was admitted on July 16, 1938 at term with a normal blood pressure, 1 plus albuminuria and edema of the ankles. Twelve days later a routine medical induction with premature artificial rupture of the membranes was followed by a thirty-two hour period of latency during which the patient developed a fever of 104.6 F. She suffered acute circulatory collapse immediately after a twelve hour labor and developed anuria, from the effects of which she died on the thirteenth day. Since no autopsy was permitted, the cause of the anuria was not ascertained.

REPEATED PREGNANCY IN OBESE WOMEN

Ninety-nine of the obese women of the present series were delivered in the clinic two or more times. Eighty-five were delivered twice, 11 three times and 1 each four,

TABLE 3.—*Previous Pregnancies*

	Patients	
	Number	Per Cent
0	129	16.9
1	115	15.3
2	109	14.3
3	90	11.8
4	68	8.9
5 or more	249	32.8
Total	760	

TABLE 4.—*Incidence of Antepartum Complications*

	Patients	
	Number	Per Cent
Toxemia of pregnancy	239	31.4
Hypertensive disease	208	27.4
Preeclampsia	29	3.8
Eclampsia	2	0.3
Glycosuria *	162	21.4
Anemia †	32	4.2
Contracted pelvis	5	0.6
Miscellaneous ‡	5	0.6
Hypertensive disease and glycosuria	53	7.0

* Presence of 1 plus sugar in urine on at least two occasions. One of these patients subsequently developed diabetes.
† Less than 10 Gm. or 70 per cent hemoglobin.
‡ Includes placenta previa, pyelitis and 1 patient with diabetes.

five and six times. In all, 218 deliveries resulting in 223 children (5 sets of twins) were observed among these 99 women. One of the mothers, previously mentioned, died of influenzal pneumonia following the second delivery at University Hospitals. Eleven (4.9 per cent) of the 223 infants succumbed.

Only 16 (16.2 per cent) of these 99 women went through successive pregnancies without a single adverse incident. Twenty-nine (29.3 per cent) were free from complication in all but one of the observed pregnancies. In the latter group the complications in order of frequency included glycosuria in 8 women, hypertensive disease, postpartum hemorrhage and breech presentation in 4 each, occiput posterior in 3, prolonged labor in 2 and fetal death, maternal sepsis, anemia and preeclampsia in 1 each.

As pregnancies were repeated, the incidence of glycosuria decreased but the incidence of hypertensive disease, fetal death and breech and occiput posterior presentation increased.

The maternal weight tended either to remain stationary or to increase from pregnancy to pregnancy, but there was no observable change in the infant birth weight.

The only patient in the series to have six deliveries at the University Hospitals lost the third and the sixth child. The first pregnancy was without incident. Glycosuria was observed in the second and fourth, but in no other. Hypertensive disease developed during the fifth and resulted in the antenatal death of the infant during the sixth pregnancy. Her weight increased some 50 pounds (23 Kg.) during the period of observation.

COMMENT

There seems to be little doubt that obesity increases the hazards of childbearing. Of these, hypertensive disease is outstanding since nearly one third of the patients suffered from it. Intervention at labor was more frequently necessary and the children were larger

TABLE 5.—*Presentation*

	Patients	
	Number	Per Cent
Occiput anterior	665	87.5
Occiput posterior *	50	6.6
Breech	42	5.5
Transverse	2	0.3
Face and brow	1	0.1
Total	760	

* Delivered as such.

TABLE 6.—*Labor*

	Patients	
	Number	Per Cent
Spontaneous	687	89.0*
Operations aimed at delivery	85	11.0
Forceps, low	39	5.1
Forceps, mid	14	1.8
Breech extraction	14	1.8*
Cesarean section	9	1.2†
Version and extraction	8	1.0†
Craniotomy	1	0.1
Operations during third stage	10	1.3
Credé	7	0.9
Manual removal of placenta	3	0.4

* *Five times on second twin.*
† Two times on second twin.

than average. The maternal death rate was twice normal expectancy, but the fetal death rate was not greatly elevated.

Although minor deviations tended toward the abnormal, there were no outstanding departures from normal other than those previously mentioned, namely, hypertensive disease, glycosuria and an increase in the operative incidence, maternal mortality rate and average infant birth weight. This is not entirely in agreement with previous reports.[1] In this connection it should be emphasized that the women of this study were essentially young. One third of them were less than 25, more than one half less than 30 and three fourths under 35 years of age. Obesity with them was not a disease of advancing years but was present from early adolescence. More and more it is becoming apparent that youth is an ally of both primigravid and multigravid women.

Considering the obesity, the fertility of this group was astonishing. Although figures were not analyzed for more than five previous pregnancies, it is possible to say that these women gave birth to at least 2,120 children before coming under observation. Together with the 774 babies born during the period of observa-

TABLE 7.—*Infant Birth Weight*

	Number	Per Cent
1,500 to 2,499 Gm.	28	3.6
2,500 to 2,999 Gm.	89	11.4
3,000 to 3,499 Gm.	217	28.0
3,500 to 3,999 Gm.	265	34.3
4,000 to 4,499 Gm.	137	17.7
4,500 to 4,999 Gm.	29	3.7
5,000 Gm. and over	9	1.2
Total (14 sets of twins)	774	

Average weight, 3,580 Gm.
Median weight, 3,600 Gm.

tion, there is a total of 2,894 infants produced by 641 obese women, or an average of 4½ apiece. Surely these figures should make one question the often repeated statement that "obese patients are more frequently sterile than women with normal weights." [2]

CONCLUSIONS

1. The incidence of obese women (200 or more pounds) among obstetric patients at the University of Iowa was 1 : 26.

2. The average age at the time of labor was 29.1 years.

3. The incidence of hypertensive disease was 27.4 per cent and of all the toxemias of pregnancy 31.4 per cent.

4. The incidence of breech presentation was slightly increased (5.5 per cent), but otherwise there was no increased rate of abnormal presentation.

5. Operations aimed at delivery were performed in 11.0 per cent of the labors.

6. The average weight of the newborn was 3,580 Gm.

7. The maternal and fetal mortality rates were 0.53 and 4.52 per cent respectively, and the maternal morbidity rate was 12.6 per cent.

8. Ninety-nine women were observed in successive pregnancies. The incidence of hypertensive disease,

TABLE 8.—*Cause and Timing of Fetal Death*

Antenatal	Intrapartum	Neonatal
Macerated, no other finding 9	Birth injury (including 1 craniotomy) 6	Birth injury 5
Maternal toxemia 3	No apparent cause 3	Atelectasis 1
Maternal diabetes 1	Intrapartum infection 2	Immaturity 1
No apparent cause 1		No apparent cause 1
Anencephaly macerated 1		Tracheoesophageal fistula 1
Total 15	Total 11	Total 9

fetal death and breech and occiput posterior presentations tended to increase with repeated pregnancies.

9. Each of the 641 women of this series produced an average of 4½ babies by the conclusion of the period of observation.

2211 Oak Lawn Avenue.

2. Möller, C. E.: Course of Pregnancy, Labor and Puerperium in Overweight Primiparas, Acta obst. et gynec. Scandinav. **18**: 226-236, 1938.

ABSTRACT OF DISCUSSION

DR. FREDERICK H. FALLS, Chicago: With the endocrine imbalance which probably accounts for the obesity of a number of these patients, it is not surprising that a glycosuria might be present in an unusual percentage. It would be interesting to know what the sugar tolerance of those not showing glycosuria might be. The relative infrequency of abnormal presentations corresponds with my experience. The conservative treatment based on the uncertainty of diagnosis possibly may have permitted spontaneous correction of some of the malpositions during the early part of the labor, which may give us food for thought in the management of some of the less obese patients. The incidence of postpartum hemorrhage may have been kept to a low level for the same reason. That the children from these women would be relatively heavy is to be expected. It would be interesting to know in this connection what patients delivered prematurely, what at term and what of them went to postmaturity. Also the fact that 85 per cent of these women were able and did nurse their babies at least in part is instructive. The effect of the obesity on the cause of death in the 4 cases described is not at all clear. Case 1 was evidently a nonobstetric death due to pneumonia. Case 2 was due to an error in obstetric judgment in repairing a previously existing third degree tear at the time of delivery. Case 4 might be legitimately charged as an obstetric death, but the propriety of rupturing the membranes when the patient was obviously not ready to go into labor might be questioned. Case 3 must be accepted as an obstetric death. The fact that all these deaths were associated with infection suggests that obesity might have some depressant action on the immunity mechanism of this group of women. The morbidity rate of 12.6 per cent also suggests this possibility. The lesson to be learned from analysis of such a series is that conservative management will give the best results. Most of them will deliver spontaneously or with low forceps if allowed to do so. Watch for toxemia as a cause of overweight. Avoid any manipulation that may introduce infection, because these women stand infection poorly. As a corollary of the last statement give penicillin, if available, and the sulfonamides, if not, prophylactically in adequate dosage to patients even suspected of having infection.

DR. NEWLIN F. PAXSON, Philadelphia: My attention was first drawn to this interesting subject in reviewing for the Philadelphia Maternal Mortality Committee a series of fatalities of hypertension and pregnancy. In a series of cases in Philadelphia it was found that approximately 25 per cent could be labeled as obese; consequently I have been particularly interested in these cases and have observed some of the common abnormalities during pregnancy and delivery. I have observed particularly hypertension and glycosuria as the most common complication during pregnancy. During labor I have observed a high incidence of uterine inertia with poor uterine contractility, which may be one factor in causing prolonged labor. I also have found a higher incidence than usual of abnormal pelves, particularly of the android type, which may account for some forms of dystocia. Post partum I have found a higher incidence of hemorrhage and a greater tendency toward sepsis, so that all cases of obesity that come to our clinic have been listed as potential danger cases requiring particular study and they are held under closer observation than the average. The cases that tax surgical judgment to the utmost are those of spontaneous premature rupture of the membranes before the onset of labor, with a greater incidence of sepsis and a long, slow labor. These are viewed with extreme respect, and I should like to ask Dr. Mengert how he would suggest that such difficult cases be handled.

DR. WILLIAM F. MENGERT, Dallas, Texas: There is an increased hazard with the obese pregnant woman, but we have tried to emphasize that this hazard is not overwhelming, that it is possible for the woman to conceive, to give birth to a great many children and still remain alive. I wonder if endocrine imbalance has a great deal to do with glycosuria in these patients, because it has always seemed to me that pregnancy represents a high function of the endocrine system, and imbalance is usually represented by failure to conceive or go to term if conception takes place. I have felt that in this series we are dealing with young women who enjoy excessive eating and have done so since early adolescence. Regarding case 2 and the error in obstetric judgment in repairing a complete tear post partum, I believe that in many quarters this is accepted practice, and the question that arises is Might not the woman have developed sepsis had her tear not been repaired? There is always criticism concerning the matter of elective, premature, artificial rupture of the membranes, but I should like to point out that in case 4 there was valid indication, since mild toxemia was present, with edema and albuminuria. Regarding Dr. Paxson's question concerning management of a patient with spontaneous premature rupture of the membranes followed by a long latent period, that is an extremely difficult problem. These women are prone to develop infection, and some recent work by the co-author of this paper shows that with sepsis developing before or during labor the fetal mortality rate is alarmingly high. In some 180 such patients approximately 50 per cent of the babies died, chiefly from septicemia or pneumonia. I think that effort should be made to get that patient into labor and then treat her by as conservative obstetric principles as possible. Regarding the high incidence of abnormal pelves in hypertensive women in Philadelphia, I wonder if this has any special association with obesity.

Clinical Notes, Suggestions and New Instruments

PRETIBIAL FEVER

LAURA L. LIPSCOMB, M.D., NEW HAVEN, CONN., AND JEAN L. McMAHON, M.D., MINNEAPOLIS

Pretibial fever, by name, is a new disease. Daniels and Grennan [1] in 1943 reported an epidemic among men in an army camp. An outbreak of a febrile disease with similar clinical features and known locally as "Brushy Creek" fever was described by Bowdoin [2] in 1942 as possibly a new disease entity.

The following case, which clearly falls into this clinical category, is reported because (1) it is unusual in its isolated occurrence, and (2) it presents an additional feature not hitherto noted:

REPORT OF CASE

History.—F. H., a white boy aged 10 years, was admitted to the New Haven Hospital on Aug. 29, 1944 with fever, nausea and pain in the extremities. He was well until two days before admission, when he became feverish and anoretic. A sensation of stiffness of the upper extremities developed and he complained of shooting pains down his arms on motion. The following day the symptoms persisted and the patient was nauseated. During the afternoon there were "stabbing" pains in the lateral aspect of both thighs on walking. On the third day of illness the pain in the extremities was less severe but he remained anoretic and feverish. The family physician examined the child and found spasm of the back muscles and a rectal temperature of 102 F. A tentative diagnosis of acute anterior poliomyelitis was made and the patient was admitted to the New Haven Hospital.

Examination.—At the time of the child's admission his temperature was 103.3 F. and the pulse rate was 96. He appeared

From the Department of Pediatrics, Yale University School of Medicine, and the Children's Clinic of the New Haven Hospital.

1. Daniels, W. B., and Grennan, H. A.: Pretibial Fever, J. A. M. A. 122: 361 (June 5) 1943.
2. Bowdoin, C. D.: A New Disease Entity (?), J. M. A. Georgia 31: 437 (Dec.) 1942.

moderately ill. There was mild injection of the pharynx, spasm of the erector spinae muscles with pain on anterior flexion of the spine, and slight spasm of the hamstring muscles bilaterally. The neck was supple and there was no rash.

The admission total white blood cell count was 8,100, with 71 per cent polymorphonuclear leukocytes, 21 per cent lymphocytes, 7 per cent monocytes and 1 per cent basophils. There was no anemia. The blood Kahn reaction was negative. Rhinopharyngeal cultures contained no pathogens, and blood culture was sterile. There was a transient 1 plus albuminuria, with normal microscopic findings. Lumbar puncture was performed on admission and revealed clear fluid under normal pressure. There were 5 white cells per cubic millimeter, all of which were lymphocytes. Stained smear of the spinal fluid showed no organisms, and cultures were sterile. The spinal fluid contained 52 mg. of protein and 81 mg. of sugar per hundred cubic centimeters. The result of the Lange colloidal gold test was 4555555543. The spinal fluid Wassermann test gave a 4 plus reaction with cholesterinized antigen and no reaction with alcoholic antigen. Lumbar puncture was repeated on the third hospital day and clear spinal fluid containing 5 lymphocytes per cubic millimeter was obtained. Protein was 21 mg. per hundred cubic centimeters and sugar 59 mg. per hundred cubic centimeters. Cultures were sterile. The Wassermann and colloidal gold tests were not repeated at this time. Intracutaneous tests with old tuberculin were negative through 1.0 mg. Agglutination tests for the typhoid-paratyphoid group, brucella, Proteus OX 19 and heterophile antibodies were done on blood samples taken on the fifth, twenty-sixth, sixty-second and one hundred and tenth days after the onset of the disease and were negative.

Course in the Hospital.—During the first two days of hospitalization the patient's temperature ranged from 100.8 to 103.3 F. He remained moderately ill. On the afternoon of the third hospital day (fifth day of illness) he had a chill and his temperature rose to 105.8 F. A blood culture taken at this time was again sterile. Shortly after the chill an exanthem vaguely resembling erythema nodosum and characterized by numerous erythematous, slightly raised, nontender lesions was observed over the pretibial surface of both legs. The lesions varied in size from 1 by 1 to 2 by 2 cm. except in areas where they were coalescent. The involved areas felt warmer than the adjacent normal skin and blanched on pressure. On the following day (sixth day of illness) the rash persisted and a few similar lesions were observed on the posterior and lateral aspect of the legs and the distal, anterior aspect of the thighs.[3] The temperature remained elevated between 102.2 and 106 F. and the spleen became palpable. On the seventh day of illness the patient was essentially afebrile until in the evening, when the temperature rose and remained between 100 and 102.2 F. during the following two days. The rash had faded considerably on the seventh day but on the eighth was more brilliant than ever. Subsequently it faded and was not apparent after the ninth day. There was no associated inguinal lymphadenopathy, and an enanthem was never observed. The patient became afebrile on the tenth day and remained so. He was discharged home two days later. The spleen was not palpable at this time.

The patient was examined in the Pediatric Dispensary of the New Haven Hospital on the twenty-sixth, sixty-second and one hundred and tenth days after onset of the disease. On each occasion he appeared well and was asymptomatic, and physical examination revealed no abnormality. Total blood leukocyte counts were 3,600, 7,000 and 7,600 per cubic millimeter respectively. On the one hundred and twenty-eighth day after the onset of the disease the patient returned for repeat lumbar puncture. Clear spinal fluid containing 2 lymphocytes per cubic millimeter was obtained. Protein was 21 mg. per hundred cubic centimeters, sugar 52 mg. per hundred cubic centimeters and chloride 127.6 milliequivalents. Colloidal gold and Wassermann tests were negative.

The parents and 3 siblings of the patient remained well. There was no known similar disease in the locality.

3. The diagnosis of pretibial fever was first suggested by Dr. Dorothy Horstman of the Section of Preventive Medicine, Department of Internal Medicine, Yale University School of Medicine.

COMMENT

The case presented is a classic example of pretibial fever. Daniels and Grennan[1] first described this disease by name in their report of an epidemic febrile illness which occurred in 40 soldiers at Fort Bragg, North Carolina. It was so named because the most striking finding was an erythematous, nonpetechial rash which appeared about the fourth day of illness and which was solely or predominantly pretibial in distribution. Other typical features were abrupt onset, myalgia, splenomegaly, bradycardia and leukopenia. The etiology and mode of transmission of the disease could not be determined despite extensive studies.

Previously Bowdoin[2] in 1942 reported an outbreak of a febrile illness which he considered to be a new disease entity and which may have been pretibial fever. The general clinical picture in these cases was compatible with this diagnosis. An

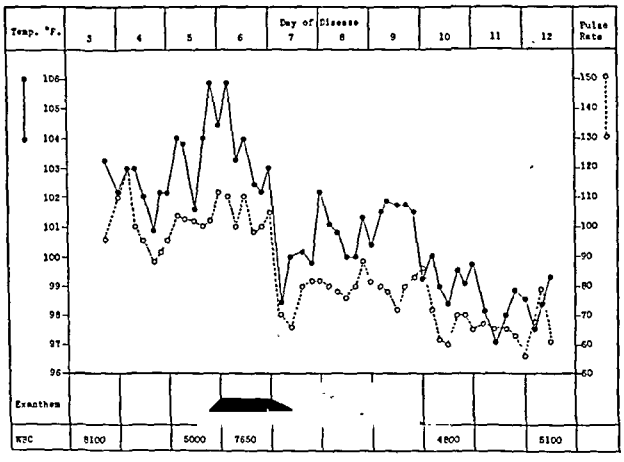


Fig. 1.—Clinical course of patient during period of hospitalization.

exanthem was observed in only 9 of the 35 cases, but in 8 cases it was solely pretibial in distribution.

At the present time the diagnosis of pretibial fever must be made on the basis of history, physical findings and clinical course. The nature of the morbid process may well remain an enigma until the appearance of the characteristic rash.

Also, in the absence of the typical exanthem, sporadic cases cannot be recognized. It should be mentioned in this connection that Greenfield[4] described as an example of pretibial fever a case in which the rash was atypical as to type and distribution and which presented other such unsual features as generalized lymphadenopathy and pneumonitis with fatal termination.

If a diagnostic test becomes available, less clinically obvious cases may be included as examples of pretibial fever. For that matter, the possibility exists that pretibial fever is not a specific disease entity. In the meantime this clinical classification tends to focus attention on such cases so that they can be studied in more detail.

SUMMARY

A case of pretibial fever, observed in a 10 year old boy, was unique in its isolated occurrence. Though some of the previously reported cases have shown nuchal rigidity, this is the first in which abnormalities of the spinal fluid have been found, namely increased protein content and positive colloidal gold and Wassermann tests.

4. Greenfield, Irving: Pretibial Fever, Urol. & Cutan. Rev. 47: 435 (July) 1943.

CORRECTIVE CAST FOR TREATMENT OF LOW BACK PAIN

EMIL D. W. HAUSER, M.D., CHICAGO

Low back pain, in most cases, is due to a strain which causes an inflammation in the region of the lumbosacral and sacroiliac articulations. Strain is the result of an imbalance between the capacity of the structures of the back and the physiologic demands made on them. This imbalance is called a functional decompensation. A decompensation of the back gives rise to certain symptoms and findings.

The symptoms are low back pain and tiredness; this fatigue of the back is often associated with a general fatigue. The first pain noted is usually generalized and is in the muscles, with associated stiffness on arising after rest. Later the pain localizes and may involve the lumbosacral angle or the sacroiliac joint. In the acute phase of this condition there is a sudden "catch," associated with lumbar muscle spasm, loss of the lumbar curve, a protective list with a pelvic tilt, limitation of motion in the lumbar area and a positive Laségue sign. Paresthesia along the course of the sciatic, lateral cutaneous and gluteal nerves is a frequent complication. This is a referred

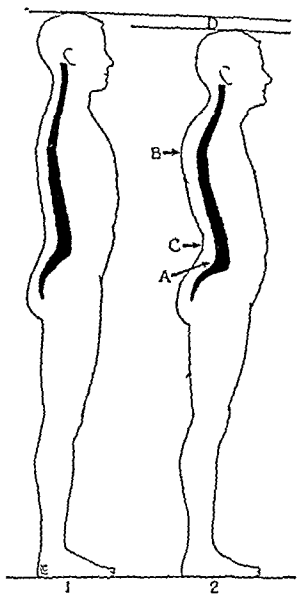


Fig. 1.—Good posture with normal anteroposterior curves.
Fig. 2.—Poor posture with increase of anteroposterior curves.

pain due to repeated stimuli caused by the strain and inflammation of the joint with a low threshold of the nervous system. Decompensation causes a sagging of the back with an increase of the normal curves, dorsal kyphosis and lumbar lordosis. The lumbosacral angle becomes more acute and the shearing force is increased. This produces strain on the lumbosacral and sacroiliac joints, with inflammation of the ligaments and articular surfaces.

The treatment of low back pain, therefore, consists in correction of the deformity, relief of the strain at the sacroiliac and lumbosacral joints and elimination of the decompensation of the back. This is accomplished by means of a so-called active cast. An active cast is one which is applied with the body in a position such that the natural forces of the body will act against the cast. In this way the cast has the effect of exerting a corrective force. To correct the dorsal kyphosis I consider first that 20 per cent of normal motion is in the dorsal area and 80 per cent in the lumbar area. Therefore the dorsal curve is more fixed than the lumbar curve. With the pelvis held in the normal position and the patient bending forward, the lumbar curve can be brought to any desired position. The lumbar curve could be fixed in the normal position by means of a plaster of paris cast applied with the body bending forward. Since the body will always assume the upright position, owing to the self-righting reflex (Sherrington), the natural forces of the body will act against the cast to correct the dorsal kyphosis.

A further analysis of the forces involved in such a corrective cast follows. Figure 1 shows the position and shape of the spinal column in a normal human body. The column is kept

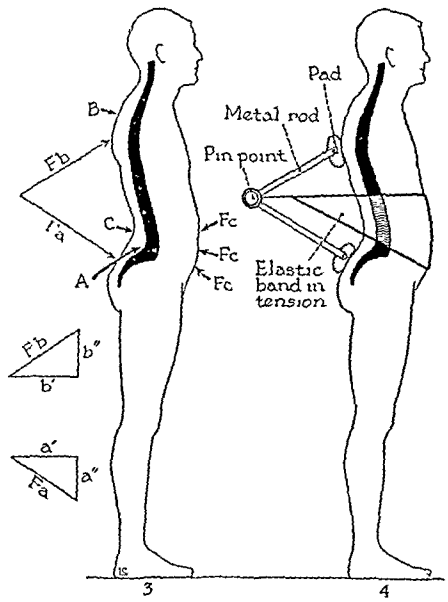


Fig. 3.—Force vectors applied to correct postural defects.
Fig. 4.—A theoretical device for correction of postural defects.

erect by the action of the muscles of the back, abdomen and chest. The action of these muscles is similar to that in a segmented tent pole which is kept erect by the action of many guy wires. If the muscles are not able to function normally, the body will sag in the direction of the curves already present. An incorrect posture, as seen in figure 2, will result. Since the lumbosacral angle has been decreased, the shearing force at this point is greater. Furthermore, the increase of the dorsal and

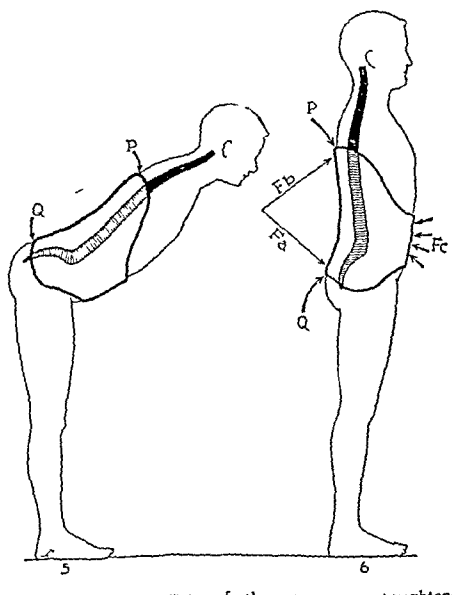


Fig. 5.—Anteroposterior curves of the spine are straightened when trunk is flexed. Plaster cast applied in this position.
Fig. 6.—Force vectors applied to correct postural defects when upright position is assumed in plaster cast.

lumbar curves results in a decrease in the height of the person. This decrease must be accompanied by more strain on the ligaments at the lumbosacral and sacroiliac joints. To correct these mechanical defects, the forces are applied as in figure 3. The

two forces *Fa* and *Fb* are concentrated in their application, while the total force *Fc*, acting on the abdomen, is distributed over a large area, and thus the pressure at any one point is not too great. For this reason the forces *Fa* and *Fb* are represented by single vectors, while the total forces in the abdomen are broken down into smaller forces over the area. All of the forces acting on the body are in equilibrium. The two forces *Fa* and *Fb* have components acting vertically away from each other, which put the spine in vertical tension and thus straighten it. The forces *Fa* and *Fc* act against each other and work toward removing the sag and reducing the shearing force. The dorsal curvature is corrected by the action of the horizontal component *Fb*. When the body assumes the upright position, the self-righting reflex acts against the force *Fb* to correct the dorsal curvature. A device which will apply the forces just described is shown in figure 4. Two rigid bars are used to apply the forces *Fa* and *Fb* respectively. To put these bars in compression, an elastic strap is applied as shown in the illustration. The strap passes over the abdomen, applying the distributed forces *Fc*. This device would apply all three forces necessary to correct the poor posture.

A practical application of this device is obtained by means of a plaster of paris cast, as seen in figure 5. With the patient bending forward and with extension on the head, curvatures of the spine are decreased. When the cast is applied to the lumbar spine and pelvis this curve becomes fixed, with the patient bending forward. When the patient stands upright (self-righting reflex), in effect the forces are applied as seen in the illustration with the elastic band device (fig. 4), with one important difference. In the elastic band device the variable force was applied by the band and the patient would have no control of the forces acting on him. In the plaster cast the patient actually applies the force on himself. After the cast is applied and the patient assumes the upright position (fig. 6) the back is longer than before. The height of the patient has been increased. Therefore when the patient is tired he will sag, but the body weight will come to rest on the top of the cast and be transmitted onto the pelvis, relieving the strain on the lumbosacral and sacroiliac joints. Thus the cast exerts forces to correct the deformity of the back and at the same time relieves the strain on the joint so that the inflammation can subside. Since the trunk is extended and the body is higher than before the application of the cast, more work is required to hold the upright position. This brings about an increase in the demand on the muscles, which acts to strengthen these structures. This increase in strength is further abetted by means of graduated exercises, alternated with periodic rests to prevent muscular strain.

The treatment is ambulatory, and relief is obtained at the same time that correction is taken. Pressure sores are not encountered.

This treatment by active cast has been applied in 2,626 cases. Excellent results were obtained in 35.6 per cent of the cases. This meant complete and permanent relief of symptoms under all circumstances. In 58 per cent of the cases the results were good. These patients were relieved of their symptoms and were satisfied but felt occasional aching or tiredness as a consequence of excessive strain. There were fair results in 3.4 per cent of the cases. These showed definite improvement but did not have complete relief of all their symptoms. Those who were not satisfied were considered poor results and composed 3 per cent of the cases.

SUMMARY

1. Low back pain is frequently due to an imbalance between the demand made on the back and the capacity of the back to do the work required of it.

2. In addition to the symptoms of low back pain, fatigue, soreness and stiffness in the back, the decompensated back has an altered posture. The normal dorsal and lumbar curves are increased.

3. The lumbosacral angle is more acute, increasing the shearing force.

4. The body sags, putting strain at the lumbosacral and sacroiliac joints, with the resulting inflammation of these joints.

5. A cast can be applied to correct the position, decrease the strain on the lumbosacral and sacroiliac joints and increase the capacity of the back.

6. A statistical study of 2,626 cases in which the corrective cast was applied showed excellent results in 35.6 per cent of the cases, good results in 58 per cent, fair results in 3.4 per cent and poor results in 3 per cent.

720 North Michigan Avenue.

Special Article

THE MEDICAL OFFICER AND FUTURE INDUSTRIAL MEDICAL PRACTICE

LIEUTENANT COLONEL HAROLD C. LUETH
Surgeon General's Liaison Officer
MEDICAL CORPS, ARMY OF THE UNITED STATES

Interest in the practice of industrial medicine has been constantly growing among the medical profession. Since the war started there have of necessity been certain changes, especially a curtailment of qualified personnel. For purposes of future planning it is desirable to have an estimate of the likely status of industrial health in the future.

The Committee on Postwar Medical Service made a study of the future desires of medical officers. At the time the committee devised its questionnaire, arrangements were made for the inclusion of questions concerning industrial practice. A pilot questionnaire mailed to 3,000 medical officers included a number of questions concerning industrial practice; in the response to this inquiry a small number of men indicated interest in the several fields of industrial practice. A final questionnaire was later prepared and distributed to each medical officer on active duty with the Army, Navy, Public Health Service and Veterans Administration. Owing to limitations of space and the indicated limited interest in industrial health compared to other features of general medical practice, the section on industrial practice of the questionnaire was brief.

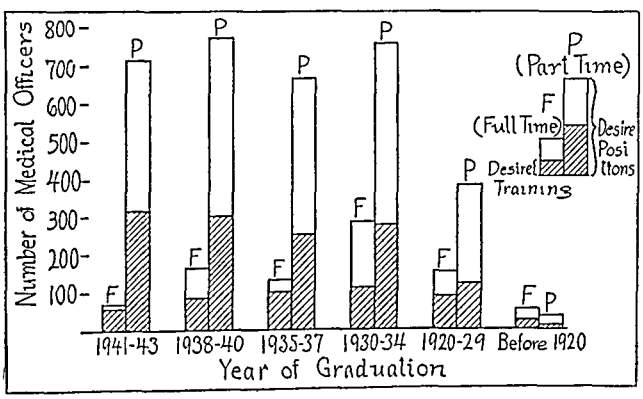
The first question asked was "Would you wish a position in industrial medical practice?" One fourth of all men, or 4,215 who returned questionnaires, indicated that they were interested in the industrial field. There were 863 men who wanted full time positions and 3,352 men who wanted part time positions. Requests for full time positions in industrial practice were scattered among the different graduation groups. For example, there were 73 requests from graduates of 1941 to 1943, 164 from graduates of 1938 to 1940, 136 from graduates of 1935 to 1937, 285 from graduates of 1930 to 1934, 153 from graduates of 1920 to 1929 and 52 from graduates of before 1920. About 80 per cent of the total, or 16,579 medical officers, definitely indicated that they were not interested in industrial practice.

Another question asked was "Would you wish special training to qualify for such a position?" Medical officers who would like to have full time positions in industrial medicine were about equally divided; there were 484, or 56 per cent, who wanted special training, and 379, or 44 per cent, who did not want special training. The greatest number of requests for special

training came from the youngest graduates. The other graduation groups were about evenly divided between those who wanted special training and those who did not. The following numbers of requests came from the several graduation groups: 59 from group 1, 88 from group 2, 99 from group 3, 118 from group 4, 95 from group 5 and 25 from group 6.

About four times as many men wanted part time positions in industrial medicine as wanted full time positions. Requests came from about the same number of men in each of the first four graduation groups. There were 716 requests from graduates of 1941 to 1943, 773 requests from graduates of 1938 to 1940, 672 requests from graduates of 1935 to 1937, 768 requests from graduates of 1930 to 1934, 388 requests from graduates of 1920 to 1929 and 35 requests from graduates of before 1920.

A little more than one third of the men who would like to engage in part time industrial medical practice would also like to take special training to qualify for positions. Nearly the same ratio of men who wanted special training to the total number in the graduation



Analysis of 21,029 returned questionnaires with respect to future desires of officers concerning industrial medical practice and training.

group was observed in each of the six graduation groups. Requests for special training came from 311 officers of group 1, 299 of group 2, 233 of group 3, 274 of group 4, 130 of group 5 and 52 of group 6.

There were 235 medical officers who were undecided about future work in industrial health, among whom 65 definitely requested further training.

Special courses in industrial health were requested by a total of 1,809 medical officers. They included men who desired full time positions in industrial medicine, men who desired part time positions in industrial medicine and men who were undecided about future positions in industrial medicine. The following number of men made requests: 381 from graduates of 1941 to 1943, 405 from graduates of 1938 to 1940, 346 from graduates of 1935 to 1937, 408 from graduates of 1930 to 1934, 231 from graduates of 1920 to 1929 and 38 from graduates of before 1920.

The questionnaire was divided into six parts: (1) general information, (2) educational, (3) industrial, (4) practice and licensure, (5) economic and (6) additional information. On the front of the questionnaire the educational portion occupied three fourths of the page, and it listed different types of training, such as internship, residency, fellowship, review courses and "other." It also listed a number of special forms of medical practice. As a result there were a number of men who entered their desire for additional training in industrial work under the educational portion of the questionnaire.[1] They naturally represented a much smaller group than those who indicated their desire for special training under the industrial section, since the questions under the latter section focused attention on the possibilities of future training and practice.

Under the educational section there were 34 requests for training in industrial medicine; of these, 21 men wanted short courses and 13 wanted long courses. There was one request for insurance training.

Short Courses.—Requests came from 3 graduates of group 2, 4 of group 3, 9 of group 4 and 5 of group 5, and most of them were for unspecified periods of training. Almost all of them had been on active military duty for two or more years.

Long Courses.—Thirteen medical officers requested training in industrial medicine and 1 in insurance work. Nearly all who wanted future training in industrial medicine were graduates before 1934 and preferred courses of six to twelve months. About half the men were in industrial practice before entering the military service; the other half were formerly in private medical practice. The request for insurance training came from a 1942 graduate who entered the Army from internship and who wanted a two year course.

Returns from the final questionnaires indicated that about 4 per cent of men in each graduation group, except group 1, wanted full time positions in industrial medicine. There were only 1.7 per cent of the medical officers in graduation group 1 who were interested in full time industrial positions. From the pilot questionnaire [2] it was shown that more than seven times as many men desired a university course of training as desired training in industry. The study also revealed that the major fields of interest were industrial surgery, insurance and plant medical department work. From this it appears that those interested in furthering sound future industrial medical practice should seek to interest younger medical officers by acquainting them with opportunities along the line of university training supplemented by in-service training in industrial plants.

Since the various aspects of industrial medical practice will be most influenced by the character and number of physicians who engage in its full time practice, encouragement of sufficient numbers of younger men in the field among whom the more capable may be selected for thorough training in its different aspects is the best assurance of meeting the objectives of good industrial medical practice in the future.

Over 16 per cent of the medical officers in each graduation group wanted part time positions in industrial medicine. While physicians engaged in part time industrial medicine render important service concerning care of patients, it is doubtful that they exert much influence on the future development of the field. Many men engaged in part time industrial practice are interested in the financial returns and view the positions as an economic security and are only secondarily concerned with future developments of sound, high grade industrial medical practice. Improved training facilities in both universities and industry and the selection of the more qualified younger men for full time positions, it is believed, will be instrumental in the development of improved industrial medical practice both for full time and for part time practitioners.

1. Lueth, H. C.: Postgraduate Wishes of Medical Officers: Final Report on 21,029 Questionnaires, J. A. M. A. **127**: 759 (March 31) 1945.
2. Lueth, H. C.: Results of Pilot Questionnaire to Physicians in Service, J. A. M. A. **125**: 558 560 (June 24) 1944.

Council on Foods and Nutrition

SPECIAL ARTICLE

This is the fourth of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication

GEORGE K ANDERSON, M D, *Secretary.*

PROTEIN IN SURGERY

CHARLES C. LUND, M D.
AND
STANLEY M. LEVENSON, M D.
BOSTON

During the period of great expansion in surgery that followed the introduction of anesthesia and of asepsis, surgeons focused their attention on anatomy, surgical technic, pathology and bacteriology Early it was seen that patients who could not survive complete operations might survive multiple stage operations if the first stage was a simple procedure that relieved an interference in some vital function. After such procedures a period of rest and good nutrition frequently resulted in improvement in the patient's health, so that he could survive the more serious curative operation at the second stage. Studies were not made of the optimum diets to use in the interval between operations.

Recently new methods of study and treatment of nutritional deficiencies, including protein deficiencies, have been developed. The opening article in this series, by Stare and Davidson,[1] reviews the modern knowledge of protein nutrition. The correction of protein deficiencies is of importance in shock,[2] in local [3] or general [4] hypoproteinemic edema, in wound healing,[5] in immunity to infection [6] and in detoxication of poisonous substances.[7] The methods of treatment include the use of whole blood, plasma and albumin for acute deficiencies such as hemorrhagic shock; protein hydrolysates, concentrates and diets for less acute and for chronic deficiencies.

THE CAUSES OF PROTEIN DEFICIENCY IN SURGICAL PATIENTS

The subject of nitrogen balance has been discussed previously in this series.[8] This discussion will therefore be limited to the importance of those causes of protein deficiency not including chronic dietary deficiencies, or failure of formation of protein due to liver disease, that are seen especially in surgical practice, although the surgeon must realize that the most important and frequent factor in protein deficiency is inadequate intake of food. Losses of protein may be from the intestine, through the kidneys, from any wound or orifice of the body, in internal exudates and transudates, and from any pathologic condition of the skin that causes oozing or desquamation. In general, losses from the intestine are important only in the presence of copious or long continued bleeding, diarrhea or vomiting, or due to the feeding of diets containing large amounts of roughage, and, from the urine, in the period of the increase in protein catabolism that follows injury or infection or in the nephrotic syndrome.

Coincident with the early effects of any acute trauma, poisoning, infection or even of unusual extreme exercise, a large output of nitrogen may occur in the urine that lasts for many days or even weeks. Surgical or traumatic shock does not necessarily form a part of this picture. A large part of this output of nitrogen in burns may be in the form of "undetermined" nonprotein nitrogen [9] rather than of the substances such as urea that are usually found in the urine. Satisfactory chemical characterization of the compounds excreted has not been made. Cuthbertson [10] found that nitrogen losses in the urine after fractures reached 25 Gm. per day and remained high for many days. *Elman* [11] found losses of similar magnitude after surgical operations. Lucido [12] and Taylor [9] found similar large losses following burns. In one of Taylor's cases there was a loss of 45 Gm. of nitrogen in one day. Browne [13] has found that a negative nitrogen balance may last up to forty-five days after some injuries. Important losses from wounds occur only in wounds of large size with large quantities of discharge such as are seen in osteomyelitis, chronic pleuropulmonary infection, other severe chronic infections or chronic bleeding. Important losses of nitrogen from the skin are commonly seen only in deep burns of large area, but in these the losses may be extreme and may continue over long periods of time. Early after superficial burns there is a large output of plasma-like fluid through the skin. This contains a high proportion of protein.[14] Later, during the sloughing stage of deeper burns there is a steady and severe loss of protein in the form of purulent material from the bed of granulations. This loss has been estimated by Taylor [15] and measured by Hirshfeld [16] and Co Tui.[17] They find that these losses may reach many grams of nitrogen per day, and the amount of loss varies directly with the area involved. These losses continue until healing is complete. Co Tui [18]

Drs C. S. Davidson and F. H L Taylor made many helpful suggestions and criticisms.

From the Burn Assignment of the Surgical Services and the Thorndike Memorial Laboratory of the Boston City Hospital and the Departments of Surgery and Medicine, Harvard Medical School The work described in this paper was done, in part, under a contract recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Harvard University.

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has also measured similar losses in wound exudates and from tube drainage of the upper gastrointestinal tract. These losses from surfaces and wounds have not, in the past, been considered in calculating conventional nitrogen balances, and therefore it must be realized that errors of great magnitude may be introduced into such studies unless this factor is considered. A good discussion of this subject is to be found in Taylor's [15] paper.

At the same time at which large quantities of nitrogen are being lost in the urine and from wound drainage of such patients, the protein intake is likely to be greatly reduced by reason of pain, anorexia and poor or absent gastrointestinal function. The negative nitrogen balance occurring under these conditions may have serious effects in a few days [19] in the patient with already depleted body protein, and in a few weeks [15] in a patient with excellent protein nutrition.

Casten [20] has found hypoproteinemia to be associated with anesthesia. Although the studies have not been carried far enough to determine whether protein lost from the blood stream in anesthesia is excreted or merely shifted temporarily into the tissues, he found a steady reduction in the protein level in the plasma with any anesthetic agent. If the liver function was impaired preoperatively as demonstrated by a hippuric acid test, reduction of plasma proteins followed even after short operations. Further studies of this effect of anesthesia are indicated.

RESULTS OF PROTEIN DEFICIENCY ON SURGICAL PATIENTS

Hypoproteinemic edema occurs in surgical patients only when the protein depletion is extreme. However, depletions of lesser severity may cause interference with the healing of surgical wounds and burns and with gastrointestinal function before and after operations and may be an important factor in the cause of gastrointestinal, leg and decubitus ulcers. Depletion of protein also may predispose a patient to various forms of shock and reduce the resistance to infection. For these reasons the protein deficient individual is a poor operative risk.

Edema.—The first publication indicating the importance of protein nutrition in the surgical patient was that of Jones and Eaton,[4] who found that edema due to hypoproteinemia was common in patients before and after gastrointestinal surgery and that it was usually associated with a prolonged inadequate food intake. When such patients were given the then customary large quantities of saline infusions by vein postoperatively, acute pulmonary edema frequently occurred and was often fatal. They showed that this danger could at times be obviated by substituting glucose in distilled water for a large part of the glucose in saline solution that was given postoperatively. This finding has been amply confirmed by others. Jones [3] and Ravdin [21] have shown also that local edema at the site of an operation may occur in the presence of hypoproteinemia but without generalized edema. This edema may result in obstruction of the stoma of a gastrointestinal anastomosis and may, unless corrected, result fatally. Meyer and Kozoll [22] have also reported poor function of anastomoses from this cause. Minot [23] has emphasized the vicious cycle that occurs under these conditions.

Wound Healing.—Clark [24] showed that a low protein diet increased the "lag" period in the healing of experimental wounds in dogs. Harvey and Howes [25] compared the healing of experimental wounds of rats fed a standard maintenance diet which was low in protein with the healing of the same wounds of rats fed a very high protein diet. They found much more rapid healing in the rats on the latter diet and stated that this diet stimulated healing. One could also state that these experiments showed that one or more deficiencies in the low protein diet delayed normal healing. Howes and McKeown [26] studied the healing of fractures in rats in the same manner and found the same results. They also found that the bones of the rats receiving the low protein diet broke after less force was applied to them than did the bones of the rats receiving the high protein diet. It was, however, as recently as 1938 that Thompson [5] showed that human wound healing was also adversely affected by hypoproteinemia. He found a high incidence of postoperative wound disruption in hypoproteinemic patients compared to a low incidence in normal patients. Koster and Shapiro,[27] Hartzell,[28] Koster and Kasman [29] and Meyer and Kozoll [22] have confirmed this observation. Depleted protein stores have been associated with failure of skin grafts.[30] However, it should be emphasized that low protein diets imply much more than mere protein deficiency, as low protein diets are, unless special precautions are taken, usually low vitamin diets and several vitamins, particularly riboflavin, ascorbic acid and vitamin A, are growth factors and therefore associated with healing.

Gastrointestinal Function.—Jones [3] and Mecray [31] showed that hypoproteinemia prolonged the emptying time of the stomach, and Barden [32] showed impaired small intestinal function from the same cause. These findings have been confirmed by others.[22] Jones [3] and Ravdin [21] have also shown that surgical gastric stomas are particularly prone to become edematous in the presence of hypoproteinemia. When this happens, complete obstruction of the stoma may occur. Further surgery to relieve such an obstruction is dangerous and usually ineffective. Reduction of the intake of sodium has alleviated this edema promptly in some cases.[33] Theoretically, human albumin given intravenously should be useful in such an emergency.

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32. Barden, R. P.; Thompson, W. D.; Ravdin, I. S., and Frank, I. L.: The Influence of the Serum Protein on the Motility of the Small Intestine, Surg., Gynec. & Obst. **66**: 819-821 (May) 1938.
33. Jones.[3] Jones and Eaton.[4] Ravdin, Stengel and Prushankin.[21]

Gastric and Duodenal Ulcers.—Three sets of experiments show that a low protein diet will always cause an ulcer in the forestomach of rats [34] and in the stomach of dogs [35] in a very few days. Jones and Eaton [4] and many others have shown that human gastroduodenal ulcers are frequently associated with hypoproteinemia. An exceedingly important observation is that of Co Tui,[36] who finds that a more striking remission of gastroduodenal ulcers follows treatment with a very high protein, high caloric diet than follows the conventional Sippy diet. All of the protein in his diet is given by mouth in the form of an enzymatic hydrolysate of casein and pancreas. He gives from 0.5 to 0.8 Gm. of nitrogen per kilogram of the patient's weight and a total of 40 to 50 calories per kilogram. The Sippy diet is quite different. In the first stage it is frequently made up of milk and cream; 39 ounces of this mixture gives only 35 Gm. of protein and 1,535 calories, of which two thirds are contributed by fat. For a 70 Kg. man the Sippy diet would furnish only one sixth the amount of protein and one half the calories that are furnished in Co Tui's minimum diet. The usual Sippy regimen later increases the protein intake to a little over double the original figure, but even after this increase neither the protein intake nor the caloric intake approaches those of Co Tui's diet.

Chronic Ulcers of the Skin.—Altschuler [37] has treated patients with skin ulceration, particularly those resulting from phlebitis or varicose veins, with protein hydrolysates. He frequently found that hypoproteinemia was present in these cases and that the ulcers healed rapidly when this was corrected. Mulholland [38] studied a large number of patients with decubitus ulcers and also found this type of ulcer to be universally associated with hypoproteinemia. Healing was rapid after an adequate protein intake was furnished.

Surgical, Traumatic, Hemorrhagic and Burn Shock.—A condition associated with hypoproteinemia is a reduced blood volume. The shock connected with surgical procedures, trauma, hemorrhage and burns is associated with reduced blood volume. Hypoproteinemic animals have been shown to be particularly susceptible to shock after any kind of injury. Whipple [39] long ago reported experimental shock from hypoproteinemia in plasmaphorized dogs. More recently Elman [40] has shown that in the presence of hypoproteinemia shock develops from very slight losses of blood and that, following such losses, a great decrease in the already low plasma protein concentration ensues.

Resistance to Infection.—Madden [41] showed that hypoproteinemic dogs were very susceptible to infection and that, once infection had developed, the regeneration of plasma protein was much more difficult. A study of the greatest importance to surgeons has recently been made by Cannon,[6] who studied the formation of antibodies in hypoproteinemic rats and found that under such circumstances their production was much reduced as compared to their production by normal rats. He gives a brief history of a patient whose plasma protein level was very low and who developed postoperative peritonitis and expresses the belief that the occurrence and outcome of various postoperative infections, including pneumonia, depend in large part on the titer of immune substances in the body, which in turn depend on the nutritional status of the patient.

Liver Damage.—It has recently been shown, in animals, that in the course of protein depletion the liver loses protein,[42] decreases in size [43] and becomes soft [44] and fatty.[45] In presence of hypoproteinemia such conditions as biliary obstruction,[46] chloroform anesthesia [47] and arsphenamine treatment [48] cause much more injury to the liver cells than they do in the well nourished patient (biliary obstruction) or well nourished animals (all three conditions). Conversely, the injured liver cannot manufacture albumin [49] or prothrombin [49] as well as the normal one. Thus it is seen that another vicious circle is encountered because the damaged liver cannot carry out its normal function of manufacturing proteins that it normally furnishes to the blood and which, in turn, protect it against damage. Although most of this work has been done on animals, it is likely that the human liver reacts in a similar fashion. However, one must remember again that the patient with hypoproteinemia may have important deficiencies other than protein which may affect the liver adversely.

FREQUENCY OF PROTEIN DEPLETION IN SURGICAL PATIENTS

1. *Prior to Operation or Injury.*—Jones and Eaton [4] found that hypoproteinemia was common among their patients with gastrointestinal disease coming to operation. Mulholland [38] has found this condition universally present in his cases of decubitus ulcers. Altschuler [37] found it commonly in ulcers of various types. Hartzell [28] found many instances in general surgical cases. Thornton [50] did not find this common in patients coming to thoracic surgery. Bartels [51] and Brown and Mecray [52] found it very common among the most severely affected group of hyperthyroid patients but less common in those

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44. Elman and Heifetz.[42] Oelgoetz, Oelgoetz and Wittekind.[45]

45. Oelgoetz, A. W.; Oelgoetz, P. A., and Wittekind, J.: Protein Insufficiency of Clinical Importance in Surgery on the Liver, Ohio State M. J. **33**: 643 (June) 1937.

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48. Messinger, W. J., and Hawkins, W. B.: Arsphenamine Liver Injury Modified by Diet: Protein and Carbohydrate Protective, But Fat Injurious, Am. J. M. Sc. **199**: 216-225 (Feb.) 1940.

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mildly affected. The group at the Memorial Hospital [53] found it common among cancer patients. In a study of 278 patients Meyer and Kozoll [22] found it frequently in association with a wide variety of surgical conditions, but in some instances the hypoproteinemia developed during acute illness or postoperatively. Evans and Boehme [54] have also found hypoproteinemia very common in general surgical patients. From these references it is seen that hypoproteinemia is to be expected frequently in a wide variety of conditions.

2. *Subsequent to Operation or Injury.*—Thornton,[50] who found essentially no hypoproteinemia prior to thoracic operations, observed that, in spite of careful replacement of the total amount of blood lost at operation, there was an average decrease of plasma protein concentration of 1 Gm. per hundred cubic centimeters in 31 of 32 patients within the first week postoperatively. Meyer and Kozoll [22] found a drop of 25 per cent of the plasma protein after operations for carcinoma of the colon and for intestinal obstruction. Ariel [55] found a greater fall in plasma protein in patients with cancer of the gastrointestinal tract than in other patients. He felt that this occurred because their protein stores were more depleted. Many groups studying burns [56] have found decreases to 3.0 to 5.0 Gm. per hundred cubic centimeters of plasma protein following severe burns even in some in whom strenuous measures to combat the fall were made. Losses of weight are frequently an indication of depleted protein stores and great losses following injury, operation and burns have been reported by Cuthbertson,[10] Hirshfeld,[16] Elman,[19] Levenson [30] and Lyons.[57]

THE EVALUATION OF PROTEIN DEFICIENCY IN SURGICAL PATIENTS

The estimation of the status of a surgical patient with regard to the presence or degree of protein deficiency is not simple. The factors necessary for a critical evaluation are (1) *optimum* weight of patient, (2) observed weight of patient, (3) plasma protein level, (4) plasma albumin level, (5) plasma volume, (6) nitrogen intake and (7) nitrogen output. Actually, main reliance in clinical work has to be placed on a nutritional history, on the patient's weight and on serum protein content determinations done most simply by a densitometer method. Interpretation of serum protein concentration values is often difficult. In surgical patients, particularly, one is frequently confronted by situations in which an acute disturbance has occurred in a patient with chronic protein deficiency. When this happens, the acute changes may intensify or mask the chronic ones, depending on the direction of change. A patient who has depleted body proteins and normally a low plasma protein level may by reason of vomiting become dehydrated. Plasma protein concentration may then become normal. However, as the blood volume of such a patient is increased by the administration of solutions of electrolytes or by other means, the plasma protein concentration will be found to fall to low values. Drew,[58] Seaman and Ponder [59] and Abbott and Mellors [60] have studied this problem and have shown how to make close evaluations of the true protein status of the patient in a short time by a few serial observations during treatment. Butler and Talbot [61] have reviewed the literature on the problems of parenteral fluid therapy and presented the best discussion of the evaluation of these patients.

The relative changes of albumin and globulin are also a factor of importance. In general, in acute depletions from any cause the albumin is lost faster and to a greater amount than the globulin and is built up again more slowly. A normal plasma protein value will mask a quite severe hypoalbuminemia when the globulin level is high. It must be remembered that except in acute loss the plasma proteins fall only after long continued depletion. Therefore, in cases of chronic illness the presence of a hypoproteinemia indicates a large tissue protein deficit. Elman [62] finds that a loss of 1 Gm. of albumin from the plasma represents a tissue loss of 30 Gm of protein. Still higher ratios of plasma to tissue protein have been found.[63]

Elman [19] stresses loss of weight in evaluating protein depletion. Serial determinations of the weight of patients with burns have been found to be of great value. The weights of these patients may be secured at each dressing change by putting the patient, covered with a sterile sheet but with dressings removed, on a weighed stretcher each end of which is placed on a scale. Slight changes of weight are often the first indication that the patient's nutritional condition is getting better or worse.[64]

When a surgeon first starts to weigh his patients he may be astounded at the losses encountered. Losses of 1 to 1½ pounds (454 to 683 Gm.) a day are common after major operations, major injury, serious infection or burns when the patients receive the customary postoperative care. These losses may continue for as long as the patient is seriously ill unless special efforts are made as outlined here to prevent them. Losses of over 50 pounds (23 Kg.) in a few weeks have been reported in burns [15] and of 11 to 66 pounds (5 to 30 Kg.) after infected wounds [57] and up to 25 pounds (11 Kg.) after a relatively uncomplicated cholecystectomy.[19] Elman also finds an appreciable loss of weight after any surgical operation.[19]

THE TREATMENT OF SURGICAL PATIENTS WITH HYPOPROTEINEMIA

Chronic Conditions.—Whenever possible, protein losses or deficiencies should be corrected by oral feeding. It is not enough for the surgeon to order a "high

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60 Abbott, W. L., and Mellors, R. C. Total Circulatory Plasma Proteins in Surgical Patients with Dehydration and Malnutrition, Arch. Surg. **46**: 277-288 (Feb.) 1943.

61 Butler, A. M., and Talbot, N. B. Medical Progress: Parenteral Fluid Therapy. I. Estimation and Provision of Daily Maintenance Requirements, New England J. Med. **231**: 585-590 (Oct. 26) 1944. II [illegible].

62. Elman, R. The Practical Use of Amino Acids in Protein Nutrition, J. A. M. A., to be published.

63 Davidson, C. S., and Taylor, F. H. L. Unpublished data.

64. Levenson, S. M.; Green, R.; Lund, C. C.; Johnson, R. E., Davidson, C. S., and Taylor, F. H. L. Unpublished data.

protein, high caloric, high vitamin diet." If such a diet is ordered the patient may fail to benefit from the order for any one of the following reasons: 1. The diet presented to the patient is not as specified. 2. The diet presented is not eaten in whole or in part because it lacks palatability, there is lack of appetite and there is a lack of nurses to encourage eating. 3. Food eaten may be partly or wholly lost because of diarrhea or vomiting.

These difficulties have been encountered frequently in caring for patients with burns during the last two years.[65] The fact that item 1 is mentioned may be a surprise. What especially happens in these days with the shortage of nurses is that there are frequent times when supplementary feedings are not brought to the patient because the nurse has other duties to perform that she thinks are more important or more urgent. This is particularly likely to happen at night.

The three items listed under number 2 are interrelated. It is common experience to find that a sick patient has "no appetite." However, if special attention is paid to the likes and dislikes of the patient and special or other nurses are available to encourage eating and to offer meals when the patient desires them instead of only at stated routine periods, many such patients will eat a surprisingly large amount of food. A patient with severe but not desperate third degree burns had special nurses for the first two weeks and had a daily nitrogen intake of 25 Gm. with a caloric intake of 1,800. During the next eleven days, without special nurses, her nitrogen intake fell to 6 Gm. and her calories to 1,600. Later, by employing special nurses again, the nitrogen intake went up to 40 Gm. with 3,500 calories.

The two items under number 3 are also related to each other. Forcing the diet in a sick patient does not always result in a net gain. Nausea, vomiting, distention and diarrhea, singly or together, are limiting factors. In general, the sicker the patient the less fat is tolerated, and the larger the proportion of protein should be. It has been found that at least 25 per cent of the calories in the diet should come from protein and not over 15 per cent from fat if any of these intestinal symptoms have occurred recently. It is well to take a number of days to increase the food intake, as sudden increases are more likely to be followed by gastrointestinal symptoms, which can usually be avoided by more cautious increases. If this diet is not tolerated, protein in the form of a digest may be tried and frequently will be well tolerated. The available digests are not particularly palatable and should be given by intubation.

Supplementary Feeding Formulas

Type of Case	Method of Feeding	Constituents of Diet	Carbohydrate, Gm.	Protein, Gm.	Fat, Gm.	Calories, Gm.
Severe chronic burn	Oral	House diet	40	55	40	740
	Oral	Skim milk powder...100 Gm. Chocolate syrup..... 90 cc. Whole milk..... 1.0 liter	180	65	40	1,340
	Tube	Amigen, oral *.....300 Gm. Nutramigen **.....150 Gm. Water..... 3.0 liters	80	255	25	1,565
Total one day intake			300	375	105	3,645
Severe acute burn	Oral	Milk	13	9	10	130
	Oral	Ginger ale	22	0	0	90
	Oral	Egg whites ..... 14 Skim milk powder...168 Gm. Karo.....200 cc. Whole milk..... 1.6 liters	315	170	70	1,300
	Intravenous	Amigen..... 2.0 liters	100	100	0	800
Total one day intake			450	280	80	2,620
Severe acute burn	Oral	Glucose in water 20% 1.25 liters	250	0	0	1,000
	Tube	Amigen, oral.....122 Gm. Nutramigen.....340 Gm. Sugar.....244 Gm. Water.....ad 3.7 liters	622	163	63	3,700
	Intravenous	Amigen..... 20 Gm. Glucose..... 75 Gm. Water.....ad 0.5 liter	77	19	0	385
Total one day intake			950	180	63	5,085
Moderate acute burn, preexisting colitis	Oral	House diet	100	50	26	834
	Oral	Glucose in water 10% 3.5 liters	350	0	0	1,400
	Tube	Skim milk powder...150 Gm. Skim milk..... 1.5 liters	135	117	7	1,070
Total one day intake			585	167	33	3,300
Compound fracture of leg, laceration of brain, ruptured kidney	Oral	House diet	115	35	55	1,100
	Oral	Glucose in water 10% 1.4 liters	140	0	0	560
	Oral	Whole eggs..... 7 Skim milk powder..... 75 Gm. Karo..... 90 cc. Chocolate syrup..... 50 cc. Whole milk.....850 cc.	190	100	75	1,840
Total one day intake			445	135	132	3,500

* Amigen (oral), an enzymatic hydrolysate of casein and pancreas.
** Nutramigen contains dextrimaltose, amigen, olive oil, starch, yeast and salts. These products were obtained from the Mead Johnson Company, Evansville, Ind.

65. Davidson and Taylor,[63] Levenson, Green, Lund, Johnson, Davidson and Taylor.[64]

Intubation feeding is important and may be used to increase the intake of food greatly. Medium caliber nasal stomach tubes are used and left in all the time or for many hours a day. If left in continuously, the tube should be removed every third or fourth day for cleaning. About 200 cc. may be given at a time, spaced between meals and at night, but there is a wide variation in the amount and frequency of supplementary tube feedings that different patients will take. It is well to start with half skim milk and half water or with a mixture of protein hydrolysate and carbohydrates. Instead of supplying the mixture in intermittent doses, a drip apparatus may be used which can, after a short period of training, be regulated by some patients themselves. If 125 to 150 Gm. of protein and 2,000 to 2,500 calories are given by intubation in addition to an average house diet, the patient should receive a total of about 200 Gm. of protein with over 4,000 calories. Usually the patients who are given "forced" supplementary feeding will not take the whole of their house diet in addition. It is difficult to get the intake above this level unless intravenous supplements are given. As some patients need 300 Gm. of protein a day, they should be given a diet and have both intubation and intravenous supplements. Sample day's food intakes of some patients are given in the accompanying table. It has been found necessary to vary the method of feeding from case to case and to a lesser extent from day to day.

Patients needing this type of feeding also need more than ordinary doses of vitamins. For two years it has been customary to use vitamin capsules with these diets in order to assure the patients 15,000 units of vitamin A, 1,500 units of vitamin D, 225 mg. of ascorbic acid, 9 mg. of thiamine, 6 mg. of riboflavin and 60 mg. of nicotinic acid. There is evidence that these doses may not always be sufficient.[64] In general, it can be stated that the patient sick enough to need intravenous feeding, alone or as a supplement, for over five days should have supplementary water soluble vitamins given intravenously or intramuscularly in approximately the following daily doses: vitamin C 500-1,000 mg., thiamine 20-40 mg., riboflavin 20-40 mg. and niacin 150-300 mg.

Acute Conditions.—In the presence of actual or threatened surgical shock, the treatment of hypoproteinemia should be by the intravenous route and should consist of human blood, plasma or albumin[66] or a combination of the three. The aim should be to restore the blood volume, red blood cell volume, blood plasma volume and plasma protein level to the point where the circulation is adequate. The best indication of restoration of an adequate circulation is the presence of urine output, normal in amount and of specific gravity between 1.010 and 1.025. At the same time it must not be forgotten that sodium chloride, various vitamins and other substances may be deficient and may need correction. If losses of all these substances continue, allowance must be made for these losses in the amounts given To replace completely the losses of blood or plasma may demand transfusions of whole blood, plasma or both of up to 6 liters in twenty-four hours. However, such amounts must not be given without adequate and frequent clinical and laboratory control, as overtreatment may result in acute pulmonary edema.

As soon as shock or the imminent danger of shock is over, treatment should be shifted to other and less expensive forms of proteins. (The current price to hospitals for dried plasma is about $1 per gram. Albumin is not on the market, but its cost to the public and to the Navy cannot be much less than this if the value of the donated blood and processing costs are both considered.)

Protein feeding should be given intravenously until mouth feeding can be tolerated and should be continued as a supplement until oral feeding, with or without gavage, has been established at a sufficient level not only to maintain the patient in nutritional equilibrium but also to restore at a rapid rate all tissues that have been depleted. Up to 225 Gm. of protein equivalent have been given in twenty-four hours in the form of an acid hydrolysate of casein[67] or an enzymatic hydrolysate of casein and pancreas.[68] The suggestion of Butler and Talbot[69] for increasing the value of intravenous protein hydrolysates by adding glucose to them has been followed successfully. By adding 300 cc. of 50 per cent glucose to 1 liter containing 5 per cent enzymatic hydrolysate and 5 per cent glucose, 1,300 cc. of solution is obtained that is composed of about 4 per cent hydrolysate and 15 per cent glucose. This quantity is given into a large vein with a 20 or 21 gage needle in four hours without much danger of thrombosis of the vein. This mixture may be given three or even four times a day. The speed of administration of this mixture is limited by the glucose present, and the ratio of glucose administration should not exceed 0.8 Gm. per kilogram of body weight per hour. Administration at a faster rate will produce glycosuria and excessive diuresis. Nausea may be caused if the enzymatic hydrolysate is introduced too rapidly, and thrombosis of the vein used for the injection may occur with the acid hydrolysate. Febrile reactions have also been seen occasionally after the use of the enzymatic hydrolysate, but these are usually not serious. A start has also been made to develop solutions of pure amino acids suitable for intravenous feeding.[70] When a high intake of nitrogen in the form of amino acids or digests is furnished during the catabolic period early after injury, the high output of nitrogen may be increased. However, not all the nitrogen administered is lost[71] and patients so treated show very definite evidence of clinical improvement.[72] In cases of serious protein deficiency, this treatment not only will shorten convalescence but will actually save lives.[73] A full presentation of the use of intravenously administered protein digests and amino acids will be made in another paper in this series.

319 Longwood Avenue, Boston 15.

66 Janeway, C. A.; Gibson, S. T.; Woodruff, L. M.; Heyl, J. T.; Bailey, O. T., and Newhouser, L. R.: Concentrated Human Serum Albumin, J. Clin. Investigation **23**: 465-490 (July) 1944. Richards, D. W., Jr.: Clinical Use of Concentrated Human Serum Albumin in Shock and Comparison with Whole Blood and with Rapid Saline Infusion, ibid., pp. 491-505. Warren, J. V.; Stead, E. A., Jr.; Merrill, A. J., and Brannon, E. S.: Treatment of Shock with Concentrated Human Serum Albumin: A Preliminary Report, ibid., pp. 506-509. Janeway, C. A.: Clinical Use of Products of Human Plasma Fractionation: I. Albumin in Shock and Hypoproteinemia, J. A. M. A. **126**: 674-680 (Nov. 11) 1944. Heyl, J. T.; Gibson, J. G., 2d, and Janeway, C. A.: Plasma Proteins: Effect of Concentrated Solutions of Human and Bovine Serum Albumin in Blood Volume After Acute Blood Loss in Man, J. Clin. Investigation **22**: 763-773 (Nov.) 1943.

67. "Parenamine," obtained from Frederick Stearns & Co., Detroit.

68 "Amigen" for intravenous use kindly supplied by the Mead Johnson Company, Evansville, Ind. Levenson, Davidson, Lund and Taylor.[20]

69. Butler, A. M., and Talbot, N. B.: Medical Progress: Parenteral Fluid Therapy: II. The Estimation of Losses Incident to Starvation and Dehydration with Acidosis or Alkalosis and the Provision of Repair Therapy, New England J. Med. **231**: 621-628 (Nov. 2) 1944.

70 Madden, S. C.; Zeldis, L. J.; Hengerer, A. D.; Miller, L. L.; Rowe, A. P.; Turner, A. P., and Whipple, G. H.: Casein Digests Parenterally Utilized to Form Blood Plasma Protein, J. Exper. Med. **73**: 727-743 (June) 1941. Bassett, Woods, Shull and Madden[71]

71. Bassett, S. H.; Woods, R. R.; Shull, F. W., and Madden, S. C.: Parenterally Administered Amino Acids as a Source of Protein in Man, New England J. Med. **230**: 106-108 (Jan. 27) 1944. Levenson, Green, Lund, Johnson, Davidson and Taylor[64]

72 Elman,[12] Levenson, Green, Lund, Johnson, Davidson and Taylor[64] Madden, Zeldis, Hengerer, Miller, Rowe, Turner and Whipple[70]

73 Elman,[12] Taylor, Levenson, Davidson, Browder and Lund,[15] Ravdin, Stengel and Prushankin[21]

MEDICAL LICENSURE STATISTICS FOR 1944

FORTY-THIRD ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

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Statistical compilations regarding medical licensure are presented annually in the State Board Number of THE JOURNAL. In the following pages will be found the report for the year 1944, which constitutes the forty-third annual presentation. Data are included regarding (*a*) medical examining and licensing boards of the United States, the District of Columbia, the territories and possessions of the United States, (*b*) boards of examiners in the basic sciences, (*c*) the National Board of Medical Examiners and (*d*) examining boards in the medical specialties.

These computations are based on official records received throughout the year from the medical licensing boards of all the states, Alaska, Puerto Rico and the Virgin Islands, the homeopathic licensing boards of Connecticut, Delaware and Louisiana, the eighteen boards of examiners in the basic sciences in operation last year, the fifteen approved examining boards in the medical specialties and the National Board of Medical Examiners. The homeopathic and eclectic examining boards in Arkansas and the homeopathic board in Maryland did not license any one during the year.

The cooperation of the officers of these agencies in furnishing complete reports makes possible these annual compilations. The Council and THE JOURNAL express thanks and appreciation to those who have supplied these data and for other records furnished throughout the year to the office of the Council.

The tables referring to medical licensing boards include figures regarding the number of candidates examined for medical licensure in 1944, the numbers licensed and those who have secured their first medical license and therefore represent additions to the medical profession. The state boards are discussed first, followed by the basic science boards, the National Board of Medical Examiners and the specialty examining boards.

STATE BOARDS OF MEDICAL EXAMINERS

LICENSES ISSUED

All medical and basic science schools in the United States are operating under an accelerated program with the exception of the Woman's Medical College of Pennsylvania, which has an accelerated plan for the juniors and seniors only. The increase in the numbers of annual graduates is reflected in the number of licenses issued to practice medicine. During the year 1944, 9,606 licenses to practice medicine and surgery were issued by the medical examining boards of the forty-eight states, the District of Columbia, Alaska,

TABLE 1.—*Licenses Issued, 1944*

	On the Basis of		
	Examination	Reciprocity and Endorsement	Total
Alabama	22	32	54
Arizona	11	16	27
Arkansas	57	4	61
California	443	469	912
Colorado	125	15	140
Connecticut	30	72	102
Delaware	27	3	30
District of Columbia	31	41	72
Florida	76	0	76
Georgia	224	47	271
Idaho	15	2	17
Illinois	222	86	308
Indiana	126	50	176
Iowa	37	16	53
Kansas	179	16	195
Kentucky	159	29	188
Louisiana	256	13	269
Maine	13	13	26
Maryland	305	62	367
Massachusetts	162	93	255
Michigan	264	146	410
	290	27	317
	94	22	116
	433	61	494
	4	6	10
	167	7	174
Nevada	1	22	23
New Hampshire	9	20	29
New Jersey	104	159	263
New Mexico	0	14	14
New York	453	335	788
North Carolina	105	47	152
North Dakota	3	4	7
Ohio	728	109	837
Oklahoma	61	15	76
Oregon	15	33	48
Pennsylvania	851	47	898
Rhode Island	9	8	17
South Carolina	97	13	110
South Dakota	3	5	8
Tennessee	210	42	252
Texas	236	161	397
Utah	13	26	39
Vermont	12	14	26
Virginia	158	32	190
Washington	76	46	122
West Virginia	24	28	52
	74	24	98
	0	10	10
	21	9	30
Totals	7,035	2,571	9,606

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F
	ARKANSAS																																								
1	University of Arkansas School of Medicine					114	0											0	1											1	0									1	
	CALIFORNIA																																								
2	College of Medical Evangelists							65	0	2	0							3	0	1	0	1	0							1	0										
3	Stanford University School of Medicine							93	0																															0	
4	University of California Medical School							77	0							1	0	1	0					1	0																
5	Univ. of Southern California School of Med.	2	0					53	2																															1	
	COLORADO																																								
6	University of Colorado School of Medicine							3	0	56	0																														
	CONNECTICUT																																								
7	Yale University School of Medicine							2	0			1	0			1	0	1	0																	1	0			1	
	DISTRICT OF COLUMBIA																																								
8	[illegible] niv. School of Med							6	0			1	0			3	0	1	0									1	0							3	0				
9	College of Medicine											3	0			2	0	2	0	0	1									1	0							1	0	1	
10	[illegible] llege of Medicine	1	0			1	0			1	0					8	2	1	0					1	0					1	0					3	0				
	GEORGIA																																								
11	Emory University School of Medicine	2	0															23	0	58	0																				
12	University of Georgia School of Medicine															1	0	4	0	60	0			1	1															1	
	ILLINOIS																																								
13	Loyola University School of Medicine							4	0			1	0	1	0							1	0	14	0	1	0	2	0									1	
14	Northwestern University Medical School	1	0					9	0	1	0					2	0	3	0			1	0	45	0	3	0			1	0			1	0					1	
15	University of Chicago, The School of Med.	1	0					3	0	1	0							1	0	3	0	1	0	18	0	2	0														
16	University of Illinois College of Medicine							15	0							1	0	2	0					59	1	1	0							1	0					2	
	INDIANA																																								
17	Indiana University School of Medicine							2	0									1	0							111	0														
	IOWA																																								
18	State University of Iowa College of Medicine	1	0			1	0			1	0							3	0			1	0	1	0			48	3											1	0
	KANSAS																																								
19	University of Kansas School of Medicine							2	0																					166	0									0	1
	KENTUCKY																																								
20	University of Louisville School of Medicine	1	0					4	0									1	0			1	0									76	0								
	LOUISIANA																																								
21	Louisiana State University School of Medicine																	1	0															79	1						
22	Tulane Univ. of Louisiana School of Medicine	9	0	1	0			1	0									8	0															166	3					0	1
	MARYLAND																																								
23	Johns Hopkins University School of Medicine											1	0			1	0	2	0																			42	0	1	1
24	University of Maryland School of Medicine and College of Physicians and Surgeons							2	0			1	0	1	0			1	0																			82	0	4	2
	MASSACHUSETTS																																								
25	Boston University School of Medicine																	2	0																						
26	Harvard Medical School	1	0					1	0	1	0	2	0					1	0	1	0			0	1											1	0	1	0	8	0
27	Tufts College Medical School					1	0					1	0																											2	1
	MICHIGAN																																								
28	University of Michigan Medical School							2	1									3	0			1	0	2	0					1	0									0	1
29	Wayne University College of Medicine							2	0									0	1																					1	0
	MINNESOTA																																								
30	University of Minnesota Medical School							3	0	1	0							0	1					4	1															1	0
	MISSOURI																																								
31	St. Louis University School of Medicine							11	0									1	0											2	0			1	0						
32	Washington University School of Medicine							9	0													1	0																		
	NEBRASKA																																								
33	Creighton University School of Medicine	1	0					21	0	4	0																	29	4	3	0			1	0						
34	University of Nebraska College of Medicine							4	0			1	0									1	0					0	1											2	0
	NEW YORK																																								
35	Albany Medical College																	2	0																						
36	Columbia Univ. Coll. of Phys. and Surgs.							2	0									4	0					1	0											1	0				
37	C[illegible] Medical College																	2	1																			3	0		1	0
38	L[illegible] licine											2	0					4	0																						
39	N[illegible] Flower and Fifth [illegible]							2	0									4	0																						
40	N[illegible]															0	1	0	3	1																				1	0
41	S[illegible]							1	0															1	0																
42	U[illegible] ol of Medicine																	1	0															1	0					1	0
43	University of Rochester School of Medicine and Dentistry							4	0			2	0					1	0					1	0													1	0	1	0
	NORTH CAROLINA																																								
44	Bowman Gray School of Medicine of Wake Forest College																																								1
45	Duke University School of Medicine																	3	0																						
	OHIO																																								
46	Ohio State University College of Medicine							1	0									1	0																					1	0
47	University of Cincinnati College of Medicine	1	0					2	0	1	0							0	1									1	0											0	1
48	Western Reserve University School of Med.							1	0									2	0																						
	OKLAHOMA																																								
49	University of Oklahoma School of Medicine							4	0	1	0							1	0																			1	0	1	0
	OREGON																																								
50	University of Oregon Medical School							6	0	1	0									3	0	1	0					1	0									3	0	1	0
	PENNSYLVANIA																																								
51	Hahnemann Med. Coll. and Hosp. of Phila.							3	0			3	0	3	0			2	0	2	0							2	0			1	0					1	0	3	1
52	Jefferson Medical College of Philadelphia							2	0			1	0	10	9			4	0			1	0													1	0	1	0	1	0
53	Temple University School of Medicine	1	0					2	0			2	0	3	0	1	0	3	0					1	0											1	0				
54	University of Pennsylvania School of Med.	3	0					1	0	2	0			4	0	1	0	3	0							1	0			1	0			1	0	1	0	2	0	1	
55	University of Pittsburgh School of Medicine																	2	0																					1	0
56	Woman's Medical College of Pennsylvania							1	1															2	0																
	SOUTH CAROLINA																																								
57	Medical Coll. of the State of South Carolina																	1	0					1	0																
	TENNESSEE																																								
58	Meharry Medical College	2	0					1	0							2	0	2	0					1	0							1	0			2	0			2	
59	University of Tennessee College of Medicine							1	0							1	0	4	0																					1	1
60	Vanderbilt University School of Medicine																	2	1																						

P—Passed; F—Failed.

Marginal Number	23 Mississippi P F	24 Missouri P F	25 Montana P F	26 Nebraska P F	27 Nevada P F	28 New Hampshire P F	29 New Jersey P F	30 New Mexico P F	31 New York P F	32 North Carolina P F	33 North Dakota P F	34 Ohio P F	35 Oklahoma P F	36 Oregon P F	37 Pennsylvania P F	38 Rhode Island P F	39 South Carolina P F	40 South Dakota P F	41 Tennessee P F	42 Texas P F	43 Utah P F	44 Vermont P F	45 Virginia P F	46 Washington P F	47 West Virginia P F	48 Wisconsin P F	49 Wyoming P F	50 U. S. Terr. & Possessions P F	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
1									3 1																1 0				122	120	2	1.6	6	1
2		1 0	1 0									1 0							2 0	1 0			2 0	6 0				1 0	90	89	1	1.1	16	2
3						0 1															1 0			1 0					97	96	1	1.0	5	3
4									3 1							1 0												1 0	86	85	1	1.2	7	4
5												1 0																	59	57	2	3.4	4	5
6		1 0																						1 0					62	62	0	0.0	5	6
7									2 0																				9	9	0	0.0	7	7
8	2 0						1 0								2 0					1 0				1 0	2 0			1 0	27	27	0	0.0	14	8
9							1 0		3 6	1 0					13 1	2 0				1 0			6 0		1 0			1 0	50	39	11	22.0	16	9
10		6 0					1 0		3 4	2 0		1 0			2 0								1 0						38	32	6	15.8	14	10
11										2 0																			85	85	0	0.0	4	11
12									1 0																				69	68	1	1.4	6	12
13			1 0				5 0		2 3			2 0			3 0									1 0					44	39	5	11.4	14	13
14	2 0	1 0				1 0	1 0			2 0	1 0	5 0			4 0			1 0	1 0		3 0			7 0		2 0			111	111	0	0.0	26	14
15									4 0			2 0	1 0		4 0									1 0		2 0			49	49	0	0.0	16	15
16		1 0							3 1			1 0		0 1						1 0				1 0		1 0			97	94	3	3.1	15	16
17																													114	114	0	0.0	3	17
18		1 0												1 0		1 0													62	59	3	4.8	10	18
19									1 0															1 0					173	172	1	0.6	6	19
20	2 0														2 0									2 0	1 0			1 0	93	93	0	0.0	11	20
21	2 0								1 0																			2 0	86	85	1	1.2	5	21
22	21 0								0 1						1 0				1 0										213	208	5	2.3	10	22
23	1 0								1 0	1 0					2 0					1 0									55	54	1	1.8	11	23
24										1 0					10 0										1 0			3 0	108	106	2	1.9	10	24
25															1 0														3	3	0	0.0	2	25
26		3 0							4 1	4 0		1 0			4 0	1 0	1 0			2 0			1 0						45	43	2	4.4	21	26
27						2 0			1 1							1 0													10	8	2	20.0	6	27
28									3 0	1 0					2 0					1 0				1 0				1 0	113	111	2	1.8	14	28
29																													84	83	1	1.2	5	29
30									1 0					1 0						1 0						2 0			141	139	2	1.4	10	30
31		91 0					2 0		5 6		1 0				4 0								1 0			1 0		1 0	128	122	6	4.7	13	31
32	1 0	92 0													1 0					2 0								1 0	107	107	0	0.0	7	32
33		1 0		7 0			1 0		1 4					1 2										2 0		2 0			84	74	10	11.9	13	33
34				74 6					1 0												1 0			2 0					93	86	7	7.5	9	34
35																									1 0				3	3	0	0.0	2	35
36							1 0		10 0						1 0										2 0				23	23	0	0.0	9	36
37		1 0					2 0		23 1	1 0		2 0			1 0	2 0							1 0	1 0		1 0			45	43	2	4.4	14	37
38							6 0		35 5						1 1														55	49	6	10.9	6	38
39							1 0		0 1																				10	9	1	10.0	5	39
40						1 0	9 0		45 9	2 0					6 0	1 0								1 0				1 0	82	72	10	12.2	12	40
41									15 2						1 0													1 0	27	25	2	7.5	8	41
42									3 0						1 0														7	7	0	0.0	5	42
43							1 0		6 2	1 0		2 0								1 0									25	23	2	8.0	13	43
44										40 0		1 0																	41	41	0	0.0	2	44
45			1 0							23 0									1 0										30	30	0	0.0	6	45
46									2 0			70 0																	75	75	0	0.0	5	46
47									6 1			71 0			1 0														87	84	3	3.4	10	47
48									4 3			72 0			3 0									1 0					86	83	3	3.5	6	48
49													70 0																79	79	0	0.0	7	49
50									1 0			1 0		8 1							1 0			23 0		2 0			55	54	1	1.8	14	50
51	1 0						9 0		5 6			10 0			119 10	2 2								1 0	2 0			2 0	192	173	19	9.9	19	51
52	3 0					1 0	6 0		2 2	14 0		3 0			185 3	1 0	1 0			1 0				1 0	2 0				247	242	5	2.0	21	52
53							6 0		2 2	1 0					136 2					2 0	4 0			3 0	3 0				179	175	4	2.2	17	53
54	1 0						3 0		6 1	7 0		2 0			162 0		1 0				1 0		1 0	4 0	3 0	1 0		1 0	217	216	1	0.5	20	54
55									1 0			1 0			146 2								1 0						154	152	2	1.3	6	55
56		2 0										1 0			8 0													2 0	18	17	1	5.6	7	56
57																	48 1								1 0				52	51	1	1.9	4	57
58									1 0						2 0				101 0										110	110	0	0.0	6	58
59	17 0	1 0											1 0						83 0	2 0									122	120	2	1.6	13	59
60					1 0				2 0						1 0				48 0										58	56	2	3.4	7	60
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	P
	TEXAS																																									
61	Baylor University College of Medicine							1	0																																	
62	Southwestern Medical College of the Southwestern Medical Foundation																																									
63	University of Texas School of Medicine																																									
	UTAH																																									
64	University of Utah School of Medicine																																									
	VERMONT																																									
65	University of Vermont College of Medicine																																									
	VIRGINIA																																									
66	Medical College of Virginia																	3	0																							
67	University of Virginia Department of Medicine																	1	0																							
	WISCONSIN																																									
68	Marquette University School of Medicine							5	1									0	1					1	0													1	0		3
69	University of Wisconsin Medical School							4	0			1	0					1	0					1	0							1	0							2	0	
	CANADA																																									
70	Dalhousie University Faculty of Medicine																																									
71	Laval University Faculty of Medicine											1	1																													
72	McGill University Faculty of Medicine	1	0					5	1																													1	1			
73	Queen's University Faculty of Medicine																																									
74	University of Alberta Faculty of Medicine							1	0															1	0																	
75	University of Manitoba Faculty of Medicine	1	0																																							
76	University of Montreal Faculty of Medicine							0	1			0	1																													
77	University of Toronto Faculty of Medicine							3	0			1	0	1	0			2	1																			1	1			
78	University of Western Ontario Medical School											1	0					1	0																							
	OTHERS																																									
79	Foreign Medical Faculties	1	0					9	7	1	0	3	7											13	16			1	0					1	0	4	2	9	3	6	31	
80	Extinct Medical Schools																	5	0			2	0	2	0														1	1		
81	Unapproved Schools and an Undergraduate									7	3	5	9	3	0									45	5	3	0												106	211		
82	Totals	20	11	115	472	82	52	27	28	139	126	15	243	126	90	179	78	259	16	155	423	1
83	Totals—Examined—Passed	20	11	115	458	79	31	27	26	130	125	15	218	126	82	179	78	255	13	151	162	1
84	Totals—Examined—Failed	0	0	0	14	3	18	0	2	9	1	0	25	0	8	0	0	4	3	4	261	
85	Percentage Failed	0.0	0.0	0.0	3.0	3.7	34.6	0.0	7.1	6.5	0.8	0.0	10.3	0.0	8.9	0.0	0.0	1.5	18.7	2.6	61.7	0.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

P—Passed; F—Failed.

Puerto Rico and the Virgin Islands, as shown in table 1. Of the 9,606 licenses issued, 7,035 were issued after examination and 2,571 by reciprocity and endorsement of other state licenses or the certificate of the National Board of Medical Examiners.

It does not follow that all physicians certified in a given year after examination were tested in that year. In twenty-three states, the District of Columbia, Alaska, Canal Zone, Hawaii and Puerto Rico the internship is a requisite for practice, but in some of them a physician is permitted to take an examination before completion of the internship and, if successful, the license is withheld until completion of the internship. Licenses are also withheld in some states for proof of citizenship and other technicalities. In others the licenses of those examined in December are dated and issued in the following year. The statistics in table 1, therefore, include many who were examined in 1943 and even a few in previous years. Consequently, figures in this table will not correspond with those hereinafter given, which deal entirely with physicians examined for licensure within the year 1944.

The greatest number of licenses during the calendar year 1944 were issued in California, 912. Three other states licensed more than 700: Pennsylvania 898, Ohio 837 and New York 788. Twenty-two states, the District of Columbia and the territories and possessions licensed fewer than 100. None were licensed by examination in Wyoming. The fewest, 7, were licensed in North Dakota.

While the great majority of physicians was licensed after examination and represents in the main physicians who obtained their medical license on completion of the medical course and before their entr, on active duty with the armed forces, there were 2,571 registered without examination—by reciprocity agreements or by the endorsement of credentials. Seventeen states licensed more physicians by reciprocity or endorsement than by examination. Florida, Idaho, Massachusetts and Rhode Island have no reciprocal agreements, but with the exception of Florida these states endorse diplomates of the National Board of Medical Examiners.

Increases in the number of physicians registered last year as compared with data reported for the year 1943 were noticeable in a number of states and particularly in California, Georgia, Maryland, Michigan, Missouri, Ohio and Pennsylvania. On the other hand, decreases were significant in some states. These variances are attributable to some extent to the accelerated program of the medical schools and the graduation of two classes of students by some schools in one year. In New York there was again a reduction in foreign graduates examined for licensure.

Thirty were registered in the territories and possessions as follows: by examination Alaska 3 and Puerto Rico 18; by endorsement Alaska 3, Puerto Rico 2 and the Virgin Islands 4.

Totals for nine previous years and for 1944 by all methods of licensure are shown for comparison in table 3. The high figures for the years from 1936 to 1941 in the annual number of licenses issued were due to the licensure of foreign graduates. In 1944 there was an increase of 1,211 over the number registered in the previous year. Acceleration started in most medical schools in the United States on July 1, 1942.

	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50					
	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Terr. & Possessions	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
1									1 0						1 0					20 0									33	33	0	0.0	5
2	1 0																			117 0									118	118	0	0.0	2
3															1 0					97 0									99	99	0	0.0	3
4																					19 0								19	19	0	0.0	1
5																						7 0							7	7	0	0.0	1
6	3 0								2 0	2 0					2 0								68 3		2 0				88	85	3	3.4	8
7									0 1						1 0								67 4						74	69	5	6.8	4
8									4 1						5 0					1 0				5 0		38 0			66	63	3	4.5	10
9		1 0							0 1			1 0			2 0								1 0	1 0	1 0	22 0			42	41	1	2.4	15
10									0 1																				1	0	1	100.0	1
11							1 0		1 2																				6	3	3	50.0	3
12						1 0			4 2						1 0								1 0	3 0					21	17	4	19.0	8
13									1 0							1 0													2	2	0	0.0	2
14																													3	3	0	0.0	3
15																													1	1	0	0.0	1
16						0 2			1 1																1 0				9	3	6	66.7	6
17									1 1						1 0														14	12	2	14.3	8
18									1 1																				4	3	1	25.0	3
19	2 0	4 0					16	10	224 286			4 0			9 1	0 1		2 0		4 1			2 1	3 0				7 0	691	325	366	53.0	22
20							1	0	2 1		1 0	2 0			1 0									1 0				1 0	25	23	2	8.0	12
21	1 0			0 5		3 1	30	1				72 25		0 1						38 2			5 1						582	318	264	45.4	14
22	60	207	3	92	1	13	115	0	816	105	3	354	72	16	873	16	52	3	237	306	30	7	167	75	24	74	0	28	6,791	.....	.....	.....	...
23	60	207	3	81	1	9	104	0	454	105	3	329	72	11	853	13	51	3	237	303	30	7	158	75	24	74	0	28	5,985	...	.....	...	8
24	0	0	0	11	0	4	11	0	362	0	0	25	0	5	20	3	1	0	0	3	0	0	9	0	0	0	0	0	.....	806	.....	...	8
25	0.0	0.0	0.0	12.0	0.0	30.8	9.6	0.0	44.4	0.0	0.0	7.1	0.0	31.3	2.3	18.7	1.9	0.0	0.0	1.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	.....	.....	...	11.9	..
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50					

The total graduates for the four-session three-year cycle to July 1, 1945 is estimated at 20,201. For the three years 1942, 1943 and 1944, 26,611 physicians received licenses. While this figure includes physicians previously licensed who are migrating to other states, it is believed that by the completion of the accelerated medical school cycle in June 1945 the great majority of recent graduates probably will have been licensed prior to entry on active duty with the armed forces.

TABLE 3.—*Licenses Issued, 1935-1944*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,275	2,772	9,047
1937	6,629	3,204	9,833
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,053	2,759	8,812
1942	6,141	2,469	8,610
1943	6,059	2,336	8,395
1944	7,035	2,571	9,606
Totals	63,163	26,999	90,162

In the past ten year period 90,162 medical licenses have been issued, 63,163 after examination and 26,999 by endorsement of credentials.

The figures given do not altogether represent individuals but include persons who may have been licensed in more than one state during a given year; nor does the total represent additions to the medical profession, since a physician may be licensed by examination in a nonreciprocating state. Among those licensed by reciprocity or endorsement are some who received licenses by endorsement of the certificate of the National Board of Medical Examiners but may not have been previously licensed. In tables 11, 12 and 13 can be noted the number who secured licenses for the first time and represent additions to the medical profession in the United States and its territories and possessions.

CANDIDATES EXAMINED BY MEDICAL EXAMINING BOARDS

In table 2 are recorded figures referring to those examined for medical licensure by individual states, the District of Columbia, Alaska and Puerto Rico, indicating the numbers who passed and failed in each state and the medical school of graduation. Throughout the year 6,791 were examined, of whom 5,985 passed and 806 failed. Candidates represented sixty-nine approved medical schools in the United States, nine approved medical schools of Canada, ninety-two faculties of medicine and two licensing corporations of other countries, seven medical schools now extinct, six unapproved institutions and seven colleges of osteopathy and 1 individual who had not completed the medical course. Osteopaths who were granted the privilege to practice medicine, surgery or both by the medical examining boards are included in these statistics. Osteopaths in other states who obtain the legal right to special practice by the osteopathic board are excluded from these compilations.

Examination schedules have been adjusted to coincide as nearly as possible with the graduating dates of the medical schools located within their states. Executive officers and members of examining boards are to be commended for adding this work to their already overtaxed responsibilities.

The 6,791 examinees represented 5,432 graduates of approved medical schools in the United States, of whom 2.9 per cent failed; 61 graduates of approved Canadian schools, 27.9 per cent failures; 25 who graduated from approved medical schools no longer operating with 8.0 per cent failures; 691 graduates of faculties of medicine located in countries other than the United States and Canada, 53.0 per cent of whom failed, and 582 graduates of unapproved institutions with 45.4 per cent failures. The number of examinees in each of these categories was considerably less in 1944 than in the previous year. In 1944 there were 1,002 fewer examinees among graduates of approved medical schools, 10 fewer Canadian graduates, 76 fewer graduates of schools now extinct, 340 fewer graduates of foreign faculties of medicine and 175 fewer from unapproved institutions. This decrease may be ascribed primarily to the accelerated program and the graduation of two classes by medical schools in 1943, by most approved institutions. Most of these graduates were examined in the year of graduation and appear in the statistics on candidates examined as published in the 1944 State Board Number. However, large numbers of those examined late in 1943 were not actually licensed until 1944. Such physicians were mainly responsible for the 1944 increase in licenses issued, discussed earlier in connection with table 1.

TABLE 4.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1944*

	Examined	Passed	Failed
Alabama	2	2	0
California	11	9	2
Connecticut	5	3	2
Delaware	1	1	0
Florida	4	3	1
Illinois	1	1	0
Indiana	1	1	0
Maine	2	1	1
Maryland	2	1	1
Minnesota	3	3	0
New Hampshire	3	1	2
New Jersey	1	1	0
New York	17	9	8
Pennsylvania	2	2	0
Rhode Island	1	1	0
Virginia	1	1	0
Washington	3	3	0
West Virginia	1	1	0
Totals	61	44	17

The closing of Rush Medical College several years ago necessitated the placing of graduates of this school among the extinct medical schools. The majority of physicians recorded in the classification of extinct medical schools were graduates of Rush. In 1944 there were far fewer graduates of this school examined than in 1943. For several years the number of graduates of foreign faculties of medicine has been decreasing. Table 27, page 122, contains totals for this category of examinees from 1930 to 1944. There were 175 fewer graduates of unapproved institutions examined. Considerable reductions occurred in Massachusetts and Ohio.

This decrease is not seen in the tables showing licenses issued in 1944 because the licenses of many who were examined in 1943 were issued and dated in 1944, since many schools graduated their second class of 1943 late in the year.

As in table 1, the 6,791 physicians and others examined for medical licensure do not represent an equal number of individuals, since a candidate might take an examination in more than one state and is counted in each state. However, if a candidate fails more than once in a given state within the year he is counted in that state as only one failure.

The greatest number of graduates of any one school examined was 247 representing Jefferson Medical College. This school had one graduating class in 1943 and two in 1944, in January and September. Licenses were earned by these persons in twenty-one states. Five of the examinees failed. More than 200 graduates of two other schools applied for licenses by examination last year, namely Tulane University 213 and the University of Pennsylvania 217. These high figures also represent two graduating classes. However, a small percentage are graduates of other years. Figures published in 1943 [1] revealed that in the year 1942 there were examined 4,609 graduates of 1940, 1941 and 1942 from approved medical schools in the United States. In that year the total number of graduates examined from sixty-five approved medical schools in the United States was 4,905. The percentage of failures of recent graduates in 1942 was 1.9 and of all graduates of these schools 2.4. In the calendar year 1944, while no compilation of recent graduates has been made, 2.9 per cent of the 5,432 graduates of the approved medical schools in the United States failed.

Twenty-three approved schools in the United States had no failures before medical licensing boards, thirty-two less than 5 per cent and six between 5 and 10 per cent. There were eight schools with 10 per cent or more failures in state examinations. These figures and percentages are modified by data on those who were examined by the National Board of Medical Examiners in its final examination as well as those passing state tests (see table 6).

Nineteen graduates of the newly developed four year medical school at the University of Utah School of Medicine, which graduated its first class in 1944, were tested for medical licensure in the state of Utah, and all were successful. This school was formerly a school of the basic medical sciences. It earned approval as a four year medical school by the Council on Medical Education and Hospitals in 1944.

Graduates of Northwestern University and the University of Pennsylvania were examined in the greatest number of states—twenty-six. Harvard and Jefferson alumni were tested in twenty-one states. All other schools had their graduates examined in fewer than twenty states. The medical schools of Indiana, Boston University, Albany, Bowman Gray, Southwestern, Texas, Utah and Vermont had graduates examined in fewer than four states. Only 3 graduates of Boston University and Albany Medical College took a state written examination.

TABLE 5.—*Source of Candidates Examined, 1944*

Medical Schools	Number of Schools	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved, in United States	69	5,432	5,275	157	2.9
Approved, in Canada	9	61	44	17	27.9
Extinct	7	25	23	2	8.0
Foreign	94	691	325	366	53.0
Unapproved Schools	13	582	318	264	45.4
Totals	192	6,791	5,985	806	11.9

Graduates of the Southwestern Medical College appeared for the first time in medical licensure statistics. This new school was developed at Dallas, Texas, in 1943 and has to date had two graduating classes, in March and December 1944. There were 118 graduates tested in two states (Mississippi 1 and Texas 117)

1. J. A. M. A. 122:95 (May 8) 1943.

with no failures. This medical school is approved by the Council on Medical Education and Hospitals.

Three of the five homeopathic boards in existence examined 7 candidates: Connecticut 3, Delaware 3 and Louisiana 1. The homeopathic boards in Arkansas and Maryland did not examine any one in 1944. The one eclectic board in existence in Arkansas likewise did not examine a candidate.

Sixty-one graduates of nine approved medical schools in Canada applied for medical registration in eighteen states (table 4), of whom 44 passed and 17 failed. The greatest numbers represented McGill University (21) and the University of Toronto (14). Graduates of each of those two schools were examined in eight states. Normally larger numbers of graduates of these schools secure licensure in this country. In 1942 the figures were 60 for McGill and 45 for Toronto.[2] In 1943 they decreased to 23 and 19 respectively. This reduction in graduates from McGill and Toronto seeking licensure in the United States is probably related to the war.

Three Canadian schools had no failures before United States licensing boards, while the other six schools had percentages higher than 14. The highest percentage of failures was 66.7, from 9 graduates of the University of Montreal examined in six states. The state of New York examined 17 Canadian graduates and California 11. All other states examined fewer than 6.

The 582 graduates of unapproved and osteopathic schools represented 346 graduates of unapproved medical schools, of whom 153 passed and 193 (55.8 per cent) failed, and 236 graduates of schools of osteopathy, of whom 165 passed and 71 (30.1 per cent) failed. Included among unapproved graduates is 1 candidate who had not completed the medical course. He was passed in Mississippi.

Graduates of osteopathic schools were examined by the medical boards of eleven states, namely Colorado, Connecticut, Delaware, Indiana, Massachusetts, Nebraska, New Hampshire, New Jersey, Ohio, Oregon and Texas, while graduates of unapproved medical schools were examined in three states—Illinois, Massachusetts and Virginia.

Graduates of medical schools of other countries were examined in twenty-one states and Puerto Rico.

The source of candidates for licensure last year on the basis of examination is further analyzed in table 5, giving totals for five groups, namely approved medical schools in the United States and those from Canada, schools no longer in existence, schools of foreign countries and unapproved schools. As already mentioned, from the United States schools 2.9 per cent failed as did 27.9 per cent of the graduates of Canadian schools. The greatest percentage of failures represented two groups, foreign schools and unapproved schools. In these two groups, 53.0 and 45.4 per cent respectively failed. From the extinct medical schools 8.0 per cent failed.

Elsewhere (see table 11, page 113) are given figures referring to actual licentiates and additions to the medical profession.

CONSOLIDATED EXAMINATIONS

In the calendar year 1944, 5,432 graduates of approved medical schools in the United States were examined by medical licensing boards, of whom 2.9 per cent failed (table 6). In the same period 1,135 graduates of approved medical schools in the United States

2. J. A. M. A. 122:93 (May 8) 1943.

TABLE 6.—*Consolidated Examinations, State Medical Examining Boards and the National Board of Medical Examiners, 1944*

School	Part III Results by Medical Examining Board Tests		Part III Examination of National Board of Medical Examiners		Total Examined	Totals		
	P	F	P	F		P	F	%F
University of Arkansas....	120	2	1	0	123	121	2	1.6
Coll. of Med. Evan. (Calif.)	89	1	31	0	121	120	1	0.8
Stanford University.....	96	1	1	0	98	97	1	1.0
Univ. of California.....	85	1	1	0	87	86	1	1.1
Univ. of Southern California	57	2	1	0	60	58	2	3.3
Univ. of Colorado.....	62	0	1	0	63	63	0	0.0
Yale Univ. (Connecticut)..	9	0	47	2	58	56	2	3.4
Geo. Washington Univ. (D.C.)	27	0	45	0	72	72	0	0.0
Georgetown University.....	39	11	23	1	73	61	12	16.4
Howard University.....	32	6	..	..	38	32	6	15.8
Emory Univ. (Georgia)....	85	0	..	..	85	85	0	0.0
University of Georgia.....	68	1	..	..	69	68	1	1.4
Loyola Univ. (Illinois)....	39	5	1	0	45	40	5	11.1
Northwestern University...	111	0	8	0	119	119	0	0.0
University of Chicago.....	49	0	5	0	54	54	0	0.0
University of Illinois.....	94	3	3	1	101	97	4	4.0
Indiana University.....	114	0	..	..	114	114	0	0.0
State University of Iowa...	59	3	18	0	80	77	3	3.7
University of Kansas.....	172	1	..	..	173	172	1	0.6
Univ. of Louisville (Ky.)..	93	0	7	0	100	100	0	0.0
Louisiana State University.	85	1	1	0	87	86	1	1.1
Tulane University.....	208	5	..	..	213	208	5	2.3
Johns Hopkins Univ. (Md.)	54	1	11	0	66	65	1	1.5
University of Maryland....	106	2	3	1	112	109	3	2.7
Boston Univ. (Mass.).....	3	0	50	0	53	53	0	0.0
Harvard Medical School...	43	2	92	0	137	135	2	1.5
Tufts College Med. School..	8	2	65	0	75	73	2	2.7
University of Michigan....	111	2	5	0	118	116	2	1.7
Wayne University.....	83	1	..	..	84	83	1	1.2
University of Minnesota...	139	2	4	0	145	143	2	1.4
St. Louis Univ. (Missouri)	122	6	6	0	134	128	6	4.5
Washington University.....	107	0	10	0	117	117	0	0.0
Creighton Univ. (Nebraska)	74	10	5	1	90	79	11	12.2
University of Nebraska....	86	7	1	0	94	87	7	7.4
Albany Med. Coll. (N. Y.)	3	0	47	2	52	50	2	3.8
Columbia University.....	23	0	66	0	89	89	0	0.0
Cornell University.....	43	2	42	0	87	85	2	2.3
Long Island Coll. of Med.	49	6	32	0	87	81	6	6.9
New York Medical College	9	1	106	5	121	115	6	5.0
New York University.....	72	10	83	1	166	155	11	6.6
Syracuse University.....	25	2	19	1	47	44	3	6.4
University of Buffalo.....	7	0	109	3	119	116	3	2.5
University of Rochester....	23	2	28	0	53	51	2	3.8
Bowman-Gray School of Med. (North Carolina)...	41	0	1	0	42	42	0	0.0
	30	0	56	1	87	86	1	1.1
	75	0	..	..	75	75	0	0.0
	84	3	6	0	93	90	3	3.2
Western Reserve University	83	3	1	0	87	84	3	3.4
University of Oklahoma...	79	0	..	..	79	79	0	0.0
University of Oregon.....	54	1	3	0	58	57	1	1.7
Hahnemann, Phila. (Pa.)..	173	19	4	0	196	177	19	9.7
Jefferson Medical College..	242	5	3	1	251	245	6	2.4
Temple University.....	175	4	9	0	188	184	4	2.1
University of Pennsylvania.	216	1	14	0	231	230	1	0.4
University of Pittsburgh...	152	2	..	..	154	152	2	1.3
Woman's Med., Pa.....	17	1	8	1	27	25	2	7.5
Med. Coll. of South Carolina	51	1	..	..	52	51	1	1.9
Meharry Med. Coll. (Tenn.)	110	0	3	0	113	113	0	0.0
University of Tennessee...	120	2	..	..	122	120	2	1.6
Vanderbilt University.....	56	2	..	..	58	56	2	3.4
Baylor University (Texas).	33	0	1	0	34	34	0	0.0
Southwestern Medical Coll.	118	0	..	..	118	118	0	0.0
University of Texas.....	99	0	..	..	99	99	0	0.0
University of Utah.....	19	0	..	..	19	19	0	0.0
University of Vermont.....	7	0	22	0	29	29	0	0.0
Med. Coll. of Virginia.....	85	3	2	0	90	87	3	3.3
University of Virginia.....	69	5	2	0	76	71	5	6.6
Marquette Univ. (Wisconsin)	63	3	2	0	68	65	3	4.4
University of Wisconsin...	41	1	..	..	42	41	1	2.4
Totals: U. S. Schools...	5,275	157	1,114	21	6,567	6,389	178	2.7
Dalhousie Univ. (N. S.)...	0	1	..	..	1	0	1	100.0
Laval Univ. (Quebec).....	3	3	..	..	6	3	3	50.0
McGill University.....	17	4	7	0	28	24	4	14.3
Queen's Univ. (Ontario)...	2	0	..	..	2	2	0	0.0
University of Alberta.....	3	0	..	..	3	3	0	0.0
University of Manitoba....	1	0	..	..	1	1	0	0.0
Univ. of Montreal (Quebec)	3	6	..	..	9	3	6	66.7
Univ. of Toronto (Ontario)	12	2	2	0	16	14	2	12.5
Univ. of Western Ontario..	3	1	1	0	5	4	1	20.0
Totals: Canadian Schools	44	17	10	0	71	54	17	23.9
Extinct Medical Schools...	23	2	1	0	26	24	2	7.7
Unapproved Schools.....	318	264	..	..	582	318	264	45.4
Foreign Medical Faculties..	325	366	20	0	711	345	366	51.5
Totals	5,985	806	1,145	21	7,957	7,130	827	10.4

were tested in part III of the examination of the National Board of Medical Examiners, of whom 1.8 per cent failed. A comparison of the failures in each group revealed that in some instances schools having a high percentage of failures before licensing boards had few, if any, failures before the National Board of Medical Examiners. In these consolidated figures for 6,567 graduates, the percentage of failures of approved medical schools in the United States was 2.7.

Of the Canadian graduates, 27.9 per cent failed state board tests and 23.9 per cent the combined tests. Ten graduates of three Canadian schools were examined by the National Board of Medical Examiners and all passed. Only 20 graduates of foreign faculties of medicine were admitted to the National Board's final examination while 691 were examined by state licensing boards. The National Board of Medical Examiners does not admit to its examinations the graduates of unapproved medical schools in the United States.

The total of all examined before medical licensing boards was 6,791, of whom 5,985 passed and 806, 11.9 per cent, failed. For both groups—state boards and the National Board—7,957 were examined; 7,130 passed and 827, or 10.4 per cent, failed. Fifty-two existing and one extinct approved medical school in the United States were represented in the National Board's examinations. Twelve of these schools had graduates examined in each group with no failures in either. These schools were Colorado, George Washington, Northwestern, Chicago, Louisville, Boston, Washington, Columbia, Bowman Gray, Meharry, Baylor and Vermont.

Four schools had failures above 10 per cent in the combined statistics: Georgetown 16.4 per cent, Howard 15.8 per cent, Creighton 12.2 per cent and Loyola 11.1 per cent.

FAILURES

Data recorded in table 7 refer to failures before medical licensing boards by licentiates of 1944. In presenting these statistics the United States is divided into two groups—the thirty-one states in which approved four year medical schools are located and those, including Alaska and Puerto Rico, which have no approved medical school within their boundaries. Included is the number who failed state board examinations and were graduates of a medical school located in the state in which they were examined and, for comparison, the number of graduates licensed in a given state who obtained their professional training in schools in other states.

Two of the three approved medical schools of Massachusetts had only one failure last year in the state, while 25.4 per cent of those who obtained their medical education in thirty-four other approved schools failed. In New York 2.8 per cent of those who studied medicine in eight of the nine schools located in that state who appeared for licensure in 1944 had previously failed, and 23.4 per cent who obtained their medical training in thirty-six schools located in other states failed. Sixty-five physicians failed examinations in the state in which the medical school they attended was located, and nineteen states had no failures from schools within their boundaries. In no instance was the percentage of failures greater in the case of graduates of schools located within the state of licensure.

Practically all states require the applicant to receive a general average of 75 per cent and 50 per cent in any one subject. In case of failure in not more than two subjects the applicant is entitled to another examination in those subjects within twelve months. A few states consider such individuals as conditioned in the subjects in which they fail and do not report them to the Council as failures. In these instances they are not considered in the calculations in this study. When their grades are raised after a successful test in the subjects in which they failed they are recorded among those who passed.

In eighteen states having no medical school only three reported failures, namely Florida, New Hampshire and Rhode Island. Fifty-one schools were represented at Florida examinations with 6.2 per cent failures. In New Hampshire with five schools represented 16.7 per cent failed, while in Rhode Island nine schools were represented with 14.3 per cent failures.

The total number examined in the first group—states in which approved four year medical schools are located—was 4,978, while in the second group—states which have no approved medical school within their boundaries—454 were examined.

In another table dealing exclusively with failures (table 8) the data are further subdivided by the number of candidates who were licensed after previous failure. The figures are presented for three groups,

TABLE 7.—*Licensure Failures by Graduates of Approved Schools Located in the State Where Examined and Elsewhere, 1944*

	Total No. Examined	No. Failures of Schools in State	No. Schools in State Represented at Examinations	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented at Examinations	Per Cent Failed	Total per Cent Failed in All U. S. Schools
Arkansas	115	0	1	0.0	0	1	0.0	0.0
California	445	2	4	0.4	3	41	0.7	1.1
Colorado	71	0	1	0.0	0	10	0.0	0.0
Connecticut	23	0	1	0.0	0	14	0.0	0.0
Dist. of Columbia	28	2	3	7.1	0	11	0.0	7.1
Georgia	126	0	2	0.0	1	5	0.8	0.8
Illinois	161	1	4	0.6	3	17	1.9	2.5
Indiana	122	0	1	0.0	0	8	0.0	0.0
Iowa	89	3	1	3.4	5	5	5.6	9.0
Kansas	179	0	1	0.0	0	10	0.0	0.0
Kentucky	77	0	1	0.0	0	2	0.0	0.0
Louisiana	258	4	2	1.6	0	8	0.0	1.6
Maryland	141	0	2	0.0	0	11	0.0	0.0
Massachusetts	67	1	2	1.5	17	34	25.4	26.9
Michigan	189	0	2	0.0	0	12	0.0	0.0
Minnesota	190	0	1	0.0	0	29	0.0	0.0
Missouri	203	0	2	0.0	0	12	0.0	0.0
Nebraska	87	6	2	6.9	0	0	0.0	6.9
New York	286	20	8	2.8	59	36	12.6	23.4
North Carolina	105	0	2	0.0	0	15	0.0	0.0
Ohio	291	0	3	0.0	0	18	0.0	0.0
Oklahoma	72	0	1	0.0	0	2	0.0	0.0
Oregon	15	1	1	6.7	3	4	20.0	26.7
Pennsylvania	860	17	6	2.0	2	31	0.2	1.9
South Carolina	52	1	1	1.9	0	3	0.0	0.0
Tennessee	237	0	3	0.0	0	4	0.0	0.0
Texas	261	0	3	0.0	0	14	0.0	0.0
Utah	30	0	1	0.0	0	6	0.0	0.0
Vermont	7	0	1	0.0	0	0	0.0	0.0
Virginia	157	7	2	4.5	0	9	0.0	4.5
Wisconsin	74	0	2	0.0	0	9	0.0	0.0
Subtotals	4,978	65	67	1.3	93	381	1.9	3.1
States Without Medical Schools								
Alabama	17				0	5	0.0	0.0
Arizona	11				0	10	0.0	0.0
Delaware	23				0	7	0.0	0.0
Florida	130				8	51	6.2	6.2
Idaho	13				0	11	0.0	0.0
Maine	8				0	6	0.0	0.0
Mississippi	57				0	13	0.0	0.0
Montana	3				0	3	0.0	0.0
Nevada	1				0	1	0.0	0.0
New Hampshire	6				1	5	16.7	16.7
New Jersey	56				0	17	0.0	0.0
New Mexico	0				0	0	0.0	0.0
North Dakota	2				0	2	0.0	0.0
Rhode Island	14				2	9	14.3	14.3
South Dakota	1				0	1	0.0	0.0
Washington	68				0	23	0.0	0.0
West Virginia	24				0	14	0.0	0.0
Wyoming	0				0	0	0.0	0.0
Alaska and Puerto Rico	20				0	15	0.0	0.0
Subtotals	454				11	193	2.4	2.4

namely graduates of approved medical schools, foreign faculties of medicine and unapproved institutions. These groups are classified according to the number licensed after failing a state board examination once and after two or more failures and indicates whether the single failures have been in the state of licensure or elsewhere; the table also indicates whether multiple failures have been in the state where licensed and/or elsewhere. The total number of candidates examined and licensed, or granted licenses without written examination—by reciprocity or endorsement—in each state, and the total number of failures in all groups is shown.

In the computation of these statistics it was noted that 58 graduates of foreign faculties of medicine failed five or more times before licensure, likewise 4 graduates of unapproved institutions failed at least five times. A graduate of one approved school made 7 unsuccessful attempts before obtaining licensure. Of the foreign graduates 16 had five failures before obtaining a license, 14 failed six examinations, 6 failed seven, 8 eight, 6 nine, 3 ten, 1 each eleven and twelve, 2 thirteen and 1 failed eighteen tests.

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates, 1944*

	Licenses Issued by Examination, Reciprocity or Endorsement	Approved Schools: Licensed After One Failure		Approved Schools: Licensed After Two or More Failures			Foreign Schools: Licensed After One Failure		Foreign Schools: Licensed After Two or More Failures			Unapproved Schools: Licensed After One Failure		Unapproved Schools: Licensed After Two or More Failures			Total Failures by Licentiates, 1944
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	
Alabama	54	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
Arizona	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Arkansas	61	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
California	932	7	3	1	..	..	2	3	1	..	1	1	..	..	..	..	19
Colorado	140	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2
Connecticut	102	..	3	..	..	..	..	..	..	4	..	..	..	..	..	..	7
Delaware	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
District of Columbia	72	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	3
Florida	76	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Georgia	271	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Idaho	17	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Illinois	308	8	..	1	..	..	3	1	3	1	3	2	..	..	..	1	23
Indiana	176	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Iowa	53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Kansas	105	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Kentucky	188	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Louisiana	209	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Maine	26	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	3
Maryland	367	..	..	..	1	..	..	1	..	1	2	..	..	..	..	..	5
Massachusetts	255	3	..	..	..	..	2	..	..	..	..	18	..	27	..	..	50
Michigan	410	..	1	..	2	..	..	..	..	..	1	..	..	..	..	..	4
Minnesota	317	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Mississippi	116	..	..	..	..	..	..	..	..	2	..	..	..	..	1	..	3
Missouri	494	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Montana	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nebraska	174	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nevada	23	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	3
New Hampshire	29	..	..	..	..	..	..	..	..	1	1	1	..	..	1	..	4
New Jersey	263	1	2	..	1	1	..	7	4	19	6	1	..	..	2	..	44
New Mexico	14	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
New York	788	17	..	8	..	1	38	4	112	3	16	..	..	..	..	..	199
North Carolina	152	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
North Dakota	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Ohio	837	..	1	..	..	..	..	..	2	1	..	9	..	..	..	..	13
Oklahoma	76	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Oregon	48	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Pennsylvania	698	1	2	..	..	..	..	..	2	..	2	..	1	..	..	..	8
Rhode Island	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
South Carolina	110	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
South Dakota	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Tennessee	252	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Texas	397	..	3	..	1	..	1	..	..	..	1	2	..	1	..	..	9
Utah	39	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Vermont	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Virginia	190	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	3
	122	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
	52	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
	98	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Wyoming	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Alaska Puerto Rico and Virgin Islands	30	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	4
Totals	9,606	44	29	10	6	3	47	16	124	37	35	36	1	28	6	1	423

Of the 9,606 licensed in 1944, 423 had previously been unsuccessful before a licensing board. From the approved schools, 92 of those licensed had previously failed a state board examination. Forty-four failed once before being licensed in a given state and 29 after one failure elsewhere. Nineteen received licenses after more than one failure, 10 of whom were registered in the original state, 6 elsewhere; 3 failed in the state where licensed and elsewhere.

The graduates of foreign faculties of medicine who were registered after previous failures numbered 259 and those of unapproved schools 72.

The 4 graduates of unapproved institutions failed as follows: five tests, 2; six tests, 1; and 1 of the graduates failed eleven attempts. The majority of these physicians with multiple failures were Massachusetts and New York examinees.

In twenty-one states all physicians licensed last year had no failure in a state medical examination before being registered. There were 2,461 such individuals. With the exception of California, Illinois, Massachusetts, New Jersey, New York and Ohio the number of physicians licensed throughout the country in each state after previously having failed was less than 10.

REGISTRATION BY RECIPROCITY AND ENDORSEMENT

A summary of the reciprocity and endorsement policies of the various states, the District of Columbia, Alaska, Hawaii and Puerto Rico will be found in table 9. Four states—Florida, Idaho, Massachusetts and Rhode Island, as well as Hawaii—have not established reciprocal agreements with regard to medical licensure. Of these four all except Florida will register diplomates of the National Board of Medical Examiners by endorsement, as will also Hawaii. Those desiring licenses by reciprocity or endorsement in seventeen states and the District of Columbia are required to obtain a certificate from the state board of examiners in the basic sciences before being eligible for licensure.

Reciprocal relationships in medical licensure have been established in forty-four states, the District of Columbia, Alaska and Puerto Rico. Twenty-five of these states, Alaska and Puerto Rico reciprocate with specifically indicated states. Twenty-five states, including six which have specific reciprocity agreements, are given discretionary powers under the medical practice act. These states will register physicians who present

TABLE 9.—*Reciprocity*

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by																													Marginal Number
		Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	
1	Alabama	..	..	+	+	+	..	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	3
4	[illegible]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies																													9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
11	Idaho	No reciprocal relations																													11
12	Illinois	+	..	+	+	+	..	..	..	..	..	..	..	+	+	+	+	+	+	+	..	+	..	+	+	..	+	+	..	+	+	12
13	Indiana	+	..	+	+	+	..	..	..	..	..	..	..	..	+	+	+	+	+	+	..	+	..	+	+	..	+	+	..	+	..	13
14	Iowa	+	..	+	+	+	..	+	+	..	+	..	+[32]	..	+	..	+	+	+	+	..	+	..	+	+	..	+	+	+	+	+	14
15	Kansas	+	+	+[19]	+	..	..	+	+	..	+	..	+	+	..	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	15
16	Kentucky	+	..	+	+	+	..	+	+	..	+	..	+	+	+	..	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	..	+	+	..	+	..	+	+	+	+	+	..	+	+	..	+	..	+	+	+	..	+	+	+	+	+	17
18	Maine	..	..	+	+	+	..	+	+	..	+	..	+	+	+	+	+	..	+	+	..	+	..	+	+	+	..	+	+	+	+	+	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	..	+	+	..	+	..	+	+	+	+	+	+	..	+	..	+	..	+	+	+	..	+	+	..	+	+	19
20	Massachusetts	No reciprocal relations																													20
21	Michigan	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	21
22	[illegible]	+	..	+	+	..	..	+	..	..	+	..	..	..	+	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	22
23	.	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	23
24		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	26
27	Nevada	..	..	+[21]	+	..	..	..	..	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	+	+	+	+	+	+	+	+	..	+	+	+	..	+	+	..	+	..	..	..	28
29	New Jersey	+	..	..	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	..	..	..	..	..	..	..	..	..	29
30	New Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	..	..	..	33
34	Ohio	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	No reciprocal relations																													38
39	South Carolina	+	..	..	..	..	..	..	+	..	+	..	..	..	..	+	+	+	+	+	..	+	..	..	..	..	..	..	+	+	..	..	39
40	South Dakota	+	+	+	+	+	..	..	..	..	+	..	..	+	+	+	+	+	..	..	..	+	+	+	..	+	+	..	..	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	+	41
42	Texas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42
43	Utah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	..	+	+	..	..	+	+	..	+	..	+	+	+	+	+	+	+	..	..	+	+	+	..	+	..	+	+	..	+	+	45
46	Washington	+	..	..	+	+	..	..	..	..	+	..	..	..	+	..	+	+	..	+	..	+	+	+	+	+	+	..	..	..	..	..	46
47	West Virginia	+	..	+	..	..	..	+	+	..	+	..	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	..	+	+	47
48	Wisconsin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	..	+	..	..	+	+	+	..	..	50
51	Hawaii	No reciprocal relations																													51
52	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52

This summary should be supplemented by direct communication with the

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board").

1. 1st P, first papers required; ⊕, in citizenship column indicates full citizenship required.
2. In most cases there is a small additional recording or registration fee.
3. If state of original license grants similar privileges.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. No professional practice required.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Reserve officers not eligible.
11. Leading medical schools of Great Britain recognized.
12. Oral examination required when original license is ten or more years old.
13. Applicant must have resided in the state used as basis or application for one year after date on said certificate.
14. Oral examination required.
15. Unless in practice in another state for five years.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
18. Foreign graduates only.
19. Regular and Homeopathic boards.
20. Licentiates of Florida, Idaho, Massachusetts, Rhode Island and Hawaii not eligible for license by reciprocity.
21. Regular board.
22. Fee same as applicant's state charges if more than $50.
23. Oral examination required if applicant's state requires it.
24. If an applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.

credentials which correspond with those required by their respective states at the time such licenses were issued. The states in which diplomates of the National Board of Medical Examiners and medical officers of the government services are accepted for licensure on the basis of these credentials are also indicated.

citizenship requirement. This is indicated in footnotes. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Additional requisites or exemptions are included in footnotes.

This chart will be available in reprint form. It has proved to be of material assistance to those physi-

and Endorsement Policies

Marginal Number	Reciprocates with, or Endorses Certificates Granted by: New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	U. S. Government Services	Requirements: Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	..	+[3]	+	+	⊕	⊕	1[4]	⊕[45]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+[6,8]	⊕[8]	..	3[4,7]	..	100	42	2
3	+	+	+	+	+	..	+	..	+	+	+	+	..	+	+	..	+	+	+	+	..	..	+[9]	..	⊕	..	1[4]	⊕	50[22]	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[12]	+[12,43]	+[10,14]	..	..	4[13]	..	100	43	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[9]	10	⊕	..	1[4]	1st P	50	42	5
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14,30]	+[14,27]	..	⊕[15]	..	3[16]	1st P	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[5]	+	..	⊕	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[3]	+[27]	+[5]	⊕	⊕	1	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	..	..	..	⊕	50	..	11
12	..	..	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	+	..	..	+[17]	+[10,17]	..	⊕	1	1st P	25	17,42	12
13	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	..	+	+	+	+	..	..	+[49]	..	..	..	1[4]	..	50	..	13
14	..	+	+	+	+	..	+	..	..	+	+	..	+	..	+	+	+	+	..	..	..	..	+	..	..	⊕	1[4]	⊕[45]	50	..	14
15	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+	..	..	..	1[4,7]	⊕	25	42	15
16	..	..	..	+	+	..	+	..	+	+	+	+	+	+	+	..	+	+	..	..	..	..	+	..	..	..	1[4]	⊕	50	42	16
17	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	..	..	..	3[3]	1st P[40,46]	50	42	17
18	..	..	+	+	+	+	+	..	+	..	+	+	+	+	+	..	+	+	+	..	..	..	+[14]	..	..	⊕[18]	1[4]	⊕[45]	52	..	18
19	+	+	..	+	+	+	+	..	+	..	+	+	..	+	+	..	+	..	..	..	..	+	+	..	..	..	1[4]	1st P	50	42	19
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	0	1st P	25	..	20
21	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+[38]	..	⊕[37]	⊕	1[4]	⊕	55	34	21
22	..	+	..	..	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	..	0	⊕[45]	75	17,42	22
23	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	..	..	..	..	⊕[45]	50	42,44	23
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[47]	..	..	⊕[33]	1[4]	⊕[45]	50	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	⊕	1[4]	⊕	75	45	25
26	+	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+[36]	..	..	..	1[4]	⊕	50	..	26
27	+	..	..	+	+	+	+	..	..	+	+	..	+	+	..	..	+	+	..	+	..	..	+	..	..	⊕	1[4]	1st P	100	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	⊕	0	⊕[45]	20	42	28
29	+	..	+	+	+	..	+	..	..	..	..	+	+	+	+	..	+	+	..	..	..	+	+	..	..	⊕	0	⊕	100	..	29
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	⊕	..	1[4]	1st P	50	42	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	2	1st P	25	..	31
32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	..	0	⊕	50	42,50	32
33	..	+	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	..	+	..	..	⊕	1	⊕	50[22]	14,42	33
34	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	..	1[4]	⊕	50	23	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	⊕	1[4]	⊕	100	42,44,50	35
36	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[20]	+[9,27]	..	⊕	⊕	1[4]	..	100	42,50	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	⊕	2[24]	1st P	100	42	37
38	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	..	⊕	0	1st P	20	..	38
39	..	+	..	+	+	..	+	..	..	+	+	..	..	+	..	..	+	..	+	..	..	..	+	..	..	⊕	1[4]	⊕	50	42	39
40	..	+	+	+	+	..	..	..	+	..	+	+	+	+	+	..	+	+	..	..	..	..	+	..	..	⊕	1	1st P	50	42	40
41	+	+	..	+	+	..	+	..	+	+	..	+	+	..	+	+	+	+	+	..	..	..	+[30]	+	..	⊕	0	..	10	42	41
42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	1[25]	⊕	50	31	42
43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	⊕	48	⊕	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[3]	+[38]	..	..	⊕	0	⊕	50	..	44
45	+	+	..	+	+	..	+	..	+	+	+	+	..	+	..	+	+	+	+	..	..	+	+	+	..	⊕[18]	2[26]	⊕[45]	50	..	45
46	..	..	..	+	+	+	+	..	..	+	+	+	+	+	+	..	..	+	..	+	..	..	+[8]	..	⊕[8]	⊕	0	1st P	25	42	46
47	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	..	..	+[28]	+	+	..	..	+	..	..	⊕	0	⊕	100	42	47
48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	+	⊕	⊕	1[29]	1st P	50[22]	42	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	+[14]	+	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	..	..	..	..	..	+	..	..	⊕	0	⊕	100	50	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	..	⊕	..	⊕	25	11,42,50	51
52	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[39]	..	⊕	0	⊕	25	..	52

secretary of the licensing board of the state in which the physician is interested.

25. Internship accepted if served in this state.
26. Internship accepted—considered equivalent to two years' practice.
27. Fee $25.
28. Conditionally.
29. A two year internship is accepted.
30. Diplomates of National Board not required to have been in practice for three years.
31. Graduates before 1907 required to take oral examination.
32. Clinical examination required.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35. May be licensed after a special (written) supplemental examination.
36. Fee for license on basis of National Board certificate, $50.
37. For matriculants after Oct. 15, 1937.
38. Fee, $20.
39. While on active duty only.
40. Permanent license withheld until completion of citizenship.
41. Graduates of foreign medical schools effective Sept. 15, 1935. Canadian schools exempted effective Sept. 19, 1939.
42. Graduates of foreign medical school are not accepted.
43. Graduates of foreign medical schools must have fulfilled all requirements of California prior to admittance to examination for any certificate used as basis of application to California.
44. Graduates of approved schools of Canada eligible.
45. Not applicable to citizens of Canada.
46. Canadian citizens are required to file first papers.
47. Fee, $15.
48. Same as required of Utah candidates applying for licensure.
49. Diplomates are accepted on basis of reexamination. The question and answer manuscripts from the National Board are submitted for regrading.
50. All applicants must be graduates of a medical school approved by the American Medical Association.

Specific requirements, such as professional practice, oral examination and internship, are recorded, as is also the fee for a license without written examination. Citizenship prequisites are mentioned. In some states physicians of Canadian birth are exempt from the

cians who are contemplating locating in another state.

The facts recorded in this table are intended to be merely general statements of licensure policies. A physician using this chart for reciprocity purposes should supplement the information contained therein by direct

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement, 1944*

Source of Former License or Credentials

State Issuing License by Reciprocity or Endorsement	Marginal Number	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Govt. Service	National Board of Medical Examiners	U. S. Terr. and Possessions	Canadian & Foreign	Miscellaneous
Alabama	1	32	..	..	..	..	..	..	..	..	..	1	..	4	..	..	..	..	3	..	..	..	1	..	4	2	..	..	..	..	..	..	1	..	..	..	..	..	1	..	9	..	..	..	3	..	..	..	..	..	..	2	..	..	..
Arizona	2	16	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	1	1	..	..	..	2	..	..	..	..	2	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	3	..	1	..
Arkansas	3	4	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..
California	4	469	2	1	3	..	6	1	..	1	2	..	1	76	13	14	8	5	12	..	8	4	18	19	..	12	1	16	..	..	2	..	61	1	..	28	4	3	20	2	1	..	11	12	3	..	4	17	1	9	1	8	56	2	..	..
Colorado	5	15	..	..	1	..	..	..	..	..	..	..	..	..	1	1	1	..	2	..	..	..	..	..	..	3	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	3	..	..	..
Connecticut	6	72	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	1	2	2	..	..	..	1	..	3	..	..	1	1	24	..	..	3	..	1	1	..	..	..	..	1	..	2	..	..	..	..	..	..	29	..	..	..
Delaware	7	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dist. Columbia	8	41	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	1	..	4	1	..	..	..	..	3	..	..	..	..	..	..	7	..	..	..	..	..	10	..	..	..
Florida	9	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	10	47	..	..	1	..	..	..	..	..	1	..	..	..	2	1	1	..	..	4	..	1	..	2	..	..	3	..	1	..	..	4	..	1	..	2	..	2	..	10	1	..	..	2	..	..	..	..	..	..	8	..	..	..
Idaho	11	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
Illinois	12	86	..	..	2	4	..	..	..	..	..	..	..	..	3	4	..	1	..	..	..	..	10	1	..	13	..	4	..	..	2	..	..	..	..	5	..	..	3	..	..	..	4	..	..	1	..	1	10	..	..	18	..	..	..
Indiana	13	47	..	..	1	..	..	1	..	..	..	1	..	10	..	2	..	6	1	..	..	..	5	..	..	3	..	..	..	..	..	..	5	..	..	2	..	..	1	..	..	..	2	..	..	..	..	1	2	..	..	4	..	..	..
Iowa	14	16	..	..	..	..	..	..	..	..	..	..	..	5	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	5	..	..	..
Kansas	15	16	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kentucky	16	29	..	..	2	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	..	..	6	..	2	..	..	..	..	..	..	1	..	1	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Louisiana	17	13	1	1	1	..	..	..	..	..	1	..	..	1	2	..	..	..	1	..	1	..	2	..	1	..	..	..	..	..	..	..	2	..	..	2	..	..	1	..	1	..	8	..	..	..	1	..	1	..	..	1	1	..	..	..
Maine	18	13	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Maryland	19	62	..	..	..	1	..	..	..	14	..	2	..	1	..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..
Massachusetts	20	93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	6	1	..	2	1	..	7	..	..	..	6	2	..	..	..	1	1	..	..	..	12	..	..	..
Michigan	21	146	..	..	4	4	1	..	..	..	..	3	..	16	3	3	1	1	1	2	4	..	..	9	..	13	..	10	..	..	1	..	4	2	..	17	2	1	9	..	..	1	7	3	1	..	3	..	2	4	..	..	14	..	..	..
Minnesota	22	27	2	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	2	..	..	1	..	3	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	2	..	..	11	..	..	..
Mississippi	23	22	..	..	1	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	1	..	..	2	..	3	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	2	..	..	11	..	..	..
Missouri	24	61	..	..	3	4	1	..	..	1	..	..	..	3	..	4	7	..	..	5	..	1	2	1	..	1	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	2	..	..	..
Montana	25	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	1	..	..	3	..	..	..	..	4	1	..	2	1	..	..	..	..	5	1	..	..	..	..	3	3	..	..	11	..	..	..
Nebraska	26	7	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..
Nevada	27	22	..	..	..	3	..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Hampshire	28	18	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	1	1	..	..	3	..	..	..	..	4	..	..	2	..	..	2	..	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..
New Jersey	29	159	..	1	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	1	2	1	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..
New Mexico	30	14	..	..	..	1	2	..	1	..	..	..	..	4	..	2	..	1	3	1	9	..	..	..	..	2	..	..	..	..	..	..	4	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
New York	31	335	..	..	..	7	..	..	1	..	..	..	..	..	..	2	..	..	..	2	..	13	..	10	3	1	..	1	..	..	..	..	75	1	..	2	..	..	15	1	..	..	5	..	..	..	4	..	1	..	..	30	..	..	..
North Carolina	32	17	1	..	..	1	..	..	..	..	..	3	..	..	3	2	..	..	..	..	..	..	..	..	..	3	..	1	..	..	..	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..
North Dakota	33	4	..	..	..	1	..	..	..	1	..	3	..	1	..	..	..	..	1	..	3	1	1	..	..	2	..	..	..	..	..	..	2	..	..	1	..	..	3	..	1	..	6	4	..	2	..	..	..	..	259	1	1	1
Ohio	34	106	..	..	2	2	..	1	..	..	..	..	..	2	3	3	3	4	3	..	5	1	9	1	..	12	..	4	..	..	1	..	14	..	..	3	..	..	15	1	..	..	5	..	..	..	4	..	1	..	..	30	..	..	..
Oklahoma	35	15	1	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
Oregon	36	23	..	..	..	2	1	..	..	..	..	..	..	1	..	2	..	1	..	..	..	..	2	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..
Pennsylvania	37	47	..	..	..	2	1	..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	1	5	..	3	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rhode Island	38	8	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	..	1	..	3	1	1	3	..	1	..	..	..	..	..	..	1	..	..	5	..	..	2	..	..	..	..	..	1	..	..	1	..	..	..	5	..	..	..
South Carolina	39	13	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	21	..	..	..
South Dakota	40	5	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	..	..
Tennessee	41	42	2	..	2	..	..	..	..	2	..	2	..	1	1	..	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Texas	42	160	1	..	13	3	4	..	..	..	..	..	..	1	..	..	..	..	4	..	1	..	..	2	5	1	..	1	..	..	..	..	3	1	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Utah	43	26	..	..	..	7	1	..	..	..	..	..	..	11	8	6	1	5	17	..	3	..	5	6	5	10	1	5	..	..	..	..	12	..	..	11	6	..	5	..	..	1	12	..	2	..	..	1	1	..	2	2	..	3	..	..
Vermont	44	11	..	..	..	..	..	..	..	..	..	..	..	1	..	3	1	..	1	..	1	..	2	2	2	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Virginia	45	32	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	2	..	..	..	..	..	..	..	1	..	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	4	..	..	..
Washington	46	46	..	..	..	6	..	..	..	1	4	..	1	..	1	3	1	..	2	..	..	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	5	..	..	5	..	..	..	..	..	..	..	..	..	7	..	..	..
West Virginia	47	28	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	5	..	2	..	..	..	..	7	..	..	2	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
Wisconsin	48	19	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	3	..	1	1	..	1	2	..	1	..	..	..	..	..	..	1	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	11	..	..	..
Wyoming	49	8	..	..	..	1	..	..	..	..	..	1	1	7	..	1	1	1	..	..	..	..	..	2	..	1	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	..	2	1	..	..	6	..	..	..	..	4	..	..	..
Alaska, Puerto Rico and Virgin Islands	50	9	..	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	2	..	..	1	..	..	..	1	..	..	..	..	..
Totals		2,517	10	4	41	56	18	4	2	26	3	19	2	163	42	58	26	33	65	7	72	12	82	68	22	102	2	65	0	1	14	0	240	18	1	100	16	10	110	3	10	5	110	32	4	11	51	22	18	40	2	13	702	3	2	5
Marginal Number			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

communication with the secretary of the licensing board of the state in which he is interested.

The credentials presented by physicians granted licenses in 1944 to practice medicine and surgery without written examination are given in table 10. There were 2,547 so registered on the basis of licenses issued by other states, the District of Columbia, the territories or possessions or foreign countries, the certificate of the National Board of Medical Examiners or one of the government services.

The greatest number of licenses issued by this method in any one state were 469 in California. New York issued 335. Four other states endorsed 100 or more, namely Ohio 106, Michigan 146, New Jersey 159 and Texas 160. The largest group representing the same type of credentials were the 702 diplomates of the National Board of Medical Examiners. On the basis of this certificate 259 were certified in New York. One hundred or more physicians presented licenses issued in Illinois, Missouri, New York, Ohio, Pennsylvania and Tennessee. No physician holding a Nevada or New Mexico certificate applied for registration in another state during the year. In Arizona and in New York one physician was registered on the basis of foreign credentials, presenting licenses from Great Britain and Austria respectively.

Four were admitted to private practice in the Virgin Islands on presentation of satisfactory credentials. Thirteen medical officers of one of the government services received licenses without written examination in four states: California 8, Kentucky 1, Texas 3 and Utah 1.

Two physicians from Alaska were registered in California and one physician presented for endorsement in New York a license obtained in Puerto Rico. The New York Board of Medical Examiners accepted the diploma of a foreign physician in lieu of a licensure credential.

Not included in the table are 24 osteopaths licensed by medical examining boards in seven states. They are omitted from this compilation since the credentials presented were osteopathic licenses. These individuals secured licenses in Indiana 3, New Hampshire 2, Ohio 3, Oregon 8, Texas 1, Wisconsin 5 and Wyoming 2.

Seventy-five licentiates of New York secured licenses to practice in New Jersey, while 61 from New York and 76 from Illinois were registered in California.

Diplomates of the National Board of Medical Examiners were registered on the basis of this credential by forty licensing boards last year. There were 702 individuals who presented these credentials. The greatest number accepted by any one state was in New York, where 259 secured licenses to practice medicine. Of all who were registered by reciprocity and endorsement, over one fourth presented National Board credentials.

The numbers of physicians securing licenses by reciprocity or by endorsement has increased in the last three years. The figure for 1944 (2,547) represented 272 more licenses issued than in 1943.

LICENTIATES REPRESENTING ADDITIONS TO THE MEDICAL PROFESSION

The number of physicians who received their first license to practice medicine and surgery in 1944, and therefore represent additions to the medical profession, are recorded in table 11. Figures represent candidates examined in 1944 and immediately licensed, also those examined in previous years whose licenses were withheld for lack of internship, citizenship and other technicalities and issued in 1944, and those without a state license who were during the year certified on the basis of the examination of the National Board of Medical Examiners, government services, Canadian and foreign credentials. The majority represent recent graduates. However, the majority of the recent graduates are now in the military services and only a small percentage of them can be considered to be additions to the present civilian physician population. It is not known how many of these are in civilian practice.

There were 6,933 additions to the medical profession in 1944. The number removed by death in the same

TABLE 11.—*Licentiates Representing Additions to the Medical Profession, 1944*

	Examination	Reciprocity and Endorsement	Total
Alabama	6	1	7
Arizona	4	1	5
Arkansas	56	0	56
California	368	15	383
	124	0	124
	17	13	30
	20	0	20
	9	11	20
	11	0	11
Georgia	220	6	226
Idaho	3	0	3
Illinois	197	13	210
Indiana	125	1	126
Iowa	34	4	38
Kansas	176	0	176
Kentucky	158	1	159
Louisiana	250	0	250
Maine	9	3	12
	295	4	299
	120	68	188
	258	10	268
	236	3	239
	91	1	92
	427	7	434
Montana	4	0	4
Nebraska	166	1	167
Nevada	0	0	0
New Hampshire	3	6	9
New Jersey	99	12	111
New Mexico	0	0	0
New York	408	229	637
North Carolina	104	10	114
North Dakota	1	0	1
Ohio	723	5	728
Oklahoma	54	0	54
Oregon	14	1	15
	807	14	821
	5	6	11
	95	0	95
	2	0	2
	209	2	211
	235	0	235
Utah	7	3	10
Vermont	11	5	16
Virginia	157	1	158
	48	3	51
	19	1	20
	70	0	70
	0	0	0
	14	3	17
Totals	6,469	464	6,933

period was 3,627. It would appear, therefore, that the physician population in the United States last year was increased by 3,306. Many more than this latter number were added to the armed forces as medical officers in 1944, so that there has resulted an actual decrease in physicians available to civilians in the course of the year. In view of the accelerated program, one might expect that additions to the profession would be considerably higher. While two classes were graduated from most medical schools in 1943, the number of physicians added to the profession in that year did not increase, since many physicians who obtained M.D. degrees in December of that year were not able to receive licenses until early in the year 1944, owing to administrative details. In 1944 the number in this group was 979 more than in the previous year.

The greatest number of physicians in any one state, 821, was added to the profession in Pennsylvania. Both New York and Ohio added more than 600, and California and Missouri more than 300. By comparison

TABLE 12.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1944*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	9	3	12
New Hampshire	3	6	9
Vermont	11	5	16
Massachusetts	129	68	188
Rhode Island	5	6	11
Connecticut	17	13	30
	165	101	266
Middle Atlantic			
New York	408	229	637
New Jersey	99	12	111
Pennsylvania	807	14	821
	1,314	255	1,569
East North Central			
Ohio	723	5	728
Indiana	125	1	126
Illinois	197	13	210
Michigan	258	10	268
Wisconsin	70	0	70
	1,373	29	1,402
West North Central			
Minnesota	236	3	239
Iowa	34	4	38
Missouri	427	7	434
North Dakota	1	0	1
South Dakota	2	0	2
Nebraska	166	1	167
Kansas	176	0	176
	1,042	15	1,057
South Atlantic			
Delaware	20	0	20
Maryland	295	4	299
District of Columbia	9	11	20
Virginia	157	1	158
West Virginia	19	1	20
North Carolina	104	10	114
South Carolina	95	0	95
Georgia	220	6	226
Florida	11	0	11
	930	33	963
East South Central			
Kentucky	158	1	159
Tennessee	209	2	211
Alabama	6	1	7
Mississippi	91	1	92
	464	5	469
West South Central			
Arkansas	56	0	56
Louisiana	250	0	250
Oklahoma	54	0	54
Texas	235	0	235
	595	0	595
Mountain			
Montana	4	0	4
Idaho	3	0	3
Wyoming	0	0	0
Colorado	124	0	124
New Mexico	0	0	0
Arizona	4	1	5
Utah	7	3	10
Nevada	0	0	0
	142	4	146
Pacific			
Washington	48	3	51
Oregon	14	1	15
California	368	15	383
	430	19	449
Territories and Possessions			
Alaska	1	0	1
Virgin Islands	0	1	1
Puerto Rico	13	2	15
	14	3	17
Totals	6,469	464	6,933

with 1943 figures[3] it can be noted that considerably more were licensed and represent additions to the profession in 1944 in the cases of Colorado, Georgia, Kansas, Kentucky, Maryland, Michigan, Missouri, Nebraska, Ohio and Pennsylvania. Most significant increases occurred in Ohio and in Pennsylvania, where the increases totaled 474 and 377 respectively.

No one was added to the profession in Nevada. New Mexico or Wyoming, while in seventeen states between 100 and 299 received initial licenses. Twenty-four states, the District of Columbia, Alaska, Virgin Islands and Puerto Rico added fewer than 100.

Of the 6,933 licentiates constituting additions to the medical profession last year, 6,469 secured their licenses by examination and 464 by endorsement of credentials. The latter represent in the main diplomates of the National Board of Medical Examiners.

Table 12 records increases in the physician population grouped in nine geographic divisions. The Middle Atlantic, East North Central and West North Central group of states added the greatest number, over 1,000 each. More than 500 were added in two groups—the South Atlantic and West South Central states. The fewest number of physicians, 146, were added to the medical profession in the Mountain states. Three states in this group—Nevada, New Mexico and Wyoming—did not add a single physician to the medical profession last year.

Comparative figures for nine years and 1944 are given in table 13. Last year the number of physicians representing additions to the medical profession

TABLE 13.—*Licentiates Representing Additions to the Medical Profession, 1935-1944*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,239	473	5,712
1942	5,558	454	6,012
1943	5,582	372	5,954
1944	6,469	464	6,933
Totals	56,082	4,831	60,913

increased 979 over the previous year. In the ten year period the greatest number of physicians were added to the medical profession in 1944.

In ten years there were 60,913 physicians added to the profession; 56,082 were licensed after a successful written examination and 4,831 by reciprocity and endorsement. In the same period 90,162 licenses were issued, 63,163 by examination and 26,999 by endorsement of credentials. Thus 29,249 licenses were obtained by physicians who had previously been licensed to practice medicine.

Estimated figures indicate that on Jan. 1, 1945 the number of physicians in continental United States including those licensed in 1944 was 191,689. Excluding physicians who are in military service, engaged in full time hospital work, retired, engaged in full time teaching or not in practice, there remain approximately 100,000 physicians in private practice, some of whom are part time teachers.

LICENSURE UNDER THE ACCELERATED PROGRAM

All states in the Union, as well as the District of Columbia, Alaska, Hawaii and Puerto Rico, have made certain adjustments in their licensure legislation or practices, where such were required, to facilitate the licensure of graduates under the accelerated program. Legislation in four states (District of Columbia, Georgia, Illinois and Minnesota) is such as might not provide for students who have completed all of their

3. J. A. M. A. 125: 133 (May 13) 1944.

medical school work under the accelerated program and spend a week or two less than thirty-six months in medical school. Such students are typical throughout the country because those starting school July 1, 1942, for example, are likely to graduate a week or so prior to July 1, 1945.

TABLE 14.—*Requirements of Preliminary Training by Medical Licensing Boards*

Two Years or More of College		
Alabama	Louisiana	Oklahoma
Alaska	Maine	Oregon
Arizona	Maryland	Pennsylvania
Arkansas	Massachusetts	Puerto Rico
Canal Zone	Michigan	Rhode Island
Colorado	Minnesota	South Carolina
Delaware	Mississippi	South Dakota
District of Columbia	Missouri	Tennessee
Florida	Montana	Texas
Georgia	Nevada	Utah
Hawaii	New Hampshire	Vermont
Idaho	New Jersey	Virginia
Illinois	New Mexico	Washington
Indiana	New York	West Virginia
Iowa	North Carolina	Wisconsin
Kansas	North Dakota	Wyoming
Kentucky	Ohio	
One Year of College		
California	Connecticut *	
High School Graduation or Its Equivalent		
Nebraska		

* Two year college requirement for graduates after 1946.

ACCELERATION OF PREMEDICAL COURSES

The minimum requirement of the Council on Medical Education and Hospitals for admission to approved medical schools since 1918 has been two years of college training, and in 1938 three years was recommended. With the exception of California, Connecticut and Nebraska (table 14) the state licensing boards, by statute in the majority of instances, require that an applicant for licensure must present evidence of having completed two years of college. In November 1942 the Council on Medical Education and Hospitals recommended that for the duration of the war premedical education, including satisfactory courses in physics, biology and inorganic and organic chemistry, be included within two calendar years. Such a program was adopted by practically all medical schools of the country.

The Army Specialized Training and Navy V-12 premedical programs call for less than two years of college

TABLE 15.—*Internship Required by Medical Schools*

College of [illegible] ool of Medicine
University [illegible]
Stanford [illegible]
Northwest[illegible]
University [illegible]
Duke University School of Medicine
University of Alberta Faculty of Medicine
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Montreal Faculty of Medicine

training, but in both of these programs the studies are continuous and provide for the student carrying more than the normal peacetime studies per semester. Both the Army and Navy programs provide for work well in excess of the sixty semester hours constituting the normal two academic years of medical study. The information received from those states whose licensure laws include specific premedical requirements seems to indicate that there should be no licensure difficulties encountered by students whose premedical work was taken under the Army Specialized Training or Navy V-12 or comparably accelerated civilian programs.

REQUIRED INTERNSHIPS

In tables 15 and 16 are listed the medical schools and licensing boards now requiring internships for the M.D. degree and licensure respectively. Six schools in the United States and 4 in Canada require an internship for graduation. Although relatively few schools require the internship for the M.D. degree, this is a requirement for licensure by twenty-three state medical licensing boards, the Arkansas and Connecticut homeopathic medical examining boards, the District of Columbia, Alaska, Canal Zone, Hawaii and Puerto Rico. Table 17 lists these states and indicates the relationship of this requirement to the nine month internship. Eleven states, the Connecticut homeopathic examining board, Alaska, the Canal Zone and Puerto Rico will accept a nine month internship as fulfilling the internship requirement. Ten states and the District of Columbia require an additional three months in a civilian hospital or military service but will permit applicants for licensure to write the examination on completion of the nine month internship but will withhold the license until this is completed. In two states physicians are not eligible to take the examination until after completion of a year's internship, three months of which may be in the military service. This is true

TABLE 16.—*Internship Required by Medical Licensing Boards of All Candidates*

Alabama	Iowa	Pennsylvania
Alaska	Michigan	Puerto Rico
Arkansas (homeo. board)	Montana	Rhode Island
Canal Zone	Nevada	South Dakota
Connecticut (homeo. board)	New Hampshire	Utah
Delaware	New Jersey	Vermont
District of Columbia	New Mexico	Washington
Hawaii	North Dakota	West Virginia
Idaho	Oklahoma	Wisconsin
Illinois	Oregon	Wyoming

Some states require the internship of graduates of medical faculties abroad and of reciprocity or endorsement applicants.

Illinois, Michigan, North Dakota, Pennsylvania and Washington require the internship to be a rotating service, while New Jersey recommends this type of service.

TABLE 17.—*Nine Month Internship*

	Additional Three Months in Civilian Hospital or Military Service Required	
Accepted as Fulfilling Internship Requirement	Will Give Examination at End of Nine Months	Will Not Give Examination Until Completion of Year's Service
Alaska	Alabama [1]	Arkansas (homeo. board)
Canal Zone	Dist. of Columbia [1]	Illinois [2]
Connecticut (homeo. board)	New Jersey [1]	New Mexico
Delaware	North Dakota	
Idaho	Oregon [1,2]	
Iowa [1]	Rhode Island [1]	
Michigan [1]	South Dakota [1,2]	
Montana [1]	Utah [1,2]	
Nevada	Vermont [1]	
New Hampshire	Washington [1]	
Oklahoma [1]	Wisconsin	
Pennsylvania [1]		
Puerto Rico		
West Virginia		
Wyoming		

1. Will also give examination on completion of the medical course but without license until internship is completed.

2. Military medical service must be in a military hospital.

Some states require the internship of graduates of medical faculties abroad and reciprocity or endorsement applicants.

Hawaii which requires an internship for licensure has not reported on the relationship of this requirement to the shortened internship.

Illinois, Michigan, North Dakota, Pennsylvania and Washington require the internship to be a rotating service, while New Jersey recommends this type of service.

also of the homeopathic examining board in Arkansas. Officers seeking licenses in these three states must delay licensure until after the war or seek furloughs to take the examinations. In the past it has been possible for officers to obtain furloughs for this purpose.

Five states (Connecticut, Maryland, Missouri, Texas and Virginia) whose laws do not require an internship withhold the licenses of candidates from schools requiring an internship for the M.D. degree until the internship is completed. In these states the examination may be taken at any time after completion of the medical school course.

The licensing boards of Illinois, Michigan, North Dakota, Pennsylvania and Washington require the internship to be a rotating service, while New Jersey recommends this type of service.

A few of the medical schools and licensing boards maintain their own list of hospitals acceptable for intern training, but the list of approved internships compiled by the Council on Medical Education and Hospitals is generally used.

TABLE 18.—*Temporary Permits, 1944*

State	Permit Valid For:	Permits Granted
Alaska	6 mos.	12
Arizona	3 mos.	68
Arkansas	Next board meeting	..
Delaware	1 yr.	3
Florida	6 mos. after cessation of hostilities	37
Georgia	Next board meeting	13
Kansas	Next board meeting	..
Kentucky	1-5 yrs.	8
Louisiana	Next board meeting	24
Maine	Duration of war	9
Mississippi	Next board meeting	22
Nevada	Until June 30, 1947	23
New Hampshire	Varies	..
New Mexico	Next board meeting	..
North Dakota	Next board meeting	..
Pennsylvania	6 mos. after cessation of hostilities	2
Puerto Rico	6 mos. after cessation of hostilities	13
Virginia	Next board meeting	5
Washington	Next board meeting	115
West Virginia	Next board meeting	6
Wyoming	Next board meeting	2
Total		362

LICENSURE FOR THE RELOCATED PHYSICIAN

To assist the physician returning to civilian practice or in locating in areas where there are shortages of physicians, the licensing boards of nineteen states, Alaska and Puerto Rico provide for the issuance of temporary permits, usually without immediate examination. These states, the length of the validity of the permit and the number of permits granted during the last calendar year are shown in table 18. During the past year four additional states and Alaska and Puerto Rico have provided for the issuing of temporary permits. Others are considering adjustments, probably impelled in part by the recent recommendation of the Procurement and Assignment Service that such legislation be enacted by states to facilitate the relocation of physicians into needy areas, especially in the case of discharged medical officers desiring such relocation.

In addition, the New Jersey medical practice act exempts from its requirements a lawfully qualified physician and surgeon of another state taking charge temporarily of the practice of a lawfully qualified physician of New Jersey during his absence from the state. Such permission may be granted by the board of medical examiners for a period of not less than two weeks nor more than four months but not to exceed one year in the aggregate.

THE BUREAU OF INFORMATION

Among its other responsibilities, the Bureau of Information of the American Medical Association is helping veteran medical officers with their medical practice and relocation problems. This is done through close association with state and county medical societies as an entirely voluntary effort without any attempt to direct the location of a physician.

An officer can obtain a brief but comprehensive picture of the economic status of any particular area he is interested in from the data contained on county summary sheets. This includes data on population, principal cities, physicians, hospital and medical facilities and pertinent economic, social and financial information. A copy of this summary sheet is forwarded to the inquirer and a copy of the letter to him is sent to the state and county medical society concerned.

In addition to the information contained on the summary sheets, other data are available for interested officers. Requests for full or part time salaried medical positions from industries, institutions and other organizations, requests from practicing physicians for associates, needs for specialists and requests of individuals for practices are cross filed and kept current by a return post card system which keeps the Bureau of Information informed of final locations, filling of vacancies and the securing of physicians.

An active cooperative effort of state and county medical societies in furnishing the Bureau of Information with current, up to date information about needs for doctors will enable the American Medical Association to be of definite help to veteran medical officers.

ANNUAL REGISTRATION

Twenty-seven states, the District of Columbia, Alaska and Hawaii require physicians to register their license annually. In table 19 are listed the states which exact this requirement. Some of these states require such registration whether or not physicians reside in the state. The fee is generally $2. With two exceptions, Colorado and Hawaii, the requirement has been waived for physicians in military service. In some instances legislative action was necessary to obtain a waiver.

CANDIDATES EXAMINED, 1940-1944

In table 20 are tabulated the number of candidates examined for medical licensure in the United States and its territories and possessions for the five year period from 1940 to 1944. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five year period and the percentage of candidates who failed also are given.

During this period 37,878 examinations were given; 31,935 were successful and 5,943, 15.7 per cent, failed. New York leads in the number of examinations given. In this state in the five year period there were 4,002 successful tests. Other states passing more than 2,000

TABLE 19.—*Annual Registration*

Alaska	Hawaii	New York
Arizona	Idaho	North Dakota
Arkansas	Iowa	Oklahoma
California	Kansas	Oregon
Colorado	Louisiana	Pennsylvania
Connecticut	Minnesota	Texas
Delaware	Missouri *	Utah
District of Columbia	Montana	Washington
Florida	Nebraska	Wisconsin
Georgia	Nevada	Wyoming

* Biennial registration.

included Pennsylvania 2,708, California 2,220 and Illinois 2,046. More than 1,000 were examined in seven other states and passed, namely Massachusetts, Michigan, Minnesota, Missouri, Ohio, Tennessee and Texas. The greatest percentage of failures, 55.6, occurred in Massachusetts. The high percentage in this state is due to the fact that, by law, the licensing board admitted to its examinations the graduates of unapproved medical schools and graduates of schools of osteopathy, many of whom repeatedly fail. New York had a failure percentage of 46.8, occasioned in large part by the admittance to examination of a considerable number of graduates of foreign faculties of medicine, who likewise repeatedly fail. Other high percentages of failures occurred in Connecticut, Maine, Nevada, New Hampshire and New Mexico. On the other hand, thirty-four states failed less than 5 per cent in the five year period. These included nine states which had no failures: Arkansas, Delaware, Indiana, Kansas, North Carolina, Oklahoma, South Dakota, Utah and West Virginia.

The percentage of failures in all states has decreased from 20.6 in 1940 to 11.9 in 1944. The lowest percentage of failures in this five year period occurred in 1943, when 10.9 per cent failed.

These figures represent examinations given and not individuals. A candidate who fails more than once in a state in a given year is counted only once, but should he also fail in a succeeding year he is counted in that year also. The same is true of successful candidates who migrate to other states. This group represents a recapitulation of the statistics computed annually and assembled for comparative purposes. It gives only a fair approximation of the number of physicians added to the profession in five years by the written examination method. Table 13, page 114, gives the corrected compilation of the number of physicians representing additions to the medical profession for this period.

TABLE 20.—*Candidates Examined, 1940–1944*

	1940		1941		1942		1943		1944		Total for Five Years		
	P	F	P	F	P	F	P	F	P	F	P	F	%F
Alabama	26	0	26	3	34	0	20	0	20	0	126	3	2.3
Arizona	20	1	17	0	9	0	6	0	11	0	63	1	1.6
Arkansas	58	0	60	0	62	0	65	0	115	0	360	0	0.0
California	396	29	400	11	439	15	507	12	458	14	2,220	81	3.5
Colorado	75	4	54	4	68	3	113	3	79	3	389	17	4.2
Connecticut	53	33	89	36	59	31	62	12	34	18	288	130	31.1
Delaware	15	0	18	0	7	0	9	0	27	0	76	0	0.0
Dist. of Columbia	49	2	33	0	27	0	42	2	26	2	177	6	3.3
Florida	131	6	143	7	110	8	129	8	130	9	643	38	5.6
Georgia	88	0	94	2	96	0	105	0	125	1	508	3	0.5
Idaho	40	1	30	0	12	1	9	1	15	0	106	3	2.8
Illinois	542	24	474	46	421	48	391	29	218	25	2,046	172	7.8
Indiana	125	0	120	0	128	0	243	0	126	0	742	0	0.0
Iowa	67	5	67	0	44	1	106	8	82	8	366	22	5.7
Kansas	92	0	92	0	99	0	86	0	179	0	548	0	0.0
Kentucky	77	0	84	0	86	0	161	1	78	0	486	1	0.2
Louisiana	154	1	145	1	175	0	228	2	255	4	957	8	0.8
Maine	32	14	38	12	42	6	29	3	13	3	154	38	19.8
Maryland	175	18	177	9	165	11	206	14	151	4	964	56	5.5
Massachusetts	338	299	254	288	201	251	257	294	162	261	1,212	1,393	55.6
Michigan	247	0	239	0	196	0	208	2	189	0	1,169	2	0.2
Minnesota	196	0	240	0	199	1	290	0	197	0	1,122	1	0.1
Mississippi	42	0	38	0	43	2	113	1	60	0	296	3	1.0
Missouri	373	0	196	0	182	1	421	1	207	0	1,385	2	0.2
Montana	9	0	7	1	7	1	4	0	3	0	30	2	6.2
Nebraska	84	0	92	0	77	2	155	15	81	11	489	28	5.4
Nevada	3	1	5	2	1	0	0	1	1	0	10	4	28.6
New Hampshire	9	1	10	1	3	3	5	4	9	4	36	13	26.5
New Jersey	179	36	155	29	110	10	150	11	104	11	698	97	12.2
New Mexico	0	1	2	0	0	0	1	0	0	0	3	1	25.0
New York	936	1,088	888	969	1,071	660	633	443	454	362	4,982	3,521	46.8
North Carolina	65	0	54	0	77	0	115	0	105	0	416	0	0.0
North Dakota	24	0	15	1	6	1	1	0	3	0	49	2	3.9
Ohio	305	16	263	14	274	6	624	22	329	25	1,795	83	4.4
Oklahoma	47	0	54	0	54	0	114	0	72	0	341	0	0.0
Oregon	33	0	22	0	45	0	52	5	11	5	163	10	5.8
Pennsylvania	478	24	446	18	456	21	475	12	853	20	2,708	95	3.4
Rhode Island	19	0	22	0	35	0	20	0	13	3	109	3	2.7
South Carolina	41	0	45	0	46	0	91	0	51	1	274	1	0.4
South Dakota	7	0	9	0	5	0	6	0	3	0	30	0	0.0
Tennessee	188	1	199	4	190	0	201	0	237	0	1,015	5	0.5
Texas	209	25	177	13	289	15	195	4	303	3	1,173	60	4.9
Utah	9	0	15	0	14	0	27	0	30	0	95	0	0.0
Vermont	21	1	18	0	24	1	19	0	7	0	89	2	2.2
Virginia	112	1	146	3	145	1	264	1	158	9	855	15	3.2
Washington	48	0	69	1	60	0	54	1	75	0	306	2	0.6
West Virginia	38	0	34	0	27	0	23	0	24	0	146	0	0.0
Wisconsin	113	0	120	0	124	1	176	0	74	0	607	1	0.2
Wyoming	16	1	8	0	0	0	0	0	0	0	24	1	4.0
U. S. Territories & Possessions	30	2	63	8	54	5	14	2	28	0	189	17	8.3
Total Examined	7,925		7,539		7,224		8,399		6,791		37,878		
Passed	6,290		6,057		6,118		7,485		5,985		31,935		
Failed	1,635		1,482		1,106		914		806		5,943		
Percentage Failed	20.6		19.7		15.3		10.9		11.9		15.7		

REGISTRATION, 1904-1944

A study of totals and percentages for forty-one years (1904-1944) is included in table 21. This tabulation covers physicians registered by written examination and by reciprocity or endorsement of credentials. There is no definite trend in the numbers annually registered from 1904 to 1933, although in 1918 the number registered dropped to the all time low record of 4,231. After 1933 there was an upward trend for a time followed by a decline which terminated in 1942. The decrease of more than 1,200 in 1918 was due to the sudden withdrawal of physicians and recent graduates from civilian life during World War I. By contrast, in 1943 the number registered increased almost 1,300 over the preceding year. The increase is a result of the accelerated curriculum and the graduation of two classes by many medical schools in that year. Under the accelerated curriculum the majority of medical schools had one graduating class in 1944, which accounts for the decrease in the numbers examined. Unless appropriate measures are adopted at once, there will be a sharp decline in graduates and licenses issued commencing in 1948. Even if such adjustments are made now there will be a decline in graduates, because inadequate numbers of qualified students are now permitted to engage in premedical studies.

TABLE 21.—*Registration, 1904–1944*

Year	Examined	Passed	Per-centage Failed	Reciprocity or Endorse-ment	Total Regis tered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,565	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,889	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,753	4,084	14.1	1,360	5,444
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,488	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,615	5,247	7.0	1,885	7,132
1933	5,673	5,244	7.6	1,989	7,233
1934	6,144	5,627	8.4	2,160	7,788
1935	6,443	5,859	9.1	2,196	8,055
1936	6,917	6,223	10.0	2,775	8,998
1937	7,334	6,604	10.0	3,203	9,807
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,925	6,290	20.7	2,865	9,155
1941	7,539	6,057	19.7	2,758	8,815
1942	7,221	6,118	15.4	2,469	8,587
1943	8,399	7,485	10.9	2,336	9,821
1944	6,791	5,985	11.9	2,571	8,556

There was an increase in registration on the basis of credentials in 1944. It is presumed that medical officers returning to civilian practice are making use of this means of obtaining licensure, if they are planning to relocate rather than return to their former practice.

The percentage of failures gradually dropped from 19.3 in 1904, when a great many proprietary medical schools were functioning, to 5.7 in 1930. Improvements in the standards of medical education have resulted in this decrease of failures in licensing examinations. With the migration of physicians to this country beginning in 1936 and the resultant licensure difficulties, the percentage of failures again began to rise, until they reached a peak of 20.7 in 1940. This rise is attributable also to the inability of graduates of unapproved schools to obtain licensure successfully without many failures. In the last two years the number of foreign graduates applying for licensure has considerably decreased. In 1944 also there was a decrease in the number of graduates of unapproved institutions registered.

TABLE 22.—*Graduates of Approved Schools and Others Registered, 1922–1944*

	Graduates of Approved Schools		Others		
	Number	Per Cent of Total	Number	Per Cent of Total	Totals
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	514	7.2	7,476
1932	6,675	93.7	457	6.3	7,132
1933	6,774	93.7	459	6.3	7,233
1934	7,171	92.1	617	7.9	7,788
1935	7,362	91.5	693	8.5	8,055
1936	7,932	88.2	1,066	11.8	8,998
1937	8,389	85.6	1,418	14.4	9,807
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,780	85.0	1,375	15.0	9,155
1941	7,766	88.1	1,049	11.9	8,815
1942	7,289	84.9	1,298	15.1	8,587
1943	8,632	87.8	1,189	12.2	9,821
1944	7,690	89.9	866	10.1	8,556
Total	161,940	88.3	21,516	11.7	183,456

In analyzing this table it should be remembered that the figures represent multiple examinations by individuals in some instances rather than actual additions to the profession.

GRADUATES OF APPROVED SCHOOLS AND OTHERS REGISTERED, 1922-1944

The educational fitness of physicians registered for the practice of medicine is recorded in table 22. In the computation of these figures, schools rated as class A and B by the Council on Medical Education and Hospitals of the American Medical Association since 1907 are classified as approved. In the column "Others" are included individuals who graduated prior to 1907, when the first classification of schools was made, graduates of foreign faculties of medicine, class C graduates, osteopaths given recognition by medical licensing boards and graduates of schools not approved by the Council. In 1928 the classification A, B and C by the Council was discontinued and a list of approved medical schools has since been maintained.

There were 8,556 candidates registered in 1944, of whom 7,690, 89.9 per cent, represented graduates of approved schools and 866, 10.1 per cent, the group designated as others.

In twenty-three years 183,456 were registered, including 161,940 approved graduates (88.3 per cent) and 21,516 others (11.7 per cent). Since 1922 the number of graduates of approved schools has increased

TABLE 23.—*Graduates of Unapproved Medical Schools Registered, 1939–1944*

	Examination						Reciprocity and Endorsement						
	1939	1940	1941	1942	1943	1944	1939	1940	1941	1942	1943	1944	Total
Arizona	2	0	0	0	0	0	0	0	0	0	0	0	2
California	0	1	1	0	0	0	1	0	0	0	0	0	3
Florida	1	0	0	0	0	0	0	0	0	0	0	0	1
Illinois	51	48	51	51	57	45	0	0	0	0	0	0	303
Indiana	0	0	0	0	0	0	1	2	0	1	0	0	4
Iowa	0	0	0	0	0	0	0	0	1	0	0	0	1
Kentucky	0	0	0	0	2	0	2	2	0	0	0	0	6
Massachusetts	79	98	90	105	177	102	0	0	0	0	0	0	651
Mississippi	0	0	0	1	0	1	0	0	0	0	0	0	2
Missouri	0	0	1	0	1	0	0	0	0	0	0	1	3
Nevada	0	0	0	0	0	0	0	0	0	0	0	1	1
New Jersey	0	0	0	0	0	0	4	13	8	0	0	0	25
New Mexico	0	0	0	0	0	0	0	2	0	0	0	0	2
New York	0	0	0	0	0	0	12	8	0	0	0	0	20
Ohio	36	0	0	0	0	0	0	0	0	0	0	0	36
Pennsylvania	1	5	0	0	0	0	0	0	0	0	0	0	6
Texas	4	6	0	0	0	0	0	0	0	0	0	0	10
Virginia	1	0	0	0	1	5	0	0	0	0	0	0	7
Wisconsin	0	0	0	0	0	0	0	0	0	0	1	0	1
Hawaii	0	0	1	0	1	0	0	0	0	0	0	0	2
Puerto Rico	0	1	0	0	0	0	0	0	0	0	0	0	1
Totals	175	159	144	157	239	153	20	27	9	1	1	2	1,087

well beyond 4,500, representing more than 80 per cent of those annually registered. Until the influx of foreign graduates in 1936, those in the second group since 1924 have been fewer than 1,000. The number in this group was considerably decreased in 1944 and 323 lower than the figure for 1943.

In computing the figure for 1944 it is revealed that the 8,556 candidates registered represented 7,640 graduates of approved or class A medical schools, 50 were graduates of schools rated in class B at the time of graduation, 350 were graduates of class C or unapproved schools and 516 were foreign graduates and graduates of medical schools before 1907, when the first classification of medical schools was made.

GRADUATES OF UNAPPROVED MEDICAL SCHOOLS REGISTERED, 1939-1944

Graduates of institutions which do not meet the educational standards outlined by the House of Delegates of the American Medical Association and administered

TABLE 24.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1939–1944*

	Examination						Reciprocity and Endorsement						
	1939	1940	1941	1942	1943	1944	1939	1940	1941	1942	1943	1944	Total
Colorado	22	15	2	9	9	7	0	0	0	0	0	0	64
Connecticut	1	0	0	0	5	5	0	0	0	0	0	0	11
Delaware	0	0	0	0	3	0	0	0	0	0	0	0	3
Dist. Columbia	0	1	0	2	0	0	0	0	2	1	0	0	6
Indiana	4	7	3	4	2	3	0	1	3	2	3	3	33
Massachusetts	10	27	26	13	5	4	0	0	0	0	0	0	85
Nebraska	0	0	0	0	6	0	0	0	0	0	1	0	7
New Hampshire	0	2	0	0	0	3	0	2	0	1	1	2	11
New Jersey	45	47	32	9	18	30	0	0	0	0	0	0	181
Ohio	0	0	0	0	158	72	0	0	0	0	0	3	233
Oregon	1	0	2	1	0	0	1	1	2	5	3	8	24
Texas	19	20	13	17	18	38	17	1	1	1	2	1	148
Virginia	0	0	3	0	0	0	0	0	1	0	0	0	4
Wisconsin	0	1	2	5	6	0	0	0	0	1	16	5	36
Wyoming	0	1	0	0	0	0	2	0	0	2	1	2	8
Totals	102	121	83	60	227	165	20	5	9	13	27	24	856

by the Council on Medical Education and Hospitals were registered in nineteen states, Hawaii and Puerto Rico during the last six years. The number so registered will be found in table 23. Figures are given separately for those licensed by written examination and

by endorsement of credentials. In the six years shown 1,087 were registered, 1,027 by examination and 60 by reciprocity or endorsement. In 1944 there were 155 so registered, 153 by examination and 2 without written examination in six states, namely Illinois, Massachusetts, Mississippi, Missouri, Nevada and Virginia.

The large numbers of unapproved graduates licensed in Illinois and Massachusetts result from the nature of the licensing laws in these two states, which accounted for over 90 per cent of these licenses. However, 28 graduates of substandard schools have been licensed in other states in the past four years.

may practice either medicine, surgery or both, as the case may be, if he passes a satisfactory examination before the medical examining board. In Delaware and the District of Columbia osteopaths are granted the right to practice surgery. In Indiana the licenses issued to osteopaths under the 1945 amendment to the medical practice act authorize the holders to practice medicine and surgery. Prior licentiates have been authorized to practice osteopathy, surgery and obstetrics. In Massachusetts the medical practice act, by definition, includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an

TABLE 25.—*Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada*

	Admitted to Examination	Admitted by Endorsement of * State License	Citizenship	Basic Science Certificate	Internship in Hospital in United States	Further Medical Training	Examination Fee, Dollars	Other Requirements
Alabama	+	..	+	..	+	..	10	1
Arizona	Not accepted							
Arkansas (reg. and homeo. boards)	Not accepted							
California	+	+[21]	..	..	+[16]	+[16]	25	11
Colorado	+	..	1st P	+	..	..	25[4]	3
Connecticut (regular board)	+	..	1st P	+	..	..	25	..
Delaware (regular board)	+	..	+	.	+	..	25	5,22
District of Columbia	+	+[6]	..	+	+	..	25	10
Florida	+	..	+	+	..	+[7]	25	..
Georgia	+	..	+	..	..	+[7]	20	..
Idaho	+	..	+	..	+	..	25	..
Illinois	+	..	1st P	..	+	..	10	8
Indiana	+	+	..	.	..	+[7]	25	..
Iowa	+[10]	..	+	+	+[2]	+[2]	25	..
Kansas	+	..	+	..	..	..	25	11
	Not accepted[27]							
boards)	Not accepted							
Maine	+	+	+	..	+	..	27	11
Maryland (reg. and homeo. boards)	+	..	1st P	..	+[26]	..	25	19
Massachusetts	+	..	1st P	..	..	..	25	..
Michigan	+	+	+	+	+	+[7]	25	..
Minnesota	Not accepted							
Mississippi	+	..	+	..	+	..	10[3]	..
Missouri	+	+	+	..	..	..	15	..
Montana	Not accepted[25]							
Nebraska	+	+	+	+	..	..	25	..
Nevada	Not accepted							
New Hampshire	+	+[12]	+	..	+	..	20	..
New Jersey	+	+	+	..	+[17]	..	25	..
New Mexico	Not accepted							
New York	+	+	1st P	..	..	..	25	14
North Carolina	Not accepted							
North Dakota	+	..	+	..	+	..	25	11
Ohio	+	+	+	..	..	..	25	..
Oklahoma	Not accepted							
Oregon	Not accepted							
Pennsylvania	+	..	1st P	..	+	..	25	..
Rhode Island	+	..	1st P	+	+[16]	+[16]	20	13
[illegible]	Not accepted[12]							
[illegible]	+	..	1st P	+	+	..	20	..
[illegible]	Not accepted							
Texas	+	..	+	..	..	..	25	..
Utah	Not accepted							
Vermont	Not accepted[23]							
Virginia	+	..	+	13	15	+	25	24
Washington	+	..	1st P	+	+	+[7]	25	9
West Virginia	Not accepted							
Wisconsin	Not accepted							
Wyoming	Not accepted							
Alaska	+	+	+	..	+	..	25	..
Hawaii	+	..	+	..	+	..	25	12
Puerto Rico	+	+	+	..	+	..	25	..

* Refer to chart of "Reciprocity and Endorsement Policies" for further data.

1. Certificate of National Board of Medical Examiners and licensure in country in which school of graduation is located.
2. Internship or one year in medical school in United States.
3. Certificate of National Board of Medical Examiners.
4. For graduates of last five years; if more than five years $50.
5. Residence of one year in Delaware.
6. If similar privileges are accorded licentiates of District of Columbia by licensing agency of jurisdiction from which applicant comes.
7. Senior year in class A medical school in United States.
8. Graduates of European medical colleges after July 1, 1936, Switzerland excepted, shall not be eligible for licensure. Graduates prior to this date may be accepted for the regular written and clinical examination after completing rotating internships in approved hospitals in the United States.
9. Enemy aliens not accepted.
10. Application must be filed six months prior to date of examination.
11. Licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States.
12. Diplomates of National Board of Medical Examiners eligible.
13. License to practice medicine and surgery in the country in which the school of graduation is located.
14. Matriculants after Jan. 1, 1940 not accepted.
15. At the discretion of the board.
16. Internship and graduate work.
17. Internship completed in foreign countries after July 1, 1934 not acceptable.
18. Rotating internship in approved hospital in the United States or completion of senior year in class A medical school in the United States.
19. These requirements apply also to graduates of Canadian schools.
20. Graduates from foreign medical colleges accepted if they present also a diploma from an approved medical school in the United States.
21. Provided standard was the same as California on the same date.
22. Degree from an American medical college acceptable to the Medical Council of Delaware required.
23. Diplomates of the National Board of Medical Examiners accepted. Citizenship required.
24. Very limited number contracting to practice in rural districts may be accepted.
25. Effective July 1, 1943.
26. Homeopathic board requires one year internship in homeopathic hospital in the United States.
27. Will consider limited license for applicant with acceptable credits from National Board of Medical Examiners and states maintaining reciprocity.

GRADUATES OF SCHOOLS OF OSTEOPATHY REGISTERED BY MEDICAL EXAMINING BOARDS, 1939-1944

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery or both by the medical examining boards of fourteen states and the District of Columbia for six years (1939-1944) are given in table 24. There have been 856 such individuals registered since 1939, 758 by examination and 98 by endorsement.

In 1944 twelve states registered 165 by examination and 24 by recognition of their credentials, 189 in all. The situation in these fifteen states is as follows:

In Colorado an osteopath receives a license to practice medicine. In Connecticut, any registered osteopath osteopathic applicant. According to a law passed in Nebraska in 1943 "any person now licensed to practice osteopathy may, if application is made prior to July 1, 1948 and upon payment of the prescribed fee, take the first regular examination given after the application is made before the Board of Examiners in Medicine . . . if successful he or she shall receive a license to practice medicine and surgery in the state." In New Hampshire, osteopaths are granted the right to practice medicine and surgery. New Jersey provides that osteopaths licensed prior to Nov. 1, 1941 who furnish proof, prior to that date, of having served for a period of two years as an intern or resident surgeon in an osteopathic or medical hospital approved by the board of medical examiners, of having completed a postgraduate course

TABLE 26.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1944*

Marginal Number		1 Alabama		2 California		3 Colorado		4 Connecticut		5 Illinois		6 Iowa		7 Louisiana		8 Maine		9 Maryland		10 Massachusetts		11 Mississippi		12 Missouri		13 New Jersey		14 New York		15 Ohio		16 Pennsylvania		17 Rhode Island		18 South Dakota		19 Texas		20 Virginia		21 Washington		22 Puerto Rico		Totals	Examined—Passed	Examined—Failed	Percentage of Failures	Number of Boards Examined by	Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
	ARGENTINA																																																		
1	Universidad Nacional de Buenos Aires																																							1	0					1	1	0	0.0	1	1
	BELGIUM																																																		
2	Université Libre de Bruxelles																			1	0							2	0																	3	3	0	0.0	2	2
3	Universiteit Gent																											0	1																	1	0	1	100.0	1	3
	CHILE																																																		
4	Universidad de Chile							0	1																																					1	0	1	100.0	1	4
	CHINA																																																		
5	Hackett Medical College for Women			1	0																																									1	1	0	0.0	1	5
6	National College of Medicine, Shanghai			1	0																																									1	1	0	0.0	1	6
	CUBA																																																		
7	Universidad de la Habana																	1	0	0	2																							1	0	4	2	2	50.0	3	7
	CZECHOSLOVAKIA																																																		
8	Deutsche Universität, Prag	1	0																	0	1	1	0					5	6																	11	7	7	50.0	4	8
9	Universita Karlova, Praha									0	1															1	1	4	4			1	0													12	6	6	50.0	4	9
10	Univerzita Komenského, Bratislava																											1	0																	1	1	0	0.0	1	10
	EL SALVADOR																																																		
11	Universidad de El Salvador									1	0																																			1	1	0	0.0	1	11
	ENGLAND																																																		
12	Kings College																																					1	0							1	1	0	0.0	1	12
13	Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London																											0	1																	1	0	1	100.0	1	13
14	St. Mary's Hospital Medical College																											1	1																	2	1	1	50.0	1	14
	ESTONIA																																																		
15	Université de Tartu																			0	1																									1	0	1	100.0	1	15
	FRANCE																																																		
16	Université de Lyon																																									1	0			1	1	0	0.0	1	16
17	Université de Montpellier																											0	1																	1	0	1	100.0	1	17
18	Université de Paris			1	0			2	1									1	0	0	1							15	14																	35	19	16	45.7	5	18
19	Université de Toulouse																											0	1																	1	0	1	100.0	1	19
20	Université de Strasbourg																			0	1							1	1																	3	1	2	66.7	2	20
	GERMANY																																																		
21	Albert-Ludwigs Universität, Freiburg			0	1					0	1							1	0									5	3																	11	6	5	45.5	4	21
22	Albertus-Universität, Königsberg																											2	3																	5	2	3	60.0	1	22
23	Christian-Albrechts-Universität, Kiel																									1	0	0	2																	3	1	2	66.7	2	23
24	Ernst-Moritz-Arndt Universität, Greifswald																									0	1																			1	0	1	100.0	1	24
25	Friedrich-Alexanders-Universität, Erlangen																											0	1																	1	0	1	100.0	1	25
26	Friedrich-Wilhelms-Universität, Berlin			1	0					2	2									1	0							23	24													1	0			54	28	26	48.1	5	26
27	Georg August-Universität, Göttingen																											0	2																	2	0	2	100.0	1	27
28	Hamburgische Universität									0	1									0	1			1	0			0	3																	6	1	5	83.3	4	28
29	Hessische Ludwigs-Universität, Giessen																											0	1																	1	0	1	100.0	1	29
30	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main			1	0					1	0	1	0					1	0									2	2																	8	6	2	25.0	5	30
31	Julius Maximilians-Universität, Würzburg																	0	1									3	1																	5	3	2	40.0	2	31
32	Kaiser-Wilhelms-Universität, Strassburg																											2	2																	4	2	2	50.0	1	32
33	Leopold-Franzens-Universität, Innsbruck									1	1																																			2	1	1	50.0	1	33
34	Ludwig-Maximilians-Universität, München																											4	9			1	0													14	5	9	64.3	2	34
35	Rheinische Friedrich-Wilhelms-Universität, Bonn																											0	2							1	0									3	1	2	66.7	2	35
36	Schlesische-Friedrich-Wilhelms-Universität, Breslau									0	1									0	2			1	0			1	4	1	0															10	3	7	70.0	5	36
37	Thüringische Landesuniversität, Jena									1	0									0	1							1	1																	4	2	2	50.0	3	37
38	Universität Heidelberg																			1	0							1	3																	5	2	3	60.0	2	38
39	Universität Köln																											1	1																	2	1	1	50.0	1	39
40	Universität Leipzig																			0	2							1	3																	6	1	5	83.3	2	40
41	Universität Rostock																			0	1							0	1																	2	0	2	100.0	2	41
42	Universität Wien			0	2	1	0	1	4	2	1					1	0	2	0	1	3	1	0			2	0	57	53	1	0	2	0					1	0							135	72	63	46.7	13	42
43	Vereinigten Friedrichs-Universität, Halle-Wittenberg																			1	0							1	1																	3	2	1	33.3	2	43
	GREECE																																																		
44	National University of Athens									0	2									0	1							1	3	1	0															8	2	6	75.0	4	44
	HONDURAS																																																		
45	Universidad Central de la República de Honduras			1	0																																									1	1	0	0.0	1	45
	HUNGARY																																																		
46	Magyar Királyi Erzsébet Tudományegyetem, Pecs									0	1					0	1	0	1							1	0	0	2	1	0											1	0			8	3	5	62.5	7	46
47	Magyar Királyi Ferencz József Tudományegyetem, Szeged															1	1			0	1																									3	1	2	66.7	2	47
48	Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest																			0	3					1	1	5	6																	16	6	10	62.5	3	48
49	Magyar Királyi Tisza-István-Tudományegyetem, Debrecen									0	1							1	0																											2	1	1	50.0	2	49

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
	IRELAND																												
50	National University of Ireland														1 0									1	1	0	0.0	1	50
51	University of Dublin														0 2									2	0	2	100.0	1	51
	ITALY																												
52	Regia Università di Bologna		0 1						2 0		0 2			4 3	9 19			0 1			1 0			42	16	26	61.9	7	52
53	Regia Università di Genova														2 2									4	2	2	50.0	1	53
54	Regia Università di Messina													1 0										1	1	0	0.0	1	54
55	Regia Università di Milano														1 0									1	1	0	0.0	1	55
56	Regia Università di Napoli									0 1				1 2	0 9									13	1	12	92.3	3	56
57	Regia Università di Padova										0 1				4 4									9	4	5	55.6	2	57
58	Regia Università di Palermo													0 1	0 2		1 0							4	1	3	75.0	3	58
59	Regia Università di Pavia														1 2									3	1	2	66.7	1	59
60	Regia Università di Perugia													1 0	0 1									2	1	1	50.0	2	60
61	Regia Università di Pisa		1 0							1 0					0 2				1 0					5	3	2	40.0	4	61
62	Regia Università di Roma									1 0	0 1			1 0	7 10									20	9	11	55.0	4	62
63	Regia Università di Siena														1 2									3	1	2	66.7	1	63
	LEBANON																												
64	American University of Beirut														1 1									2	1	1	50.0	1	64
65	l'Université de St. Joseph, Beyrouth														0 1									1	0	1	100.0	1	65
	LITHUANIA																												
66	Universito Kaunas										0 1				2 1									4	2	2	50.0	2	66
	MEXICO																												
67	Escuela Libre de Homeopatía, México																						1 0	1	1	0	0.0	1	67
68	Instituto Libre Homeopático de México							1 0																1	1	0	0.0	1	68
69	Universidad de Guadalajara		0 2																					2	0	2	100.0	1	69
70	Universidad Nacional, México																			1 1			4 0	6	5	1	16.7	2	70
	NETHERLANDS																												
71	Universiteit van Amsterdam														2 1									3	2	1	33.3	1	71
72	Rijks-Universiteit te Utrecht														1 1									2	1	1	50.0	1	72
	NEW ZEALAND																												
73	University of New Zealand														1 1									2	1	1	50.0	1	73
	POLAND																												
74	Uniwersytet Jagielloński, Cracow														1 0									1	1	0	0.0	1	74
75	Uniwersytet Jana Kazimierza, Lwów														0 1									1	0	1	100.0	1	75
76	Uniwersytet Józefa Piłsudskiego, Warszawa														4 3									7	4	3	42.9	1	76
77	Uniwersytet Stefana Batorego, Wilno														0 1									1	0	1	100.0	1	77
	RUMANIA																												
78	Universitatea din Bucuresti														1 0		1 0							2	2	0	0.0	2	78
	SCOTLAND																												
79	Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow														18 3		1 0							22	19	3	13.6	2	79
80	University of Edinburgh				0 1										1 0									2	1	1	50.0	2	80
81	University of St. Andrews		1 0																					1	1	0	0.0	1	81
	SPAIN																												
82	Universidad de Barcelona												1 0		0 1								1 0	3	2	1	33.3	3	82
	SWITZERLAND																												
83	Universität Basel					1 2									1 6		0 1							11	2	9	81.8	3	83
84	Universität Bern		0 1			3 0					0 1				5 7									17	8	9	52.9	4	84
85	Universität Zürich		1 0			1 0									3 9									14	5	9	64.3	3	85
86	Université de Genève					0 1					0 1				2 5									9	2	7	77.8	3	86
87	Université de Lausanne										1 3			2 1	12 18		2 0			1 0	0 1			41	18	23	56.1	6	87
	UNION OF SOCIALIST SOVIET REPUBLICS																												
88	First Moscow Medical Institute												1 0		0 4									5	1	4	80.0	2	88
89	Kharkov Medical Institute														1 1									2	1	1	50.0	1	89
90	Kiev Medical Institute					0 1									0 1									2	0	2	100.0	2	90
91	Odessa Medical Institute														1 1									2	1	1	50.0	1	91
92	Second Moscow Medical Institute														0 1									1	0	1	100.0	1	92
93	Voronezh Medical Institute														1 0									1	1	0	0.0	1	93
	YUGOSLAVIA																												
94	Universiteta Zagreb														1 0									1	1	0	0.0	1	94
95	Totals	1	16	1	10	29	1	1	6	12	37	2	4	26	510	4	10	1	2	5	3	3	7	691	...	...	....	..	95
96	Totals—Examined—Passed	1	9	1	3	13	1	1	4	9	6	2	4	16	224	4	9	0	2	4	2	3	7	...	325	...	....	..	96
97	Totals—Examined—Failed	0	7	0	7	16	0	0	2	3	31	0	0	10	286	0	1	1	0	1	1	0	0	...	...	366	....	..	97
98	Percentage Failed	0.0	43.8	0.0	70.0	55.2	0.0	0.0	33.3	25.0	83.8	0.0	0.0	38.5	56.1	0.0	10.0	100.0	0.0	20.0	33.3	0.0	0.0	...	...	...	53.0	..	98
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						

P—Passed; F—Failed.

of two years in a college of osteopathy or medicine approved by the board, or of having had at least three years of practice in a hospital approved by the board, can be admitted to an examination in pharmacology, therapeutics and surgery and, if successful, can obtain a license to practice medicine and surgery. Since 1941 all osteopathic applicants who have met the requirements of the medical practice act have been licensed to practice medicine and surgery.

A law passed in Ohio in 1943 gives osteopaths who obtain their licenses under that act the right to practice osteopathic medicine and surgery. In Oregon they are granted the right to practice surgery. The medical practice act of Texas provides for the issuing of a license to practice medicine only and osteopaths are issued licenses unrestricted in scope. In Virginia, osteopaths may obtain the right to perform surgery with the use of instruments if they satisfy the board of medical examiners that they have had adequate clinical facilities in their respective college of graduation or by hospital work to enable them to perform such operations. Wisconsin grants osteopaths the privilege to practice surgery and in Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act of the latter state provides that the certificate issued to all applicants "shall be deemed licenses to practice medicine in all branches in which the applicant has taken examination in the state."

PHYSICIANS EXAMINED ON THE BASIS OF CREDENTIALS OBTAINED IN COUNTRIES OTHER THAN THE UNITED STATES AND CANADA

The Council on Medical Education and Hospitals does not grade or classify medical schools outside the United States and Canada. It does not attempt to evaluate institutions which it is not in a position to visit to determine whether they meet the minimal essentials of an acceptable medical school as outlined by the Council. This was true even before the war.

For a period of twelve years beginning in 1926 the credentials of physicians coming from abroad were verified by the Council through official correspondence with the medical schools directly or through the diplomatic services. Prior to the onset of the war in Europe it was necessary to discontinue this effort, and on the licensing boards rests the responsibility of evaluating the credentials presented by these graduates. In the 1942 edition of the American Medical Directory a symbol in the biographic data of foreign graduates indicates when the information given is the licensing board's record of the credential accepted as meeting the educational qualifications for licensure. The absence of the symbol may be interpreted to indicate that official verification is on file in the office of the Council.

The requirements of candidates for medical licensure in the United States, Alaska, Hawaii and Puerto Rico on the basis of credentials obtained in countries other than the United States and Canada are given in table 25. Eighteen states report that the holders of such credentials are not eligible for licensure. Eighteen states, Alaska, Hawaii and Puerto Rico require full citizenship and ten states naturalization papers as a condition precedent to taking the examination. California, Indiana and the District of Columbia make no reference to citizenship. In some states the recognition or nonrecognition of such individuals is by rule of the board, in others the provision is by statute. Ten states require a certificate from the state board of examiners in the basic sciences. In eighteen states, Alaska, Hawaii and Puerto Rico an internship in a hospital in the United States is a prerequisite. Additional qualifications of individual states are given in footnotes. No state has changed its laws regarding these graduates or relaxed its requirements in recent years.

Table 26 presents figures relating to physicians examined on the basis of credentials obtained in countries other than the United States and Canada by licensing boards in 1944. The figures represent both American and foreign born physicians educated abroad. Ninety-two faculties of medicine and two licensing corporations of nineteen European countries and nine other countries are represented. There were 691 examined by twenty-one states and Puerto Rico, of whom 325 passed and 366, 53.0 per cent, failed. Graduates of the University of Vienna represented the largest group, 135, who were examined in thirteen states, with a failure percentage of 46.7. Five states examined 54 graduates of the University of Berlin, of whom 48.1 per cent failed. More than 35 graduates of the Universities of Paris, Bologna and Lausanne also were examined in the United States last year.

TABLE 27.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930–1944*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
Totals	12,949	6,834	47.2

The greatest number of foreign graduates examined by any one state was 510 in New York, of whom 224 passed and 286 (56.1 per cent) failed. No other state tested more than 37 of these physicians. Fewer than 5 were examined by eleven states. The proportion of failures in seventy-three schools of the total of 94 was 25 per cent or more.

Table 27 records the number of graduates of faculties of medicine abroad examined for medical licensure in the United States in fifteen years, 1930 to 1944 inclusive. In this period 12,949 were examined, of whom 6,834 passed and 47.2 per cent failed. There has been a decrease of 340 in the number examined in 1944 as compared with the previous year. In 1943 there were 599 fewer examined than in the previous year. The percentage of failures however has not changed significantly in recent years. The greatest number of failures occurred in 1941 when 59.2 per cent failed. At no time in this fifteen year period did fewer than 30.7 per cent fail.

From 1936 to 1940 there were large annual increases in foreign graduates examined, so that in 1940 there were over three times as many tested as in 1936. Since 1940 there have been annual decreases. The number last year was 1,397 fewer than that of 1940, but has not yet reached the average number of foreign graduates examined annually prior to 1936 and before the increased migration of foreign physicians to this country from Europe.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Basic science requirements underlying the practice of the healing arts have been established by legislative action in seventeen states and the District of Columbia. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before that board and demonstrate his knowledge. Such boards are distinct from licensing boards. A certificate of proficiency in the basic sciences does not authorize the possessor to practice the healing art; it enables him only to apply for licensure so to practice.

TABLE 28.—*States Having Basic Science Laws and Year of Enactment*

Arizona	1936	Nebraska	1927
Arkansas	1929	New Mexico	1941
Colorado	1937	Oklahoma	1937
Connecticut	1925	Oregon	1933
District of Columbia	1929	Rhode Island	1940
Florida	1939	South Dakota	1939
Iowa	1935	Tennessee	1943
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925

Connecticut and Wisconsin were the first states to adopt such legislation. Laws were passed in these states in 1925. Other states comprising the group, together with the year of enactment of their basic science law, are recorded in table 28.

The subjects in which examinations are conducted by the respective states and the District of Columbia are shown in table 29. These subjects are specified by statute. The examining boards are not authorized to add any subjects or to refrain from giving an examination in any subject specified by the law. All eighteen boards examine in anatomy, pathology and physiology, sixteen examine in biochemistry, fourteen in bacteriology, eight in hygiene, two in diagnosis and one in public health.

TABLE 29.—*Subjects Included in Basic Science Examinations*

	Examinations Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Arizona	+	+	+	..	+	+	+	..
Arkansas	+	+	+	..	..	+	+	..
Colorado	+	+	+	..	..	+	+	..
Connecticut	+	..	..	+	+	+	+	..
Dist. Columbia	+	+	+	..	..	+	+	..
Florida	+	+	+	..	..	+	+	..
Iowa	+	+	+	..	+	+	+	..
Michigan	+	+	+	..	+	+	+	+
Minnesota	+	+	+	..	+	+	+	..
Nebraska	+	+	+	..	+	+	+	..
New Mexico	+	+	+	..	..	+	+	..
Oklahoma	+	+	+	..	..	+	+	..
Oregon	+	..	+	..	+	+	+	..
Rhode Island	+	+	+	..	..	+	+	..
South Dakota	+	+	+	..	..	+	+	..
Tennessee	+	+	+	..	..	+	+	..
Washington	+	..	+	..	+	+	+	..
Wisconsin	+	..	..	+	..	+	+	..

The results of examinations held in these states or the number of certificates issued on the basis of endorsement during the calendar year 1944 are presented in tables 30 and 31. Applying for a basic science certificate, the candidate is not required to mention his school of practice. Official reports which formed the basis for these compilations in some instances included the name of the candidate and but little additional data other than perhaps the name of the high school attended and the present address of the applicant. However, by checking the biographic and medical student records of the American Medical Association and various directories it has been possible to determine the profession of the majority of the candidates. The figures here presented are tabulated in four groups, namely physicians and medical students, osteopaths, chiropractors and unclassified applicants. The latter category includes those for whom it was not possible to determine the profession represented. The unclassified group in Connecticut includes doctors of naturopathy, while in Rhode Island doctors of dentistry represent the unclassified group. The American Medical Association maintains a complete file of physicians and medical students, so that it may be presumed that the unclassified group represents mainly osteopaths and chiropractors which have not been identified by checking the directories and other reference material available.

TABLE 30.—*Applicants Examined, 1944*

	Physicians and Medical Students		Osteopaths		Chiropractors		Unclassified		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Arizona	26	0	0	0	0	0	3	0	43	29	14*	32.6
Arkansas	77	1	0	0	0	0	0	0	78	77	1	1.3
Colorado	110	15	2	2	0	0	8	1	138	120	18	13.0
Connecticut	76	4	1	0	0	2	0	2	85	77	8	9.4
District of Columbia	11	2	0	1	0	0	0	0	14	11	3	21.4
Florida	173	53	10	6	3	6	3	2	256	189	67	26.1
Iowa	125	45	12	19	0	0	72	47	320	209	111	34.7
Michigan	280	102	5	12	0	0	25	19	443	310	133	30.0
Minnesota	236	41	11	9	0	0	21	16	334	268	66	19.8
Nebraska	122	23	0	0	0	0	14	2	161	136	25	15.5
New Mexico	2	1	4	0	0	0	0	0	7	6	1	14.3
Oklahoma	71	1	0	0	0	0	0	0	72	71	1	1.4
Oregon	72	20	6	1	0	0	3	10	112	81	31	27.7
Rhode Island	35	2	1	0	2	0	22	3	65	60	5	7.7
South Dakota	9	0	1	1	0	0	0	0	11	10	1	9.1
Tennessee	215	77	0	0	0	0	12	2	306	227	79	25.8
Washington	131	28	6	12	0	1	0	4	182	137	45	24.7
Wisconsin	97	1	0	0	0	0	29	9	136	126	10	7.4
Totals—Examined	2,284		122		14		329		2,763			
Totals—Passed	1,868		59		5		212		.....	2,144		
Totals—Failed	416		63		9		117		.....	.....	619	
Percentage failed	18.2		51.6		64.3		35.6		.....	.....	...	22.4

* Nature of practice undetermined, since names of failures not supplied.

The eighteen basic science boards examined in 1944 a total of 2,763 candidates (table 30). Physicians and medical students represent the greatest number examined. There were 2,284 in this group. There were 122 osteopaths examined, 14 chiropractors, and 329 were placed in the unclassified group. Of all the applicants 22.4 per cent failed. If a candidate failed more than once in a given year he is regarded as a single failure. Of the physicians or medical students

examined, 18.2 per cent failed, osteopaths 51.6 per cent, chiropractors 64.3 per cent and unclassified 35.6 per cent. Among those who were successful there were 1,868 physicians or medical students, 59 osteopaths, 5 chiropractors, and 212 were unclassified. The basic science board of Michigan examined the greatest number of applicants, 443, representing 382 physicians and medical students and 61 others. Of those examined, 30 per cent failed. Iowa, Minnesota and Tennessee respectively examined more than 300 candidates. The percentages of failures in these states were respectively 34.7, 19.8 and 25.8. Four states reported 1 failure each.

Osteopaths were tested in all states except Arizona, Arkansas, Nebraska, Oklahoma, Tennessee and Wisconsin. Chiropractors appeared for examination in four states—Connecticut, Florida, Rhode Island and Washington.

It is the policy of the Arizona Board of Examiners in the Basic Sciences to omit the names of applicants who failed examinations. Failures for this state are recorded only in the total column.

Ten states granted certificates without examination—by reciprocity, endorsement, waiver or exemption. Arkansas, Colorado, Michigan, Minnesota, Nebraska and Oregon waived the written examination for those candidates presenting basic science certificates from other states, while the boards in Iowa, Tennessee and Wisconsin exempted from examination those candidates who had been examined in the basic sciences by professional boards. The District of Columbia certified

TABLE 31.—*Certificates Issued by Examination, Reciprocity and Endorsement, 1944*

	Examination					Reciprocity, Endorsement or Waiver					
	Physicians and Medical Students	Osteopaths	Chiropractors	Unclassified	Totals	Physicians and Medical Students	Osteopaths	Chiropractors	Unclassified	Totals	Registered
Arizona	19	0	0	2	21	0	0	0	0	0	21
Arkansas	6	0	0	0	6	6	0	0	0	6	12
Colorado	110	2	0	8	120	25	7	0	3	35	155
Connecticut	76	1	0	0	77	0	0	0	0	0	77
District of Columbia	11	0	0	0	11	36	0	0	0	36	47
Florida	173	10	3	3	189	0	0	0	0	0	189
Iowa	125	12	0	72	209	7	2	0	3	12	221
Michigan	280	5	0	25	310	6	7	0	6	19	329
Minnesota	236	11	0	21	268	45	0	0	6	51	319
Nebraska	122	0	0	14	136	8	0	0	0	8	144
New Mexico	2	4	0	0	6	0	0	0	0	0	6
Oklahoma	71	0	0	0	71	0	0	0	0	0	71
Oregon	72	6	0	3	81	12	9	0	14	35	116
Rhode Island	35	1	2	22	60	0	0	0	0	0	60
South Dakota	9	1	0	0	10	0	0	0	0	0	10
Tennessee	215	0	0	12	227	44	0	0	2	46	273
Washington	131	6	0	0	137	0	0	0	0	0	137
Wisconsin	97	0	0	29	126	33	12	0	17	62	188
Totals	1,790	59	5	211	2,065	222	37	0	51	310	2,375

without examination diplomates of the National Board of Medical Examiners. Among the states mentioned, the National Board examination was also acceptable to the boards in Arkansas, Colorado, Iowa, Minnesota and Tennessee. These ten states issued 310 certificates without examination, and the boards of all states granted 2,065 certificates after examination.

The figures for Arizona in table 31 do not agree with the previous table discussed, since a number of those examined were issued their certificates in 1945 and will be included in the next annual compilation of basic science tests. Likewise, in Arkansas the majority of those examined were medical students and will receive

TABLE 32.—*Total Candidates, 1927-1944*

		Physicians and Medical Students						Other Practitioners					
	No. of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	291	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	280	1,840	356	191	165	46.3	73	264
1942	17	1,725	1,476	249	14.4	213	1,689	497	249	248	49.9	91	340
1943	18	2,330	2,098	232	10.0	296	2,394	389	211	178	45.8	86	297
1944	18	2,284	1,868	416	18.2	222	2,012	465	276	189	40.6	88	363
Totals		19,921	17,403	2,518	12.6	3,594	20,919	3,137	1,602	1,535	48.9	745	2,346

their certificates on the completion of their medical training.

The number of successful applicants (2,375) registered by examination, reciprocity, endorsement, waiver or exemption are recorded in table 31. Among the successful candidates were 2,012 physicians, 96 osteopaths, 5 chiropractors and 262 unclassified persons. Wisconsin certified 62 without examination—the greatest number, of whom 33 were physicians, 12 osteopaths and 17 unclassified. No state certified a chiropractor without examination, and five states certified osteopaths without examination.

Altogether, 2,375 candidates received basic science certificates in seventeen states and the District of Columbia in 1944, ranging from 6 in New Mexico to 329 in Michigan.

In table 32 is included the number of candidates examined and certified by basic science boards for each year since and including 1927. In 1928, when five boards were functioning, there were 646 physicians examined, of whom 9.3 per cent failed and 59 other practitioners, of whom 47.5 per cent failed. By comparison, in 1944 the eighteen boards in operation examined 2,284 physicians, of whom 18.2 per cent failed and 465 other practitioners, with 40.6 per cent failures.

In the eighteen year period 19,921 physicians and medical students were examined, of whom 17,403 were successful in these examinations. In the same period 3,137 other practitioners took the test and 1,602 were successful. Of the physicians or medical students examined during these years, 12.6 per cent failed and 48.9 per cent of the other practitioners were unsuccessful. There were in this same period 3,594 physicians and 745 others certified without examination

In eighteen years 23,265 certificates have been granted by basic science boards. These certificates were awarded to 20,919 physicians and medical students and 2,346 other practitioners.

There was created a basic science examining board in Virginia in 1944 to consist of three members appointed by the governor from the faculties of the accredited colleges and universities of the state. None of the members may be a practitioner of any branch of the healing art. The board will cease to function July 1, 1949. It was created solely to examine a group of naturopaths and chiropractors who were practicing in the state without benefit of license during the twelve month period prior to July 1, 1944. Such practitioners must within the five year period either pass an examination given by this board in anatomy, bacteriology, elementary chemistry, pathology and physiology or must pass the examination given by the state board of medical examiners. The basic science board has no function whatever in connection with any other applicant for a license. An examination was scheduled by this board for 1944, but no candidate applied.

The basic science acts in two states were amended in 1945. In Arizona, the act was amended to provide that an applicant who is a citizen of the United States who furnishes proof of a certification, registration, or license issued to him "within any state or territory of the United States in which the requirements for the registration of said applicant at the date of issuance of his license shall be deemed by the board to be equivalent to those of Arizona, shall be eligible for registration by reciprocal endorsement at the discretion of the board." In Tennessee, the amendment in effect imposes a basic science requirement on osteopaths, chiropractors and naturopaths in addition to physicians. Theretofore only the last group named was required to take the examination.

The principle of basic science legislation is to provide a means of insuring that all who seek licensure to care for sick and injured persons shall first possess a reasonable knowledge of the sciences fundamental to the healing art. The enforcement of such laws affects mostly the group classified as "other practitioners." This is particularly significant when one takes into account that the testing of individuals for basic science registration is made by nonmedical examiners. The results demonstrate that, in general, practitioners other than regular physicians are poorly equipped in the fundamentals of medicine and should not be entrusted to care for the health of the people.

Efforts are being made by the American Association of Basic Science Boards to provide information based on experience to states contemplating new basic science board legislation and to develop procedures to facilitate reciprocity arrangements. In some instances basic science certification by reciprocity is unnecessarily difficult because of otherwise unimportant differences in the laws of the various states. The officers of the association are: president, Orin E. Madison, Ph.D., Michigan Board, Detroit; vice president, Charles D. Byrne, Ed.D., Oregon board, Eugene; secretary-treasurer, Ben H. Peterson, Iowa board, Cedar Rapids; executive committee, John S. Latta, Ph.D., Nebraska board, Omaha, and Rev. Nicholas H. Serror, O. P., Rhode Island board, Providence.

NATIONAL BOARD OF MEDICAL EXAMINERS

The certificate of the National Board of Medical Examiners is accepted as an adequate qualification for a medical license by the licensing authorities of forty-four states and the District of Columbia and by the territories and possessions of Alaska, Hawaii, Puerto Rico and the Canal Zone. At present Louisiana exempts diplomates of the National Board from the state examination if they have been licensed in some other state with which Louisiana reciprocates. The provisions of the medical practice laws or state board regulations of a few states are such that diplomates of the National Board are required to take an oral examination in Connecticut, Illinois, Maine, Rhode Island and Wyoming. A brief supplemental examination is required in Michigan. Illinois, Michigan, North Dakota, Pennsylvania and Washington require a rotating internship, while New Jersey recommends this type of service. The National Board certificate is not recognized by the licensing boards of Florida, Montana, Texas and Wisconsin. The states, territories and possessions which will endorse certificates of the National Board of Medical Examiners are recorded in table 33.

TABLE 33.—*States Endorsing Certificates of the National Board of Medical Examiners*

Alabama	Illinois	Nebraska	Puerto Rico
Alaska	Indiana	Nevada	Rhode Island
Arizona	Iowa	New Hampshire	South Carolina
Arkansas	Kansas	New Jersey	South Dakota
California	Kentucky	New Mexico	Tennessee
Canal Zone	Louisiana	New York	Utah
Colorado	Maine	North Carolina	Vermont
Connecticut	Maryland	North Dakota	Virginia
Delaware	Massachusetts	Ohio	Washington
Dist. of Columbia	Michigan	Oklahoma	West Virginia
Georgia	Minnesota	Oregon	Wyoming
Hawaii	Mississippi	Pennsylvania	
Idaho	Missouri		

The examinations of the National Board in the basic sciences are accepted in lieu of the examinations in those subjects given by the basic science boards of Connecticut, Iowa, Minnesota, Nebraska, New Mexico, Tennessee and the District of Columbia.

Diplomates of the National Board are admitted to the final examination of the Examining Board in England, the Triple Qualification Board of Scotland and the Conjoint Board of England. They are also granted recognition by the licensing bodies in Lebanon, South Africa, Spain and Turkey. Diplomates are also admitted without further examination to the Mayo Foundation (Graduate School of the University of Minnesota) and are exempt from some of the qualifications required by the United States Public Health Service.

Requirements for admission to the National Board examinations include a standard four year high school course, two years of acceptable college work including English, physics, chemistry, biology and a foreign language, and a medical education satisfactorily completed in an approved school in this country or Canada. Graduates of the university medical schools of Great Britain and Ireland are admitted to the examination provided these graduates have been licensed to practice in the country in which the school attended is located.

During the last few years there has been an increase in the number of medical schools that are using the

National Board's examinations as part of their own examination and promotion procedure. At some of the schools the students are required to pass part I at the end of the second year and part II at the end of the fourth year. Other schools require that part II be passed at the end of the fourth year. At one school all students are required to pass part I before graduation. Candidates who fail to pass the National Board examinations are given a supplemental examination at most schools. The schools that require practically all of their students to take the National Board's examinations under one plan or another are Albany, Boston, Buffalo, Duke, George Washington, Harvard, Long Island, New York Medical College, Tufts and Yale. In addition to the schools named there are a few others at which those students who voluntarily take and pass the National Board's examinations, either in part I or in part II, are excused from the corresponding final school examinations. This group of schools includes Colorado, Georgetown, Illinois, Loyola, Pennsylvania and Woman's Medical College.

Regarding this plan, the board states that "this practice places additional work and responsibility on the National Board of Medical Examiners. The board believes, however, that such use of its examinations is of definite value to the board because it necessitates that the examination be kept in close step with present medical education in this country. It appreciates the confidence in the fairness and thoroughness of its examinations that is implied by the substitution of the board's examinations for the former college comprehensive examination."

The first examination was given by the National Board in October 1916. From that date and up to and including a test held in June 1921, eleven examinations were held and 268 candidates were certified. The results of each examination during this period are given in table 34. These data, together with subsequent tabulations containing current figures, have been presented annually in THE JOURNAL for twenty-seven consecutive years and are based on official reports received periodically. This information is also included in the biographic file of physicians maintained by the American Medical Association.

Since 1922 the examination of the National Board has been divided into three separate parts which must be taken and completed in the following sequence: part I, consisting of a written examination in the basic sciences; part II, a written examination in five major clinical subjects, and part III, a clinical and practical examination in six major clinical divisions and their component subjects or subdivisions.

The tables that are presented herewith enumerate the results of examinations in parts, I, II and III for each calendar year since 1922, including those who passed and failed examinations and those certified.

During 1944, four examinations were given in parts I and II in various approved medical schools. Examinations in part III are given under the direction of local subsidiary boards at times sufficiently frequent to accommodate all eligible candidates. Such boards have been organized for this purpose in twenty-four centers.

TABLE 34.—*Examinations, 1916-1921*

Date	Total Examined	Failed	Percentage Failed
October 1916	10	5	50.0
June 1917	12	3	25.0
October 1917	28	6	21.4
January 1918	20	2	10.0
April 1918	23	5	21.7
December 1918	16	1	6.3
June 1919	52	1	1.9
February 1920	48	12	25.0
May 1920	60	14	23.3
February 1921	16	5	31.3
June 1921	40	3	7.5
Totals	325	57	17.5

TABLE 35.—*Examinations in Part I in 1944 and in the Years 1922-1944*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
January 1944	1,231	637	433	161	13.1
May	758	471	202	85	11.2
August	843	395	376	72	8.5
November	1,396	823	453	120	8.6
Totals	4,228	2,326	1,464	438	10.4
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	800	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	15.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,866	1,203	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,228	2,326	1,464	438	10.4
Totals	31,152	19,191	8,657	3,304	10.6

TABLE 36.—*Examinations in Part II in 1944 and in the Years 1922-1944*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
January 1944	124	120	0	4	3.2
May	147	137	0	10	6.8
August	1,004	968	0	36	3.6
November	129	124	0	5	3.9
Totals	1,404	1,349	0	55	3.9
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,859	1,803	0	56	3.0
1944	1,404	1,349	0	55	3.9
Totals	16,420	15,233	46	1,141	6.9

A candidate is eligible for part I who has completed successfully the first two years of the medical course. An incomplete examination is allowed candidates at the end of their second medical year in schools whose third year curriculums include courses in one or two subjects of this part. These subjects may be taken at any examination period after the candidate has completed them in his medical school. They are recorded in these statistics under the heading "Incomplete Examinations."

A candidate is eligible for part II who has completed his four year medical course and has already passed part I.

The figures in tables 35, 36 and 37 cover details of each examination given during 1944 and include some who fail and are reexamined during the same year and those who pass parts I and II in the same year. They represent, therefore, examinations conducted and not individuals examined.

TABLE 37.—*Examinations in Part III, 1922-1944*

	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	791	770	21	2.7
1941	910	885	25	2.7
1942	1,053	1,040	13	1.2
1943	1,230	1,213	17	1.4
1944	1,166	1,145	21	1.8
Totals	12,664	12,222	442	3.5

During the year 1944, 4,228 examinations were given in part I; 2,326 were passed and 438, or 10.4 per cent, failed. During 1944 also 1,464 incomplete examinations were given. In part II, 1,404 were given. Fifty-five of this number, 3.9 per cent, were failures. Incomplete examinations are only rarely given in part II. There were none last year.

Since 1922 a total of 31,152 examinations have been given in part I and 16,420 in part II: During this period 19,191 candidates passed part I and 15,233 passed part II. In twenty-three years there have been 3,304 failures in part I, 10.6 per cent, and 1,141 failures in part II, 6.9 per cent. Since the medical schools have been operating on the accelerated plan, candidates taking the examinations of the National Board have greatly increased since 1942. In 1944 the examinations given exceeded the figure for the previous year by 1,572, while in 1943 the number of part II examinations given were in excess of the previous year; those given in 1944 decreased. This variance is again due to the accelerated curriculum.

Part III, the final examination of the National Board, is given when the candidate has received the M.D. degree and has satisfactorily completed an internship in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association or by the Canadian Medical Association or has served in a laboratory acceptable to the National Board. During the war period candidates may take part III after nine months of internship, but their certificates will be withheld until three additional months have been served as a hospital intern or resident or on active duty in the medical department of the armed forces. In 1944, 1,166 examinations were given, twenty-one of which (1.8 per cent) were unsuccessful tests. Results of examinations in this part during twenty-three years are given in table 37 and indicate that 12,664 were tested, of whom 12,222 were granted certificates. The percentage of

TABLE 38.—*Parts I, II and III, Excluding Duplications, 1922-1944*

	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	16.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,513	3,670	606	237	6.1
1944	5,363	4,235	759	369	6.9
Totals	53,971	42,560	7,275	4,136	7.7

TABLE 39.—*Diplomates from Individual Medical Schools, 1944*

Univ. of Arkansas	1	Long Island Coll. of Med.	32
Coll. of Med. Evangelists	31	N. Y. Med. Coll.	106
Stanford Univ.	1	New York Univ.	83
Univ. of California	1	Syracuse Univ.	19
Univ. of So. California	1	Univ. of Buffalo	109
Univ. of Colorado	1	Univ. of Rochester	28
Yale Univ.	47	Bowman-Gray Sch. of Med.	1
George Washington Univ.	45	Duke Univ.	36
Georgetown Univ.	22	Univ. of Cincinnati	6
Loyola Univ.	1	Western Reserve Univ.	1
Northwestern Univ.	8	Univ. of Oregon	3
Univ. of Chicago	5	Hahnemann Med. Coll.	4
Univ. of Illinois	3	Jefferson Med. Coll.	3
State Univ. of Iowa	18	Temple Univ.	9
Univ. of Louisville	7	Univ. of Pennsylvania	14
Louisiana State Univ.	1	Woman's Med. Coll.	6
Johns Hopkins Univ.	11	Meharry Med. Coll.	3
Univ. of Maryland	3	Baylor Univ.	1
Boston Univ.	50	Univ. of Vermont	22
Harvard Med. School	93	Med. Coll. of Virginia	2
Tufts Coll. Med. School	65	Univ. of Virginia	2
Univ. of Michigan	5	Marquette Univ.	2
Univ. of Minnesota	4	McGill Univ.	7
St. Louis Univ.	6	Univ. of Toronto	2
Washington Univ.	10	Univ. of Western Ontario	1
Creighton Univ.	5	Extinct medical school	1
Univ. of Nebraska	1	Foreign	20
Albany Med. Coll.	47		
Columbia Univ.	66	Total	1,145
Cornell Univ.	42		

failures in 23 years was 3.5. Since the inception of the National Board in 1916, 12,490 certificates have been awarded.

Physicians who earn the certificate are designated diplomates of the National Board and are privileged to use the designating initials D.N.B.

The figures thus far presented represent examinations given. The number of individuals tested during any one year is recorded for the twenty-three year period in table 38. The classification of "Passed" or "Failed" in cases in which more than one examination has been taken in a given year was based on the results of the last examination during the year in question. For example, if in 1944 a candidate passed part I but later in 1944 failed part II he is computed in the tabulation as having failed. On this basis figures computed indicate that there were 5,363 who took at least one of the tests of the National Board in 1944, as compared with 525 in 1922. The trend has been steadily upward, and last

TABLE 40.—*Licenses Granted on the Basis of National Board Certificates, 1944*

Alabama	2	Nebraska	1
Arizona	3	Nevada	1
Arkansas	1	New Hampshire	10
California	56	New Jersey	30
Colorado	3	New Mexico	2
Connecticut	29	New York	259
District of Columbia	19	North Carolina	13
Georgia	8	Ohio	13
Idaho	2	Oklahoma	2
Illinois	18	Oregon	5
Indiana	4	Pennsylvania	21
Iowa	5	Rhode Island	8
Kentucky	1	South Carolina	1
Maine	6	Tennessee	6
Maryland	12	Utah	4
Massachusetts	93	Vermont	7
Michigan	14	Virginia	2
Minnesota	11	Washington	11
Mississippi	2	West Virginia	4
Missouri	11	Puerto Rico	2
Total			702

year the number of candidates was 850 greater than in the previous year. In all, 53,971 individuals were examined in one or more of the annual examinations in the twenty-three years shown, of whom 42,560 passed, 7,275 took incomplete examinations and 4,136, or 7.7 per cent, failed.

The 1,145 physicians certified as diplomates last year represented graduates (table 39) from fifty-two existing and one extinct medical school in the United States, three in Canada and 20 graduates of faculties of medicine abroad. A few of these foreign graduates were diplomates from medical schools in continental Europe who had registered before the National Board discontinued admitting graduates of these schools.

Diplomates licensed to practice medicine on the basis of their credentials increased from 2 in 1917 to 702 in 1944, and 8,925 have been so licensed since the National Board was formed. However, 12,490 have received the certificate of the board. It would appear that 3,565 have not used the credentials as a licensing medium. In 1944 diplomates were granted licenses to practice medicine on the basis of their credentials in thirty-eight states the District of Columbia and Puerto Rico. The number so registered in each state is reported in table 40.

EXAMINING BOARDS IN THE MEDICAL SPECIALTIES

On authorization of the House of Delegates of the American Medical Association, the Council on Medical Education and Hospitals in 1933 formulated minimal standards deemed essential for certification as a specialist. At that time there were five examining boards in the medical specialties functioning: pediatrics, dermatology and syphilology, obstetrics and gynecology, ophthalmology and otolaryngology. Other boards were later organized, and since 1940 fifteen boards have been in operation. These boards are fully approved by the Council.

In addition to regulations relating to the organization and operation of specialty boards, the Council's "Essentials of Approved Examining Boards in Medical Specialties" contains also the minimum qualifications deemed necessary for certification as a specialist. Such qualifications include graduation from an approved medical school, completion of an internship in a hospital approved by the Council, and a period of specialized training in a selected specialty. Each board publishes a booklet containing a brief statement regarding its organization, personnel, purposes and requirements for certification. A statement of these requirements for each board was given in detail in the 1942 Educational Number of THE JOURNAL. Only a few minor changes have been made by some of the boards since these regulations were published in 1942.

The Advisory Board for Medical Specialties was organized in 1933-1934 to coordinate graduate education and certification of medical specialists in the United States and Canada. This board reports directly to its member groups and functions in close collaboration with the Council on Medical Education and Hospitals of the American Medical Association.

The majority of the boards will grant some credit for military service which will compensate in part for the interruption of the graduate training of physicians by military exigencies. The policies adopted by the boards vary. One grants an indefinite amount of credit, to be determined by an evaluation of the experience of individual applicants. Another grants full credit for work done in the surgical division of a regularly constituted Army or Navy hospital. Most boards limit the credit allowed to one year of training and/or one year of experience. The special provisions for military credit made by each board were published in the 1943 Educational Number of THE JOURNAL.

Prospective applicants who are in military services should obtain the booklet entitled "Record of Professional Assignments for Prospective Applicants for Certification by Specialty Boards" from the secretary of the board in the specialty desired. This booklet describes procedures pertaining to military credit and will enable the candidate to keep an accurate account of work done in military service duly certified and will constitute part of the credentials to be submitted on application for certification. One board, the American Board of Internal Medicine, under the direction of Col. William S. Middleton, is conducting special examinations for certification in the European theater of war.

The 9-9-9 program curtails the number of physicians desiring specialty certification. Under this wartime program the various boards will probably allow credit for the actual time spent by the candidate in house officer training in approved hospitals.

Two boards certify candidates in subspecialties. The American Board of Internal Medicine certifies in allergy, cardiovascular disease, gastroenterology and tuberculosis. Similarly the American Board of Surgery certifies specialists in proctology. Regular board certification is a prerequisite for certification in the subspecialty.

A list of the specialty boards and their officers and the number of certificates awarded prior to March 30, 1944 and the number certified until March 1, 1945 respectively appear in table 41. On March 30, 1944 there were 23,444 physicians certified by the fifteen boards and in the following year 1,308 were certified. Up to March 1, 1945 a total of 24,752 certificates had been issued. Included in these figures are 764 who had been certified in the subspecialties mentioned, namely allergy 75, cardiovascular disease 325, gastroenterology 157, proctology 71 and tuberculosis 136.

The greatest number in any one specialty thus far certified were in otolaryngology. In this specialty 3,848 have received the board's certificate since its organization in 1924. The board in ophthalmology, organized in 1917 and the oldest board in existence, has to date certified 2,437 individuals. In the major specialties of general medicine and general surgery, 3,541 and 2,499 respectively have received the certificate of these boards.

A key number has been assigned to each approved board, such as A.B. 1, and the biographic records of physicians published in the American Medical Directory includes by these means reference to those certified by the boards.

The Council on Medical Education and Hospitals works in close collaboration with the various specialty boards in the approval of residencies acceptable for certification. In most instances the Council inspects and evaluates new residencies and approves residency programs jointly with the specialty boards. This program has been established so that approved services may be equally acceptable to the Council and to the respective specialty boards.

There are indications [4] that over 12,000 medical officers will seek specialty certification after the war. The Council, working with specialty boards, hospitals, medical schools and the Committee on Postwar Medical Service, has made notable progress in meeting these educational needs of the future in the advanced training of specialists.

The Council on Medical Education and Hospitals and representatives of the various boards, and the Advisory Board for Medical Specialties, annually hold a joint session for the interchange of ideas and the discussion of problems of mutual interest. These meetings have proved to be worthwhile contributions to the improvement of medical education and medical practice in this country.

TABLE 41.—*Approved Examining Boards in Medical Specialties*

Key No.	Name of Board	Year of Incorporation	Total Certificates Awarded to March 30, 1944	Total Certificates Awarded to March 1, 1945
A.B. 1.	American Board of Pediatrics..... Pres., Edward B. Shaw, 384 Post St., San Francisco Sec., C. A. Aldrich, 115½ First Ave. S. W., Rochester, Minn.	1933	2,220	2,318
A.B. 2.	American Board of Psychiatry and Neurology ..... Pres., Hans A. Reese, Wisconsin Psychiatric Institute, Madison Sec., Walter Freeman, 1028 Connecticut Ave. N. W., Washington, D. C.	1934	1,716	1,899
A.B. 3.	American Board of Orthopaedic Surgery ..... Pres., Frank D. Dickson, 1400 Professional Bldg., Kansas City, Mo. Sec., Guy A. Caldwell, 3503 Prytania St., New Orleans	1934	860	896
A.B. 4.	American Board of Dermatology and Syphilology ..... Pres., Howard Fox, 140 E. 54th St., New York City Sec., George M. Lewis, 66 E. 66th St., New York City	1932	680	710
A.B. 5.	American Board of Radiology..... Pres., John W. Pierson, 1107 St. Paul St., Baltimore Sec., Byrl R. Kirklin, 102-110 Second Ave. S. W., Rochester, Minn.	1934	2,012	2,095
A.B. 6.	American Board of Urology..... Pres., Herman L. Kretschmer, 122 S. Michigan Ave., Chicago Sec., Gilbert J. Thomas, 1409 Willow St., Minneapolis	1935	983	1,018
A.B. 7.	American Board of Obstetrics and Gynecology ..... Pres., W. T. Dannreuther, 580 Park Ave., New York City Sec., Paul Titus, 1015 Highland Bldg., Pittsburgh	1930	1,764	1,871
A.B. 8.	American Board of Internal Medicine ..... Chairman, Reginald Fitz, 319 Longwood Ave., Boston Asst. Sec., W. A. Werrell, 1301 University Ave., Madison, Wis.	1936	3,263	3,541
A.B. 9.	American Board of Pathology..... Pres., Arthur H. Sanford, 102 Second Ave. S. W., Rochester, Minn. Sec., F. W. Hartman, Henry Ford Hospital, Detroit	1936	984	1,047
A.B. 10.	American Board of Ophthalmology Chairman, John Green, 3720 Washington Blvd., St. Louis Sec., S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.	1917	2,336	2,437
A.B. 11.	American Board of Otolaryngology ..... Pres., Harris P. Mosher, 127 Front St., Marblehead Mass. Sec., Dean M. Lierle, University Hospital, Iowa City	1924	3,737	3,848
A.B. 12.	American Board of Surgery..... Chairman, Arthur W. Elting, 119 Washington Ave., Albany, N. Y. Sec., J. S. Rodman, 225 S. 15th St., Philadelphia	1937	2,349	2,499
A.B. 13.	American Board of Anesthesiology Pres., H. Boyd Stewart, 27th Place, Tulsa, Okla. Sec., Paul M. Wood, 745 Fifth Ave., New York City	1938	231	249
A.B. 14.	American Board of Plastic Surgery ..... Chairman, John S. Davis, 135 E. 65th St., Baltimore Sec., James B. Brown, 400 Metropolitan Bldg., St. Louis	1937	160	161
A.B. 15.	American Board of Neurological Surgery Chairm[illegible] 384 P[illegible] Sec., Paul C. Bucy, 912 S. Wood St., Chicago Advisory Board for Medical Specialties Pres., Paul Titus, 1015 Highland Bldg., Pittsburgh Sec., Byrl R. Kirklin, 102-110 Second Ave. S. W., Rochester, Minn.	1940	149	163
	Totals.....		23,444	24,752

Certification in the subspecialties: By the American Board of Internal Medicine: allergy 75, cardiovascular disease 325, gastroenterology 157, tuberculosis 136, total 693. By the American Board of Surgery: proctology 71. Total certified in the subspecialties, 764. These figures are included in the above tabulation.

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SATURDAY, MAY 12, 1945

MEDICAL LICENSURE

In this state board number the Council on Medical Education and Hospitals presents the forty-third annual compilation of data on medical licensure (pp. 101-129). These valuable statistics, covering the calendar year 1944, are widely used by medical schools, licensing and examining bodies, government agencies, medical educators, students and physicians. They were compiled with the generous cooperation of medical and basic science examining boards in the United States, territories and possessions, the National Board of Medical Examiners, the various American boards in the specialties and other agencies. The Council and THE JOURNAL greatly appreciate the cooperation of these agencies in making available this material. Besides publication in THE JOURNAL, a reprint edition is available and given wide circulation. Reprints of certain separate tables are also made and assist the Council in replying to the annual thousands of requests for information on licensure and related subjects.

Primarily as a result of the accelerated program there were 1,211 more licenses issued in 1944 than in the previous year. Of the 9,606 physicians licensed, many previously held licenses elsewhere; 6,933 were licensed for the first time and represent additions to the profession. This is the largest number added to the profession for many years, including the years 1936 to 1941, when large numbers of foreign graduates were licensed and added to the profession in this country. The number of foreign graduates licensed was fewer than at any other time since 1935.

The inadequacy of the educational programs of unapproved schools is clearly reflected in an analysis of failures in licensing examinations. Failures exceeded 45 per cent among the graduates of unapproved medical and osteopathic schools examined by medical examining boards. Approved medical schools had less than 3 per cent failures.

THE NATURE OF ANIMAL VIRUSES

In medical literature the word virus is now used in a special sense to designate certain agents of infectious disease that are not subject to successful study by the usual bacteriologic procedures. The nature and properties of viruses so designated cannot be determined by the morphologic and cultural methods applied with such momentous results to bacteria. Viruses cannot be seen with the light microscope and so far they have not been cultivated outside of living tissue. Scarcely more than a decade ago they were demonstrable only by their power to cause disease. Special and new methods were required to gain some closer insight into their nature and properties. Recent and current results of intensive work with newer methods at Duke University are reviewed by Beard,[1] with special reference to the viruses of vaccinia, equine encephalomyelitis, influenza and rabbit papilloma. By means of air driven, analytical centrifugation of virus infected materials, the viruses just mentioned may be obtained in sufficiently pure forms for study of their chemical and electron micrographic properties. It concerns "complex structures comprised of protein, lipid and nucleic acid." The simplest in composition is the papilloma virus, which appears to be essentially nucleoprotein. There are indications that the vaccinia and influenza viruses are surrounded by semipermeable membranes. The electron microscope is yielding surprising information of the greatest significance with regard to the size, shape and internal structure of the particles of these viruses. Of special interest is the unmistakable differentiation within particles.

These advances in the knowledge of the properties of the animal viruses studied, barely indicated in the foregoing but presented clearly and in detail by Beard, have forced him to abandon his advocacy of the molecular hypothesis of the nature of viruses. The results of the work with the products of the ultracentrifuge do not support the molecular assumption. "The images of the animal virus particles in electron micrographs indicate morphologic characters of the agents obviously similar to those of the relatively highly organized bacteria." But whether viruses are all of the same nature remains to be determined.

Now that purified viruses can be obtained for chemical and physical studies, for biologic experiments and for morphologic examination with the electron microscope, continued work on their nature and on virus diseases, e. g. infantile paralysis, promises results of great significance.

1. Beard, Joseph W.: The Ultracentrifugal, Chemical and Electron Micrographic Characters of Purified Animal Viruses, Proc. Inst. Med. Chicago **15**: 294, 1945.

HEARINGS ON THE ELLENDER BILL

The Senate Committee on Military Affairs conducted hearings on the Ellender bill (S. 637) on May 1. This bill (THE JOURNAL, March 10, p. 599) seeks to correct the present policies and regulations, which will either (1) reduce medical school freshmen enrolments materially in 1945 and drastically in 1946 or (2) result in the admission of inferior applicants by some schools. The measure provides for the deferment of qualified premedical students and the assignment of acceptable men in the armed forces to premedical and medical schools. The committee has not yet acted on the bill.

Medical education was represented at the hearings by Dr. Walter Bloedorn of the executive council of the Association of American Medical Colleges and Drs. Harvey Stone and Victor Johnson of the Council on Medical Education and Hospitals of the American Medical Association. There was no representation from the Procurement and Assignment Service, which had previously supported the measure.

A joint statement was made, giving the views of the American Medical Association and the Association of American Medical Colleges. The main outlines of this statement were endorsed by every medical school in the country except Columbia; it demonstrated that utterly inadequate numbers of qualified students will be available for admission to 1946 freshman medical classes. These must come from the following categories: women, men under 18 or physically disqualified and veterans. It will be fortunate if these groups will provide 2,000 qualified students, as compared with the normal admission of about 6,000. For example, a recent survey of eight large universities by Dr. Harold Diehl revealed that only 42 veterans were enrolled there as premedical students who would become available to medical schools before 1947. Of these about 28 were judged to be good material. Normally these eight universities provide 800 to 900 medical school freshmen annually.

The Army, the Navy and the Selective Service System opposed the bill, contending that the deferment of the few thousands involved would seriously hamper the war effort. The measure was also called unnecessary, since it was claimed that adequate numbers would be available without deferments. The opposition, especially General Hershey, repeatedly quoted Dr. Willard Rappleye; they illustrated contentions with Columbia's experiences and prospects as an example. In the critical months to come, the stronger and more favorably situated schools, including Columbia, will suffer least in reduced enrolments. Opposition by this school or its dean to a measure which all other schools believe to be necessary is an unjustifiable performance. Failure of this legislation will make it impossible to maintain enrolments at a level adequate to provide the country with physicians it needs. The action of Dr. Rappleye in lending his aid to the opposition can be characterized as one of reckless irresponsibility.

POLIOMYELITIS IN THIAMINE DEFICIENT MONKEYS

About three years ago it was shown by Foster and her associates [1] of the University of Pennsylvania that the resistance of mice to poliomyelitis virus is increased as a result of thiamine deficiency and that a similar though less pronounced increase in antiviral resistance results from other forms of malnutrition. Similar results were reported by Rasmussen and his associates [2] of the University of Wisconsin. On account of wartime interest in malnutritional immunity, Clark and his associates [3] of the University of Wisconsin have attempted to confirm these seemingly paradoxical results on monkeys.

As a preliminary to the attempted confirmation the Wisconsin biochemist [4] developed a synthetic diet for rhesus monkeys containing optimum amounts of all essential food elements. They found that the signs of mild thiamine deficiency in monkeys are cessation of normal growth, anorexia, apathy and an unkempt appearance. More serious thiamine deficiency is characterized by tremors, ptosis, muscular weakness, cachexia and temporary spastic paralyses. These symptoms are easily alleviated by tube feeding or by the intraperitoneal injection of an adequate amount of thiamine.

To date the immunologic effects of the milder type of thiamine deficiency have been tested on 40 monkeys (four groups of from 4 to 18 each) injected with poliomyelitis virus. Half of the members of each group were maintained on a thiamine deficient diet. Controls were given the optimum synthetic or natural diet. The first series (4 animals) was inoculated intracerebrally with the supernate from a 5 per cent suspension of infected spinal cord. Regardless of diet, all monkeys of this series succumbed to typical poliomyelitis (quadriplegia). There was no essential difference in the incubation period, severity of the symptoms or necropsy findings in the thiamine deficient and adequately fed animals.

In the three remaining groups (7 to 18 monkeys each) inoculation was made by repeated intranasal instillation of 1 cc. of the same supernate. All animals of these three series developed poliomyelitis. The symptoms and necropsy findings in the thiamine deficient monkeys tended to be slightly more severe than in the adequately fed controls. The Wisconsin bacteriologists conclude from these findings that, in contrast to the well confirmed increase in antiviral resistance in thiamine deficient mice, vitamin deficiency does not materially alter poliomyelitis susceptibility in monkeys.

1. Foster, Claire; Jones, J. H.; Henle, Werner, and Dorfman, Frieda: Proc. Soc. Exper. Biol. & Med. **51**: 215 (Nov.) 1942; J. Exper. Med. **79**: 221 (Feb.), **80**: 257 (Oct.) 1944.
2. Rasmussen, A. F., Jr.; Waisman, H. A.; Elvehjem, C. A., and Clark, P. F.: J. Infect. Dis. **74**: 41 (Jan.-Feb.) 1944.
3. Clark, P. F.; Waisman, H. A.; Lichstein, H. C., and Jones, E. S.: Proc. Soc. Exper. Biol. & Med. **58**: 42 (Jan.) 1945.
4. Waisman, H. A.; Rasmussen, A. F., Jr.; Elvehjem, C. A., and Clark, P. F.: J. Nutrition **26**: 205 (Aug.) 1943.

Current Comment

OLEOMARGARINE AND THE COUNCIL ON FOODS AND NUTRITION

Misinterpretation is being placed on the action of the Council on Foods and Nutrition in withdrawing acceptance from individual brands of oleomargarine. Reports published in the periodicals devoted to the interests of the dairy industry and comment stimulated in the public press falsely attribute this action to a lack of confidence in the nutritional value of margarine. Such is not the case. The report of the Council on Foods and Nutrition in THE JOURNAL, Sept. 16, 1944, stated clearly that margarine is considered a general purpose food and therefore outside the Council's scope of acceptance, now limited to "special purpose" foods. For this reason acceptance is no longer granted to margarine. Confidence in the nutritional value of margarine fortified with vitamin A was reaffirmed by the Council at the time acceptance was withdrawn. The attempts of those opposing margarine to cast doubt and suspicion on its food value as a result of the withdrawal of acceptance by the Council are unwarranted and misleading.

HAND BOOKBINDING AS OCCUPATIONAL THERAPY

A recent article on hand bookbinding, by Scheirer,[1] points out the interesting and valuable diversional activity of hand bookbinding in the army convalescent reconditioning program. This particular measure of occupational therapy requires considerable hand skill and facilitates the development of a calm mental atmosphere, which is recognized as having a soothing effect on nervous and irritable persons. The opportunity, the interest and the incentive for hand bookbinding in the occupational therapy program can be provided by instructors and occupational therapists who are willing to prepare food for the mind as well as work for the hands. The tools, materials and technics required are described in Scheirer's contribution.

DETERMINATION OF ALBUMIN AND GLOBULIN IN HUMAN SERUM

One of the limitations in the use of serum albumin and globulin values obtained by salt fractionation is the accuracy of the methods. While the salting out methods give reliable values in normal bloods the errors of the methods are largest in abnormal blood samples, where the clinical need is greatest. Pillemer and Hutchinson[1] recently proposed a method of determining the albumin and globulin content of human serum with the use of methyl alcohol as the reagent. They found that the globulin of human serum can be practically quantitatively precipitated by the addition of methyl alcohol in the cold at a controlled p_H. The albumin remains in solution. In addition they found that the albumin, globulin and the albumin globulin ratios obtained by this method agreed favorably with the values obtained on the same blood by the electrophoretic method. The methyl alcohol method does not require special equipment other than a cold room or an ice box. This accurate procedure is readily carried out and holds considerable promise as a tool in the investigation of blood protein concentration.

1. Scheirer, George A.: Some Notes on Hand Bookbinding—Forwarding, Occup. Therapy **23**: 332 (Dec.) 1944.

1. Pillemer, Louis, and Hutchinson, M. C.: J. Biol. Chem. **158**: 299 (March) 1945.

AN ADVERTISING BACKFIRE

Seldom have more earnest letters of protest been received in the headquarters office of the American Medical Association than have come in connection with an advertising technic for selling penicillin used during the third week in April by the Cheplin Laboratories, Inc., of Syracuse, N. Y. Apparently telegrams marked "urgent" were sent to the homes of physicians urging them to buy penicillin directly from this company. These telegrams were sent to the homes rather than to the offices of the physicians. In many homes where the telegrams were received sons, daughters and sometimes the father himself were abroad with the armed forces; the telegrams with the heading "urgent" struck consternation. At a time when private messages are so severely restricted, such as congratulations, messages of condolence and those concerning the usual affairs of life, this technic for promoting the sale of a drug would seem to be an infringement of the government's request to aid the war services by diminishing the burden on the telegraph agencies as much as possible. The question of good taste is even more conspicuous.

HYPERSENSITIVITY IN PERIARTERITIS NODOSA AND RHEUMATIC FEVER

In a recent lecture before the Institute of Medicine of Chicago, Rich[1] discussed the role of hypersensitivity in disease, particularly in periarteritis nodosa and rheumatic fever. Widespread periarteritis nodosa was found by him in patients with pneumonia who died after treatment with antipneumococcus serum and a sulfonamide drug, singly or combined. The evidence pointed to the production of periarteritis nodosa by hypersensitive reactions of the serum sickness type induced by the foreign serum or by sulfonamides. Rich has shown that typical periarteritis nodosa may develop in experimental serum disease of rabbits following the injections of large amounts of foreign serum, but the animal has not been rendered hypersensitive to sulfonamides, possibly because the drug does not unite with rabbit plasma protein to form an abnormal antigenic molecule. From clinical observations we have learned that in human beings sulfonamides may act as powerful sensitizers. Rich states that since the introduction of sulfonamides in 1936 there has been an increase in the number

1. Rich, A. R.: The Role of Hypersensitivity in the Pathogenesis of Rheumatic Fever and Periarteritis Nodosa, Proc. Inst. Med. Chicago **15**: 270 (March) 1945.

of cases of periarteritis nodosa coming to necropsy in the Johns Hopkins Hospital. He cautions against the ungoverned use of sulfonamides for minor ailments and urges that patients under sulfonamide treatment be watched carefully so that the drug may be discontinued immediately on the first appearance of symptoms of hypersensitiveness. Undoubtedly other forms of sensitization than by foreign serum and sulfonamides may result in periarteritis nodosa. Rich refers to the relationship that has been observed between this vascular disease and asthma. In every case of periarteritis earnest effort should be made "to determine the inciting antigen." In the course of his experiments on sensitized rabbits Rich found cardiac lesions which closely resembled those of rheumatic fever. The focal changes in the collagen of the connective tissue, the Aschoff body, the inflammatory lesions, the small foci of necrosis in the cardiac muscle, characteristic of rheumatic fever, were all found in rabbits subjected to reactions of the serum disease type. These facts support the view that the lesions of rheumatic fever result from reactions to antigen to which the body is sensitized. While the hemolytic streptococcus may be the most common source of the antigen, the possibility that other antigens may be concerned in some of the cases cannot now be excluded. It appears then that in periarteritis nodosa hypersensitivity plays a causative role, and there is good evidence that this is the case also with respect to lesions in rheumatic fever. There are indications, according to Rich, that hypersensitivity may be a factor in the genesis of rheumatoid arthritis, lupus erythematosus, certain forms of purpura and glomerulonephritis in some cases.

SIR THOMAS LEWIS

The death of Sir Thomas Lewis on March 17 ended a distinguished career highlighted by pioneer accomplishments in the application of scientific standards and methods to clinical practice. A mere recital of Lewis's achievements is impressive; his influence, however, rested largely on his use of the experimental method to analyze problems of the patient. Early interest and training in physiology and close friendship and association with James Mackenzie no doubt led Sir Thomas to the new science of electrocardiography. In vascular physiology Lewis and his colleagues elucidated the mechanism of Raynaud's disease, acrocyanosis, intermittent claudication and angina pectoris. Later he became interested in the mechanism of pain. Lewis, his colleagues and his students have contributed to the fundamental knowledge of physiology on which rational therapeutics is based. Throughout his life of active research Sir Thomas recognized the needs of the student and practitioner by contributing a number of exceptional books, most of them widely known in this country, including "Clinical Disorders of the Heart Beat," "Clinical Electrocardiography" and "Diseases of the Heart." He was editor of the medical periodical *Heart* from its founding in 1908 and of this journal's successor, *Clinical Science,* which in the change of names reflects Lewis's broad interests and physiologic approach to medical problems. The death of Sir Thomas Lewis is a loss to the medical world. His influence on methods of clinical research perhaps even more than his own accomplishments has made an indelible impression on medical science which will persist for decades.

INTRAVENOUS ALCOHOL ANESTHESIA AS USED IN RUSSIA

Verkhovskaya,[1] pointing out that alcohol, like chloroform and ether, belongs to those poisons which act by paralysis of the central nervous system, emphasizes that alcohol has the advantage over chloroform and ether that it is almost completely metabolized to carbon dioxide and water. In narcosis produced by administration of alcohol, sleep begins quickly and analgesia soon follows. The toxic dose of alcohol is 7.7 cc. per kilogram of body weight. The dose producing analgesia and sleep varies from 1.5 to 3.0 cc. Thus the difference between the toxic and the therapeutic dose is 4.7 to 5.2 cc. The margin of safety is considerably less for ether and chloroform. The difference between the toxic and therapeutic blood concentrations is 1.5 mg. for chloroform and 4 mg. for ether per hundred cubic centimeters. Two cc. of a 1 per cent solution of morphine is given to the fasting patient half an hour before the operation. Intravenous administration of 1 part of 95 per cent alcohol with 2 parts of 5 per cent glucose solution is started on the operating table. The average dose for complete narcosis is 2 to 2.5 cc. per kilogram of body weight. Thus a person weighing 60 Kg. requires 120 cc. of alcohol and 240 cc. of 5 per cent glucose solution. The mixture is prepared on the day of operation. The glucose solution is sterilized and the required amount of alcohol is added just before use. The standard apparatus for blood transfusion is utilized for the infusion, which is given slowly for fifteen to twenty minutes. When sleep sets in, the rubber tube is clamped to stop the infusion. The clamp is released if signs of awakening appear before the operation is finished, and the drip is resumed. When deep anesthesia has set in, the vein is flushed with 30 to 40 cc. of isotonic solution of sodium chloride to prevent possible thrombophlebitis. Sleep begins following the introduction of 40 to 60 cc. of alcohol. The stage of excitement is passed without difficulty and sleep sets in quickly. The conjunctivas, face and neck become red; the pupils contract and stop reacting to light. Respirations become even and steady and the pulse is of good volume. Sleep lasts from two to five hours. On awakening the patient is irrational and requires special observation. Thirty operations have been performed at an evacuation hospital under intravenous alcohol anesthesia. Complications noted were vomiting in 6 per cent of the cases, temporary retention of urine, transitory headache and the occasional appearance of albumin and flat epithelial cells in the urine, which disappeared in a few days; 20 to 30 red blood cells per high power field also were found. Verkhovskaya concludes that alcohol narcosis is an inexpensive method, devoid of the defects of some other methods of anesthesia.

1. Verkhovskaya, E. V.: Intravenous Alcohol Anesthesia, Am. Rev. Soviet Med., February 1945, p. 260.

MEDICINE AND THE WAR

ARMY

HARMON GENERAL HOSPITAL IS TROPICAL DISEASE CENTER

Harmon General Hospital, Longview, Texas, was recently designated for the treatment of tropical diseases. The only other army tropical disease center is Moore General Hospital, Swannanoa, N. C. Lieut. Col. Francis R. Dieuaide, chief of the Tropical Disease Branch, Medical Consultants Division, Office of the Surgeon General, stated that the medical staff of Harmon General Hospital has for some time been engaged in a study of relapsing malaria which has resulted in a permanent contribution to the knowledge of the disease. This study is now being extended to other tropical diseases which are rare in this country, such as filariasis, schistosomiasis and dysentery. Col. Gouveneur V. Emerson is commanding officer of Harmon General Hospital, Lieut. Col. Worth B. Daniels is chief of the medical service and Lieut. Col. Stuart W. Lippincott is chief of the laboratory division.

HEADS NEW DEPARTMENT AT SCHOOL OF AVIATION MEDICINE

Major R. Lee Clark, former fellow in surgery of the Mayo Foundation, was recently appointed director of the newly formulated Department of Surgery of the School of Aviation Medicine, Randolph Field, Texas. Major Clark, who was transferred to Randolph Field from Wright Field at Dayton, Ohio, was also appointed director of surgical research for the Army Air Forces. In addition to his new posts he will continue as the surgical consultant of the Army Air Forces for the Central District of the United States, which area includes Texas, Louisiana, Arkansas, Oklahoma, Colorado, Missouri, New Mexico, Iowa, Minnesota, North Dakota, South Dakota and Nebraska.

HOSPITAL SHIP NAMED FOR FRANCES Y. SLANGER

The U. S. A. H. S. *Frances Y. Slanger* will enter active service under the operation of the Transportation Corps in a short time and will be the largest and fastest American hospital ship afloat. It was formerly the Italian luxury liner *Saturnia*. Second Lieutenant Slanger, army nurse for whom the ship is named, was the seventh nurse to lose her life in this war and was the first American nurse to be killed in the European theater of operations.

TWINS IN THE ARMY MEDICAL CORPS

The military careers of Col. Ziba L. Henry and Lieut. Col. William H. Henry, twins in the Army Medical Corps, both of whom graduated from the Starling Medical College, Columbus, in 1903, illustrate the extent to which identical twins resemble each other.

Col. Ziba L. Henry was ordered to active duty in the Medical Reserve Corps in 1908 and continued on active duty until World War I started, when he was rapidly promoted to captain, major and lieutenant colonel. He was retired for age in 1936 as a lieutenant colonel but again assigned to active duty in 1941 and later promoted to colonel and was retired because of disability in 1943.

Lieut. Col. William H. Henry entered the Medical Corps as a first lieutenant early in 1917 just after the declaration of war. He was promoted to captain and major and served for four years as a major, with one year's service in England, France and Russia. He was discharged in December 1922 and appointed as major in the Reserve Corps and still later to lieutenant colonel, which rank he still holds.

Both were commissioned as majors in the Medical Corps of the Regular Army in 1920. Both served tours of duty in the Philippines. They graduated from literary and medical school at the same time and both did general practice for a number of years. They are identical twins and few except their intimate friends can tell them apart.

ARMY AWARDS AND COMMENDATIONS

Lieutenant Colonel Richard L. Meiling

Lieut. Col. Richard L. Meiling, formerly of Columbus, Ohio, was recently awarded the Legion of Merit "for services as air evacuation officer and executive officer, operations division, Office of the Air Surgeon, from Sept. 22, 1942 to July 11, 1944. Because of his thorough medical professional knowledge as well as his knowledge of air forces operations and organization, he was given the difficult and responsible assignment of preparing studies and plans for the organization of the first organized Air Evacuation Service. His enthusiasm, diplomacy and complete knowledge of his task enabled him to 'sell' this program to War Department chiefs of staff, theater commanders and our Allies. An ardent advocate of air evacuation, he has been ever active in the development of medical equipment peculiar to air evacuation. Today air evacuation squadrons are performing these duties in each theater of war. They have evacuated wounded from the South Pacific, Africa, Sicily, Italy and Normandy and in the Continental United States. Their contribution to the improvement of the morale of all personnel, as well as an aid to the tactical commander in the rapid evacuation of noneffectives, has proved to be of inestimable value in the prosecution of the war. His superior organizational ability and efficiency in the development of air evacuation of the Army Air Forces reflect the highest credit on himself and the armed forces of the United States." Dr. Meiling graduated from the Ludwig-Maximilians University Medical Faculty in 1937 and entered the service Oct. 7, 1940.

Lieutenant Colonel John D. Handley

The Bronze Star was recently awarded to Lieut. Col. John D. Handley, formerly of Hodgenville, Ky. The citation accompanying the award read "for meritorious service in connection with military operations against an enemy of the United States from July 20, 1944 to Dec. 20, 1944. Colonel Handley, serving as chief of medical service, 101st Evacuation Hospital, worked untiringly with approximately 12,000 patients passing through the hospital during the period named. His assignment of officers and men of his section resulted in most effective and frictionless institutional operation. Knowledge of latest standards of diagnosis and treatment left few instances requiring assistance from outside sources. Good humor and rare tact kept morale at high pitch in spite of fatigue and nervous tension due to long continued activity. Colonel Handley has displayed and exemplified the highest traditions of the Medical Department of the United States Army." Dr. Handley graduated from the University of Louisville School of Medicine in 1928 and entered the service June 12, 1942.

Colonel Ira V. Hiscock

Col. Ira V. Hiscock, officer in charge of the Public Health Section, Economics and Relief Branch of the Civil Affairs Division, was recently presented the Legion of Merit for his work in typhus control in liberated countries, particularly in Italy, from April 1943 to February 1945.

Colonel Hiscock was placed on inactive duty April 12 to become chairman of the Department of Public Health at Yale

University. He was professor of public health in the School of Medicine at Yale prior to entering the service.

The citation accompanying his award read:

"For exceptionally meritorious conduct in the performance of outstanding services from April 1943 to February 1945. As officer in charge of the Public Health Section, Economics and Relief Branch of the Civil Affairs Division, Colonel Hiscock with rare foresight and ability supervised all matters relating to health services, hospitals, medical services and sanitation pertaining to the civilian populations in liberated or occupied countries and acted as liaison between the Office of the Surgeon General and Civil Affairs Schools and the School of Military Government at Charlottesville, Va.

"His advice to the Civil Affairs Division on all medical matters within its jurisdiction and to the G-5 Division of the theaters of operation and tactical command headquarters, together with the prompt action taken by him, prevented the serious consequences which might have resulted from the dangers of disease to which our troops were exposed.

"The effectiveness and adequacy of the plans made and executed under Colonel Hiscock's supervision were demonstrated in the typhus outbreak that occurred in Naples. This community had been devastated by the enemy; the populace was suffering from malnutrition and was living in unspeakable filth without water and sewerage facilities and lacking elementary sanitary means of modern civilization; it was a potential breeding place for disease. Colonel Hiscock's plans to meet just such a contingency prevented what might have been a catastrophe. As an indelible tribute to his genius the records show that, of the thousands of troops stationed in and passing through the Naples area, not a single American soldier died of typhus."

Major Ralph H. Riegelman

The Bronze Star was recently awarded to Major Ralph H. Riegelman, formerly of Milwaukee, Wis., "for meritorious achievement as a group surgeon of a heavy bomb group and station surgeon of a station hospital in the North African and European theaters of operation from September 1942 to the present day. With no precedent to guide him and only limited personnel to work with, Major Riegelman established a most efficient station hospital to satisfy the many needs of an extensive combat operations program. By his diligence and devotion to duty he has successfully cared for the health of the group while operating from North Africa under adverse conditions. His skill, judgment, initiative, foresight and devotion to duty are most praiseworthy and reflect great credit on himself and the armed forces of the United States." Dr. Riegelman graduated from Marquette University School of Medicine, Milwaukee, in 1941 and entered the service in December 1940.

Captain Leo Lefkowitz

The Bronze Star was recently awarded to Capt. Leo Lefkowitz, formerly of Woodside, N. Y. The citation accompanying the award read "for meritorious service in connection with military operations against the enemy as orthopedic surgeon, 44th Evacuation Hospital, Semimobile, from June 19, 1944 to Dec. 4, 1944 in France and Belgium. Captain Lefkowitz performed numerous operations on all types of battle casualties with superior surgical skill and versatility. In many instances, after laboring for long periods of time in surgery, he voluntarily remained on duty to give expert postoperative care to his patients. By his untiring efforts and professional ability Captain Lefkowitz contributed materially to the success of his hospital, thus reflecting credit on himself and the military service." Dr. Lefkowitz graduated from Columbia University College of Physicians and Surgeons, New York, in 1924 and entered the service April 1, 1943.

Major Jay E. Tremaine

Posthumous award of the Bronze Star was recently made to Major Jay E. Tremaine, formerly of Ajo, Ariz., for "service from March 2 to Sept. 7, 1944. While at Lasang, Davao, Philippine Islands, he patiently and untiringly served American prisoners of war who were constantly in need of medical assistance. On board a prison ship, the men were crowded, starved and overheated, but his cheerful attitude and optimism encouraged them and inspired them with the will to survive. When the ship was torpedoed he lost his life. His courageous services in the face of almost unbearable conditions were an invaluable contribution to the welfare of his comrades." Dr. Tremaine graduated from Rush Medical College, Chicago, in 1930 and entered the service April 2, 1941. He was killed in action when the ship was sunk Sept. 7, 1944 off the Philippine Islands.

Colonel Lyle S. Powell

Col. Lyle S. Powell, formerly of Lawrence, Kan., and at present medical officer for a field headquarters of the Chinese Combat Command in south central China, was recently awarded the Bronze Star "for meritorious service." Dr. Powell also served overseas for two years in the first world war, serving first as commanding officer of the 99th Aero Squadron and later as group commander of the 99th and 104th squadrons. He was awarded the Legion of Honor with two stars. Dr. Powell graduated from the University of Nebraska College of Medicine, Omaha, in 1925 and entered the service Sept. 22, 1942.

Lieutenant Colonel Melvin F. Huth

A citation for the "efficient, rapid and uninterrupted support the medical battalion rendered the division during its rapid attack through the Vosges Mountains and its subsequent attack north across the German border" was recently awarded to Lieut. Col. Melvin F. Huth, formerly of Baraboo, Wis. Colonel Huth is commanding officer of the medical battalion which received the commendation for its ceaseless devotion to duty and care of the wounded. He graduated from the University of Wisconsin Medical School, Madison, in 1933 and entered the service in January 1941.

Major Howard A. Lowy

Major Howard A. Lowy, formerly of Creve Coeur, Ill., and now serving as assistant to the surgeon at the headquarters of the Chinese combat command near Kunming, was recently awarded the Presidential Unit Citation for his service with the India-China Wing of the Army Transport Corps and is also entitled to wear two bronze stars on his Asiatic-Pacific Campaign Ribbon, one for service in India and the other for service in China. Dr. Lowy graduated from the University of Illinois College of Medicine, Chicago, in 1940 and entered the service in October 1942.

Captain William H. Reiff

Capt. William H. Reiff, formerly of Oklahoma City, was recently awarded the Bronze Star "for meritorious service in connection with military operations against the enemy in France, Luxembourg, Belgium and Germany during the period July 3, 1944 to March 10, 1945." Dr. Reiff graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1941 and entered the service July 1, 1942.

Captain Fred J. Ansfield

Capt. Fred J. Ansfield, formerly of Glidden, Wis., was recently awarded the Silver Star and the Bronze Star. His division was awarded the Presidential Citation for superb fighting. Dr. Ansfield graduated from the University of Wisconsin Medical School, Madison, in 1933 and entered the service Oct. 29, 1942.

Major Edouard E. Lyon

The Soldier's Medal was recently awarded to Major Edouard E. Lyon, formerly of Toledo, for heroism. He rescued two soldiers from drowning when a landing craft overturned during a landing operation in the Southwest Pacific. Dr. Lyon graduated from Northwestern University Medical School, Chicago, in 1929 and entered the service Aug. 31, 1942.

Captain William W. Schildecker

Capt. William W. Schildecker, formerly of Pittsburgh and now with the 5th Army Ski Troops in the mountains of northern Italy, was recently awarded the Bronze Star and the Purple Heart. Dr. Schildecker graduated from the University of Pittsburgh School of Medicine, in 1943 and entered the service Jan. 1, 1944.

NAVY

SIX HOSPITAL SHIPS TO JOIN NAVY

The U. S. S. *Tranquility*, first of a new class of navy hospital ships being converted from Maritime Commission C-4 hulls, was recently inspected at the Atlantic Basin Iron Works in Brooklyn. The Navy is acquiring six of the 15,000 ton air conditioned ships with a speed of 17½ knots. The vessels will have hospital beds for 802 patients, including 742 enlisted men and 60 officers. Under emergency conditions, however, the craft may carry several hundred more cases. A ship's company will consist of 58 officers, 30 nurses, 2 women Red Cross workers, 24 petty officers, 230 crew members and 238 hospital ratings. The *Tranquility*, which will be commissioned soon, will be commanded by Capt. Merritt D. Mullen, U.S.N.R. The senior medical officer will be Capt. B. W. Hogan, U.S.N., with Lieut. Sylvia Koller, U.S.N., as chief nurse.

PLAQUE IN MEMORY OF LIEUTENANT F. B. BEGOR

McGill University has prepared a plaque in memory of the late Lieut. F. B. Begor U.S.N.R. Medical Corps, which is to be placed in the ward room of the U. S. destroyer bearing Dr. Begor's name. The plaque reads "In proud memory of Fay Broughton Begor, M.D., C.M., (McGill) Lieutenant (jg), Medical Corps, U.S.N.R., who was posthumously awarded the Navy Cross for his gallantry under fire on the beaches of Lae, New Guinea, in September 1943, and in tribute to the four hundred graduates of McGill University who are serving with the armed forces of the United States of America."

NAVY AWARDS AND COMMENDATIONS

Lieutenant (jg) Edgar M. Rector

The Silver Star Medal was recently awarded to Lieut. (jg) Edgar M. Rector, formerly of Ann Arbor, Mich., "for conspicuous gallantry and intrepidity in action against the enemy on the islands of Saipan and Tinian, Marianas group, while serving as a medical officer with an infantry battalion. On July 3, 1944, when the entire front line was forced to withdraw because of heavy enemy fire, Lieutenant (junior grade) Rector remained forward of our lines until late at night, administering first aid and plasma to the wounded until they could be evacuated. Later on Tinian, despite a painful wound in his hand, he moved forward under fire to aid a wounded Marine who could not be evacuated. Lieutenant (junior grade) Rector received a serious chest wound at this time. His outstanding courage and disregard for his own safety were in keeping with the highest traditions of the United States Naval Reserve." Dr. Rector has also been the recipient of the Silver Star, the Purple Heart and a Presidential Unit citation. He graduated from Harvard Medical School, Boston, in 1941 and entered the service Nov. 1, 1943.

Lieutenant Michael J. O'Grady

Lieut. Michael J. O'Grady, formerly of Nutley, N. J., was recently awarded the Bronze Star for bravery in the Southwest Pacific. The citation read, in part, "After receiving an emergency call from a patrol craft he entered a small open boat and with disregard for his own safety made his way to stricken craft through intense crossfire, rendering medical aid and saving many lives." Dr. O'Grady graduated from Georgetown University School of Medicine, Washington, in 1933 and entered the service in November 1942.

Lieutenant Jesse John Wimp

The Bronze Star was recently awarded to Lieut. Jesse John Wimp, formerly of Kirksville, Mo. The citation accompanying the award read "for meritorious service as medical officer attached to a Marine Battalion in the Empress Augusta Bay Area, Bougainville, Solomon Islands, from Nov. 7, 1943 to Jan. 20, 1944. With the assistance of one junior officer and a small enlisted staff, Lieutenant Wimp established four organizational sick bays and rendered medical assistance not only to his own battalion but to all other troops in the area. Although suffering from a painful illness during the entire period, he worked tirelessly, treating or supervising the treatment of more than 300 sick and wounded a day despite the ever present danger from constant attacks by enemy bombers and artillery. His courageous devotion to duty and inspiring leadership were in keeping with the highest traditions of the United States Naval Service." Dr. Wimp graduated from Washington University School of Medicine, St. Louis, in 1933 and entered the service Sept. 7, 1942.

Lieutenant Paul Ashley

Lieut. Paul Ashley, formerly of Chicago Heights, Ill., was recently awarded the Bronze Star "for distinguishing himself by heroic and meritorious achievement in connection with operations against the enemy as division medical officer aboard an aircraft carrier on Nov. 25, 1944 off the coast of the Philippines while this vessel was under attack by Japanese aircraft. During and after a heavy aerial assault by Japanese aircraft he displayed exceptional ability and untiring devotion to duty which contributed greatly to the recovery of many wounded. His relentless zeal in the execution of his duties was exemplary and at all times in keeping with the highest traditions of the United States Naval Service." Dr. Ashley graduated from Rush Medical College, Chicago, in 1937 and entered the service Nov. 30, 1942.

Lieutenant (jg) Francis Ambrose Lagorio Jr.

Lieut. (jg) Francis Ambrose Lagorio Jr., formerly of Chicago and now battalion surgeon of the 7th Marines, 1st Division, has been commended for heroism in the bitter fighting on Peleliu Island last September and October by the Marines' commanding officer, Lieut. Gen. H. M. Smith. The citation states that "Lieutenant Lagorio organized and directed stretcher bearers to the front and to the rear. . . . He . . . contributed greatly to the ultimate combat efficiency of the battalion." Dr. Lagorio graduated from Loyola University School of Medicine, Chicago, in 1943 and entered the service early in 1944.

Dr. Paul E. Walker

Dr. Paul E. Walker, formerly of Louisville, Ky., was recently awarded the Legion of Merit for "exceptionally meritorious conduct" as medical officer on the assault transport *Cavalier* in the Pacific. Dr. Walker graduated from the University of Tennessee College of Memphis in 1931 and joined the Public Health Service in 1934. He was stationed at the Marine Hospital in Louisville, Ky., prior to his overseas assignment. The citation stated in part that Dr. Walker "displayed exceptional ability in organizing and training the medical department of the assault transport during operations at Saipan and Tinian Islands and at Leyte."

Captain Charles P. Archambeault

The Bronze Star was awarded to Capt. Charles P. Archambeault, formerly of Washington, D. C., and now with the 3d Marine Division somewhere in the Pacific. He was cited for sending troops into battle in good physical condition and training medical personnel who held losses from sickness and wounds down to a minimum during the Guam campaign. Dr. Archambeault graduated from Albany (N. Y.) Medical College in 1918 and entered the service Nov. 12, 1920.

Commander Alpha Rees Klopfenstein

Comdr. A. Rees Klopfenstein, formerly of Toledo and now commanding officer of a Navy hospital which was in operation on Saipan two days after the initial landings, according to an overseas dispatch from the U. S. Marine Corps, was awarded the Bronze Star for his share in this achievement. Dr. Klopfenstein graduated from the University of Michigan Medical School, Ann Arbor, in 1925 and entered the service Jan. 2, 1942.

Commander Fred Shapiro

Comdr. Fred Shapiro, formerly of Chicago, was recently awarded the Legion of Merit at the U. S. Naval Hospital in Seattle, where he is now staff surgeon, for serving as marine regimental surgeon during the Tarawa, Gilbert Islands, Saipan and Tinian operations. The citation read, in part, "his skill as a surgeon contributed greatly to the saving of many lives.

During this period he personally took care of 262 compound fractures, displaying outstanding skill and untiring effort in the care of the wounded." Dr. Shapiro graduated from the University of Illinois College of Medicine, Chicago, in 1931 and entered the service March 30, 1942

Commander Carnes Weeks

The Navy's Commendation Ribbon was recently presented to Comdr. Carnes Weeks, formerly of New York. The citation accompanying the ribbon read "For outstanding service in the line of his profession while serving as fleet and staff surgeon on the staff of commander Third Fleet during a series of highly successful offensive attacks on the western Carolines, the Bonins, Nansei Shoto Islands, Formosa, Luzon-Visayas-Mindanao areas in the Philippine Islands, French Indo-China bases and Hong Kong-Canton-Hainan areas in support of Central and Southwest Pacific Amphibious operations covering the period of Aug. 24, 1944 to Jan. 26, 1945. Commander Weeks assisted materially in planning for the evacuation of the wounded in connection with the amphibious operations conducted by the Western Pacific Task Forces (Third Fleet) against the Palaus and Ulithi Atoll. In addition thereto this officer, throughout the period of operations, was instrumental in the maintenance of the morale and well-being of the commander, members of his staff and the Flag complement during a most difficult and arduous cruise. His conduct throughout was in keeping with the highest traditions of the United States Naval Service." Dr. Weeks graduated from Columbia University College of Physicians and Surgeons, New York, in 1923 and entered the service Feb 28, 1942.

MISCELLANEOUS

SURPLUS MEDICAL AND SURGICAL EQUIPMENT FOR CIVILIAN USE

Announcement was made through the April 28 issue of the *Surplus Reporter*, published monthly by the Department of Commerce, Office of Surplus Property, formerly Treasury-Procurement, of a large variety of surplus surgical equipment and supplies now available to tax supported institutions and established firms selling to the profession Included in the list of items offered are 15 Graefe's largest size Strabismus hooks, 163 Tyrroll iris hooks, an assortment of nasal, ear, sphenoid, tonsil and other knives, and several lots of minor operating scalpels, some with two handles and twelve blades in a canvas case, some with 1 inch, 1½ or 2 inch sharp point blades. Also included are nasal, bandage, dissecting, surgical, ganglion and operating scissors, 22 intestinal clamps, 176 hemostatic and 11 tenaculum forceps and 19 used tonsil hemostats of the clamp type. The catalogue also lists 35 galvanized iron food trucks equipped with 20 cold trays and 110 alternating current three phase heater and compact server, suitable for use in institutions or hospitals. A list of the regional offices of surplus property was published in the March 17 issue of THE JOURNAL. At that time the program was under the Treasury Department. It has since been transferred to the Department of Commerce, Office of Surplus Property, the offices remaining the same.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, May 5, page 37)

CALIFORNIA

Hospital of the Good Samaritan, Los Angeles Capacity, 455; admissions, 10,695. Miss Margaret J. Wherry, R N, Superintendent (Resident—pathology, July 1, disqualified for military service).

ILLINOIS

Norwegian American Hospital, Chicago Capacity, 232, admissions, 6,151. Mr. James E. Moore, Superintendent (intern, July 1).

LOUISIANA

Shreveport Charity Hospital, Shreveport Capacity, 790; admissions, 12,172. Dr. Edgar Galloway, Superintendent (2 interns, July 1).

NEW JERSEY

Mercer Hospital, Trenton. Capacity, 274, admissions, 6,115. Mr. George H. Buck, Superintendent (interns)

NEW YORK

Coney Island Hospital, Brooklyn Capacity, 300, admissions, 5,519. Dr. Saul M. Penner, Medical Superintendent (5 interns, July 1 and August 1).

NORTH CAROLINA

Watts Hospital, Durham Capacity, 225, admissions, 7,527. Mr. Samuel B. Forbus, Superintendent (assistant resident—surgery, disqualified for military service).

PENNSYLVANIA

Women's Homeopathic Hospital, Philadelphia Capacity, 400, admissions, 3,197. Miss Mary A Smith, Administrator (intern, disqualified for military service).

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Station Hospital, Fort Ord: Experiences with Infectious Diseases in Army Camps in England, Dr. Gordon E. Hein, May 19; Suppuration of the Chest, Dr. Clayton G. Lyon, May 19.

U. S. Naval Hospital, Mare Island: Abdominal Surgery, Dr. Thomas F. Mullen, May 18; Surgery of the Gallbladder, Dr. H. Glenn Bell, May 25.

Illinois

A. A. F. Regional Hospital, Scott Field: Psychosomatic Medicine, Dr. Robert E. Britt, May 17; X-Ray Findings in Chest Injuries, May 31.

Nebraska

Station Hospital, Army Air Base, Kearney: Hematuria, Dr. W. Joseph McMartin, May 21; Management of Common Anorectal Conditions, Dr. Louis E. Moon, May 21; Recent Advances in Diabetes Mellitus, Dr. John R. Kleyla, May 21.

South Dakota

Station Hospital, Army Air Base, Rapid City: Common Lesions of the Fundus Oculi, Dr. Charles M. Swab, May 17; Psychoneuroses and Psychosomatic Disorders, Dr. A. E. Bennett, May 17; Surgical Management of Carcinoma and Ulcer of the Stomach, Dr. J. Dewey Bisgard, May 17.

Station Hospital, Army Air Base, Sioux Falls: Thrombocytopenic Purpura, Dr. Joseph D. McCarthy, May 29; Radiation Treatment of Benign and Inflammatory Conditions, Dr. Roy W. Fouts, May 29; Granulopenia, Dr. Warren Thompson, May 29.

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

The Medical and Surgical Relief Committee of America, Inc., 420 Lexington Avenue, New York 17, recently donated 12 million units of penicillin to the French Hospital of Ste. Anne in Toulon, France, in answer to an appeal received from Vice Admiral Raymond Fenard, chief of the French Naval Mission in the United States, for help in treating the wounded. In October and December of 1944 the committee sent assorted medical and surgical supplies and 50,000 vitamins to Ste. Anne's, and in February of this year an ambulance. Mrs. Huttleston Rogers, executive chairman of the Medical and Surgical Relief Committee of America, reported that contributions for the month of April to Italy, India, China, Africa, France, Bolivia and the United States brought the total value of donated medicines and drugs to $714,290.71. Through its ability to assemble medical materials quickly and because of its stock of used instruments (often unobtainable new) the committee has been the means of bringing relief at crucial times to our own service, to allied fighting forces, to hospitals and to welfare agencies and to missions.

ORGANIZATION SECTION

Postwar Medical Service

THE JOINT COMMITTEE ON POSTWAR MEDICAL SERVICE

Meeting of March 17, 1945

The meeting of the Joint Committee on Postwar Medical Service was called to order by the Chairman, Dr. Ernest E. Irons, in the Board of Trustees Room of the American Medical Association Building, Chicago.

There were present, as members of the committee of the American Medical Association, Drs. E. L. Henderson, H. H. Shoulders, Olin West and Morris Fishbein; as members of the committee of the American College of Physicians, Drs. Ernest E. Irons and W. W. Herrick; as members of the committee of the American College of Surgeons, Drs. Frederick A. Coller, Evarts A. Graham, James M. Mason and Irvin Abell and, representing the organizations named, Federation of State Medical Boards, Dr. Walter L. Bierring; American Hospital Association, Mr. Graham L. Davis; Veterans Administration, Col. Hugo Mella; Liaison Office, Lieut. Col. Robert D. Bickel; Association of American Medical Colleges, Dr. Fred C. Zapffe; Catholic Hospital Association, Rev. A. M. Schwitalla, S.J.; Advisory Board for Medical Specialties, Dr. Paul C. Bucy; American Dental Association, Dr. Lon W. Morrey; U. S. Public Health Service, Col. F. V. Meriwether; Office of the Surgeon General, War Department, Col. F. M. Fitts, Lieut. Col. G. R. Gessner, Lieut. Col. H. C. Lueth and Col. G. M. Powell. Also present were Dr. Herman L. Kretschmer, President of the American Medical Association; Dr. R. L. Sensenich, member of the Board of Trustees of the American Medical Association, and Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals.

Approval of Minutes of Meeting of Feb. 10, 1945.—The Chairman stated that changes in the circulated minutes suggested by Lieut. Col. Gessner, Father Schwitalla, Mr. Davis and Colonel Mella had been made and were incorporated in the minutes as published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for March 17. The minutes as circulated, with the changes mentioned by the Chairman, were approved.

Committee Membership.—It was announced by the Chairman that Mr. Barry C. Smith, general director of the Commonwealth Fund, New York, had been appointed to serve as a member of the Joint Committee representing the American Medical Association and had accepted the appointment; that Dr. W. W. Herrick of New York had accepted appointment to represent the American College of Physicians in place of Dr. W. W. Palmer, resigned, and that Dr. B. R. Kirklin of Rochester, Minn., would represent the Advisory Board for Medical Specialties.

The Chairman introduced Dr. Paul C. Bucy, representing the Advisory Board for Medical Specialties in the absence of Dr. Kirklin, and Dr. Lon W. Morrey, representing the American Dental Association in the absence of Dr. C. W. Camalier.

Further Progress Report on Questionnaires Sent to Medical Officers.—Lieutenant Colonel Lueth presented an informative report concerning industrial medical practice and the economic aspects of postwar practice, covering the second two parts of the complete analysis of the postwar planning questionnaires that had been returned by medical officers. (The report presented by Dr. Lueth at the meeting of the Joint Committee on Feb. 10, 1945, covered the first two parts of the complete analysis and appeared in THE JOURNAL for March 31, 1945.) Following is a summary of the present report:

INDUSTRIAL MEDICAL PRACTICE

In the pilot questionnaire sent to 3,000 medical officers by the Committee on Postwar Medical Service, a number of questions concerning industrial medical practice were included. In the response only a small number of men indicated interest in this field, and the section on industrial practice in the final questionnaire was limited.

One fourth, 4,215, of all medical officers who returned the questionnaire indicated that they were interested in the industrial field, 863 men wanted full time positions. Requests for full time positions were scattered among the different graduation groups. Of the medical officers who would like to have full time positions in industrial medicine 56 per cent, or 484, indicated a desire to have special training to qualify for such positions, 44 per cent, 379, did not wish special training. The greatest number of requests for special training came from the most recent graduates.

About four times as many men wanted part time positions in industrial medicine as wanted full time positions. A little more than one third of those who would like to engage in part time industrial practice would also like to take special training. Special courses in industrial medicine were requested by 1,809 medical officers, including men who desired full time and part time positions and men who were undecided about future positions in industrial medicine.

In addition to the answers obtained from the section of the questionnaire specifically devoted to industrial medical practice, replies to questions on educational training indicated that 34 men wanted training in industrial medicine, 21 wishing short courses and 13 longer courses. Nearly all of the 13 who wished longer courses graduated before 1934, and about half of them were in industrial practice before entering military service.

A total of 4,215 medical officers expressed a desire to engage in industrial medical practice. About 80 per cent, 16,579, definitely indicated that they were not interested in this branch of medicine. The study revealed that the major fields of interest were industrial surgery, insurance and plant medical department work. It appears that those interested in furthering sound industrial medical practice in the future should seek to interest and encourage the younger men.

ECONOMIC ASPECTS OF POSTWAR PRACTICE

Economic aspects of future medical practice were indicated by the desires expressed by medical officers in 21,029 returned questionnaires analyzed.

The questionnaires were first studied for indications of the type and location of former medical practice, and it was found that 27.4 per cent, 5,785 medical officers, were formerly in general practice and 34.5 per cent, 7,282, had been in special practice. More than one third of the group studied, 7,962, gave no indication of their former type of practice or had not been in civilian practice before entering the armed forces. The total number of those who came directly from internships or residencies was 6,831.

Of the men formerly in general practice, 624 were from communities of less than 2,500 population, 1,962 from towns of between 2,500 and 25,000, 1,509 from cities of from 25,000 to 250,000 and 1,592 from the large cities of over 250,000 population. Only 61 of the 7,282 medical officers who were formerly in special practice came from communities of less than 2,500, and 791 from communities of between 2,500 and 25,000. More than three fourths of the specialists came from large cities, 2,500 from cities of 25,000 to 250,000 and 3,246 from cities of more than 250,000. Many, both general practitioners and specialists, did not indicate the size of their former locations. Among the specialists, about 40 per cent had been certified by the American specialty boards. Four fifths of the certified specialists had been graduated prior to 1935.

An analysis of the desires of medical officers to engage in private practice showed an increased interest in special types of practice. Of the 5,785 men who came from general practice, 4,326 indicated a desire to return to it. There were 3,530 medical officers who wanted to engage solely in general practice. Only 158 desired to return to communities of less than 2,500 population, compared to 625 who came from places of that size. About half as many wanted to return to communities of 2,500 to 25,000 and of 25,000 to 250,000 as originally came from them. Relatively few, 315, wanted to engage in general medical practice in cities of more than 250,000, compared to 1,592 who were formerly located in such cities. More than half, 418, of the 796 medical officers who indicated a desire to engage in general medical practice combined with part time teaching would like to practice in communities of more than 25,000 population.

Nearly two thirds of all medical officers in the group studied, 12,627, were interested in future specialty practice. Of these, about one half desired to engage solely in special practice and the other half in special practice combined with part time teaching. The whole group represents about half again as many as originally were engaged in special fields. Those interested in future specialty practice seemed to favor communities of 25,000 to 250,000 population.

One of the queries included in the questionnaire was "What is the minimum salary you would accept on a salary basis?" Only about half, 9,683, of the group studied replied to this question. There was a wide range in the answers, but the median appeared to be about $500 a month.

Four questions asked of the medical officers concerned voluntary redistribution to areas needing physicians. About 13 per cent, 2,817, stated that they would be willing to go to such an area if an office was already established, 11 per cent, 2,364, would go if a subsidy was provided for several months, more than 15 per cent, 3,284, would be willing to move if diagnostic facilities were available, and nearly 29 per cent, 6,091, would go if there were hospital facilities. From a study of the graduation groups involved, it appears that the younger men are willing to move into communities needing physicians, under certain preferred conditions, and that the majority of the graduates of 1937 or earlier are not willing to accept relocation.

The question of full time government service as a future type of medical practice was included in the questionnaire. About 85 per cent

of the medical officers indicated that they did not desire to remain in government service. Only 2,501 medical officers stated that they would like to stay in government service. Officers of the regular medical departments of the Army and Navy and other government services were considered separately in the study. Of this group of 532, 49 were older men who presumably wished to be retired after the war.

After extended discussion, the progress report was received and publication authorized.

Further Progress Report on Educational Internship and Residency Opportunities for Medical Officers.—Dr. Victor Johnson informed the Committee that he and Lieutenant Colonel Bickel were working out a plan whereby there will be available through the Bureau of Information at American Medical Association Headquarters as complete information as possible concerning openings in hospitals for internship and residency training. Requests for such information are already being received from returned medical officers, and it is expected that the machinery for providing it will be running smoothly in a very short time.

Dr. Graham thought that the number estimated by Dr. Johnson, 12,500, as desiring residencies probably was greater than would actually be the case, and Dr. Johnson agreed that probably the 12,500 or more men who had said that they wanted six months or more of hospital training would not all carry through on their desires, but he thought that it was better to be prepared for too many rather than for too few.

There was a lengthy discussion by most of those present, and it seemed to be the consensus that the most pressing single problem is the supply of physicians three years from now.

Dr. Johnson stated that his report will be ready for publication shortly, and the Committee authorized such publication.

Bureau of Information.—Lieutenant Colonel Bickel gave a brief report on the work of the Bureau of Information, stating that excellent cooperation was being had from the state medical societies, a follow-up system is being established, 65 requests for specific information as to places where men can practice have already been received, and the material for supplying answers to such requests is being gathered from the Procurement and Assignment Service, the U. S. Public Health Service and other agencies. To give the Committee an idea of what the men want to know, Dr. Bickel read one or two letters received from medical officers.

The Chairman stated that the report showed definite progress and growth and that one of the most important features of this bureau should be complete cooperation with the state organizations.

Local Organization of Courses for Graduate Study.—Dr. Johnson stated that the Council on Medical Education and Hospitals collects information semiannually from all kinds of organizations regarding short courses and publishes it semiannually, and that from now on the Council will ask for information concerning possible expansion.

Report of Subcommittee to Draw Up Recommendations to the Governors of the States (Dr. Shoulders, Chairman; Dr. Paullin, Dr. Coller, Father Schwitalla and, as consultants, Lieutenant Colonel Lueth and Miss Switzer).—Dr. Shoulders, chairman of the subcommittee, stated that his committee had been very active and that specimen letters designed to be sent to the governors of the several states had been drafted.

Following intensive discussion of all phases of the proposals offered, it was moved that a letter harmonizing the various drafts read be sent in the name of the Joint Committee directly to the governors of the states and that copies of it be sent to all agencies in the states that should be concerned in the matter. An amendment was offered that the subcommittee be empowered to take the necessary steps for the development of committees within the states for the purpose of advising the governors, and the Committee took action as follows: That a letter along the lines outlined by Dr. Shoulders, with certain modifications, be sent to the governor of each state and, in addition, that the subcommittee be empowered to take additional measures to see that those in authority in the states are apprised that these letters have been sent and to suggest measures for the development of advisory committees.

The Committee then adopted a motion that the proposed letter be given adequate publication, including publication in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, as a part of the minutes of the Joint Committee after the letters had been sent to the governors.

The letter as finally prepared, approved by the subcommittee and sent to the governor of each state, territory and the District of Columbia is as follows:

April 17, 1945.

The Honorable————
Governor of————
————
Dear Governor————

The undersigned Committee on Postwar Medical Service, composed of representatives from the several organizations mentioned, was created two years ago for the purpose of giving consideration to many medical problems which will arise as a result of the war and the demobilization which will follow.

Of particular interest to the Committee at the moment are the provisions of Public Law 346, 78th Congress (The G. I. Bill of Rights) as they may affect the entire field of medical education.

The governor of each state, as you doubtless are aware, is vested with the power and duty of certifying to the Veterans Administration the institutions in his state which are qualified to give acceptable courses of education and training in each of many categories.

The field of medical education, in its broadest sense, embraces (*a*) premedical education, (*b*) undergraduate education, (*c*) postgraduate education, (*d*) nursing education and (*e*) the education of medical technicians. There have been developed high standards of premedical education as well as undergraduate medical education. Medical schools are classified according to those standards. Similarly, there are well recognized standards in dental education and in nursing education. There should be little difficulty, therefore, in reaching decisions concerning institutions giving instruction in these fields.

This is true to a lesser extent with respect to the postgraduate education and training doctors receive in hospitals and with respect to schools for the education and training of medical technicians. It is true that many hospitals have been approved for intern and resident training and for the training of medical technicians in some fields. This approval is based on the number of beds and other facilities available in a hospital for teaching and the type of educational program carried on by the staff of the institution.

The importance of maintaining educational standards which are commensurate with the progress that has been made in the fields of medicine, dentistry and nursing must be obvious to you. The maintenance of these standards is in the public interest because they determine the quality of medical, dental and nursing care the public will receive.

It seems appropriate to suggest to you that certain schools which have thus far failed to secure approval will make effort to participate in the tuition payments under the G. I. Bill of Rights by having their names placed on the list of approved institutions which the governor will send to the Administrator of Veterans' Affairs. Such schools may be schools of the medical cults. These should be approved only after they thoroughly establish their ability to give a creditable course in the several subjects embraced in the basic sciences which are mentioned in the basic science laws in effect in most states.

The Committee on Postwar Medical Service is keenly aware of the difficulties which will face the governor in the administration of this act. We are aware also of the pressure which will be brought to bear on you to obtain your approval of institutions which are not qualified and equipped to give acceptable courses of education and training in these several fields.

The Committee, therefore, begs leave to recommend that the governor appoint an advisory committee composed of persons qualified to advise him with respect to the quality of education and training given by institutions in his state in the fields of medicine, dentistry, nursing and medical technology, which includes x-ray technicians as well as laboratory technicians.

The Committee wishes to assure the governor that the facilities and information in the hands of the Committee on Postwar Medial Service are available to him for whatever purpose he may wish to use them, and that we shall be glad to cooperate with him to whatever extent he may wish in the solution of these difficult problems.

Very respectfully yours,
COMMITTEE ON POSTWAR MEDICAL SERVICE
ERNEST E. IRONS, M.D., Chairman.
H. H. SHOULDERS, M.D., Secretary.

[List of Committee Members.]

Progress Report of Subcommittee on Surplus Medical and Hospital Supplies (Father Schwitalla, Chairman; Dr. Irons, Dr. Fishbein, Miss Switzer, Dr. Piersol).—Father Schwitalla presented a progress report, which he stated all the members of his subcommittee had seen but had not had opportunity to approve.

After discussion, the report of the subcommittee was received and filed, and consideration of the recommendations made therein tabled until the next meeting of the Joint Committee. The Chairman stated that the subcommittee would be continued to make a further report at the next meeting.

Further Progress Report on Laws Concerning Temporary Licensure.—Dr. Bierring informed the Committee that the Federation of State Medical Boards had held a meeting of

delegates on February 12 and 13, at which twenty-nine of the forty-four state boards were represented. Two definite actions were taken, one of which was to endorse the action of the Council on Medical Education and Hospitals recommending that the appointment of residents and house officers in approved hospitals be made only from graduates of approved medical schools. The second action had to do with temporary licensure: It was the opinion of the federation delegates that no definite action should be taken as regards any recommendation to state boards, that each individual board is responsible for determination or action. Dr. Bierring said it was the general feeling that temporary action was not the solution and that permanent licensure would be better. There is an altogether sympathetic attitude on the part of state board officers with respect to discharged medical officers. Some states have already acted, and others are sympathetic to permitting licensure for those graduates of approved schools returning from military service by exempting them from examination or giving credit for experience gained in military service. He thought that the individual state boards could be depended on to be very considerate in endeavoring to harmonize existing regulations for the benefit of those who desire to relocate.

Formulation of Lists of Medical Officers to Be Considered for Demobilization.—The Chairman brought up the matter of the formulation and submission of lists of medical officers needed in essential civilian positions who might be considered for demobilization.

Dr. Zapffe stated that the Association of American Medical Colleges has submitted a list of essential teachers to the Procurement and Assignment Service but that, so far as he knows, no action has been taken by the Army or Navy. Lieutenant Colonel Lueth thought the Joint Committee should figure out a "civilian adjusted service rating" card for the purposes involved. On motion of Dr. Henderson, duly seconded and carried, the Chairman appointed the following subcommittee to study the problem and bring recommendations to the Joint Committee: Dr. Frederick A. Coller, Chairman; Dr. Victor Johnson, Dr. H. H. Shoulders, Lieut. Col. H. C. Lueth, Dr. Fred C. Zapffe, Dr. Walter L. Bierring, Dr. W. W. Herrick and Rev. A. M. Schwitalla.

Report of Subcommittee on Establishment of Medical Corps in the Veterans Administration.—Father Schwitalla, chairman of the subcommittee, presented the following report, stating that the action called for is a decision by the Joint Committee as to whether or not the subcommittee should interest itself in supporting one or the other of the bills mentioned in the report, whichever is recognized as the more desirable:

This subcommittee was created by the Committee on Postwar Medical Service in response to the suggestion expressed by some Committee members that some of the criticisms leveled by professional persons and the public against the quality of medical care given to our veterans under the present form of organization of the medical service in the Veterans Administration are possibly justified. The subcommittee as such is not concerned with the validity of the criticism but is concerned with the important suggestion that there should be in the Veterans Administration for the effective medical care of the veterans, by reason of the enormous size of the problem as well as for many other reasons, a medical corps comparable in standards, quality and numerical strength of the personnel and procedures to the Medical Corps in the Army, the Navy and the Public Health Service.

Two bills dealing with a reorganization of the medical service in the Veterans Administration have been introduced into the House of Representatives since the opening of the 79th Congress, first session, and have now been referred to the Committee on World War Veterans Legislation: H. R. 1661, introduced Jan. 22, 1945 by Mrs. Edith Nourse Rogers, Republican of Massachusetts, and H. R. 2253, introduced Feb. 19, 1945 by Mr. J. Percy Priest, Democrat of Tennessee.

THE ROGERS BILL, H. R. 1661

The purpose of the Rogers bill is "to authorize the establishment of a permanent veterans' medical and hospital service in the Veterans Administration, and for other purposes." The bill establishes the Medical and Hospital Corps (section 2 correction to be introduced), which includes the following corps: (1) Medical, (2) Nurse, (3) Laboratory Technicians, (4) Pharmacists, (5) Dietitians, (6) Social Work. It has been recommended by interested groups that there be also (7) a Dental Corps, (8) a Therapists in Physical Medicine Corps and (9) a Librarians' Corps. The functions of these various corps are suggested by their names and are to be more fully defined by the administrator. Clarifications in the bill are to be introduced here since, among other defects in this section, there seems to be some confusion in the designation of the various corps.

The bill goes on to define the Medical Corps, stating the membership of the various corps, sections 4 to 11 inclusive. (In section 7 there is mention for the first time of a Corps of Physical Therapists and Occupational Therapists.) Corrections must be introduced into sections 4, 5, 6, 7 and 11 to harmonize them with prevailing practice as well as to bring unity into the organization.

The successive sections, beginning with section 12, deal respectively with the appointment of the Surgeon General of the Veterans Administration and of the various heads of the several corps (section 12), filling of vacancies (section 13), requirements for promotion (section 14), power vested in the Surgeon General to prescribe rules and regulations (section 15), establishment of the Reserve Corps and its regulations (section 16), powers of a discipline board (section 17), interchangeability of officer personnel with the Army or the Navy (section 18), establishment of a professional medical council (section 19), authorization of expenses (section 20), authority for leaves (section 21), employment of civilian professional personnel (section 22), insignia (section 23), definitions particularly of military benefits (section 24), subjection of the corps to articles of war and exemption from Selective Service (section 24, c, d), commissioned officers and men of the corps entitled to benefits under U. S. Employees' Compensation Act (section 25), pay and allowances (section 26) and "conflict of law" clause (section 27).

COMMENT ON THE ROGERS BILL

The bill as presented by Mrs. Rogers seems in many respects excellent and meets the purposes which those have in mind who have pleaded for the establishment of a Medical Corps in the Veterans Administration. Some persons will, no doubt, say that the bill establishes too complex an organization, but when it is borne in mind that the organization is designed to take care of by far the largest group of persons for whom the government is directly responsible, it would seem that the type of organization contemplated in H. R. 1661 is by no means too intricate. The interim report of the Subcommittee on Wartime Health and Education, February 1945, shows abundantly how large is the responsibility of the government for the health needs of the veterans.

Some of the corrections in the bill besides those to which attention has already been called might be stated to be the following: The power of the Surgeon General to employ civilian technical personnel should be wider than it is now contemplated in the bill (section 22); equivalence for credit for time service in the various government agencies should be liberalized (section 26 a, 1); disability provisions should probably be extended (section 26 a, 2); certain Civil Service deductions had probably better be omitted (section 26 a, 3); other provisions of the bill with reference to pay, for example, exemption of retirement pay from taxation, will probably merit careful restudy (section 26 in toto) and possibly radical reformulation or deletion. Perhaps these "benefits" are not the concern of this subcommittee.

THE PRIEST BILL, H. R. 2253

The purpose of the Priest bill is stated to be "to establish in the Veterans Administration a commissioned service consisting of physicians, surgeons, dietitians, nurses and medical technicians."

Section 1 establishes the Veterans Administration Medical Service in the Veterans Administration to perform the functions and duties now being performed by civilian physicians, surgeons, dentists, dietitians, nurses and medical technicians. Section 2 defines the commissioned personnel, section 3 the medical director and deputy medical director, section 4 the grades, ranks and titles. Section 5 prescribes the method of appointment of commissioned personnel in both the regular and the reserve corps. Section 6 provides for pay and allowances for the different classes of officers and enlisted personnel, while section 7 provides for promotions and the separation of commissioned officers from the regular corps. Provision is made in section 8 for the retirement of commissioned officers, and in section 9 military benefits are defined. Section 10 authorizes an allowance for uniform and equipment for each commissioned officer. Interchangeability of personnel with the Army, Navy or Coast Guard is legalized in section 11. The power to write regulations is vested in the medical director, subject to the approval of higher authorities, section 12. Section 13 provides for the use of the service in war emergency, and finally section 14 authorizes appropriations made to the Veterans Administration under "salaries and expenses" to be available to the personnel authorized by this act.

RECOMMENDATIONS

In view of the fact that at present these two bills are before committees of the House of Representatives, the subcommittee recommends to the Committee on Postwar Medical Service:

1. That the subcommittee be asked to submit the bills to further study with the intention of ascertaining the suitability of the bills for meeting (*a*) the needs of the veterans for a comprehensive medical and hospital service of a high order of excellence; (*b*) the needs of the Veterans Administration for a flexible, effective and professionally superior organization in the health care of the veterans; (*c*) the needs of the various professional groups in medicine and its related professions for an efficient organizational instrument within the Veterans Administration for channeling to the veterans the very best care which the various professions have to offer.

2. That the subcommittee give discriminating study to the two bills with the purpose of determining which of the two can better meet the purposes which the Committee on Postwar Medical Service has in mind.

3. That the subcommittee be requested to ascertain the responsible agencies which will carry through the bills pertaining to the health care of veterans from their present legislative status to final passage; to ascertain, furthermore, how the Committee on Postwar Medical Service can be of assistance in facilitating the passage of the bill and to determine in whose hands the leadership for sponsoring these bills should be centralized so as to avoid conflicting activities.

4. That the subcommittee determine to what extent the summary of recommendations of Report No. 4 of the Subcommittee on Wartime Health and Education is achievable more effectively through the development of a medical corps and auxiliary corps as contemplated in these bills.

5. That the subcommittee be authorized to enlarge its membership if such enlargement may seem desirable, depending on the interest which the Committee decides to take in furthering the passage of the bill.

ALPHONSE M. SCHWITALLA, S.J., Chairman.
LEROY H. SLOAN.
H. H. SHOULDERS.

After lengthy discussion, the Committee endorsed the intent and provisions of the Rogers Bill, H. R. 1661, with modifications that are quite generally recognized as necessary and that have already been submitted, and the subcommittee was continued and instructed to report further at the next meeting.

Report of Subcommittee on Enrolment of Medical Students.—The report of the Subcommittee on Enrolment of Medical Students was presented by Lieutenant Colonel Lueth. (This report was printed in THE JOURNAL, April 7, p. 931.)

Dr. Johnson presented each member of the Committee with a statement which he and Dr. Zapffe had prepared in anticipation of hearings to be held on the Ellender bill, S. 637. Dr. Zapffe commented on some portions of the statement presented by Dr. Johnson, saying that the emergency is acute; the medical schools are concerned about the output of physicians; as the outlook is now, there will be very few graduates in 1949 and in 1950 there probably will be none; out of every entering class 20 to 25 per cent do not graduate; if no students are available for 1946, it is essential that something be done; in the main, the Ellender bill should be supported in principle and everything possible done to secure its passage.

Colonel Fitts presented figures showing the estimated number of graduates in medicine for the years 1945 through 1949 under Army and Navy specialized training programs. He stated that while the Navy is putting some men into first year classes in 1946 the Army is not, which means that the graduates in medicine in 1950 will be limited to women, 4-F's and veterans.

It was stated by Dr. Zapffe that the Association of American Medical Colleges had gone into this matter with the Veterans Administration. The Committee concluded that there would be hardly any of the now returning men available to the medical colleges, so that only two groups could be counted on—the women and the 4-F's.

The report of the subcommittee presented by Lieutenant Colonel Lueth, recommending support of the Ellender bill, was approved.

Additional Member of Subcommittee on Enrolment of Medical Students.—Pursuant to remarks by Lieutenant Colonel Lueth, the Chairman appointed Dr. Fred C. Zapffe as a member of the Subcommittee on Enrolment of Medical Students.

Letters from Medical Officers.—The Chairman presented for the interest of the Committee a letter from an overseas medical officer, and Colonel Powell informed the Committee that it has been learned informally that the European theater plans to carry out a program of professional rehabilitation for medical officers as far as time and other conditions permit.

Informational Reports.—Office of the Surgeon General, War Department: Lieut. Col. G. R. Gessner stated that the Army Air Forces has instituted a clinical refresher training program for its medical officers similar to the Army program; it provides two weeks of didactic work and ten weeks of hospital work. (An account of this activity appeared in THE JOURNAL for April 7, 1945.)

American Dental Association: Dr. Morrey presented a report of the War Service and Postwar Planning Committee of the American Dental Association in accordance with the request of Dr. C. W. Camalier. (This report was also presented to the Committee on Feb. 10, 1945.)

Liaison Office: Lieutenant Colonel Bickel reported that the project of replying to medical officers who submitted questions on their returned Postwar Planning Questionnaires has been completed for the first 23,000 questionnaires, and each officer submitting such questions has been sent a personal reply in the name of the Committee on Postwar Medical Service. Questions dealing with policies of this committee were referred to Dr. Irons for reply; questions concerning policies of the American Medical Association were referred to Dr. West; questions about medical education were referred to Dr. Johnson and Dr. Arestad, and questions concerning licensure, reciprocity and other legal matters were referred to Mr. J. W. Holloway Jr. for information on which to base replies. All other inquiries were answered directly. There were about 200 such replies sent out, and the work of answering the questions of medical officers is now current. As new inquiries come in they will be answered immediately.

Time and Place of Next Meeting.—The Committee voted to hold its next meeting at the American Medical Association Headquarters in Chicago on Saturday, May 12, 1945.

The meeting adjourned at 1:50 p. m.

H. H. SHOULDERS, M.D., Secretary.

Bureau of Information

KANSAS REPORTS

Mr. Oliver E. Ebel, executive secretary of the Kansas State Medical Society, has recently sent the Bureau of Information valuable data concerning some of the counties in Kansas. These reports contain unusually concise and descriptive remarks about the general characteristics of the counties and of the present needs of these areas for physicians.

The accompanying table gives certain of the economic data for ten representative counties chosen from various sections of the state.

Kansas

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Doniphan	.....	10,408	4	2,602	6
Ellis	Hays	16,034 6,385	12	1,336	10
Graham	.....	4,404	0	.....	12
Johnson	Olathe	40,229 3,979	4	10,057	7
McPherson	McPherson	22,904 7,194	6	3,817	5
Ness	.....	6,395	1	6,395	7
Saline	Salina	32,974 21,073	17	1,940	6
Sedgwick	Wichita	194,945 114,966	113	1,725	7
Shawnee	Topeka	84,765 67,833	40	2,119	5
Wyandotte	Kansas City	144,453 121,458	63	2,293	9

1. Bureau of census, estimated population 1943.
2. Bureau of census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

Excerpts from the remarks contained on the county summary sheets follow:

Doniphan.—Doniphan County is in the northeast corner of the state. It is an apple growing area without large cities and with almost no other industry. The county is separated from St. Joseph, Mo., by the Missouri River and is near Kansas City.

Ellis.—Ellis County is located in the center of the western third of the state and has splendid medical facilities. These furnish medical and hospital care for a large portion of the western part of the state. Hays, on the eastern boundary of this area, is considered the most lacking in medical care. The comparatively high ratio of physicians here must be considered in respect to the wide area outside the county served by doctors.

Graham.—Graham County, north and west of Ellis County, represents a typical county in the western part of the state.

Johnson.—The close proximity of this county to Kansas City decreases the need for doctors in spite of a high physician-population ratio.

McPherson.—This county is an agricultural and oil producing district near the center of the state and includes a number of small towns. At the present time medical care is given by physicians who would be retired had the war not happened.

Ness.—This is an agricultural community. At the present time there is only one doctor.

Saline.—This county, like Ellis County, is considered a medical center. It serves an area east of Ellis County.

Sedgwick.—This, the second largest county in Kansas, has experienced a large wartime increase in population owing to the presence of several airplane factories and other war industries. This county is a business and medical center for the south central part of this state. It is locally estimated that the population is now 50,000 more than shown by the 1943 census figures.

Shawnee.—This county is the third most populous county in Kansas. It contains the state capital and many state operated institutions and medical facilities. Since many physicians in this county have full time appointments in various institutions or in the state board of health, the ratio of practicing physicians to population is higher than the table indicates.

Wyandotte.—This county is similar to Sedgwick County in many respects. Kansas City, Mo., is just across the river from Kansas City, Kan., and this factor influences the medical economic aspects of the area.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. The further investigation through state and county medical societies is thus greatly facilitated, and much unnecessary correspondence and perhaps travel may be avoided. In many communities vacancies are being held open for physicians now in the medical service. The number of physicians listed may therefore be misleading and consequently direct correspondence with the county medical society will always be necessary.

Washington Letter

(From a Special Correspondent)

May 7, 1945.

V Day Not to End War for Army Doctors

Final victory on both fronts will not mean the end of the war for the physicians and surgeons of the Army Medical Department, Major Gen. George F. Lull, Deputy Surgeon General, told the Columbia University College of Physicians and Surgeons. With battle casualties returning at 30,000 to 40,000 a month, the department will be busy providing these men with medical and surgical care. General Lull says that many medical officers will be needed long after fighting stops. Long term cases will require considerable reconstructive surgery and will not reach the stage of maximum improvement until long after V day. The number of casualties is large in comparison with the number of skilled medical specialists, and it has been expedient to concentrate certain specialties in a relatively small number of hospitals, he explained. Special treatment centers have been established in a number of general hospitals in this country, covering one or more of the following specialties: amputation, neurosurgery, thoracic surgery, tropical diseases, surgery of blood vessels, neuropsychiatry, plastic surgery, care of the deaf and care of the blind.

Nurses Not to Be Drafted in This War

Major Gen. Norman T. Kirk, Surgeon General, states that although he still believes passage of the nurse draft bill is "absolutely necessary," it is unlikely that any American nurse will be drafted in this war. The measure requested by President Roosevelt January 6 passed the House March 7 and was approved by the Senate Military Affairs Committee March 28 but is being allowed to die on the Senate calendar. Representative Frances P. Bolton, Republican of Ohio, has told the senators that a nurse draft "would be unwise." Senator Edwin C. Johnson, Democrat of Colorado, and Senator Robert A. Taft, Republican of Ohio, promised to oppose the measure on the Hill if introduced and acting majority leader Lister Hill, Democrat of Alabama, has decided against calling it up.

National Induction of Cadet Nurses May 12

National induction ceremonies of the U. S. Cadet Nurse corps will be held Saturday, May 12, in cities and communities throughout the country, reports Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service. Extensive ceremonies will take place simultaneously with a coast to coast program from New York City. Dr. Parran will administer the formal induction pledge to nurses gathered at public ceremonies all over the nation. More than 60,000 new students enrolled since last year will take the formal pledge for the first time. Miss Lucile Petry, corps director, will pay special tribute to the cadet nurses.

Final Senate Approval for Hospital Bill Forecast

Despite a hitch in authorization of the Tydings-Bilbo bill for a 1,500 bed hospital center in Washington after the war, its sponsors expect final Senate approval. Senator Ellender, Democrat of Louisiana, has asked for reconsideration of passage of the bill voted last week by the Senate.

Capital Notes

The District of Columbia Social Hygiene Society has passed resolutions describing current District health regulations as too indefinite and ineffective for vigorous enforcement of venereal disease control measures and opposing H. R. 2424, a bill to create a quasiautonymous tuberculosis organization to supplant the present Tuberculosis Bureau of the District Health Department.

Chairman Basil O'Connor of the American Red Cross Society has thanked the nation for its oversubscription of the 1945 Red Cross War fund goal of $200,000,000. He reported that a total of $219,075,000 was contributed. He also announced that scores of trained disaster workers, including doctors and nurses, had been sent into tornado and flood areas of eastern Oklahoma, Kansas and Arkansas.

A rabies control bill for the District of Columbia is reported held up in the Budget Bureau awaiting the approval of Surg. Gen. Thomas Parran of the U. S. Public Health Service.

Corporation Counsel Richmond B. Keech opines that unless Congress enacts a law specifically authorizing the sterilization of feebleminded women no further operations of this kind can be performed in the District of Columbia.

To assure an adequate supply of amyl acetate, made from amyl alcohol, for the production of penicillin, the WPB announces that amyl alcohol and amyl acetate have been placed under allocation control.

Official Notes

DOCTORS LOOK AHEAD ON NATIONAL HOSPITAL DAY

Once in a long time a combination of occasions offers opportunity for a special broadcast in such a series as Doctors Look Ahead. On May 12 there occurs National Hospital Day and the fiftieth anniversary of the Chicago Lying-In Hospital. On this occasion the entire production facilities of the National Broadcasting Company needed for Doctors Look Ahead will be moved to the Dora De Lee Amphitheater at the Chicago Lying-In Hospital, and the program will be devoted to a history of the hospital and of the late Dr. Joseph B. De Lee —two stories which are inseparable and which typify the pioneer spirit behind the growth of American medicine. In broadcasting on this occasion the medical profession salutes not only this hospital and this doctor but all institutions and all doctors of similar type which exemplify American medicine at its best—free, daring, yet solidly scientific and constructively conservative.

In addition to the May 12 broadcast, The Beloved Pioneer, the following programs are scheduled:

May 19. Look Sharp.
May 26. Unfinished Business (Dr. Fishbein).

Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting Company network each Saturday at 4 p. m. Eastern War Time (3 p. m. Central War Time, 2 p. m. Mountain War Time and 1 p. m. Pacific War Time).

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

The Medical Quarter Hour.—The Arizona State Medical Association on March 26 opened a second series of radio transcriptions during its "Medical Quarter Hour" Monday night at 6:15 over station KTAR. "More Life for You!" is the theme of this series of transcribed interviews and round table discussions. The first series was devoted to "American Medicine Serves the World at War" and consisted of a small group of radio transcriptions. "Keep Cool" will be the theme of a series of transcribed interviews with Dr. William W. Bauer, Director of the Bureau of Health Education, American Medical Association, June 25 through September 10. This activity on the part of the state association includes the advertisement of the program in various papers of the state and the distribution of pamphlets to patients of physicians. The council of the association has appropriated funds to continue these broadcasts for a year.

ARKANSAS

Personal.—Dr. S. J. McGraw has been appointed health officer of El Dorado.——Dr. Albert S. Buchanan, Prescott, has been appointed a member of the state board of health.——Dr. and Mrs. William C. Russwurm, Helena, celebrated their golden wedding anniversary on January 10.

Oldest County Society in State.—The Phillips County Medical Society, which is considered the oldest medical society in Arkansas, held its seventy-fourth annual meeting recently. Dr. Earl F. Norton, Marvell, was chosen president and Dr. James W. Nicholls, Helena, vice president. Dr. Montague Fink, Helena, is permanent secretary of the society. The society was organized in 1871 and antedates the establishment of the Arkansas Medical Society.

CALIFORNIA

University News.—Dr. Isabella H. Perry, assistant professor of pathology, University of California Medical School, San Francisco, was recently given the additional title of coordinator for cancer clinics.

Personal.—Dr. Jacob C. Geiger, director of public health of the city and county of San Francisco, recently received the European and Catholic Order, the Cavaleiro da Ordem de Cristo (Order of Christ), in recognition of his services to the Portuguese people of Portugal and California.

Changes in Health Officers.—Dr. Nicolai N. Rilcoff, formerly venereal disease control officer with the Kern County Health Department, has been appointed health officer of the county, succeeding Dr. John K. Coker Jr., Bakersfield, effective April 1.——Dr. John A. Carswell, Santa Barbara, has resigned as health officer of Santa Barbara County.

Conference on Health Professions.—On April 21 the Conference on Health Professions was held on the San Francisco campus of the University of California for high school and junior college counselors. Sponsored by the Northern California Vocational Guidance Association and the University of California, the conference featured talks on the professions of medicine and allied occupations, dentistry and related fields, pharmacy, nursing and public health nursing and public health occupations.

ILLINOIS

Personal.—George H. Van Dusen became superintendent of the Christian Welfare Hospital, East St. Louis, April 5.——Dr. Paul H. Pernworth, Venice, addressed the student branch of the American Pharmaceutical Association at the St. Louis College of Pharmacy, St. Louis, March 22, on "Practical Application of Certain Pharmaceutical Agents to Clinical Medicine and Surgery."——Dr. John H. Brantley, Poplar Grove, recently completed fifty years in the practice of medicine.

Outbreak of Food Poisoning.—About 100 persons were known to be ill in St. Francisville, March 26, in an outbreak of food poisoning that was subsequently attributed to long horn cheese which had been purchased from two local stores. In the subsequent investigation the cheese from the two stores was found to have been obtained from the same distributor in a nearby town in Indiana and the sale was stopped. Additional investigation traced the cheese to East St. Louis and then to a cheese manufacturing plant in northern Illinois. During the investigation it was revealed that similar outbreaks showing symptoms of diarrhea, nausea, vomiting and fever occurred in other sections of the country including one in Dyersburg, Tenn. All of the cheese that could be located was withdrawn from the market by the distributor.

Chicago

Personal.—Dr. Josiah J. Moore, Treasurer of the American Medical Association and president of the Chicago Medical Society, will receive the honorary degree of doctor of laws by Montana State University, Missoula, during its graduation exercises in June. The degree is being awarded to Dr. Moore, an alumnus of the university, for his "distinguished record in pathology." Dr. Moore will deliver the commencement address.

Rorschach Test Course.—Samuel J. Beck, Ph.D., head of the psychology laboratory, Michael Reese Hospital, will conduct the Rorschach test course at the hospital, June 4-8. The records to be demonstrated will be representative of the older adolescent and younger adult with special emphasis on persons discharged from military services. Persons interested may communicate with the secretary of the department of neuropsychiatry at the hospital.

Meeting of Council of Social Agencies.—The twelfth annual meeting of the health division of the Council of Social Agencies of Chicago will be held in the ballroom of the Standard Club, May 16. Among the speakers will be Drs. Robert S. Berghoff on "Tuberculosis Control in the State of Illinois including County of Cook," and Reginald M. Atwater, New York, "Realistic Planning for Community Health." Mr. Alexander Ropchan is executive secretary of the health division of the council.

MARYLAND

Society News.—Dr. Samuel A. Cosgrove, Jersey City, N. J., addressed the semiannual meeting of the Baltimore City Medical Society April 6 on "Conservatism in Operative Intervention in Obstetrics."

Personal.—Dr. Lawrence F. Woolley, formerly clinical director of the Sheppard and Enoch Pratt Hospital, Towson, has been appointed director of therapy and research at the Haarlem Lodge, Cantonsville, and Elkridge Farm, Ellicott City.

Bureau of Medical Services.—The state board of health has been authorized to create a bureau of medical services under the provisions of a law which is to become effective June 1. The bureau will administer a program furnishing medical care for indigent and medically indigent persons and will conduct and operate the chronic disease hospitals to be constructed in the postwar period. A chief of the bureau will be nominated under the merit system by the director of health. A council of medical care will be established by the state board to assist in formulating policies connected with the medical care program.

MICHIGAN

Changes in Health Officers.—Dr. Ralph Ten Have, Grand Haven, health officer of Ottawa County, has resigned to enter private practice.——Dr. D. H. Swengel recently resigned as health officer of the Cass County Health Unit to accept a similar position with the Mecosta-Osceola District health unit.

The Hickey Memorial Lecture.—Dr. John B. Barnwell, associate professor of internal medicine, University of Michigan Medical School, Ann Arbor, gave the ninth annual Hickey Memorial Lecture before the Wayne County Medical Society, Detroit, April 2. His subject was "Observation of the Minimal Lesion." The Hickey lectures commemorate the life and works of Dr. Preston M. Hickey, who was the first chief of the roentgen ray department at Harper Hospital and later professor of roentgenology at the University of Michigan Medical School, a position he held until his death, Oct. 30, 1930.

Mental Clinics for Veterans.—Five clinics for veterans have been established by the Michigan Society of Neurology and Psychiatry at Ann Arbor, Detroit, Flint, Kalamazoo and Saginaw in cooperation with the Michigan State Hospital Commission and the state office of veterans' affairs. The Detroit clinic began accepting patients for treatment February 6. This clinic, which is financed principally by the war chest of metropolitan Detroit, occupies quarters provided by Harper Hospital and is in operation three evenings each

week; eighteen psychiatrists are contributing their services without compensation. Five additional clinics in upper Michigan are being planned by the Michigan Society of Neurology and Psychiatry sometime within the near future.

Regional Meeting of Federation for Clinical Research.—The first regional meeting of the American Federation for Clinical Research was held at the Dr. William J. Seymour Hospital, Eloise, March 10, with Dr. Gordon B. Myers, professor of medicine, Wayne University College of Medicine, Detroit, acting as chairman. Among the speakers were:

Dr. Paul H. Noth, Detroit, Follow-Up Studies on Patients with Heart Wounds.
Dr. Jere M. Bauer, Ann Arbor, Vitamin D Intoxication with Metastatic Calcification, a Fatal Dose in an Adult.
Drs. Charley J. Smyth and Andrew G. Lasichak, Eloise, Influence of Amino Acids on Voluntary Food Intake.
Drs. Edwin T. Williams and Franklin H. Top, Detroit, Graphic Method for Rapid Estimation of Clinical Status in Poliomyelitis.
Dr. John H. Seabury, Ann Arbor, Recent Treatment of Subacute Bacterial Endocarditis.
Dr. Herman M. Pollard, Ann Arbor, Effects of Lipotrophic Substances in Biliary Disease.

Centennial Celebration of St. Mary's Hospital.—A two day program, May 16-17, will be held at St. Mary's Hospital, Detroit, to observe its 100th anniversary. Dr. Euclide V. Joinville, president of the hospital staff, will give the address of welcome at the clinical program the second day, to be held for physicians in the auditorium of Wayne University College of Medicine. Among the speakers will be:

Dr. William J. Stapleton Jr., Detroit, History of Wayne University College of Medicine—St. Mary's Hospital Association.
Dr. Russell L. F. Cecil, New York, Modern Conception of Arthritis and Its Management.
Dr. Emil Novak, Baltimore, Functional Tumors of the Ovary.
Dr. Alexander Brunschwig, Chicago, Extension of Radical Surgery in the Treatment of Advanced Abdominal Carcinoma.

Dr. Frederick A. Coller, Ann Arbor, will preside at a round table discussion on diseases of the gallbladder, participated in by Drs. Hugo A. Freund and Charles S. Kennedy, Detroit, in addition to the other guest speakers. Dr. Arturo Castiglioni, professor of the history of medicine, Yale University School of Medicine, New Haven, will be the guest speaker at the dinner meeting in the Statler Hotel in the evening.

Annual Alumni Clinic Day.—Wayne University College of Medicine Alumni Association will hold its annual alumni clinic day in the auditorium of the medical school in Detroit, May 16. Among the speakers will be:

Dr. Loren W. Shaffer, Detroit, Modern Treatment of Syphilis.
Arthur H. Smith, Ph.D., Detroit, Recent Advances in the Field of Nutrition.
Dr. Paul H. Noth, Detroit, Rheumatic Fever.
Dr. Amedo S. Marrazzi, Detroit, Intravenous Anesthesia.
Dr. Charles B. Huggins, Chicago, Endocrine Treatment of Carcinoma of the Prostate.
Dr. Geza de Takats, Chicago, Problem of Thromboembolism.
Dr. J. Grafton Love, Rochester, Minn., Protruded Intervertebral Disks.
Dr. Roscoe R. Graham, Toronto, Ont., Surgery of Peptic Ulcer.

A dinner session, with Dr. Clarence E. Umphrey, Detroit, acting as toastmaster, will be addressed by Dr. Irvin W. Sander, Detroit, who will be installed as president at the meeting, and Dr. Clarence A. Mills, professor of experimental medicine, University of Cincinnati College of Medicine, Cincinnati, on "Climatic Imprint on Man." A feature of the meeting will be the inauguration this year of honors to fifty year graduates. Because of the initiation this year the classes from 1881 to 1885 will be similarly honored.

NEW HAMPSHIRE

George Moulton Honored.—Plans are under way to hold a testimonial dinner at the Statler Hotel, Boston, May 17, to honor George A. Moulton, Phm.D., Peterborough, in recognition of his service to pharmacy. Any one wishing to participate in the memorial should communicate with Carleton A. Wheeler, Gray Rocks, Old Street Road, Peterborough.

NEW JERSEY

New Head of Tuberculosis Division.—Dr. Irving Willner, assistant physician in charge of the division of tuberculosis of the bureau of health, Newark Health Department, has been appointed director of the division, succeeding the late Dr. M. James Fine.

Postwar Expansion for Medical Center.—Plans to expand the facilities of the Jersey City Medical Center after the war to care for children in a "hospital school" while their mothers are undergoing treatment were announced by Mayor Frank Hague, April 24. No specific plans were given, but it was indicated that the proposed school would be staffed with "nurses, teachers and physicians who would supervise and teach the children with expert care while they are temporarily orphaned."

Ricketts Prize Awarded.—Maurice R. Hilleman, Ph.D., Brunswick Arms, New Brunswick, has been awarded the Howard Taylor Ricketts Prize by the University of Chicago. The presentation of the award took place on the thirty-fifth anniversary of the death of Dr. Howard Taylor Ricketts, who died of typhus May 3, 1910, while conducting research on the disease in Mexico. Dr. Hilleman was given the prize for developing a way of making an antiserum of value in identifying a recently discovered group of viral agents. The viruses which he studied cause diseases in both animals and man and include the agents of psittacosis, lymphogranuloma venereum and atypical types of pneumonia. His investigations resulted in the discovery of a more efficient tool for identifying the viruses of this group. Dr. Hilleman is now engaged in investigative work in the field of filtrable viruses with E. R. Squibb and Sons.

NEW YORK

Changes in State Society Officers.—At the April meeting of the council of the Medical Society of the State of New York, Dr. Herbert H. Bauckus, Buffalo, resigned to make it possible for the president-elect, Dr. Edward R. Cunniffe, New York, to take over the office at the same time he normally would have if the house of delegates had met in May. Dr. Cunniffe assumed the presidency May 1. Dr. Walter Guernsey Frey Jr., New York, has been elected to succeed Dr. George W. Kosmak, New York, who has been acting as assistant secretary during the past few months of emergency in the society and who also resigned at the April meeting.

Results of Service Questionnaires.—Of the physicians who on April 24 had returned questionnaires to the war participation committee of the Medical Society of the State of New York, 518 indicated that they want to practice in the same location from which they came when they leave military service. About half of the group replied that they wanted postgraduate refresher courses when they return. Of the total, 193 think they will want or need financial assistance to resume practice on their return. Forty-five of the approximately 710 questionnaires returned thus far replied that they planned to stay in government service of some kind. The questionnaire study is a part of the society's program to assist members returning as medical veterans.

Kaiser Medal Goes to Colonel Wentworth.—The Rochester Academy of Medicine has announced Col. Edward T. Wentworth, M. C., as the Albert David Kaiser medalist for 1945. The medal is awarded annually by the academy to honor one of its own members whose services have been considered outstanding. Colonel Wentworth was chosen in recognition of both his community service and the honors he has won in military duty. Colonel Wentworth, who graduated at Harvard Medical School, Boston, in 1913, served an internship and residency at the Rochester General Hospital. He has spent all of his time practicing in Rochester with the exception of service in the two world wars. He was credited with organizing base hospital 19 in World War I and also in World War II, a unit which he now heads somewhere in Europe. After the first world war he was a member of the medical reserve corps. Colonel Wentworth is past president of the Medical Society of the County of Monroe, the Rochester Academy of Medicine and the Rochester Pathological Society. The medal was presented to Colonel Wentworth in absentia and the citation was read by Dr. Walter S. Thomas, Rochester. Dr. Harold W. Brown, professor of tropical diseases, DeLamar Institute of Public Health, Columbia University College of Physicians and Surgeons, New York, gave an address on "Tropical Diseases, with Special Reference to Filariasis."

Millions Authorized for Veterans' Aid.—Governor Dewey on April 17 signed a bill appropriating $2,825,000 for the first year's operation of a statewide program to aid returning war veterans in rehabilitation and employment. The program, which includes the creation of a veterans' affairs division in the state executive department, will proceed after the governor names a state director, who must be a veteran. The new division will be empowered to establish rest camps and local veterans' service agencies as well as coordinate other veterans aid plans and expand "on-the-job" and apprentice training programs. The service agency will be set up in each county with state aid up to $5,000. Newspapers indicated that the agencies also may be organized in cities. On April 22 the governor signed a bill extending to all handicapped persons, irrespective of the type or nature of the cause of their handicap, the benefits of machinery already set up by the state for the treatment of the physically handicapped. In a comment to the press, the governor said that "what makes this

legislation particularly important is the effect it will have in providing additional procedure for the care and adjustment of the many veterans who will be returning after this war is over and who will be in need of such care and adjustment." The bill was developed by the temporary veterans commission and the state department of mental hygiene and specifically removes the exclusion of epileptics from the benefits of the statute.

New York City

The Bela Schick Lecture.—Dr Allan M Butler, associate professor of pediatrics, Harvard Medical School, Boston, delivered the third annual Bela Schick Lecture, April 20, under the auspices of Mount Sinai Hospital His subject was "Estimation and Parenteral Provision of Maintenance and Rehydration Requirements for Dehydrated Patients."

A Subcommittee on Industrial Medicine.—A Committee on Medicine and the Changing Order of the New York Academy of Medicine has created a subcommittee on industrial medicine consisting on April 26 of Drs. Anthony J. Lanza and Thomas D. Dublin. The purpose of the committee is to advance certain recommendations as to the developments that are indicated in the immediate future in the field of industrial health.

Physician Exonerated in Workmen's Compensation Inquiry.—Dr. Harry C. Stein, who was suspended for a year from rendering medical care under the workmen's compensation law as the result of the Moreland investigation in December 1943 on charges of having accepted "kickbacks," was exonerated by the appellate division and his suspension annulled newspapers reported The evidence in the hearing failed to show that the physician had received any such "kickbacks."

Meeting on Health Education.—The revision of "Suggested School Health Policies" was the object of a conference at Teachers College, Columbia University, April 19-21, under the auspices of the National Conference for Cooperation in Health Education. The document "Suggested School Health Policies" is an attempt to integrate the views of many professional groups regarding various phases of school health programs. Dr. Charles C. Wilson, professor of health education, Teachers College, was chairman of the meeting, and Justus J. Schifferes, New York, of the National Committee on School Health Policies, the secretary. The following representatives of the national organizations, comprising the National Committee on School Health Policies, were among those who attended the meeting:

Dr. William E. Ayling, Syracuse, N Y, American School Health Association.
Dr. Katherine Bain, Washington, D. C, Children's Bureau, U. S. Department of Labor.
Dr. William W. Bauer, Director, Bureau of Health Education, American Medical Association, Chicago
Edward S. Evenden, Ph.D, New York, American Teachers College Association.
W. H Lemmel, American Association of School Administrators, Washington, D. C.
S. S. Lifson, U. S. Public Health Service
Ben W. Miller, Ph.D., American Association for Health, Physical Education and Recreation, Washington.
Dr. Harold H. Mitchell, Long Island, N. Y, American Academy of Pediatrics.
Dorothy B. Nyswander, Ph.D., New York American Public Health Association.
Dr. Thurman B. Rice, Indianapolis, Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association.
Maycie K. Southall, Ph D., Nashville, Tenn Educational Policies Commission of the National Education Association
Frank Stafford, M A., U. S. Office of Education, Washington, D. C.
Alberta B. Wilson, R.N., National Organization for Public Health Nursing, New York.
J. M. Wisan, D D.S, Elizabeth, N J, American Dental Association.

Cornelius Rhoads Returns to Memorial Hospital.—Col. Cornelius P. Rhoads, M. C., since 1939 medical director of Memorial Hospital for the Treatment of Cancer and Allied Diseases, returned to his post April 15 after nearly two years' leave of absence, during which he was chief of the medical division of the Chemical Warfare Service of the Army of the United States. Dr. Rhoads is technically on leave until May 26, when he will be returned to "inactive status" subject to recall in case of emergency. On April 15 Major Gen. William N. Porter, chief of the Chemical Warfare Service, conferred on Dr. Rhoads the legion of merit for his work from June 1943 to April 1945, during which time he established the Toxicological Research Laboratory in the Edgewood Arsenal, Maryland, and the Medical Research Laboratory at Dugway Proving Ground, Tooele, Utah. He also established medical testing stations at Bushnell, Florida, and San Jose Island, Canal Zone. He developed new methods of diagnosis and treatment for the relief of injuries due to toxic chemicals, perfected a compound to counteract the effects of blister gas and all together perfected new technics and other contributions used beneficially during the war. Announcement was made also of a postwar development plan including the expansion of the hospital's present patient-care and laboratory research facilities and an extended clinical research and teaching program in cooperation with the city of New York through its contemplated hospital building for advanced cancer cases. This building will be erected on Memorial Hospital property adjacent to the present structure. The complete plant will provide 600 beds, the present capacity being 213.

OHIO

Prize for Essay on Premedical Education.—An award of $50 in war bonds was made to the Ohio Alpha Chapter of Alpha Epsilon Delta, national honorary premedical fraternity, at the Ohio State University, Columbus, for the prize winning essay "A Plan for Postwar Premedical Education," which the chapter submitted in an essay contest conducted by the fraternity's magazine, the *Scalpel*. On April 13 the award was presented by Maurice L. Moore, Ph.D., editor of the *Scalpel* and national secretary of Alpha Epsilon Delta, and director of the organic research division of Frederick Stearns & Company, Detroit, who lectured on "Sympathomimetic Agents."

Public Health Workshop.—A summer workshop in methods of visual communication will be given for the benefit of public health nurses by the Cleveland Health Museum. The workshop will be given for a three week period, June 18-July 6, at the Frances Payne Bolton School of Nursing, Western Reserve University, Cleveland. In announcing the course, Dr. Bruno Gebhard, the museum's director, stated that the workshop of the museum and its permanent and loan exhibits, study collections and health education reference material will be available to students. There will be a minimum of class instruction, and the students will work in small groups. The workshop is open to graduate registered nurses, especially those interested in public health, school and industrial nursing, and nurses in outpatient department and clinics, supervisors and teachers. Applications must be on file before June 1.

Advisory Tuberculosis Committee.—On April 12 Governor Frank J. Lausche named an advisory committee to assist in developing a state policy respecting tuberculosis. The members of the advisory committee comprise the membership of the advisory committee on coordination of tuberculosis programs of the Ohio Public Health Association. This committee has been at work on the problem for more than two years. The members of the governor's advisory committee are Drs. Roger E. Heering, Columbus, state director of health, chairman; Edgar C. Baker, Youngstown; Lynne E. Baker, Dayton; Willoughby D. Bishop, Greenville; Harold H. Brueckner, Lima; Charles A. Doan, Columbus; William D. Hickerson, Cincinnati; Clarence L. Hyde, Akron; Myron D. Miller, Columbus; Louis Mark, Columbus, Carl A. Wilzbach, Cincinnati; Joseph B. Stocklen, Cleveland, and John B. Hozier, Chicago. The lay members are W. K. Curfman Cincinnati; Charron Payne, Columbus, Delmar R. Serafy, Canton, and Floyd A. Rowe, Cleveland.

PENNSYLVANIA

Eighty Years of Age.—Dr. Tempest C. Miller, Abbottstown, said to be the oldest practicing physician in Adams County, observed his eightieth birthday March 22. He has practiced in Abbottstown for fifty-six years.

Society News.—Dr. Donald Guthrie, Sayre, will address the Harrisburg Academy of Medicine May 15 on "Diagnosis and Treatment of Tumors of the Breast."——At a meeting of the Lackawanna County Medical Society in Scranton, May 15, Dr. Charles Alexander Hatfield, Philadelphia, will discuss "Some Newer Diagnostic and Therapeutic Aids in the Treatment of Peripheral Vascular Disease." The society will be addressed May 22 by Dr. Bernard J. Alpers, Philadelphia, on "Effects of the War in Regard to Psychoneurosis and Other Mental Conditions." On May 29 Dr. William H. M. Erb, Chester, will discuss "Present Day Treatment of Varicose Veins."

Course in Psychosomatic Medicine.—A graduate course in psychosomatic medicine for the internist and general practioner will be conducted at Temple University School of Medicine and Hospital, June 3-30. The instructors will include Drs. Edward Weiss, professor of clinical medicine, Oliver

Spurgeon English, professor of psychiatry, and Gerald H. J. Pearson, associate professor of psychiatry. The course is designed to assist internists and practitioners of general medicine in the diagnosis and management of psychoneurotic and psychosomatic problems. It is not intended for specialization in psychiatry. The course will consist of lectures, seminars, conferences and clinical work in wards and the outpatient department. Additional information may be obtained from Dr. William N. Parkinson, Temple University Hospital, 3401 North Broad Street, Philadelphia 40.

Philadelphia

Personal.—Dr. Ralph Pemberton, professor of medicine in the Medico-Chirurgical College Graduate School of Medicine, University of Pennsylvania, has been elected president of the Pan American League for the Study and Control of Rheumatic Diseases, according to *Science.*

Special Lectures.—Edwin J. Cohn, Ph.D., professor of biochemistry and head of the department of physical chemistry, Harvard Medical School, Boston, delivered the fifth annual Phi Delta Epsilon Honor Lecture, April 27, at the University of Pennsylvania School of Medicine. His subject was "The Separation of Blood Derivatives, Their Natural Functions and Their Clinical Uses."——Dr. Alfred Blalock, professor of surgery, Johns Hopkins University School of Medicine, Baltimore, gave the Phi Lambda Kappa Honor Lecture May 3 in the medical amphitheater in the Hospital of the University of Pennsylvania. His subject was "The Surgical Treatment of Certain Types of Disease of the Heart and Great Vessels."

TENNESSEE

Changes in Health Officers.—Dr. W. D. Burkhalter, Memphis, has resigned as assistant health officer of the Memphis and Shelby County Health Department, effective Dec. 31, 1944. Dr. Burkhalter, who will enter private practice, has been directing the child hygiene division and the crippled children service of the department since 1941.——Dr. John H. Morris, Pulaski, was recently elected health officer of Giles County to fill the unexpired term of the late Dr. James K. P. Blackburn.

Portrait of Walter Garrey.—On April 6 a portrait of Dr. Walter Eugene Garrey, professor emeritus of physiology, Vanderbilt University School of Medicine, Nashville, was presented to him by friends, students and associates. Dr. Frank H. Luton, professor of psychiatry at the medical school, presented the portrait, which was the work of Mrs. Frank Avent, local artist. The principal speaker was Howard J. Curtis, Ph.D., assistant professor of physiology, Columbia University College of Physicians and Surgeons, New York, who discussed "Excitation and Conduction in Nerve." Dr. Garrey had been a member of the faculty since 1925.

State Medical Election.—The Tennessee State Medical Association, during a business session of the house of delegates in Nashville, April 8, chose Dr. Charles M. Hamilton, Nashville, president-elect. Dr. William C. Chaney, Memphis, was installed as president to succeed Dr. Kyle C. Copenhaver, Knoxville. Dr. Harrison H. Shoulders, Nashville, secretary-editor of the association for the past seventeen years, resigned. The board of trustees of the association was empowered to name a temporary successor. Dr. Shoulders first declined the nomination, but in a spontaneous expression of appreciation for his service the delegates insisted on his election prior to acceptance of his resignation, according to the Nashville *Banner.*

WISCONSIN

Academy of Surgery.—On May 23 the Wisconsin Academy of Surgery will conduct a program at the St. Mary's Hospital, Racine, with the following speakers, all of Racine:

Dr. William R. Kreul, Curare as an Adjunct in Anesthesia.
Dr. Louis E. Fazen Jr., Surgical Management of Thrombophlebitis, with Case Report.
Dr. Edmund W. Schacht, Report on Gallbladder Surgery at St. Mary's Hospital.
Dr. Kenneth C. Kehl, Mechanism of Reflex Pain Originating in the Gall Duct System Causing Cardiac Pain.
Dr. Frederick C. Christensen, Plastics on the Breast—Presentation of Case.
Dr. Russell M. Kurten, Presentation of Cases of Skin Grafting in Trauma and Burns.

Dr. Geza de Takats, Chicago, will address the dinner session in the evening on "Thromboembolism."

Conference on Poliomyelitis.—May 24 has been tentatively selected as the date for a statewide conference of city health officers on poliomyelitis. The meeting will be in Milwaukee under the auspices of the state board of health and the local representatives of the National Foundation for Infantile Paralysis. Among the speakers will be Dr. John L. Lavan, Toledo, Ohio, director of research for the medical foundation. One of the objectives of the conference is to clarify thinking on the matter of area or regional age level quarantines, provisions for care of poliomyelitis cases, transportation facilities, follow-up of cases and related problems, the last to assist in a proposed uniform pattern of action by health officers throughout the state.

ALASKA

Basic Science Law Defeated.—*Northwest Medicine* announce the failure to pass a bill creating a basic science law, prepared by a professional bill writer and containing several mistakes that were not caught until after its introduction. The bill was passed by the senate but did not carry any appropriation for expenses of operating a board. It was tabled in the house until the last night of the session. During the second reading of the bill, an amendment providing membership on the board to consist of three nonmedical and two medical persons was passed. The senate asked the house to recede from this amendment, the house refused and the senate let the bill die, according to *Northwest Medicine.*

Mobile Health Boat.—A mobile health unit vessel, *Hygeno,* has been placed in operation for southeastern Alaska, supported by federal funds, to provide medical, nursing, x-ray, diagnostic, laboratory and sanitary services to many areas that have heretofore received little or no public health education. The vessel is equipped with x-ray and bacteriologic laboratories for diagnosis of tuberculosis, contagious diseases and control of epidemics. Dr. N. Berneta Block, director of the division of maternal and child health and crippled children's services, Juneau, has been temporarily appointed physician in charge. Mrs. Magnhild Oygard Bogue has been appointed nurse-technician, and at intervals a department sanitarian will join the staff for sanitary inspections in outlying areas.

GENERAL

National Noise Abatement Week.—April 29-May 5 was designated National Noise Abatement Week and devoted to the theme "Prescription for War Nerves—Stop Needless Noise—Keep Fit, Keep Well, Keep Working." The National Noise Abatement Council, 9 Rockefeller Plaza, New York, serves to promote the national consciousness for the elimination of needless noise.

Meeting of Medical Service Representatives.—Twenty-two representatives from Michigan, Indiana, Missouri, Iowa, Wisconsin and Illinois convened at the Palmer House April 22 with Dr. Charles H. Phifer, Chicago, chairman of the committee on the study of prepayment plans for medical and surgical care of the Illinois State Medical Society, presiding. Various problems were discussed.

Examinations in Ophthalmology.—The American Board of Ophthalmology will hold an examination in Los Angeles next January. It is expected that the examination dates will coincide with the dates of the midwinter course sponsored by the Research Study Club of Los Angeles, these dates to be announced later. Applications for this examination must be filed before September 1. For details prospective candidates should write at once to Dr. S. Judd Beach, secretary, Cape Cottage, Maine.

Narcotic Violations.—The U. S. Bureau of Narcotics announces the following actions:

Dr. Alpheus C. Koon, Lakeland, Fla., following his plea of guilty in the U. S. District Court at Tampa to the false execution of narcotic prescriptions, received on March 8 a prison sentence of two years and one day. The sentence was suspended and he was placed on probation for a period of five years.

Dr. Matthew Arnow, Jacksonville, Fla., pleaded nolo contendere in the U. S. District Court at Jacksonville to the false execution of narcotic prescriptions and received on March 26 a suspended prison sentence and was placed on probation for three years.

Joint Committee on Health Problems in Education.—The annual meeting of the joint committee on health problems in education of the National Education Association and the American Medical Association was held at the American Medical Association, May 8-9, to consider, among other subjects, the revision of "Suggested School Health Policies," school luncheons and health implications of a uniform military training program if adopted. Guests at the meeting included Dr. Roscoe L. Sensenich, South Bend, Ind.; Dr. Charles C. Wilson, professor of health and physical education, Teachers College, Columbia University, New York; Ruth Grout, Ph.D., associate professor of education, University of Minnesota, Minneapolis, and Col. Leonard G. Rowntree, M. C.

Tri-State Tuberculosis Group Formed.—The recent creation of the Association for the Rehabilitation of the Tuberculous is announced in the *Bulletin of the National Tuberculosis Association* for March. The new group includes the states of New York, New Jersey and Connecticut and aims to study the common problems and the development of work programs. Officers of the association are Marion C. Moore, rehabilitation secretary, Bergen County (N. J.) Tuberculosis and Health Association, president; Joseph Newman, educatioinal director, Municipal Sanatorium, Otisville, N. Y., vice president; Irma Minges, rehabilitation secretary, New York Tuberculosis and Health Association, secretary, and Walter Wenkert, rehabilitation service, National Tuberculosis Association, treasurer.

Physician Impersonated by Impostor.—Dr. René Bine, San Francisco, writes that a man has been traveling about the country using the name of his son, Dr. René Bine Jr., who is now serving overseas as a captain in the medical corps of the Army of the United States. One report describes the impostor as about 6 feet in height and weighing about 175 pounds; dark brown hair, gray blue eyes with a slight cast in the left eye. He appeared to be about 45 years old. The impostor seems to have a good background of medicine and carried a bag on which was printed "Dr. Rene Bines Jr., Grace Hospital, Detroit." Dr. Bine asks that persons be on the lookout for the impostor, pointing out that his son, who graduated at Stanford University School of Medicine, San Francisco, in 1941, is 29 years old and has been overseas thirty months.

Courses to Prepare Instructors in Sight-Saving.—The National Society for the Prevention of Blindness announces that five colleges and universities are cooperating with it in offering special courses for the preparation of supervisors, teachers, nurses and social workers and others concerned with the education of the partially seeing child. Elementary courses are being offered at Wayne University, Detroit, June 18-July 27; University of Wisconsin, Madison, June 25-August 17; and Teachers College, Columbia University, New York, July 2-August 10. Special short courses are being given at the University of Oregon, Eugene, June 18-July 27 and Indiana State Teachers College, Terre Haute, Ind., June 3-June 23. Additional information may be obtained from the National Society for the Prevention of Blindness, 1790 Broadway, New York.

Grants by Sugar Research Foundation.—Six grants amounting to $45,400, which were announced by the Sugar Research Foundation, April 16, include:

Pauline B. Mack, Ph.D., and associates of the Ellen H. Richards Institute, Pennsylvania State College, State College, Pa., $20,000 for one year, to measure the effect of high and low sugar containing diets on the health, growth and physical condition of children. In recommending this grant, Robert C. Hockett, Ph.D., scientific director of the foundation, pointed out that the institute has a collection of measurements and records from a mass nutritional study of 9,000 subjects which is probably not duplicated anywhere else.

Dr. Rachmiel Levine, director of metabolic and endocrine research, Michael Reese Hospital, Chicago, $7,500 for one year, to study the physiologic behavior of levulose, a sugar produced by inversion of ordinary sugar.

Dr. Israel L. Chaikoff, associate professor of physiology, University of California, Berkeley, $7,400 for two years, to study the protective action of sugar against cirrhosis of the liver.

Natural Resources Research Institute of the University of Wyoming, Laramie, $4,000 for one year, to investigate utilization of pectin from the pulp of sugar beets and to study derivatives of beet pectin.

Dora Stern, literature consultant, $4,000 for one year, to devise a system for classifying sugar derivatives and to compile a list of new derivatives discovered since 1930.

Dr. Israel M. Rabinowitch, McGill University Faculty of Medicine, Montreal, $2,500 for one year, to study further the body's relative rate of absorption of sucrose, dextrose and levulose

The foundation members include growers and processors of beet and cane sugar from the continental United States, Hawaii, Puerto Rico, Cuba, Canada and Haiti. Joseph F. Abbott, New York, is president.

Foundation for Tropical Medicine.—At the recent annual meeting of the American Foundation for Tropical Medicine Col. Thomas T. Mackie, M. C., was reelected president. Other officers include Dr. Henry E. Meleney, New York, vice president; Mrs. C. James Attarian, New York, acting secretary; Mr. William W. Lancaster, New York, treasurer, and Lee T. Melly, New York, executive director. During 1944 the foundation received $47,350 from twenty-five sources toward the work of the foundation, according to *Tropical Medicine News*. Eleven grants totaling $38,767 were made, of which seven were to medical schools in this country for the continuation of undergraduate teaching in tropical medicine, for research and for paying the expenses of technical assistance and supplies for teaching. The largest single contribution was made to the Tulane University of Louisiana School of Medicine, New Orleans, for budgetary needs of its department of tropical medicine. Another medical school was given financial assistance to provide a month's training for a technician at the Army Medical School in the latest technics of tropical medicine and parasitology. One of the most important contributions was to Duke University School of Medicine, Durham, N. C., for the establishment of a registry for mycotic diseases. A grant by the John and Mary R. Markle Foundation was made through the foundation to the Army Medical Museum for continuation of its preparation and distribution of teaching material in tropical medicine and medical parasitology.

CANADA

Chilean Physician Named to International Labor Office.—Dr. Marcos Charnes, Santiago, Chile, has been appointed scientific officer of the industrial hygiene service of the International Labour Office, Montreal, effective sometime in May. The position of director of this service had not yet been filled on April 28. The International organization still maintains a small staff in Geneva, Switzerland, and branch offices in Washington, London, Paris, New Delhi and Chungking.

PUERTO RICO

Proposed Medical Construction.—The Superior Educational Council of the University of Puerto Rico recently approved plans to establish a school of medicine and a school of nurses. The decision called for four "minimum guaranties" before the medical school could be projected: the construction and equipment of an adequate building for the school, the establishment of a modern 300 bed hospital in connection with the school, the selection and preparation of the faculty and technical personnel, and provision of necessary funds for operation of the school and hospital. An announcement indicated that the establishment of the school of medicine will have to wait until after the war but that the school of nurses would be constructed this summer. The four year course will consist of two years of academic studies and two years of clinical work, the latter to be conducted at the Bayamon district hospital. To offset the expenses of building and operating a medical school, it has been suggested that a scholarship fund be created to send fifty students each year to schools of medicine in the United States and Latin American countries (THE JOURNAL, May 27, 1944, p. 298, and Aug. 26, 1944, p. 1202). On April 26, in a special communication to the American Medical Association, it was stated that Governor Tugwell had vetoed a bill passed by the legislature to establish a school of medicine at the city of Ponce. The bill appropriated $400,000 for the proposed medical school but the governor, in a letter sent to Mayor Andres Grillasca of Ponce, stated that he would not approve the bill solely because he believed that it controverted the spirit of the University Statute of 1942, at which time a hard fight was made to make as certain as possible not only that the university should be exempt from partisan politics and patronage but that it should be lifted above controversies of any kind. The governor said that he would be naive if he "did not conclude from the nature of your campaign that you were trying to bring the school of medicine to Ponce for the sake of the city rather than for the good of the university." The city of San Juan was also campaigning to get the proposed school of medicine established at Rio Piedras, within the metropolitan area of the capital of the island. The governor in his letter to Mayor Grillasca stated that he could not "join an attempt to divide prosperity and prestige among competing communities." He added "I am not objecting to the establishment of the medical school at any site, including Ponce, I disapproved because I feel strongly that the university statute ought to be strengthened rather than weakened, and because this bill would lead definitely to its weakening." The controversy on the site for the proposed medical school arose when the Popular Democratic party, controlling the legislature, passed the bill with the understanding that the buildings for the school should be erected in Ponce. Puerto Rico, therefore, will not have this year the proposed school of medicine.

Deaths in Other Countries

Raymond C. Shannon, American entomologist and malarial expert, was found dead March 7 in his hotel in Port of Spain, Trinidad, aged 51.——**Sir Hubert Bond**, authority on mental diseases, died in Lancashire, England, aged 74.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 7, 1945.

The Promotion of Medical and Scientific Research in India

The physiologist A. V. Hill, secretary of the Royal Society, has visited India at the invitation of the government there to discuss and advise on Indian scientific research problems. The result is a valuable report by the only British scientist who has ever been asked to offer advice on a subject of tremendous importance for a subcontinent occupied by hundreds of millions of peoples, many with advanced oriental civilizations which are being rapidly modified by European culture. Professor Hill finds that there is great need for reforms. An Indian scientific office should be set up in London with specialists in various subjects, including medicine, representative Indian scientists should be attached to the British Commonwealth Scientific Office in Washington, and young Indian teachers and research workers should be given facilities for advanced study abroad, especially in Britain. The medical colleges should have full time teachers and research workers in all subjects. He recommends the establishment in Delhi of an all India medical center where selected students should be trained and receive financial aid in the form of scholarships. Such a center must be free from all racial, religious, political or provincial bias. Its purposes should be to provide the best type of teacher and research worker and thereby to foster throughout India a high standard of medical practice. He also recommends a special hospital for the clinical study of malaria and the bringing of existing research institutes into closer touch with the medical colleges.

To facilitate scientific research in general, Professor Hill wants to see a central organization under a minister without departmental duties. This organization should have six boards charged with research respectively in medicine, agriculture, industry, natural resources, engineering and defense. The director and principal administrative officer of each board should be ex officio a member of the other five, so as to maintain the closest liaison. There should be formed an Indian central register for scientific and technical personnel, and a central scientific academy, the equivalent of the Royal Society, he said. As scientific work in universities is the basis of progress in science, grants are necessary, and medicine and biology are the two subjects which badly need these. But Professor Hill feels the drawbacks of making research an entirely government subsidized affair, and the need for enlisting private benevolence in the endowment of scholarships and fellowships and other means whereby research is assisted.

The Improvement of Hospital Meals

Much dissatisfaction has been expressed with hospital meals, which are described as too monotonous and unappetizing. The subject has been taken up by the Ministry of Health, which has made recommendations to the hospital authorities. Official visits were paid to hospitals of various types by representatives of the Ministries of Health, of Labor and National Service and of Food. On their recommendations, suggestions for improved catering and feeding are based.

The minister of health, Mr. Willink, points out that the provision of hospital food necessitates a scientific approach, which involves questions of judicious purchasing, good cooking, palatability and the attractive presentation of the prepared food so as to ensure the nutritional requirements of all patients. An important recommendation is that a special committee might be appointed to deal with this side of hospital management, each of the various branches being represented. In larger hospitals it is recommended that catering be in charge of a full time officer suitably trained. In the smaller hospitals the work should be combined with the duties of another officer, or, alternatively, a full time officer should supervise and advise on catering in a group of hospitals. Other suggestions are made for planning and training courses. Fuller advantage might be taken of the advisory dietetic service of King Edward's Hospital Fund, as well as the expert staffs of the Ministry of Health in the regular visiting of hospitals.

Prevention of Malaria on Board Ship by Means of a Mosquito Repellant

A new measure for the prevention of malaria on board ships calling at malarious ports has been adopted. Ships going to tropical African ports and the East Indies must now carry a supply of dimethyl phthalate to be issued to the crew as a protection against mosquitoes when the vessel is in a malarious area. The instructions are that a few drops are to be applied to the exposed parts of the body, avoiding areas around the eyes and mouth, and to the clothing if the mosquitoes are biting through it. One application lasts four hours.

PARIS

(From Our Regular Correspondent)

March 25, 1945.

Anesthesia in War

According to a communication of Curtellet, consulting physician of the first French army, two modes of anesthesia are principally utilized in the primary evacuation hospitals, which receive the wounded directly from the combat line several hours after the wound has been received. These two methods are those of intravenous injections of pentothal and that of protoxide-ether in a closed circuit. These are delicate technics, but special centers for training in anesthesia have been so well organized that a total of 2,340 anesthesias of which 1,979 were done with pentothal did not result in a single miscalculation.

After numerous trials the mode of administration has been regulated in the following manner: The initial dose varies between 0.6 and 0.7 Gm. Then 0.1 Gm. is given successively when the patient becomes active. Under these conditions a perfect anesthesia of one or two hours will not require more than from 1.5 to 2 Gm. The only inconveniences of anesthesia with pentothal may consist in a laryngeal spasm due to the stimulation of the vagal irritability; sometimes, by reduction of the excitability of the bulbar respiratory centers, there may be a respiratory arrest lasting several seconds, which ceases after the immediate administration of oxygen under pressure. The grave syncopes are avoided by the system of fractionated doses. However, there are several contraindications; pentothal should not be employed in operations on the face, the neck and the mediastinum. It is not advisable for patients with severe anoxic shock or for those with abdominal wounds. On the other hand, it is satisfactory in those with cranial lesions and with wounds of the extremities. If this mode of anesthesia is used, it is indispensable to have on hand nikethamide as an antidote against the barbiturates, atropine against possible convulsive accidents and finally oxygen under pressure. Anesthesia with protoxide-ether-oxygen in closed circuit is preceded by a basal anesthesia, for instance by the intravenous administration of morphine. This anesthesia is advisable in all cases in which pentothal is contraindicated.

Colchicine and Cancer

Certain drugs, such as the alkaloids of the colchicine type, provoke abnormal mitoses and blockages of karyokinesis which end in the degeneration of cells rather than in their division. This property has made it possible to obtain in mice regression and even disappearance of tumors of the type of lymphoid

sarcoma. Similar results have been obtained on malignant and papillomatous tumors produced in rabbits by the virus of Shope.

However, in order to obtain these results toxic doses of colchicine are necessary. Nevertheless the usually tolerated doses, which produce only an elevation of the karyokinetic index without either blockage or degeneration of the cells, cause a sensitization of the cells to radiations. The cellular radiosensitivity is in fact related to the process of division.

Mallet reported at the Société of d'électrologie et de radiologie the results which he obtained on cancers of diverse localization by employing intravenous injections of colchicine from ten to twelve days before the application of roentgen therapy. Epitheliomas of the pharynx, larynx and tonsils seemed to regress more rapidly than with exclusive roentgen therapy. Cancers of the breast with cutaneous generalizations have been rapidly influenced: with a dose of 400 roentgens the nodules disappeared in about fifteen days. However, caution is necessary, because of the toxicity of colchicine, which causes agranulocytosis, diarrhea and febrile attacks.

These complications have induced Calvet, who discussed this question before the Société de chirurgie de Toulouse, to employ colchicine only in situ. Calvet stresses among other difficulties the difficulty of rendering a definite judgment about the cures possible by the combination of colchicine and radiations, because this therapy is relatively new. However, the results reported encourage the continuation of experiments with these karyokinetic poisons.

Chronic Rheumatoid Arthritis and the Nervous System

Charcot attributed the deformity of chronic rheumatoid arthritis to a reaction of the originally impaired nervous system, and more recently May and Laffite have identified a trophoneurotic type of rheumatic arthritis. A study of 16 cases of chronic rheumatoid arthritis led Martin to the following conclusions, which were presented before the Société médicale de Genève:

1. Certain disorders of the diencephalon, such as Parkinson's disease, assume the traits of a rheumatoid disorder before revealing their character as a disease of the nervous system.

2. A succession of purely nervous symptoms is frequently observed to dominate the clinical picture in certain cases of rheumatoid arthritis.

3. In a large number of cases of chronic rheumatoid arthritis neurologic signs are observed, such as modification of the reflexes, trophic disturbances, trembling, insomnia, cachexia, disturbances in the blood composition, disturbances of the regulation of the carbohydrates and even tetanic or fainting attacks.

The question arises whether the morbid element has its primary or secondary localization in the brain. At present the problem of the nervous origin of chronic rheumatoid arthritis remains unsolved.

Death of French Physicians

French medicine deplores the loss of a number of important scientists since 1940. Among them are Professors J. L. Faure, A. Gosset, Cuneo, Pierre Duval, Rathery, Sergent, Achard and Nobécourt, Dean Spillmann, de Nancy, d'Arsonval, Tréfouel, director of the Institute Pasteur of Paris, Claude Regaud, founder of the Radium Institute, Marchoux and Yersin both of the Institute Pasteur, Armand Carrel and Bandelac de Pariente.

Professor Roussy, member of the institute, who had been rector of the University of Paris at the onset of the war, has been recalled to that office. He has also been elected general secretary of the Académie de médecine.

BRAZIL

(From Our Regular Correspondent)

SÃO PAULO, April 3, 1945.

Medical Meetings

Two important medical congresses were held at São Paulo early in March. Many Brazilian doctors assembled to commemorate the fiftieth anniversary of the foundation of the Sociedade de Medicina e Cirurgia de São Paulo. The meeting was presided over by Prof. Carlos Gama of the department of neurology of the Faculdade de Medicina de Salvador, Baia. The official themes of the congress were "Arterial Hypotension" and "The Problem of the Hospital in São Paulo." The first was discussed by Prof. Aloysio de Castro, president of the National Academy of Medicine of Rio de Janeiro, and by Dr. J. Mesquita Sampaio, clinician in São Paulo. The question of hospital organization was discussed by Prof. Benedito Montenegro, director of the Faculdade de Medicina de São Paulo, and by Prof. Godoy Moreira, director of the Hospital das Clinicas of the same faculty. The problem of the rural hospitals was considered by Dr. Gama Rodrigues, a well known physician of Lorens. The congress devoted special sessions to the discussion of papers on trachoma, tuberculosis and rheumatism. Many other communications on other subjects were presented.

The other meeting was the first Congresso Medico-Social Brasileiro. The assembly was presided over by Prof. Antonio Candido de Camargo of the Faculdade de Medicina de São Paulo. Its program included the following items: (1) legal regulation of medical work in the hospitals; (2) legal regulation of medical work in private organizations; (3) the medical work in the industrial organization; (4) the medical work in the country zones; (5) insurance against diseases; (6) order of doctors; (7) providence institute; (8) assistance to parentless boys; (9) assistance to delinquent boys; (10) prenuptial medical examination; (11) medical assistance to country people; (12) standard medicine for poor people. All the topics were widely discussed. The conclusions of the congress were submitted to the governmental study.

Blood Groups Among Indians

There are many differences in the blood groupings of Brazilian Indians, when compared to the general population of North and South America. Although Drs. L. Ribeiro W. Berardinelli and M. Roiter had obtained only group O in 107 "guaranis" living in the south of Brazil, in 61 "carajás" of the north of that country Dr. Golden obtained 24 of group O, 3 of A, 31 of B and 3 of AB.

In 237 Indians from northeast Brazil Drs. E. Bioca and F. Ottensooser found only individuals belonging to group O. An examination of 50 Indians known to have or supposed to have some white blood, in the region of the Alto Rio Negro in the Estado do Amazonas, showed O 36, A 12, B 2 and AB O. These investigations confirm the data obtained by Blackfeet in the United States, Mazza in Argentina and Larreta in Peru, showing the preponderance of group O among Indians in America.

Marriages

WILLIAM REVERE WELLBORN Jr., Elkin, N. C., to Miss Lola Margaret Holcomb of Jonesville in Greenville, S. C., March 19.

JOHN WARREN REID, Mill City, Ore., to Miss Josephine Gresham Lockhart of Galveston, Texas, April 7.

ARTHUR B. SHAUL Jr., Cleveland, to Miss Mary Frances Hinds at Hudson, Ohio, March 8.

HARRY S. GRADLE to Miss Audrey Hayden, both of Chicago, April 28.

Deaths

Alfred Gibson Farmer ⊕ Dayton, Ohio; Kentucky University Medical Department, Louisville, 1904; from 1905 to 1915 engaged in medical service in the Panama Canal for the United States government, serving as physician at Gorgas Hospital at Panama, as district physician at Gatun, Corozal and Cristobal and as chief of the medical service in Colon Hospital; during World War I medical officer and post surgeon with rank of major, aviation service, U. S. Army, Wilbur Wright Aviation Field, and medical officer at the Army and Navy General Hospital in Hot Springs National Park, Ark.; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology and the Aero Medical Association; fellow of the American College of Surgeons; past president of the Montgomery County Medical Society; medical examiner for the Civil Aeronautics Authority; member of the staffs as ophthalmologist at the St. Elizabeth's and Good Samaritan hospitals; in 1935 chief of staff and since 1919 ophthalmologist of the Miami Valley Hospital, where he died April 2, aged 67, of cerebral hemorrhage.

Louis Fischer ⊕ New York; University of the City of New York Medical Department, 1884; secretary of the Section on Diseases of Children, 1899-1900, and Affiliate Fellow of the American Medical Association; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; formerly instructor in diseases in children at the New York Post-Graduate Medical School and Hospital; served on the staffs of the Sydenham, Willard Parker and Riverside hospitals in New York, and St. Vincent's Nursery and Babies Hospital in Montclair, N. J.; author of "Infant Feeding in Health and Disease," the "Health-Care of the Baby," "Diseases of Infancy and Childhood" and "Health-Care of the Growing Child"; died April 9, aged 80, of coronary thrombosis.

Albert Earle Boozer ⊕ Columbia, S. C.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; since 1909 a member of the South Carolina State Board of Medical Examiners, serving as its secretary from 1911 to 1943 when he resigned; on the first board of physicians of Columbia Hospital; until a few years ago, when he resigned, served as medical director and examiner for the Carolina Life Company for about twenty years; assistant medical referee with the Mutual Life Insurance Company and medical referee of the Missouri Life Insurance Company, serving as examiner for twenty-five other insurance companies; died in Asheville, N. C.; March 1, aged 76, of generalized arteriosclerosis.

Sanders Lewis Christian ⊕ Medical Director, U. S. Public Health Service, retired, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1912; fellow of the American College of Surgeons; served overseas during World War I and with the consular service in a medical capacity for many years, serving in London, Paris and Belgium; formerly assistant surgeon general and chief of the hospital division, U. S. Public Health Service; medical officer in charge of the U. S. Marine Hospital in San Francisco from 1940 to 1944, when he retired; died in the U. S. Marine Hospital March 9, aged 56, of acute peritonitis following perforation of a duodenal ulcer.

Claude William Asbury, Hymera, Ind.; Illinois Medical College, Chicago, 1903; formerly on the staff of the Union Hospital in Terre Haute; on the staff of the Mary Sherman Memorial Hospital, Sullivan; served during World War I; died in March, aged 67, of cerebral hemorrhage.

John K. Berk, Frackville, Pa.; Jefferson Medical College of Philadelphia, 1896; member of the American Medical Association; director of the First National Bank; member of the board of trustees of the Wernersville State Hospital in Wernersville; for many years surgeon for the Philadelphia and Reading Coal and Iron Company; company doctor for the Bell Telephone Company; member of the Rotary Club; died in the Pottsville Hospital, Pottsville, March 22, aged 73, of coronary thrombosis and renal insufficiency.

William Andrew Borders, Armuchee, Ga.; Atlanta Medical College, 1890; member of the American Medical Association; honorary member of the Medical Association of Georgia; on the staffs of the Harbin Hospital, McCall Hospital and the Floyd County Hospital in Rome, where he died January 15, aged 78, of cerebral hemorrhage.

Victor McMurry Brian ⊕ Lawrenceville, Ill.; George Washington University School of Medicine, Washington, D. C., 1917; served during World War I; on the staff of the Good Samaritan Hospital, Vincennes, Ind.; died in St. Louis March 27, aged 53, of cerebral hemorrhage.

Elmer Lee Burch, San Jose, Calif.; College of Physicians and Surgeons of San Francisco, 1905; died in the Alameda Hospital, Alameda, February 6, aged 75.

George M. Dill ⊕ Prescott, Wis.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; died in St. Paul, January 30, aged 74, of uremia.

Henry Clay Eargle, Dublin, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1905; died February 5, aged 62, of cardiac decompensation and arteriosclerosis.

Charles Henri Evans, Danville, Ill.; Illinois Medical College, Chicago, 1905; member of the American Medical Association and the Colorado State Medical Society; served with the British army during World War I; died in St. Elizabeth Hospital March 26, aged 69, of hypostatic pneumonia.

Abraham Judson Forman, Milwaukee; Marquette University School of Medicine, Milwaukee, 1936; member of the American Medical Association; interned at St. James Hospital in Butte, Mont.; began active duty as a captain in the medical corps, Army of the United States, on July 15, 1942; service terminated March 12, 1943; on the staffs of the Columbia, Mount Sinai and St. Mary's hospitals; died in a Port Washington hospital March 15, aged 40, of a skull fracture received in an automobile accident near Mequon.

Charles C. Gafford, Wymore, Neb.; College of Physicians and Surgeons, Keokuk, Iowa, 1881; member of the American Medical Association and honorary member of the Nebraska State Medical Association; died February 1, aged 86, of senility.

John T. Garland, Macon, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1878; died February 18, aged 88, of coronary occlusion.

Leigh Daniel Gillespie, Ardmore, Okla.; Baylor University College of Medicine, Dallas, Texas, 1904; member of the American Medical Association; died January 4, aged 75.

William W. Gregory ⊕ Stevens Point, Wis.; Rush Medical College, Chicago, 1897; member of the staff of St. Michael's Hospital; died in Madison January 30, aged 75, of cerebral hypertension.

George H. Grimmell Jr., Howard, Kan.; Barnes Medical College, St. Louis, 1896; member of the American Medical Association and honorary member of the Kansas Medical Society; died January 30, aged 89, of chronic myocarditis.

Fred William Hall ⊕ Chicago; Indiana University School of Medicine, Indianapolis, 1926; interned at the Methodist Hospital in Indianapolis; died March 14, aged 50.

Claud Cleburne Hardison, Lewisburg, Tenn.; University of Nashville Medical Department, 1890; Vanderbilt University School of Medicine, Nashville, 1890; died February 27, aged 75, of heart disease.

Frederick Smith Heller, Oakharbor, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; member of the American Medical Association, for many years physician for the Ottawa County Home; served on the staff of the Magruder Hospital, Port Clinton; in 1938 received a gold plaque from the Ottawa County Medical Society in honor of his fifty years of practice; died February 27, aged 81, of cerebral hemorrhage.

Carl Gottfried Johnson, Galesburg, Ill.; Long Island College Hospital, Brooklyn, 1892; member of the American Medical Association; in 1943 was made a member of the "Fifty Year Club" of the Illinois State Medical Society; served as a member of the city council and as commissioner of health; on the staff of the Galesburg Cottage Hospital; for many years a trustee of the Augustana College in Rock Island; died March 20, aged 80, of coronary thrombosis.

Harry Norton Kelley ⊕ Worcester, Mass.; Harvard Medical School, Boston, 1925; on the staff of St. Vincent's Hospital; died February 20, aged 45, of coronary thrombosis.

James Samuel King ⊕ St. Albans, Vt.; University of Vermont College of Medicine, Burlington, 1893; honorary member of the Vermont State Medical Society; served during World War I; died January 7, aged 74.

Charles Franklin Kivlin ⊕ Troy, N. Y.; Albany Medical College, 1898; served as district supervisor of the U. S. Public Health Service; on the staffs of St. Joseph's Maternity Hospital and the Troy Hospital, where he died March 21, aged 69, of coronary occlusion.

John Moser Kuhns, Freeburg, Pa.; Medico-Chirurgical College of Philadelphia, 1896; member of the American Medical Association; died in the Community Hospital, Sunbury, January 24, aged 73.

Lewis A. Ledford, Chattanooga, Tenn.; Southern College of Medicine and Surgery, Atlanta, 1914; at one time on the staff of the Chattanooga Hospital; died February 5, aged 68, of carcinoma.

William Duncan Mackechnie, Indianola, Neb.; Western University Faculty of Medicine, London, Ont., Canada, 1899; died in Boulder, Colo., March 4, aged 67, of cerebral hemorrhage.

John Henry Moore, Boston; Harvard Medical School, Boston, 1897; member of the American Medical Association; for many years medical examiner for the John Hancock Mutual Life Insurance Company; died in the Baker Memorial Hospital February 24, aged 75, of hypertensive heart disease and fracture of the right femur incurred in a fall.

Risdon Dent Moore, Springfield, Tenn.; Vanderbilt University School of Medicine, Nashville, 1890; member of the American Medical Association and honorary member of the Tennessee State Medical Association; served as city health officer; died in the Robertson County Hospital January 9, aged 87.

James Coleman Morehead, Flat Lick, Ky.; Louisville Medical College, 1902; died January 1, aged 69, of coronary thrombosis.

Samuel Murdock ⊕ Sabetha, Kan.; Kansas City (Mo.) Medical College, 1893; fellow of the American College of Surgeons; established the Sabetha Hospital, which he gave to the Sisters of the Order of St. Joseph and which is now known as St. Anthony Murdock Memorial Hospital, serving as its medical director; died February 26, aged 73, of myocardial failure.

Frank Blair Murphy ⊕ Akron, Ohio; Medical College of Virginia, Richmond, 1895; served on the staff of the People's Hospital, where he died March 30, aged 76, of cerebral hemorrhage.

Samuel Casper Murphy ⊕ Warsaw, Ind.; Indiana University School of Medicine, Indianapolis, 1910; served during World War I; medical superintendent of the Murphy Hospital; died February 10, aged 59, of lymphosarcoma

John A. Murray, Patton, Pa.; University of Maryland School of Medicine, Baltimore, 1885; Jefferson Medical College of Philadelphia, 1893; member of the American Medical Association; fellow of the American College of Surgeons; also a pharmacist; consulting surgeon and for many years surgical chief, Miners' Hospital of Northern Cambria, Spangler, which he assisted in establishing; a founder of the Clearfield Hospital in Clearfield; formerly U. S. Pension examiner; died February 27, aged 86, of chronic nephritis.

Robert Offenbach, Margate City, N. J.; University of the City of New York, 1879; died in the Atlantic City Hospital, Atlantic City, February 8, aged 85, of gastrointestinal hemorrhage from a ruptured duodenal diverticulum.

Robert Abner Partain, San Antonio, Texas; University of Texas School of Medicine, Galveston, 1927; member of the American Medical Association; served an internship at the Charity Hospital of Louisiana in New Orleans and a residency at the Central Louisiana State Hospital in Pineville, La.; on the staffs of the Robert B. Green Memorial Hospital and the Medical and Surgical Memorial Hospital, where he died February 15, aged 46, of coronary occlusion

Franklin James Pattenden ⊕ Asbury Park, N. J.; Long Island College of Medicine, Brooklyn, 1935; interned at the Fitkin Memorial Hospital in Neptune; died January 27, aged 34, of accidental carbon monoxide poisoning due to illuminating gas.

Edwin Francis Pierce, Lewiston, Maine; Columbia University College of Physicians and Surgeons, New York, 1901; member of the American Medical Association; surgeon on the consulting staff of the Central Maine General Hospital, where he died February 2, aged 72, of coronary thrombosis.

Frank McClung Postlethwaite ⊕ Kansas City, Mo.; University Medical College of Kansas City, 1913; on the staffs of St. Joseph's, Kansas City General, St. Mary's, St. Luke's and Trinity Lutheran hospitals; died March 22, aged 61, of coronary thrombosis.

Joseph Henry Potts, New Britain, Conn.; Dartmouth Medical School, Hanover, N. H., 1905; resigned in April 1934 as chairman of the board of park commissioners; director of the New Britain Memorial Hospital; on the staff of the New Britain General Hospital, where he died March 24, aged 65, of cerebral hemorrhage.

Charles-Jacob Price, Mount Morris, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1900; served in France during World War I; major, medical reserve corps, U. S. Army, not on active duty; died March 20, aged 70, of coronary occlusion.

Oscar Frank Reinhardt, Mascoutah, Ill.; Chicago College of Medicine and Surgery, 1908; member of the American Medical Association; served during World War I; died in St. Elizabeth Hospital, Belleville, March 11, aged 59, of bronchiectasis.

Carl Emery Richards, Sumner, Wash; University of Louisville Medical Department, Louisville, Ky., 1907; died February 13, aged 68.

Ernest Franklin Robinson ⊕ Kansas City, Mo.; University of Pennsylvania Department of Medicine, Philadelphia, 1896; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; medical director of the Business Men's Assurance Company; on the staffs of the Research and St. Luke's hospitals; died February 5, aged 73, of coronary thrombosis.

Albert Walton Roth ⊕ Tulsa, Okla.; the Hahnemann Medical College and Hospital, Chicago, 1900; honorary member and in 1917 president of the Tulsa County Medical Society; founder and president of the Tulsa Public Health Association; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staff of the Hillcrest Memorial Hospital; died March 17, aged 71, of pulmonary edema and heart block.

Joseph Roth, Passaic, N. J.; New York Homeopathic Medical College and Hospital, New York, 1906; died in the Beth Israel Hospital March 20, aged 60, of postencephalitis.

Fritz Rubinstein, Woodhaven, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1923; served a residency at St. Joseph's Hospital for Consumptives in New York and the Rocky Glen Sanatorium in McConnelsville, Ohio; resident on the staff of St. Anthony's Hospital; died in New York December 6, aged 47.

Joseph Cheesman Thompson ⊕ Medical Inspector, Commander, U. S. Navy, retired, San Francisco; Columbia University College of Physicians and Surgeons, New York, 1896; entered the U. S. Navy on Nov. 26, 1897; retired Nov. 15, 1929 on his own application after thirty years' service; died March 7, 1943, aged 68, of heart disease.

Stephen Tarnoczi Turney ⊕ Barberton, Ohio; Ohio State University College of Medicine, Columbus, 1931; interned at the Charity Hospital in New Orleans; on the staff of the Citizens Hospital; died in the Cleveland Clinic Hospital, Cleveland, February 13, aged 43, of respiratory failure following laminectomy.

Francis Raymond Ward, New York; University of the City of New York Medical Department, New York, 1890; died December 18, aged 77.

Henry C. Werner ⊕ Fond du Lac, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1905; member of the American Psychiatric Association; superintendent of the Wisconsin Memorial Hospital in Mendota from 1927 to 1933 and the Southern Wisconsin Colony and Training School in Union Grove from 1917 to 1923; died February 6, aged 70, of carcinoma of the prostate.

William Francis Willoughby, Englewood, N. J.; New York Homeopathic Medical College and Flower Hospital, New York, 1913; assistant medical examiner for Bergen County; served as a member of the Englewood Board of Health for many years; a member of the medical staff of the Englewood Hospital; died February 28, aged 60, of cerebral hemorrhage and hypertension.

Charles M. Wood ⊕ Maroa, Ill.; Northwestern University Medical School, Chicago, 1894; served on the staffs of the Decatur and Macon County Hospital and St. Mary's Hospital in Decatur; died in the West Suburban Hospital, Oak Park, February 25, aged 73, of diabetes mellitus.

PUBLIC HEALTH SERVICE

Orestus D. Adamson, Sabine, Texas; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; acting assistant surgeon in the U. S. Public Health Service; medical officer in charge of U. S. Quarantine Station at the time of his death; died in the U. S. Marine Hospital, Galveston, February 13, aged 66, of heart disease.

Correspondence

BLOOD AND SPINAL FLUID TESTS FOR SYPHILIS IN MALARIAL PATIENTS

To the Editor:—The article "Blood and Spinal Fluid Tests for Syphilis in Malarial Patients," by Harold W. Potter, Lewin H. Bronstein and Charles M. Grüber (THE JOURNAL, March 24, p. 699) is excellent evidence for the occurrence of nonspecific syphilis reactions in "natural" malaria. To make these observations completely useful, it is necessary to look at them from the opposite side too and establish the conditions under which a positive serologic reaction may be accepted with no more criticism than is always required in evaluating serotests for syphilis. The authors have not overlooked this, but more emphasis is advisable if we don't want to err by leaning back too far.

The clearcut experiences on inoculated malaria, although not applicable without discernment, should facilitate orientation in the more intricate maze of natural malaria. The regular occurrence of positive syphilis reactions in nonsyphilitic persons inoculated with malaria was first described by Ludwig Horn (*Jahrb. f. Psychiat. u. Neurol.* **43**:247, 1924). His results were confirmed by subsequent investigators. The facts (also derived from unpublished observations) were that every case becomes distinctly seropositive after the sixth fever bout; every case becomes seronegative again within eight weeks after termination of malaria; the most sensitive test (at that time the Wassermann reaction with R. Mueller's antigen) becomes positive sooner and stays so longer than the less sensitive ones (at that time Meinicke's earlier methods and the Sachs-Georgi reaction).

Although these observations were made only on inoculation with a strain of Plasmodium vivax acclimatized to transmission from man to man, there is no reason to assume a smaller percentage of positive reactions during a limited period of natural malaria. As for the return to negativity, such a straight conclusion is not permitted, because of circumstances that are too complicated to be discussed here. An indirect approach can be gained by performing the Henry test (*Arch. Inst. prophylac.* **1**:341, 1929) in inoculation malaria (Brandt, Robert, and Horn, Ludwig: *Klin. Wchnschr.* **14**:1538 [Oct. 26] 1935). The curve of reactions, from negative to positive to negative, closely resembles the curve of the nonspecific reactions for syphilis. As Henry describes the behavior of his test in malaria disease just the way we found it in malaria inoculation, we may expect the same parallelism also in the nonspecific syphilis reactions, meaning that, a certain time after cessation of fever attacks, malaria does not produce such reactions (except, of course, in an indirect manner e. g. by having caused liver damage that outlasts the actual infection). A negative Henry test, therefore, by indicating that the period of manifest malaria infection has passed, would enhance the dependability of a positive syphilis reaction, where malaria has to be taken into account.

We can also supply a direct contribution. After the last war the number of patients with a history of malaria was considerable among former Austrian soldiers. Since at that time the introduction of routine serologic examination on the one hand and the progressively increased sensitivity of the tests (in our case the Mueller conglobation reaction) on the other hand furnished a great number of unexpected positive reactions, the question of specificity was foremost in our minds. We explored every such case for nonspecificity, applying all the required criteria. These extensive investigations did not present the slightest indication that, beyond the stage of attacks, malaria has any influence on the outcome of serologic syphilis reaction.

Altogether, the average percentage of positive reactions in nonsyphilitic persons does not give the full picture. During the manifest disease we must expect a much higher incidence, but afterward the percentage soon reaches zero.

ROBERT BRANDT, M.D., Cincinnati.

USE OF MAGNET FOR REMOVAL OF FOREIGN BODIES

To the Editor:—In the January 13 issue of THE JOURNAL, under Clinical Notes, Dr. Murdock Equen reports "A New Magnet for Foreign Bodies in the Food and Air Passages." The widespread newspaper, trade journal and magazine coverage of the original use by us of the Alnico magnet for this purpose in June 1943 was perhaps considered too well known to require quoting as the source of the method employed by Dr. Equen.

However, there are medical references of which Dr. Equen was apparently unaware when he requested a duplicate of the magnet we employed from General Electric. Our case was reported at a meeting of the Section on Otology, Rhinology and Laryngology of the Medical Society of the County of Kings and Academy of Medicine of Brooklyn, Nov. 10, 1943. Dr. Moorehead and Dr. Clerf, who discussed our paper, predicted the future usefulness and easy general applicability of the method, which our continued use and Dr. Equen's communication some fifteen months later confirms.

The original article presenting the use of the Alnico magnet was published in the *Annals of Otology, Rhinology & Laryngology* (**53**:589 [Sept.] 1944) and was entitled "The Use of a Permanent (Alnico) Magnet in the Peroral Removal of a Metallic Foreign Body (Padlock) from the Stomach," by Samuel Silber, M.D., Carl Kaplan, M.D., and Bernard Epstein, M.D.

It should be further noted that the magnet was not new even when we used it. The only thing new about it was the search by one of us (S. S.) for such an instrument to serve the specific purpose of removing a swallowed magnetic foreign body. This search led to an industrial plant, which like many others, began using the Alnico magnet in a wide variety of machines soon after it was first introduced by the General Electric Company in 1935.

We believe that the interests of historical accuracy and your high standards will be served by this addendum.

SAMUEL SILBER, M.D.
CARL KAPLAN, M.D.
BERNARD S. EPSTEIN, M.D.
Brooklyn.

MEDICAL COLLEGE OF SOUTH CAROLINA

To the Editor:—In THE JOURNAL for March 31, page 867, there is a statement relative to affairs in South Carolina which misrepresents the situation rather seriously and I beg you to publish this correction.

The commissioners of the Roper Hospital have not opposed the expansion program of the medical college except as far as the building of a large hospital is concerned, feeling that the addition to the Roper Hospital now under construction would furnish the facilities needed for larger classes. The commissioners were authorized by the medical society to give full publicity to their proposal and they thought they were carrying out the expressed wishes of the society in acting as they did. The society had at no time approved the program in toto but only in principle, and the commissioners expressed definitely their approval of expanding the teaching facilities of the college and their willingness to cooperate.

A few days after passing the condemnatory resolution, the society passed another resolution expressing confidence in the board of commissioners. I am asking you to publish this letter in justice to the commissioners, whose attitude and whose actions have been misrepresented.

ROBERT WILSON, M.D., Charleston, S. C.
Dean Emeritus, Medical College of the State of South Carolina.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Venereal Disease: Breaking of Quarantine as a Punishable Offense.—The relator, because of being infected with venereal disease, was committed to "communicable disease isolation quarters." She escaped from those quarters, was subsequently apprehended and fined $25 for breaking quarantine and was committed to jail until payment of the fine. She filed a petition for habeas corpus on the ground that no law in Tennessee, the state in which she was committed, provides for fine and imprisonment as a penalty for leaving or escaping from quarantine. The trial judge ordered her discharge from jail but remanded her to the communicable disease isolation quarters from which she had escaped. The sheriff, the custodian of the jail, appealed to the Supreme Court of Tennessee.

The sole question to be determined here, said the supreme court, is whether or not the statutes of Tennessee provide for punishment by fine of one who leaves quarantine without permission of the health officer in charge. Chapter I of title 13, Code of Tennessee, 1932, deals comprehensively with the general subject of "Preventing the Spread of Disease," and article VII specifically deals with syphilis and other venereal diseases, which are defined in the code, section 5813, as amended, and declared to be "communicable, and dangerous to the public health." By section 5816, as amended, health officers are empowered to "make examinations of persons reasonably suspected . . ." of "being infected with a venereal disease of a communicable nature" and, "when in the judgment of the state, municipal or county health officer, it is necessary to protect the public health, to isolate and quarantine persons infected with a venereal disease." The relator having been found to be so infected and thereon placed in quarantine, it cannot be questioned, in view of the code provisions just referred to, that her isolation and quarantine confinement by the health officers was lawful. It is the general rule, continued the court, that one who breaks a lawful quarantine is subject to punishment for so doing. See 12 R. C. L. 1292 and cases cited in notes. Furthermore, the code, section 5818, as amended, provides that "No one but a state, municipal, district or county health officer or his duly authorized representative shall establish and terminate isolation or quarantine of persons infected with venereal diseases." Also that "the release of a person from isolation or quarantine shall be made when in the judgment of the health officer the disease is no longer communicable."

The sheriff relied on the provisions cited for enforced segregation and quarantine of those found to be afflicted with such contagious diseases and for the termination of such isolation or quarantine only by a health officer and as justifying the imposition of the fine on the relator, invoked section 5824, *ibid*, which provides that:

> Any health officer or *any other person* who fails to perform the duties required of him in this statute, or violates any of the provisions of same, or of any rule or by-law promulgated under its authority, shall be guilty of a misdemeanor, and be fined not less than twenty-five dollars and not more than five hundred dollars, and each violation shall be a separate offense.

No stretch of construction, said the Supreme Court, is required to bring relator within the descriptive phrase "any other person," as italicized. It seems reasonably clear that one who has been placed in quarantine "fails to perform the duties required of him" and violates a basic purpose of the statute, when he leaves quarantine against the orders of those in charge and thereby subjects himself to the penalty provided by this code section. The whole scheme of segregation and isolation by quarantine would be ineffectual and frustrated unless an obligation is imposed on those found necessary to place in quarantine to observe its isolation restrictions. Moreover, supporting this view, by code, section 5822, it is provided that "The state department of health is empowered and directed to make such rules and by-laws for the . . . isolating and quarantining of infected persons as it may, from time to time, deem advisable." A copy of "regulations" issued by the department is brought up with the record on the appeal and "regulation 13" therein provides that:

> (A) Every person who is infected with a communicable disease, who is a carrier of the infection of a communicable disease, who is suspected of having a communicable disease or who is a contact with a case of communicable disease shall strictly observe and comply with all orders, isolation and quarantine regulations and restrictions given or imposed by the local health officer or the State Department of Public Health, in conformity with law and pursuant to these regulations

One who fails and refuses to "observe and comply with" such isolation and quarantine regulations violates a duty imposed on him by law and is not only subject to the penalty provided by the foregoing section 5824 but is guilty under code section 11054, declaring it a misdemeanor for one confined in a workhouse or jail on any charge of a criminal offense *"or otherwise lawfully so confined"* to escape or attempt to escape therefrom. The language italicized would seem to include one lawfully confined in quarantine. And, finally, under article V of this same chapter, subhead "Prevention of Communicable Diseases," appears code section 5793, which expressly provides for fine and imprisonment of "any person isolated or quarantined who shall wilfully escape . . . before he has fully recovered," and so on, which would seem to have application. It is true that venereal diseases were excepted from communicable diseases dealt with under this article, code section 5789, but, as has been seen, by subsequent enactment (code section 5813) venereal diseases are expressly declared to be communicable diseases subject to quarantine, so that, in application of the pari materia rule, this provision for punishment may well be extended to those quarantined for such diseases who escape before recovery. But, however this may be, on the grounds hereinbefore set forth, we hold that the relator was lawfully in isolation and confinement and was subject to fine for having escaped therefrom. Her detention was therefore not illegal and the judgment below must be reversed. Accordingly, apparently, the prisoner was remanded to the custody of the sheriff. —*State ex rel. Kennedy v. Head, Sheriff, 185 S. W. (2d) 530 (Tenn., 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, May 5, page 53.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. Parts I and II, July 16-18. Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* New Orleans, May 21-23, Philadelphia, June 6-8 and Chicago, June 27-29. San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY. Chicago, May 28. Sec., Dr. Paul Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY. *Part II. Oral.* Atlantic City, June 13-19. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY. New York, June 13-16, Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY. *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY. Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PATHOLOGY. Philadelphia, June 13-14. Final date for filing application is May 15. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit 2.

AMERICAN BOARD OF SURGERY. *Written.* Various centers, October. Final date for filing application is Aug. 1. Sec., J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY. *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

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Resection of Stomach. H. M. Clute and C. W. Howe.—p. 495.
Common Knee Injuries. Some Aspects in Diagnosis and Treatment. W. A. Dalmain.—p. 503.
Collapse of Glass Eyes in Orbit: Case Report. W. M. Hayes.—p. 510.
Dislocations of Shoulder. L. F. Bush.—p. 520.
*Local Treatment of Burns with Pressure Dressings and Films Containing Sulfonamide. E. C. Reese.—p. 524.

Pressure Dressings and Films Containing Sulfonamides in Burns.—Reese reports results obtained in 43 cases of burns treated with films containing sulfonamides held in place by pressure dressings. The film used was 0.004 inch thick, transparent and pliable, and it conformed easily to body surfaces. The base of the film was methylcellulose, to which was added triethanolamine in addition to a plasticizer. The standard film employed contained 20 per cent sulfanilamide and 10 per cent sulfacetimide. It was estimated that 1 sq. cm. of the film contains 3 mg. of the sulfonamide. Recently 0.5 per cent proflavine has been added to the film. Triethanolamine was used in this film because it maintains the hydrogen ion concentration of the surrounding medium at a slightly alkaline reaction (p_H 8.5), which enhances the effectiveness of sulfanilamide. Utmost aseptic precautions were taken. In 39 cases the burns were second degree, in 4 cases second and third degree burns were present. Reese found that the healing time with this treatment compares favorably with most of the accepted methods of therapy. The film appears to possess an important advantage in that it forms a protective transparent coating which is not removed until full healing has occurred. Painful redressings are thus eliminated, and injury to partially devitalized structures and fragile newly growing epithelium is prevented.

American Journal of Tropical Medicine, Baltimore

25:1-74 (Jan.) 1945

Place of Tropical Medicine in International Health. W. A. Sawyer.—p. 1.
Present Status of Tropical Medicine and Some Future Problems. E. B. Vedder.—p. 5.
Complement Fixation Test in Diagnosis of Yellow Fever: Comparative Value of Serologic and Histopathologic Methods of Diagnosis. E. H. Lennette and Alma Perlowagora.—p. 11.
Use of Rhesus Monkeys in Testing of Aqueous Base Yellow Fever Vaccine. M. V. Hargett and H. W. Burruss.—p. 19.
Serologic and Entomologic Survey of Murine Typhus. M. Pollard and G. F. Augustson.—p. 31.
Infection of Pediculus Albidus Rudow, the Maggot's Louse, on Typhus Carrying Monkeys (Macacus Sylvanus). G. Blanc and T. E. Woodward.—p. 33.
Amebic Hepatitis. W. A. Sodeman and B. O. Lewis.—p. 35.
Blood Picture in Asymptomatic Schistosoma Mansoni and Other Intestinal Parasitic Infections. J. T. Bercovitz, H. Shwachman and R. Rodriquez Molina.—p. 41.
Chinese Soy Bean Sauce as Transmitting Agent of Bacterial Gastrointestinal Infections. C. I. Wang.—p. 47.
Trichinella Skin Tests in Tuberculosis Sanatoriums, Hospitals for Mental Diseases and General Hospitals. Comparison of Results in Tuberculous and Nontuberculous Patients. G. T. Harrell and S. F. Horne.—p. 51.
Metabolic Acclimatization to Tropical Heat. C. A. Mills.—p. 59.
Wartime Tropical Medicine Activities of National Research Council. H. E. Meleney.—p. 63.
Method for Counting Microfilariae of Litomosoides Carinii of Cotton Rat. H. W. Brown and R. W. Williams.—p. 67.

American Review of Soviet Medicine, New York

2:196-288 (Feb.) 1945

Blood Transfusion in Treatment of Internal Disease. A. A. Bogomolets.—p. 196.
Blood Transfusion in Military Medicine. A. A. Badgisarov and M. C. Dultsin.—p. 199.
*Frozen Plasma. New Blood Substitute. V. I. Kasanski.—p. 207.
Preservation of Erythrocytes and Their Clinical Use. V. I. Kasanski.—p. 210.
Effect of Prolonged Pressure on Peripheral Abdominal Nerves. A. I. Browde.—p. 213.
Neurohumoral Factors in Pathogenesis of Slowly Healing Wounds. S. M. Leites, R. M. Veger and E. I. Zhitopolskaya.—p. 218.
Physiotherapy of Wounds. I. A. Piontocovsky.—p. 221.
*Stimulation of Wound Healing by Embryonal Tissue. D. I. Goldberg.—p. 225.
Treatment of Suppurating Wounds with Ammonium Bicarbonate. I. F. Berezin.—p. 230.
Some Aspects of Peptic Ulcer During Wartime. V. M. Kogan Yasny.—p. 233.
Stachybotryotoxicosis. New Disease of Horses and Humans. V. G. Drobotko.—p. 238.
Thrombin: Its Properties and Method of Utilization in Surgery. V. A. Kudryashov.—p. 243.
Penicillin Crustosin. Z. Yermolieva, T. Kaplun and M. Levitov.—p. 247.
Control of Infectious Diseases. O. A. Rickman, V. L. Olshevskaya and O. N. Dodonova.—p. 251.
Control of Chronic Dysentery. E. D. Ravitch Birger and E. M. Ravikovitch.—p. 256.
Intravenous Alcohol Anesthesia. E. V. Verkhovskaya.—p. 260.

Frozen Plasma.—Fresh blood plasma, prepared according to the directions of the Central Institute for Blood Transfusions in ampules or bottles, is placed in a freezing chamber at temperatures of from −15 to −25 C. Before transfusion plasma is thawed by placing the unopened containers into a water bath at a constant temperature of 38 to 40 C. The time required for thawing and warming averages twenty minutes. Only in rare cases does residual flocculation necessitate filtration of plasma. Determinations of viscosity, turbidity, protein fraction and refractive index were carried out before freezing and after thawing. These investigations established the absence of irreversible physicochemical changes of the proteins. The use of

frozen plasma does not cause toxic effects The therapeutic effect of transfused thawed blood plasma is the same as with fresh plasma. Thawed plasma may be used for the same diseases and in the same doses as fresh blood. Like fresh plasma, it is the best blood substitute.

Stimulation of Wound Healing by Embryonal Tissue.—Goldberg prepared embryonal extracts in a castor oil emulsion or petrolatum ointment. Since war wounds are contaminated, 0 3 or 0 5 per cent of xeroform or 0 5 to 1 per cent of sulfanilamide was added. Ointments with a petrolatum base containing embryonal tissue were used in the clinics and hospitals of the Siberian military medical units beginning with July 1942. Petrolatum ointments are more convenient in the treatment of superficial wounds and of ulcers, since they remain in contact longer with the wound surface. The emulsion in castor oil produced sensations of burning and irritation of the surrounding skin. The same emulsion in petrolatum facilitated the filling of osseous defects after sequestrotomy The 15 per cent ointment proved more effective than the 5 per cent emulsion previously used and replaced the emulsion in evacuation hospitals and clinics in wounds of soft tissues with or without periostitis and fracture, *in sluggish wounds in denervated tissue*, in chronic wounds in stumps with or without osteomyelitis, in sluggish ulcers from varicosities, burns and frostbite, and for filling osseous defects after sequestrotomy Embryonal emulsion in ointment form stimulated the growth of epithelium and fibroblasts. Wound exudates diminished after treatment with 15 and 25 per cent ointments. Granulation tissue appeared earlier and grew more intensively than in control cases. Epithelization was rapid, with penetration of epithelial strands into the granulation tissue. Cornification of epithelium was hastened.

Bulletin of Los Angeles Neurological Society

9:121-178 (Sept.-Dec) 1944

Neonatal Asphyxia: Its Encephalic Residuals and Mechanism of Their Production C. B Courville and C Marsh —p 121
Damage to Cranial Nerves Resulting from Head Injury A. P Friedman and H H Merritt —p 135
Cerebellar Embolism G N. Thompson —p 140
Chronic Extradural Hematoma. Report of Case of Hematoma in Anterior Cranial Fossa W. T. Grant —p 156
Complete Obstruction of Cerebral Aqueduct Associated with Lumbar Meningocele: Report of Case E H Shryock —p 163
Chronic Abscess of Postcentral Convolution Report of Case, with Autopsy. G N. Thompson —p 167
Unusual Reaction to Electroshock Treatment Unilateral Convulsion and Transient Hemiplegia C. W. Olsen —p 171.

Connecticut State Medical Journal, Hartford

9:81-164 (Feb.) 1945

Industrial Medicine and General Practitioner C F Yeager.—p 81.
Neuropsychiatry and Placement of Industrial Workers. M. Brody. —p 84
Observations on Certain Inorganic Industrial Hazards L T Fairhall. —p. 88
Treatment of Asphyxia J. Kreiselman —p 94
Present Status of Treatment in Angina Pectoris J E F Riseman. —p 99
How Red Cross Supplements Medical Care H E Kleinschmidt —p 103.
Postwar Problem of Tuberculosis. C. B Gibson —p 106
Roentgenography of Feet Under Weight Bearing Conditions. C. W. Goff —p 109

9:165-252 (March) 1945

Progress in Cancer Research J J. Morton —p 167.
Therapy of Breast Carcinoma. J. B Herrmann —p 178
Periodic Gynecologic Examination. H. Thoms —p 185
Medical Service Plans G Mooney —p 187
Study of Distribution of Physicians in Connecticut in Wartime. C. Barker.—p 190.
Choice of Digitalis Preparation H Gold —p 193
Community Hospital: Its Outpatient Clinic J C Leonard —p 197.
Connecticut Plan for Chronically Ill K. F Heiser —p. 199.

Delaware State Medical Journal, Wilmington

17:1-18 (Jan) 1945

Newer Developments in Treatment of Heart Disease C C Wolferth. —p 1
Rocky Mountain Spotted Fever. S. Worden —p 6

17:19-34 (Feb) 1945

Early Diagnosis and Management of Gynecologic Cancer C T. Beecham. —p 19
Infusions Through Bone Marrow. G J Bones —p 22

Georgia Medical Association Journal, Atlanta

34:1-24 (Jan.) 1945

Treatment of Cancer of Breast J. I Campbell —p 1.
Use of Antistreptolysin Titer in Differential Diagnosis of Rheumatic Fever and Allied Conditions H. Parks —p. 5.
Why Are You a Citizen of Dougherty County? J. M. Barnett —p. 10.

34:25-45 (Feb) 1945

Clinical Aspects and Treatment of Cutaneous Cancer. W. L Dobes and P. H. Nippert —p. 25.
Common Duct Stones B. H. Clifton —p. 30.
Multiple Arterial Thromboses Involving Major Vessels of Lower Extremities and Right Arm. Report of Case A. D. Little and G. T. McCutchen —p. 34.

Journal of Immunology, Baltimore

50:61-126 (Feb.) 1945

Comparative Study of Complement: I. Specific Inactivation of Components J E. Cushing.—p. 61.
Id.: II Interaction of Components of Different Species J. E Cushing —p 75
Specificity of Acquired Tumor Immunity. L Gross —p. 91.
Serologic Relationship of Blood Group A and B Antigens: Production of Anti B Precipitins W. C. Boyd and Estelle R Warshawer.—p 101.
Attempts to Transmit Primary Atypical Pneumonia and Other Respiratory Tract Infections to Mongoose: Commission on Acute Respiratory Diseases G J. Dammin and T H Weller —p 107.
Antigenic Variation in Clones of Paramecium Aurelia. J. A Harrison and Elizabeth H Fowler.—p. 115

Journal of Lab. and Clinical Medicine, St. Louis

30:99-199 (Feb.) 1945

*Isoimmunity to Rh Factor as Cause of Blood Transfusion Reactions E. L. De Gowin —p. 99.
Studies of Sickle Cell Formation in Normal Saline, Plasma and Sera with Carbonic Anhydrase Inhibitors W. J. Tomlinson and J. E Jacob —p 107.
Nonspecific Complement Fixing Antigen in Embryonic Egg Tissues K Wertman —p 112.
Alkaline Medium and Procedure for Selection of Dermatophytes in Presence of Saprophytic Fungi. J. M. Leise and L H James —p 119
Therapeutic Effectiveness of Penicillin in Treatment of Vincent's Stomatitis and Its Failure to Influence Favorably Certain Other Medical Conditions J. S Sweeney, W J. Morginson, R W Robinson and E M. Kilpatrick —p. 132
Evaluation of Technics Used in Diagnosis of Enterozoic Parasitism in Children R L Brown —p 135
Low Toxicity in Animals of Boric Acid as Preservative Agent D. V. Frost and R K Richards —p 138
Relationships of Chemical Constitution to Antibacterial Effects of Derivatives of 9 Ammoacridine G R. Goetchius and C A Lawrence —p 145

Isoimmunity to Rh Factor and Transfusion Reactions.—In order to obtain some perspective on the incidence of isoimmunity to the Rh factor in a general transfusion service De Gowin studied 5,386 consecutive blood transfusions at the University of Iowa Hospitals Multiple transfusions were given to recipients without regard to Rh type or to obstetric history of female recipents. Transfusion reactions of all types were studied for evidence of isoimmunization with the Rh factor. In 3,132 transfusions given to 1,112 males, the incidence of reactions was 3.1 ± 0.2 per cent. In 1,004 female recipients of all ages the incidence of reactions was 3.9 ± 0.4 per cent in 2,254 transfusions. This is considered to be a statistically significant difference in the sexes which may possibly be explained by isoimmunity to the Rh factor developed during pregnancy. In the 186 transfusion reactions of all types, only 6 could be attributed to isoimmunity to the Rh factor. Isoimmunity was attributed to multiple transfusions in 4 instances and to pregnancy in 2. There was a fatality from transfusion of Rh positive blood into a recipient who had been sensitized by multiple transfusions. It is estimated that of the 399 recipients receiving four or more transfusions approximately 60 were Rh negative. Only 4 of these were immunized to the Rh factor by multiple blood transfusions The case histories of the 6 recipients with isoimmune reactions are reported Preliminary cross matching for the anti-Rh agglutinin would not have prevented all of the reactions. The author shows that there are many difficulties in testing for Rh incompatibilities, such as lack of sources of Rh typing serums and of adequate methods of demonstrating anti-Rh antibodies in the laboratory. It is frequently necessary to work with weak anti-Rh agglutinins in cross matching blood. The time required for incubation of cell-serum suspensions for the

demonstration of the anti-Rh agglutinin (from thirty to sixty minutes) imposes a serious delay if the transfusion is an emergency treatment, and, since the delay is considered more dangerous than the possibility of a reaction from Rh incompatible blood, the Blood Transfusion Service has decided to forego the incubation of cell suspensions preliminary to urgent transfusions.

Michigan State Medical Society Journal, Lansing

44:1-112 (Jan.) 1945

Preanesthetic Preparation of Surgical Patient. E. A. Rovenstine.—p. 45.
Clinical Manifestations of Sulfonamide Toxicity and Hypersensitivity. R. H. Lyons.—p. 51.
Advance in Prevention and Treatment of Poliomyelitis. J. L. Wilson.—p. 59.

44:113-208 (Feb.) 1945

Tuboovarian Gastrostomy: History and Technic (Determining Credit for Origination in Surgery). M. Thorek.—p. 153.
Observations on Tropical Medicine in United States Army. C. C. Hillman.—p. 165.

New England Journal of Medicine, Boston

232:149-180 (Feb. 8) 1945

*Diagnosis of Posterior Herniation of Lumbar Intervertebral Disks. D. Munro.—p. 149.
Convulsions During General Anesthesia. E. E. Simpson.—p. 160.
Giant Calculus of Appendix: Report of Case. L. S. Pilcher.—p. 163.
Abdominal Surgery. A. W. Allen.—p. 165.

Posterior Herniation of Lumbar Intervertebral Disks.—Munro believes that a clinical diagnosis of a posterior herniation of the nucleus pulposus of a ruptured lumbar intervertebral disk which is based only on the history and physical and neurologic examinations, if unconfirmed by other objective findings, is at best only a "possible" diagnosis. Surgery is not justified under such circumstances. If one can demonstrate a sensory deficit that corresponds to the peripheral distribution of a low lumbar or upper sacral root, together with atrophy and loss of ankle jerk in the same leg, a diagnosis of irritation or compression of this particular root is justified. If in addition there is a history of intermittent attacks of pain in the back with radiation to any part of the leg, especially to the lower part of the leg, which is associated with initiation or increase of the typical pain by coughing, sneezing or straining or by back motion or lifting, and if these attacks started after a back injury, back strain, lifting strain or fall, a posterior herniation of either the fourth lumbar or lumbosacral disk must be seriously considered as a cause of the radiculitis. This cannot be regarded as a certainty, however, unless confirmed by other and more accurate data. A positive straight leg raising or Lasègue test, limitation or loss of back motion, a change in the lumbar curve, spasm of the erector spinae muscles and local tenderness in the lumbosacral area indicate only that the patient has some trouble with the lower part of his back, lumbosacral roots or cauda equina and neither confirm nor deny the diagnosis of a herniation. A history and examination such as given, if accompanied by a partial or complete dynamic block or an increase in the total protein of a sample of cerebrospinal fluid properly collected from below the level of the block, or both of these, justify a diagnosis of irritation or compression of any part or all the cauda equina and a probable diagnosis of either an intraspinal tumor or a midline posterior herniation of a lumbar disk. Final differentiation must at least await myelography and in many cases operation. The level of herniation is usually not determinable on the basis of pure clinical data. Multiple herniations cannot be diagnosed without adequate preoperative visualization of the lower subarachnoid space. Certain diagnosis, both concerning the presence of a herniation or herniations and concerning the level, depends on adequate visualization of the lumbosacral subarachnoid space by some opaque contrast medium. Skiodan in 20 per cent solution has proved satisfactory for this purpose.

New Jersey Medical Society Journal, Trenton

42:37-74 (Feb.) 1945

Purpura Annularis Telangiectodes (with Report of Early Case). E. M. Satulsky.—p. 42.
Penicillin Sodium in Treatment of Sulfonamide Resistant Gonorrhea. J. T. Judge.—p. 45.
Brief Psychotherapy: Report of Case. E. T. Baker.—p. 46.

Oklahoma State Medical Assn. Jour., Oklahoma City

38:1-42 (Jan.) 1945

The "Reformed Gallbladder." G. H. Miller.—p. 1.
Fever Treatment. M. O. Nelson.—p. 3.
Present Status of Pain Relief During Labor. S. H. Starr.—p. 7.

38:43-88 (Feb.) 1945

Corneal Ulcers. M. D. Henley.—p. 43.
Wartime Tuberculosis Control in Oklahoma. R. M. Burke.—p. 47.
Surgery of the Spleen. O. White.—p. 53.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

20:125-286 (Dec.) 1944

Human Toxoplasma. D. Weinman.—p. 125.
Pulmonary Schistosomiasis. R. M. Suárez and T. Hernández Morales.—p. 194.
Skin and Precipitin Reactions to Antigens from Cercariae and Adults of *Schistosoma Mansoni*. J. O. Gonzalez and Caroline K. Pratt.—p. 242.
Gastroscopic and Rectosigmoidoscopic Observations in Tropical Sprue. I. Hernandez Morales.—p. 257.

Surgery, St. Louis

17:1-152 (Jan.) 1945

Traumatic Perforation of Colon as Seen in General Hospital. B. P. Colcock.—p. 1.
Congenital Absence of Gallbladder. C. F. Dixon and A. L. Lichtman.—p. 11.
*Influence of Local Application of Sulfathiazole on Incidence of Infections in Surgical Incisions. R. H. More.—p. 22.
Appendicitis and Sulfonamide Drugs. R. L. Sewell.—p. 32.
Prevention of Staphylococcus Infections of Peritoneum. R. A. Daniel Jr. and T. J. Holbrook.—p. 39.
Certain Sulfonamide Drugs and Certain Derivatives of Ascorbic Acid in Experimental Gas Gangrene in Wounded Mice. T. J. Ryan, R. Ballentine, Lillian K. Schneider and Gwendolynn M. Tuck.—p. 47.
Efficacy of Heparin Administered by Intravenous, Intramuscular and Subcutaneous Routes and Study of Effect of Five Bacteriostatic Agents on Heparin Action. J. Walker.—p. 54.
Allergic Pathogenic Mechanism of Thyrotoxicosis. A. O. Wilensky.—p. 61.
Cotton Sutures in Surgery of Warfare. R. S. Sparkman.—p. 73.
Surgical and Anatomic Significance of Mamillary Tubercle of Last Thoracic Vertebra. E. B. Kaplan.—p. 78.
Traumatic Osteochondritis of Patella. T. J. Cox.—p. 93.
Treatment of Tendons in Finger Amputations and Description of New Instrument. G. V. Webster.—p. 102.
Modified Calibrated Skin Grafting Knife. Further Observations. K. M. Marcks.—p. 109.
Anesthesia for Burned Patient. E. M. Papper.—p. 116.
Orthopedic Surgery for Reconstruction of Congenital Malformations of Kidney. R. Gutierrez.—p. 122.
Extensive Varicosities of Leg Originating from Gluteal Vein: Report of Case. W. H. Prioleau.—p. 135.
New *Hemostatic Clamp*: Description of Hemostat Carrying Multiple Preformed Ligatures. G. Cubero.—p. 138.

Local Application of Sulfathiazole in Incisions.—Seventy incisions for lobectomies and pneumonectomies were studied. The incisions passed through the skin and subcutaneous tissue, posteriorly through the trapezius and rhomboid muscles and anteriorly through the latissimus dorsi and serratus anterior. The control or prior groups consisted of 35 patients. The experimental group consisted of the 35 patients operated on in the period immediately following that in which the control group of patients came to operation. In this experimental group not more than 2 Gm. of sterilized sulfathiazole powder was rubbed into every nook and cranny of the extensive incisions before opening into the pleural cavity, thus producing a film of serum and blood saturated with sulfathiazole overlying all of the exposed tissue. Thirteen wound infections occurred in the control group, while only 4 occurred in the experimental group. Sulfathiazole applied locally in the experimental series was the only important factor to which the reduced incidence of wound infection in the experimental group could be attributed.

Wisconsin Medical Journal, Madison

44:190-271 (Feb.) 1945

Treatment of Involutional Psychosis in the Male. E. Haynes and J. S. L. Jacobs.—p. 209.
Carcinoma of Cervix. W. D. Stovall.—p. 212.
Use of Conditioned Reflex in Treatment of Alcohol Addicts. F. Kant.—p. 217.
Tracheoesophageal Fistula. E. R. Schmidt and D. W. Melick.—p. 222.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Heart Journal, London

6:167-254 (Oct.) 1944

Congenital Pericardial Defects. S. Sunderland and R. J. Wright-Smith. p. 167.
*Casual and Basal Blood Pressures: IV. Their Relationship to Supplemental Pressure, with Note on Statistical Implications. F. H. Smirk. —p. 176.
Myocardial Infarction. T. E. Lowe and W. B. Wartman.—p. 183.
Case of Tuberculous Pericarditis. A. M. Barrett and L. Cole.—p. 185.
Perforation of Interventricular Septum Due to Cardiac Infarction. Anne M. Wood.—p. 191.
Cardioaortic Fistula. A. Macleod.—p. 194.
*Mercurial Diuretics: Addition of Magnesium Sulfate to Prevent Toxic Effects of Their Intravenous Administration. I. Pines, A. Sanabria and R. T. Hernandez Arriens.—p. 197.
Clinical Evaluation of Pressor Activity of Methedrine, Neosynephrine, Paredrine and Pholedrine. F. Prescott.—p. 214.
Unity of Paroxysmal Tachycardia and Auricular Flutter. W. Evans. —p. 221.
Chest Leads for Demonstration of Auricular Activity. P. Szekely. —p. 238.

Casual and Basal Blood Pressures.—Smirk defines casual blood pressure as the sum of the basal blood pressure and the supplemental pressure; this last represents the degree of blood pressure elevation above the basal level due to whatever degree of physical, emotional and suprabasal metabolic activity is present at the time of blood pressure measurement. The basal pressure is the pressure measured at a time when physical, emotional and metabolic activity are reduced to a physiologic minimum. Failure to obtain the true basal reading will not always be apparent to the observer, especially when the failure is due to emotional reasons. Both normal and hypertensive subjects with a high basal pressure have a greater statistical expectation of having a high casual pressure than do those whose basal pressure is low. Likewise those with high supplemental pressures have a greater statistical expectation of a high casual pressure than do those whose supplemental pressure is low. In comparing one individual with another the basal and supplemental pressures, on the other hand, are independent variables in the sense that the level of the basal blood pressure in an individual is no guide to the probable level of the supplemental pressure. Most statistics concerning the level of the blood pressure are concerned with the casual readings. The fact that, when comparing 1 individual with another, within a comparable physiologic group, the casual blood pressure is to be regarded as the sum of two independent variables has statistical implications. The supplemental pressure forms a significantly higher proportion of the casual pressure among patients with essential hypertension than among normal subjects. An improved method is recommended for determining the basal blood pressure.

Magnesium Sulfate to Prevent Toxic Effects of Mercurial Diuretics.—Pines and his associates state that an analysis of toxic symptoms and signs which appear after mercurial diuretics proves that some of them depend on the drug itself and not on the diuresis. The mercuric ion liberated from organic mercurials produces abundant diuresis through its action on the renal tubules, but simultaneously in certain doses, and if appearing rapidly in the blood stream of a mammal, it provokes serious disturbances in the conduction system of the heart as well as in the musculature of the ventricles. The authors studied the course of acute intoxication produced by the intravenous or intracardiac injections of esidrone on normal dogs with the help of the electrocardiograph. They concluded from these studies that mercurial diuretics in certain doses are general depressants for the whole cardiac muscle. The following pattern of intoxication was observed: changes of T waves, intraventricular and auriculoventricular conduction disturbances, diminution of frequency of impulse formation in the sinoauricular node, ventricular paroxysmal tachycardia, chaotic heart action, ventricular fibrillation and death. The addition of small quantities of magnesium sulfate (0.5 cc. of a 20 per cent solution) prevents ventricular fibrillation and death even if doses seven times higher than normal lethal doses are used. Magnesium sulfate does not prevent and perhaps even increases the conduction disturbances resulting from the administration of lethal doses of mercurial diuretics. On the other hand, such amounts of magnesium sulfate increase the diuretic response, are entirely safe and mix with mercurial diuretics without forming any precipitate. It is suggested that small quantities of magnesium sulfate be incorporated into the mercurial diuretics in order to prevent fatal reactions sometimes resulting from the intravenous injections of these drugs.

British Medical Journal, London

3:141-174 (Feb. 3) 1945

Clinical Characters of Pain. W. Ganado.—p. 141.
Some Social Aspects of Burns in Glasgow. A. Brown, E. Lewis-Faning and M. M. Whittet.—p. 144.
Chronic Intracerebral Hematomata: Their Pathology, Diagnosis and Treatment. G. F. Rowbotham and A. G. Ogilvie.—p. 146.
*Sulfanilylbenzamide, Sulfanilylamidobenzamide and Succinylsulfathiazole in Chemotherapy of Sonne Dysentery. R. Swyer and R. K. W. Yang. —p. 149.
Hemolytic Disease of Newborn in One of Dizygotic Twins. F. Stratton, F. A. Langley and U. Lister.—p. 151.
Elimination of Cross Infection: An Experiment. H. P. Pickerill and Cecily M. Pickerill.—p. 159.

Chemotherapy of Sonne Dysentery.—Swyer and Yang say that of 179 patients with bacteriologically proved Sonne dysentery 41 were treated with sulfanilylbenzamide, 112 with sulfanilylamidobenzamide and 26 with succinylsulfathiazole. The stools became formed, normal in color and free from blood or mucus in twenty-four to forty-eight hours in the sulfanilylbenzamide series, and in 38 of these cases bacteriologic clearance was obtained in an average of 1.8 days. Improvement in characteristics of stools was well defined with sulfanilylamidobenzamide but rather less so than with sulfanilylbenzamide. The average time for clearance was 3.6 and 2.5 days with full and half dosage respectively. With succinylsulfathiazole there was not a great improvement in stools, but clearance time was 2.4 days. Bacteriologic relapse rates were 7.3 per cent with sulfanilylbenzamide, 15 per cent with a full dose of sulfanilylamidobenzamide and 3.3 per cent with a half dose and 34.6 per cent with succinylsulfathiazole.

Deutsche medizinische Wochenschrift, Leipzig

69:679-712 (Oct. 1) 1943

Observations on Meningitis and on Encephalitis at the Battle Front. H. Assmann.—p. 679.
Differential Diagnosis of Tularemia from Tuberculosis. H. Schulten. —p. 683.
Treatment of War Nephritis. Hantschmann.—p. 685.
Clinical Picture of Epidemic Hepatitis. M. Bürger.—p. 687.
*Deliberate Puncture of Liver. H. Kalk, W. Brühl and W. Sieke. —p. 693.
Participation of Secretion of Renal Tubules in Production of Urine. G. Kuschinsky and H. Langecker.—p. 695.
Prognosis of Nephritis. H. Sarre.—p. 698.
Fatal Ascending Paralysis After Diphtheria. R. Bauer and F. Schennetten.—p. 702.

Deliberate Liver Puncture.—Deliberate liver puncture is the term coined by Kalk and his associates to designate a method in which the macroscopic examination of the liver by laparoscopy was combined with liver puncture for the purpose of microscopic examination. Puncture was performed under local anesthesia by means of a cannula of Roholm and Iversen's type after the introduction of the laparoscope into the air filled abdomen. This cannula is 2 mm. thick and has four fine teeth at its end, which may produce a sawlike effect on rotation. The cannula is graduated at a distance of from 3 or 4 cm. from its end so that it may not be inserted too far into the liver. In cases of diffuse changes of the liver, i. e. in parenchymatous icterus or in icterus due to obstruction, the puncture was carried out at a distance of from 5 to 7 cm. from the anterior border of the liver. The danger of hemorrhage may be prevented by this method, which has been used 123 times within two years. One additional advantage for this method is the fact that puncture of the left lobe of the liver may be carried out successfully. There were no untoward reactions and the patient was free from pain during the entire procedure. The cirrhotic origin of a primary cancer of the liver was demonstrated on microscopic examination in 2 cases and the diagnosis of sarcoma was clarified in a doubtful case of tumor.

Book Notices

The Diagnosis and Treatment of Acute Medical Disorders. By Francis D. Murphy, M.D., F.A.C.P., Professor and Head of the Department of Medicine, Marquette University School of Medicine, Milwaukee. Cloth. Price, $6. Pp. 503, with illustrations. Philadelphia: F. A. Davis Company, 1944.

The author has written a small but valuable book intended primarily for the general practitioner and medical student. Drawing from his more than twenty years' experience as clinical director of the Milwaukee County Hospital he has observed that, while chronic disorders are managed satisfactorily, difficulties are encountered in the treatment of the acute diseases. The subject matter is well organized and written in a style that is read with ease. The book begins with a comprehensive discussion of the acute vascular episodes, including the management of cerebral vascular crises and acute vascular occlusions. This is followed by chapters on diseases of the blood and heart, metabolic disorders, diseases of the nervous system, kidneys, lungs and acute abdominal emergencies. Chapters on the acute infections, tropical diseases and acute poisonings are presented in outline form. A final short chapter on drugs summarizes the pharmacology of digitalis and the sulfonamides. Lengthy discussions of etiology and pathology have been avoided to a great extent, while more emphasis has been placed on diagnosis and therapy. Since the form of management is based primarily on the medical experience of the author, and because of the size of the book, a bibliography is not included. Certain phases of therapy are questionable, such as endocrine therapy for cerebral vascular crises and the use of leeches in thrombophlebitis. The reviewer does not believe that hemophilia and Gaucher's disease are acute disorders.

Report upon the Work of the Miners' Phthisis Medical Bureau for the Three Years Ended 31st July, 1941. Published by Authority. Paper. Price, 8s. 6d. Pp. 46. Pretoria: Government Printer, 1944.

As heretofore, this publication contains a wealth of detail that can be appreciated only in the original. The exceptional opportunities of the bureau for continued observation of a large and relatively stable group of persons exposed to a dust of comparatively uniform composition provides one of the major sources of information on silicosis. It should always be remembered, however, that this disease varies in its local manifestations and that every detail of the conclusions is not necessarily applicable to other industries. The data demonstrate convincing evidence of the effect of a well regulated control program.

Before considering the results of the routine examinations, the report mentions several special investigations. In one based on 350 necropsies of persons previously given chest x-ray examinations it is concluded that, exclusive of chronic heart disease with pulmonary congestion, coarse miliary tuberculosis and perhaps siderosis from exposure to hematite dust, the x-ray pattern of "generalized mottling" is pathognomonic of silicosis. In persons with long industrial exposures in these mines the presence of "irregular opacities" in the apical regions with "well marked increase in linear striation" or "generalized arborization" are strongly suggestive of silicosis or tuberculosilicosis. A necropsy is reported on a hematite miner whose antemortem film had shown "generalized small mottling" but in which microscopic examination of lung sections revealed no evidence of nodular fibrosis. This is contrary to experience with hematite miners in the United States. It brings to mind the "pseudonodulation" of welders.

Previous summaries of the incidence of primary cancer of the lung in necropsies had indicated 1.27 per cent of 1,806 European males with no underground exposure, 0.74 per cent among 2,292 nonsilicotic European miners and 0.72 per cent among 1,948 silicotic miners. During the past eight years among 1,120 necropsies on deceased European miners there were 20 more cases of such tumor, 15 of them in silicotic miners and 5 in nonsilicotic ones. As the total number of men included in each category is omitted, no comparison of the current frequency is possible. However, it is concluded that "primary cancer of the lung is not more common in silicotic miners than in nonsilicotic miners."

Among 606 necropsies on native laborers examined because of pulmonary disease, 77 per cent had active tuberculosis with or without silicosis, all but 1.3 per cent being in relatively acute forms.

In the preemployment examinations of white miners, exclusion is rigorous and less than 40 per cent pass their initial tests Sixty-eight per cent of those accepted were under 25 years of age and 87 per cent under 30. "Special certificates," certifying freedom from tuberculosis, are required for any person working underground for less than one hundred hours a month, a fact which indicates the rigorous exclusion of sources of occupational infection.

Periodic examination of all regular underground employees is made at six month intervals. Detection of tuberculosis at any periodic examination immediately debars a person from underground work. On discovery of silicosis it is optional whether a miner takes an award and quits or remains at work to accept compensation later, "provided he does not thereafter develop silicosis." During each of the three years covered by the report, the number of white persons given periodic examinations was 30,465, 32,382 and 29,817 respectively. The corresponding prevalence rates for silicosis were 15.46, 15.53 and 18.67 per thousand. The "production rates" (i. e. the number of new cases developing each year) were 7.61, 7.90 and 10.05 per thousand. In 1927-1928 the production rate was 19.41, and it had decreased to the all time low of 7.03 in 1937-1938. However, it is pointed out that these figures are misleading, particularly now when the population under consideration contains an excess of men employed for relatively short periods. The "New Rand Miners," i. e. those employed since dust control was established in 1916, now constitute 83 per cent of the group currently examined, and their production rates vary from 1.76 to 3.20. Among the white miners employed previous to 1916 the corresponding annual rates now range from 44.59 to 60.96. These figures indicate pointedly *the effect of rigid selection of employees and the control of* underground environment. They also emphasize the chronicity of silicosis, since so many men employed for over twenty-five years are still developing their first signs of the disease. The average duration of employment of cases first detected with silicosis in 1940-1941 was 9¾ years, as contrasted with 19½ years in 1922-1923. The effect of control has been to double the time required to produce the disease. As the result of improvements in the drills, these machines now produce a great deal less dust and the special rates for drill operators have correspondingly decreased. Whereas in 1929-1932 drillers developed four times as much silicosis as nondrillers, their current rates are essentially the same as those for other underground employees.

The data on progression of silicosis are somewhat confusing because it is not clear whether all or only a part of the cases under discussion are still under exposure. However, the figures do indicate that progression is dependent on the amount of dust retained within the lungs at the time exposure ceases and the presence or absence of associated tuberculosis. In the absence of such infection cessation of exposure often results in prolonged and apparently indefinite arrest of the silicosis. This leads to the present conclusion that, regardless of economic considerations, miners should be urged to seek other occupations on first detection of evidence of silicosis.

The continued effort to eradicate tuberculosis has yielded returns and today this complication, which accounts for so much of the disability in the silicotic, develops rarely. During the three year period of the report there were only 46 new cases of tuberculosis not previously detected in this group of some 29,000 to 32,000 white miners. Ten of them made their first appearance as the combined lesion, "tuberculosis with silicosis," 7 in men continuing to work underground after notification of silicosis and 3 in persons with no previous evidence of silicotic fibrosis. The other 36 cases appeared as uncomplicated tuberculosis, although in some instances silicotic reaction was subsequently manifest after a variable period. In each of these years the annual production rates per thousand for "tuberculosis with silicosis" were 0.16, 0.12 and 0.03, and those for simple tuberculosis were 1.19, 0.65 and 0.44. The "Old Rand Miners," whose employment dates back to the days before dust control, still continue to develop five to seven times as much tuberculosis as the more carefully selected group of more recent employees.

Reexamination of beneficiaries under compensation who are no longer exposed to dust revealed that some who left the mines when notified over twenty-five years ago have experienced no progression of silicosis. Only about 27 per cent have advanced from one to successive stages of the disease in the past triennium, in three fourths of the cases without the intervention of tuberculosis.

Native laborers, who constitute the largest part of the working force, also receive frequent physical examinations. The cost has prevented general use of the x-rays and the reason is apparent when one considers the number employed in each of these three years, 315,742, 328,506 and 359,710 respectively. Besides preemployment and discharge examinations any native found to have lost 5 or 6 pounds in weight on a routine check every six weeks is given at least a physical examination, and after five years of service all are checked routinely every three months. Among this group the incidence rate for silicosis is only about 2 per thousand; for tuberculosis in all forms it now runs about 3.3 to 3.5 per thousand. The need is stressed for routine x-ray examinations of all natives to check such development. The low silicosis rate for natives is due to the fact that their periods of employment are much shorter than for white miners.

Clinical Evaluation of the Rehabilitation of the Tuberculous: Experience at Altro Work Shops 1915-1939. By Louis E Siltzbach, M.D., Chest Physician, Committee for the Care of the Jewish Tuberculous, Inc., New York. Cloth. Pp. 70, with 10 illustrations. New York: National Tuberculosis Association, 1944.

In seventy well printed and nicely bound pages Dr. Siltzbach has presented in an admirable manner a practical demonstration of the effectiveness of rehabilitating tuberculous patients. He describes the Altro Workshop, which opened its doors in June 1915 for the employment of tuberculous patients as a part of their rehabilitation. This workshop is engaged in the manufacture of washable garments for hospitals, health organizations and commercial establishments. Just now a large part of its output consists of cotton uniforms for the Red Cross and the government services.

Applicants between the ages of 16 and 55 are eligible, without regard to sex, marital status, race, color or creed. Patients are accepted from all institutions and from public and voluntary agencies as well as from private physicians. They are admitted to begin on part time work. It is preferred that their disease be classified as arrested before work is begun. Some patients are still receiving artificial pneumothorax while they are being rehabilitated. The workshop also receives a few persons who need permanent, sheltered employment. Some of these individuals actually have tubercle bacilli in the sputum but are able to work under close medical supervision. All of the persons employed in this workshop are observed with extreme care and at frequent intervals by the medical staff, and the work they do as well as the number of hours per day is prescribed by physicians.

Usually patients are not discharged until they are able to work on a full time basis. After discharge, a close follow-up is made to be sure that their lesions remain well under control. This is for the remainder of their lives. Of course those with tubercle bacilli in the sputum are never discharged to be employed in outside organizations.

Between 1915 and 1939, 964 patients were admitted to this workshop and were followed to the closing date of the survey, July 1941. Ninety-seven per cent of the workers were traced five years and 92 per cent ten years. Four out of five of the workers had moderately or far advanced lesions on entrance to the workshop; in 63 per cent the lesions were arrested. At the end of ten years after discharge, 87 per cent of the workers with minimal lesions and 86 per cent of those with moderately advanced lesions survived. Of those with far advanced lesions only 63 per cent survived. Seventy-two per cent were able to work full time on the fifth anniversary of their discharge, on the tenth anniversary 62 per cent. Five hundred and fifty-two of the workers completed the course and were graduated as apparently fully rehabilitated, 89 per cent of whom were working or were able to work on a full time basis on the fifth anniversary and 85 per cent on the tenth anniversary from discharge. This is a splendid accomplishment and should lead the way to the establishment of many more similar institutions.

The Embryology of Behavior: The Beginnings of the Human Mind. By Arnold Gesell, M.D., Ph.D., Sc.D. In collaboration with Catherine S. Amatruda, M.D. Cloth. Price, $5. Pp. 289, with illustrations. New York & London: Harper & Brothers, 1945.

This book is a description of the body and mind "in the making." The author's assumption is that, as the soma takes shape, the psyche takes shape: "we are dealing with a single developmental morphology." In the first nine chapters the beginnings of behavior are traced. Here an enormous literature is digested and organized into a fascinating account of the development of the embryo and of the structure and behavior of the fetus. The primitive motor system, breathing, behavior and muscle tone are discussed. The concept of electrotonic integration and the interdependence of structure and function are elaborated skilfully. Two chapters are devoted to observations of the behavior of prematurely born infants. The subjects were infants cared for in the station for prematurely born infants at the New York world's fair. Here the methods of observing and recording infant behavior already made familiar in the author's previously published works were utilized to give a vivid and exact description of the behavior patterns of these youngest infants. A chapter on the cycle of sleep gives in great detail observations on the development of the normal diurnal sleep cycle. In the first chapter the universality of the laws of physical and biologic science that underlie the possibility of "bringing into unitary progressive relationship both living and nonliving systems" is discussed. Numerous photographs delineate the behavior patterns of prematurely born infants. This carefully written book condenses for physicians and students of behavior much of present day knowledge of the beginnings of behavior. The new work of the author pertaining to the prematurely born is of a high order of importance. The concept of behavior as an aspect of the functioning of a total organism, understandable in terms of its immaturity or maturity, is a valuable one for medical students to grasp adequately. While the publishers would like us to believe that this book is one that could be read by prospective parents, it is much more suitable for the medical student, pediatrician and students of behavior than for lay readers. It is certainly one of the best of the many excellent publications by Dr. Gesell.

Atlas of Dental and Oral Pathology. By James B. Mann, Colonel Dental Corps, U. S. Army; J. E. Ash, Colonel Medical Corps, U. S. Army, and Joseph L. Bernier, Major Dental Corps, U. S. Army. Prepared at the Army Institute of Pathology of the Army Medical Museum, Office of the Surgeon General, Washington, D. C. From Material in the Registry of Dental and Oral Pathology. Third edition revised by Henry M. Goldman, Lieutenant, Dental Corps, U. S. Army. Cloth. Price, $5. Pp. 310, with illustrations. Chicago: American Dental Association, 1944.

The revised edition of this well known atlas gives a complete illustration of dental and oral pathologic conditions. Although attention is focused on the histopathology, photos of patients and roentgenograms are added wherever they are necessary for the understanding of the condition. The photomicrographs are, with a few exceptions, good and clear. In some instances the general view pictures under low power are not entirely satisfactory. Some of the diagrams used are too primitive. The text accompanying the illustrations is excellent in its brevity and clarity. Every dentist and oral surgeon will study this atlas to great advantage and will want to have it in his library. The physician will find it to be a useful reference book.

A Source-Book of Biological Names and Terms. By Edmund C. Jaeger. Cloth. Price, $3.50. Pp. 256, with 96 illustrations by Merle Gish and the Author. Springfield, Illinois & Baltimore: Charles C Thomas, 1944.

This work includes 12,000 elements from which scientific biologic names and terms are made. With them are the Greek, Latin or other origins and some concise definitions. The book should be most useful to students of biology.

Old Age: Some Practical Points in Geriatrics. By Trevor H Howell, M.R.C.P., Captain, R. A. M. C. Boards. Price, 4s. 6d. Pp. 50. London: H. K. Lewis & Co., Ltd., 1944.

This work represents a collection of reprints from a number of British medical periodicals. It is exactly what the title purports it to be—a collection of clinical points by an experienced practitioner.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HEALTH FACILITIES AND LIABILITIES IN SUMMER CAMPS

To the Editor:—I am a member of a board regulating activities at a summer camp for children. We are about to erect an infirmary, and in that connection I am debating the wisdom of confining sick children there or sending them home, particularly those who have acute upper respiratory infections who might be ill for two or three days or, as occasionally happens, might develop complications. What legal difficulties might develop if a sick child is cared for in the infirmary and something unforeseen should occur? Would this legal liability apply equally to the scholarship camper (nonpaying) and the paying camper? I should like to know how other camps caring for about 100 to 150 campers weekly have approached this problem. Any information you can give me would be appreciated.

M.D., Ohio.

ANSWER.—The question is in two parts, medical and legal. Each is answered separately.

1. Summer camps, except those specifically established for the care of sick or handicapped children, should be places where well children can enjoy a full measure of activity. They are not places for prolonged care of ill children. The camp infirmary, except in rare instances, is not usually a suitable place to care for sick children beyond a short time. A camp should have at least a dispensary and a few beds for emergencies; more important, and usually neglected, is that competent personnel shall be available for the use of facilities. The erection of an infirmary is only a beginning in the solution of the problem here posed. Provision must be made for resident medical care or availability from nearby with genuine ease and promptness, plus nursing care if required.

Children mildly ill for a day or two may often return to full participation in camp life and can safely be observed in an infirmary, but if illness is severe or prolonged the child should be removed to home or to a nearby hospital. Authorization for such action may be obtained from parents in advance or as the occasion arises and should include clear statement as to responsibility for expense incurred. Communicable diseases are usually at a minimum in the summer; nevertheless the possibility of their occurrence should be considered. The infirmary will be less likely to prove a center of contagion if it is built so that one or at most two persons occupy a cubicle. Construction of such an infirmary need not be elaborate, but it should be a building finished with plaster and paint and glass windows; rough open construction is difficult to keep clean.

2. The courts, as far as the reported court decisions indicate, have never been called on to pass on legal liability in this particular connection. In the absence of any specific agreement between camp authorities regarding the medical care or attention to be provided for a particular child, on general legal principles there would seem to be no basis for imposing a different degree of care on the part of the camp with respect to a "paying" camper and a "nonpaying" or "scholarship" camper, and the law would seem to impose the same degree of care and solicitude on camp authorities with respect to each type of camper. An answer concerning the legal liability that might develop "if a sick child is cared for in the infirmary and something unforeseen should occur" must be extremely general. As far as is here material, the foundation of legal liability rests either on negligence or on the breach of a promise to do a particular thing. In the absence, then, of a specific undertaking to do certain things, liability must rest on negligence—that is, on a failure to do what an ordinarily reasonable man would do under similar circumstances. Neither the camp nor the physician is an insurer of good results. It is not responsible for bad results—presumably the "something unforeseen" referred to in the question—unless that bad result is causally related to a responsible negligence. Whether or not the camp was negligent is a question of fact to be determined in the light of the evidence in each case.

PRESERVATION OF BREAST MILK

To the Editor:—What is the accepted method of preserving breast milk in small quantities for hospital use? H. A. Raube, M.D., Beloit, Wis.

ANSWER.—Breast milk can be kept as long as a year by freezing. For small quantities, pasteurize the milk and strain through sterile gauze into a sterile 4 ounce nursing bottle; cap immediately. When cold, place in the freezing chamber of an ordinary electric refrigerator. About ten hours is required to freeze the milk solid when the gage is set to freeze ice cubes. Bottles holding more than 4 ounces will break during freezing. The frozen milk may be kept in the coils or the freezing chamber of the ice box; however, a "deep freeze" storage chamber is preferable if one can be obtained. The milk should be repasteurized before using, and a check of the condition of the supply should be occasionally made by culturing a sample for the presence of bacteria. Milk that has thawed for any length of time should not be used.

Reference:

Watson, Mary L.: Our Frozen Milk Bank, *Am. J. Nursing* **41**:673 (June) 1941.

PATCH TESTS FOR OCCUPATIONAL DERMATOSES

To the Editor:—What is the diagnostic importance of the skin patch test in occupational contact dermatoses? What is the relationship of the patch test to the history and to the clinical and laboratory examination in cases of occupational dermatoses? M.D., Pennsylvania.

ANSWER.—The patch test is an important and valuable criterion in the diagnosis of allergic occupational dermatitis. In industry it is a comparatively easy matter to learn all of the allergenic substances which come in contact with the worker in his occupational environment. Therefore, obtaining these substances and performing patch tests with them is not difficult.

The patch test should be employed only by physicians familiar with the technic of its application and experienced in reading and evaluating the reactions.

Patch tests should not be performed with primary skin irritants, i. e. those which will inflame all skins. If it is necessary to ascertain whether a worker is hypersensitive to the action of primary skin irritants, patch tests can be performed with such dilutions of the chemical as will not affect the normal skin. Such dilutions have been ascertained for many chemicals (Schwartz, Louis, and Tulipan, Louis: A Textbook of Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, pp. 53-61).

The patch test is not the sole criterion on which the diagnosis of occupational dermatitis is made, other criteria being the occupational history, the site of the eruption, its appearance and differential diagnostic data. The subject of patch testing is broad. For further discussions the following references are suggested:

U. S. Public Health Bulletins "Occupational and Related Dermatoses, Abstracts of the Literature," No. 266, pp. 35-39, and No. 284, pp. 114-117.

Schwartz, Louis, and Peck, Samuel M.: The Patch Test in Contact Dermatitis, *Pub. Health Rep.* **59**: 546 (April 28) 1944, Reprint No. 2552.

ENCEPHALOGRAM IN DIAGNOSIS OF IMBECILITY OR ENCEPHALITIS

To the Editor:—A boy now 6 years of age has a mental age of about 18 months. He had an apparently normal first year according to the parents and the family doctor; he walked well at 15 months. Snapshots taken during his first year certainly tend to confirm the impression of normality, his expression being bright and alert, in striking contrast to that at present. Sometime in his second year mental development stopped. Skeletal x-rays show normal ossification. During his second winter he had repeated severe upper respiratory infections, in the course of one of which he was extremely drowsy for an entire week. If he had had some form of encephalitis at that time would an encephalogram made now establish such a diagnosis? The parents are expecting a second child, and any light on the situation might serve to relieve their anxiety. They have been told at the institution where the child is an inmate that an encephalogram would be a foolish waste of time and money.

Elizabeth Roylance Daley, M.D., Bronxville, N. Y.

ANSWER.—An encephalogram would not furnish information which would alter the therapy or improve the prognosis in this case; from this aspect it would be a waste of time and money. However, it probably would furnish evidence of any gross atrophy of the brain. Such pathologic changes, if present, would presumably be acquired and not genetic in origin—a matter of moment to the parents. The examination would not disclose the agent responsible for such pathologic changes; the history is suggestive of encephalitis. An electroencephalogram might give additional information of localized acquired pathologic changes.

THIAMINE HYDROCHLORIDE FOR PAINS IN ARMS DURING PREGNANCY

To the Editor:—In the February 17 issue of The Journal there was an inquiry by O. G. Mills of Oshawa, Ont., regarding pains in the arms during late pregnancy. The answer stated that the administration of vitamins and calcium is of no value. I wish to disagree because I have found in many cases that the use of 10 to 30 mg. of thiamine hydrochloride taken orally stopped the pains and the numbness frequently both in the arms and in the legs.

Edward Lyman Cornell, M.D., Chicago.

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CLINICAL EFFECTS OF SURGICAL AND X-RAY CASTRATION IN MAMMARY CANCER

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A consideration of the value of castration in relation to cancer of the breast is one which periodically has presented itself to the medical profession for a period of fifty-five years since its suggestion by Schinzinger in 1889. The work of Huggins in cases of cancer of the prostate has again brought up for review the subject of castration in cancer of the breast. It may be recalled in Huggins' work that the total effect of castration of the male was not obtained when castration was carried out by x-rays. He obtained his effects by surgical castration, and this is the reason for bringing up at this time a reconsideration of the subject of x-ray castration versus surgical castration.

This study represents a review of all the patients with carcinoma of the breast who have been castrated with surgery or radiation in a period of eighteen years at the Memorial Hospital in New York City. All the women considered in this series for effect of castration on the course of mammary cancer are selected carefully to include only those who have functioning ovaries. Patients are included up to 55 years if they were having regular menstrual periods. If those under 45 years have had a hysterectomy or ceased menstruation for any reason, they were excluded from this series.

Often the castration was performed for reasons unrelated to the mammary cancer, such as menorrhagia caused by fibromyomas of the uterus or for a carcinoma of the cervix. The total number castrated was 342: 335 women and 7 men. Of the women 31 were surgically castrated and 304 received high voltage x-radiation or intrauterine radium in sufficient amount to stop the ovarian function.

From the Breast Department of the Memorial Hospital.

Part of the expense of the follow-up work, as well as certain funds for clinical research, were furnished by the Katherine Straub Cancer Fund.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

On account of the length of the paper, the entire review of the literature together with the bibliography and other matter is deleted but will be found in the authors' reprints.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

REVIEW OF LITERATURE

The experimental literature on the subject of castration in animals is enormous and, unfortunately, most contradictory. With the exception of a few outstanding points in the experimental field, a review of the work of the experimentalists leaves one somewhat unconvinced.

For the sake of estimating the value of castration we considered the results as susceptible of being placed in one of three groups: (1) improved by castration, (2) uncertain as to improvement by castration, (3) not improved by castration.

The criteria for consideration as to improvement were (1) the presence of axillary nodes, (2) pregnancy, (3) age of the patient, (4) grade of malignancy of the tumor, (5) duration of life following castration and (6) course of the disease following castration.

We hold that it is improper to consider that the patient received any benefits by castration if the course of the disease was not materially changed or if the patient died within a two year period following castration. However, if the patient lived more than two years after bone or soft part metastasis we then classified that patient as having received benefit from castration, provided the patient had no axillary involvement at the time of the operation. In other words, if the patient had no axillary involvement that patient had at least a 75 per cent chance of cure anyway. If the patient has had only a year or a year and one-half following castration when there appeared to be some improvement in the clinical course, that patient was placed in the group "uncertain as to improvement."

Analysis of the 335 women castrated reveals that of the 304 castrated by x-rays 47, or 15 per cent, according to our criteria, were improved, 57, or 19 per cent, were in the group uncertain as to improvement and 200, or 66 per cent, were not improved by castration. Of the 31 patients surgically castrated 4, or 13 per cent, were in the improved group. 7, or 23 per cent, were in the uncertain group and 20, or 64 per cent, were in the unimproved group.

It will be noted from the study of table 2 that women castrated by surgery or by irradiation methods appear to have approximately the same result as far as improvement goes, namely 15 and 13 per cent. Those definitely not improved were 66 per cent by x-rays and 64 per cent by surgical castration. It is obvious that, in order for us to make this comparison a proper comparison, we should have a greater number of surgical castrates. The analysis of improved cases according to age groups shows that among the 51 improved patients in the entire series 33, or 62 per cent, were 40 years of age or less.

During the course of this analysis we have written to twelve outstanding radiation therapists for their opinions on the value of castration in mammary cancer,

and the average of their combined opinions was that castration was of value in approximately 20 per cent of the cases. In contrast to this opinion our 304 patients castrated by the x-rays gave a 15 per cent improvement. However, it is quite possible that of the "uncertain" group some would eventually be added to the improved group, making the 15 per cent a little higher. The same holds true with the 13 per cent improvement in the surgical group. It should be here stated that an exact evaluation of improvement is a very difficult matter for one to determine. Owing to the vagaries of the cancerous diseases and because of the human soil in which the cancer grows and as the result of many other factors, evaluation of castration will always remain out of the realm of exact scientific evaluation. On the other hand, one may obtain a general idea of the value of castration on purely clinical grounds. Unfortunately one cannot predict which case will receive benefits and which case will not. From our studies it would appear that the sum total of improvement amounts to approximately 13 to 15 per cent in women. It should be here repeated that this applies to women who still menstruate and does not include those who are past the menopause. A study of the value of castration in women past the menopause should be made.

It has been of some interest to note that approximately one third of the patients castrated surgically showed metastatic disease present in the ovaries at the time of microscopic study. Unquestionably there are instances in which a patient castrates herself by metastatic disease. In 1 of the most striking instances in our experience, reported by Hoffman in the *Surgical Clinics of North America,* self castration was responsible for the spectacular change in the clinical course of the disease. The patient was a private patient of one of us and was rapidly losing ground from local recurrence about the operative wound and from metastatic disease including large nodules on the scalp as well as pelvic bone metastasis. Her clinical course changed, she gained 50 pounds (23 Kg.) and had a complete improvement in general health, which was maintained for about a year and a half. She then started downward, death coming within six months. At autopsy both ovaries were completely replaced by metastatic disease. This entire subject of castration must be considered also in the light of what may take place in the adrenals following castration. In laboratory

TABLE 2.—*Castration of 335 Women with Carcinoma of the Breast*

Course of Disease	Radiation		Surgical Castration	
	Number	Per Cent	Number	Per Cent
Improved	47	15.4	4	12.9
Uncertain as to improvement	57	18.8	7	22 6
Not improved	200	65.8	20	64.5
Total	304	100.0	31	100.0

animals there is evidence that the ovarian function is taken over by the adrenals, and it is possible that this same effect may take place following oophorectomy in the human being, which may help to explain the temporary nature of the improvement that takes place in castrates.

We recognize that castration is a very disturbing procedure both mentally and physically for any young woman. It upsets her career as a woman, so that the procedure should not be taken lightly. On the other hand, if it saves lives it is worth the ill effects. In our clinic we have attempted to make a sharp line of indication for castration. For example, we castrate by x-rays any young woman with breast cancer which involves the axilla or which has metastasized to a distant part or has recurred locally. We do this because we recognize that any such case is a desperate one. We do not castrate a young woman if at operation a study of the axillary contents proves it to be negative for metastasis and, on the other hand, if the patient has passed her menopause we do not give a castration dose even though the axilla is involved. However, this problem must be further studied. Unquestionably the function of the ovary does not cease at once with the cessation of menstruation and it is highly probable that some women will receive benefit by ovarian irradiation, even though the menopause has been passed.

TABLE 3.—*Results in 304 Cases in Which Castration Was Done by X-Rays or Radium*

Indication	Course of Disease			
	Improved	Possibly Improved	Not Improved	Totals
Bone metastases	28	27	126	181
Primary castration	9	10	5	24
Lung or liver metastases	2	3	10	15
Local recurrence	6	4	16	26
Carcinoma of cervix	0	0	4	4
Menorrhagia from fibroids	1	7	24	32
Following pregnancy	1	3	7	11
Metastases to ovaries	0	3	8	11
Total	47	57	200	304

The patients receiving high voltage x-ray treatment to the pelvis are analyzed to show why castration was carried out. A considerable number had this treatment for pelvic complications at a time when the mammary cancer was assumed to be under control; consequently, although patients may be alive many years later, the result will be given here as "no improvement." Table 3 analyzes the 304 cases in which castration was done by high voltage x-rays or radium, according to the reason for this treatment. Each group will be analyzed separately, with illustrative cases.

CASTRATION FOR BONE METASTASIS

By far the largest group of young patients with carcinoma of the breast had castration with high voltage x-rays for the treatment of bone metastasis incidental to the treatment of metastasis in the pelvic bones. The total number was 181. Of this total 126, or 70 per cent, had no appreciable improvement attributable to castration. Fifty-nine, or 47 per cent, of those unimproved lived only six months or less after castration, and 45, or 36 per cent, lived from six to twelve months. Only 22, or 17 per cent, lived twelve months or over, and these were not improved clinically, having continued extension of the bone metastases and extreme disability.

A small number, 28, or 15 per cent, had definite improvement following the administration of a castrating dose of radiation therapy to the pelvic region, and the duration of life was over five years in 5 patients, from four to five years in 1, from three to four years in 5 and from two to three years in 17. These patients had well defined clinical improvement with relief of pain, some with radiologic evidence of healing of the bone, and in some instances life was prolonged in spite of the advanced stage of the carcinoma. One patient is still living and well today eight years after roentgen castration whose radical amputation for a

grade 3 carcinoma of the breast was carried out ten years ago. She had bone metastasis two years after the treatment for a primary operable carcinoma at the age of 36 years. Another patient who lived six years after castration died of a coronary occlusion. Two other patients are still well with no demonstrable carcinoma two years after castration.

An equal percentage, 15, or 27 patients, who were clinically improved after roentgen castration for bone metastasis may possibly have received this benefit from castration. A number of these patients are still living and have no symptoms. The duration of life was over five years in 3 patients (2 still living and well), 3 years in 1, from two to three years in 2, from eighteen to twenty-four months in 6 and from twelve to eighteen months in 15.

PRIMARY CASTRATION

This group is termed primary castration because a cycle of high voltage roentgen therapy was used as part of the initial treatment of the mammary cancer when the patients applied for treatment. The patients included in this group were young women, 67 per cent 40 years of age or less, who either had advanced operable carcinoma with axillary lymph node involvement or inoperable carcinoma or had been maltreated for operable carcinoma, such as, for example, by repeated local excision of the cancer in the breast.

Although not a large group, 24 in all, 37 per cent of these patients showed improvement beyond the expected history of the individual case, having lived three and one-half to fourteen years after castration. An additional 41 per cent were possibly benefited by this treatment; that is, 78 per cent of the total showed clinical improvement which may or may not be attributed to x-ray castration. This is a small group and the patients were selected for this in a rather desperate chance, as may be judged by the following case:

A woman aged 31, who applied to the Memorial Hospital for treatment on March 9, 1938, gave a one year history of an inverted nipple and a lump in the right breast. Because of her age and lack of axillary involvement, several attempts were made without success to prove the diagnosis by aspiration biopsy and excision of skin nodules. A short cycle of high voltage x-radiation was given to the breast and three weeks later a simple mastectomy was performed. The pathologist's report was infiltrating duct carcinoma, grade 3, with metastases in the skin. Within a short time a mass appeared in the opposite breast and a month after the first operation a left radical mastectomy was done, removing the same type of carcinoma with metastases in the axillary nodes. Within the next two months, right axillary nodes became enlarged and the tissue from an axillary dissection contained seven nodes which the pathologist reported as replaced by metastatic carcinoma, grade 4.

High voltage roentgen therapy had been given to the pelvis in March of 1938 at the time of the first treatment (therefore termed "primary castration") and a heavier cycle was given in September of 1938 after the three operations described. Postoperative roentgen therapy was also given locally to the axillas and chest wall. Another cycle of pelvic x-radiation was given in 1941 for bone pain. The patient was living and well with no evidence of recurrence or metastasis when last seen, Dec. 2, 1943, over five years after castration and initial treatment.

LUNG OR LIVER METASTASES

Fifteen patients with carcinoma of the breast metastasizing to the lungs or liver or both received pelvic x-radiation in large enough amounts to produce cessation of the menses. This was given as a last resort to patients who seemed to require some form of palliative treatment. Two patients seem to have improved after castration in spite of radiographic evidence of pulmonary metastases. They are still living five years and nine years after castration, though symptoms of metastases have recurred. Three other patients may have had their lives prolonged by the castration produced by x-radiation. They had relief of symptoms and lived more than a year after diagnosis of lung or liver metastases and castration. The remaining 10 had no change in the usual rapid downhill course, with death in a few months.

CARCINOMA OF CERVIX

Four patients with carcinoma of the breast developed carcinoma of the cervix uteri. All were diagnosed by biopsy as having epidermoid carcinoma, which was a second primary carcinoma in each instance. The time interval from treatment of the mammary cancer until development of the cancer of the cervix was one and one-half years, eight months, six years and five years, respectively. One patient lived nearly three years after treatment of the second cancer and died of pelvic extension of the carcinoma of the cervix. Her mammary cancer had not recurred, although it was nearly nine years since she had had a radical mastectomy for a "low grade infiltrating tubular carcinoma of the duct and foci of sweat gland adenoma and sclerosing abortive adenomatosis, somewhat atypical and suggestive of further foci of neoplastic growth." She was 44 years of age at that time, and there was no axillary node involvement. In none of these cases did the castration, in our opinion, affect the course of the mammary carcinoma.

MENORRHAGIA CAUSED BY FIBROMYOMAS OF UTERUS

A total of 32 patients treated for carcinoma of the breast had radiation castration for menorrhagia caused by fibromyomas of the uterus at some time in the period of treatment or observation. Only 1 of these, or 3 per cent, is judged to have had any benefit from the cessation of ovarian stimulation:

This patient, L. V., aged 36, had an operable carcinoma after local excision elsewhere five weeks before. She had a radical mastectomy performed, and the axillary lymph nodes contained metastases. Heavy postoperative external radiation was given with the radium pack locally. The following year she had local recurrences treated successfully with more external radiation. Two years later pelvic x-radiation was given because of the presence of large fibromyomas of the uterus and menorrhagia. She was improved after this and required no further treatment until six and one-half years later, when there was bone destruction in the spine and extension of carcinoma in the cervical lymph nodes. She survived another year, a total of eleven years after the original treatment and nearly eight years after castration.

The 7 patients (22 per cent of 32 treated for fibromyomas) who are listed as possibly improved had treatment within a short time after treatment of the mammary cancer and are alive several years later (two to ten years) or lived for several years after castration, dying of carcinoma.

Unimproved by castration in this series were 24 patients, or 75 per cent. Most patients lived four or more years after castration but, because the mammary cancer was apparently adequately treated, the course is considered to be uninfluenced by the ovarian dysfunction.

CASTRATION FOLLOWING PREGNANCY

Twelve patients had pregnancy complicating the course of carcinoma of the breast. The pregnancy occurred either with the primary carcinoma or follow-

ing the treatment. Eleven patients were castrated with high voltage x-radiation after the termination of the pregnancy by abortion or delivery. The twelfth had surgical castration and is included in that group in the tables. This case is very interesting and may be reviewed briefly:

S. Z., aged 34, who was admitted to the Memorial Hospital Dec. 29, 1928 with a history of a caked breast following the weaning of her youngest child two years before, had noticed a swelling the size of a hen's egg in her left armpit in October 1928 and redness and swelling beneath the left clavicle. Her local physician gave her "baking treatment" and the swelling subsided somewhat. When examined she was found to have extensive involvement of the left breast, chest wall, axilla and supraclavicular region with a carcinoma which was hopelessly inoperable. She was treated with high voltage roentgen therapy combined with radium pack and radon gold seeds to the breast, axilla and lower neck, with some regression of the tumor. In 1930 she was found to have a large pelvic mass, and in February 1930 a laparotomy was performed and the uterus, both ovaries and oviducts were removed. The uterus contained an embryo 3 cm. long, and one ovary was destroyed by a tumor which was diagnosed as metastatic tubular carcinoma of the breast. On March 16, 1931 a simple mastectomy was performed because of an increasing mass, and the tumor, 4.75 by 2.0 by 3.0 cm., was a cellular bulky adenocarcinoma. The patient was well for over a year but developed local recurrences on the chest wall extending to the opposite breast and died Nov. 20, 1932, almost four years after primary treatment and two years and eight months after surgical castration.

Of the 11 patients who had castration doses of radiation to the pelvis following pregnancy, 7 lived less than a year, during which time there was rapid progression of the mammary carcinoma. Three had longer survival, which we think may have been influenced by the castration, since further disease had developed, indicating lack of cure. The survival following castration was two years, four and one-half years and eight years, respectively.

One patient is listed as definitely improved by castrating effect, since she had an early pregnancy during the course of preoperative radiation therapy. Radical mastectomy proved the presence of carcinoma with axillary node metastases. Postoperative pelvic x-ray therapy caused abortion and castration. She survived three years longer.

TABLE 4.—*Results of Orchiectomy in 6 Cases*

Case	Clinical Classification	Mammary History	Pathologic Condition	Physical Findings on Admission	Treatment	X-Ray Studies	Date of Castration	Pathologic Report on Testes	Course
1. M. S. Age 72 White, Italian-Catholic. Married, 2 children. Date of admission, 4/28/41	Primary inoperable, left	Ulceration of nipple for 4 months; mass 5×6×2 cm.; axillary nodes	2/9/42: formal biopsy; infiltrating carcinoma, grade 2	Areola and nipple destroyed; stayed away for 9 months after mastectomy was suggested	None except orchiectomy	4/30/41: negative 1/30/42: widespread 5/28/42: rib fractures healed 6/17/42: calcification 6/22/42} continued 8/24/42} improvement 3/17/44: no change 5/25/44: ? reactivation	2/9/42	Atrophy and interstitial cell hyperplasia	Remarkable clinical regression of primary lesion with regeneration of bone; blood chemistry returned to normal; question of relapse
2. J. S. Age 75 White, English-Protestant. Married, 6 children. Date of admission, 6/10/41	Recurrent inoperable, right	Lump for 1 year, 6×4 cm.; nodes in axilla	7/1/43: infiltrating carcinoma, grade 3; node metastases, multiple	Lesion ulcerating; nodes involved	Radical mastectomy 7/1/41: estrogen 228,000 mouse units 7/23: orchiectomy 8/18/42	2/26/42: skull positive 3/27/42: ribs, spine, pelvis 6/20/42: widespread 7/17/42: increased 12/28/42: right lung increased	1/27/42	Testes slightly atrophied	Had liver cirrhosis; died at operation 1/30/43; estrogens reactivated ?
3. B. D. Age 65 White, Austrian-Jew. Married, 1 child. Date of admission, 4/13/42	Prophylactic, right	Local excision 15 years prior to axillary dissection, 2/23/42	2/23/42: infiltrating duct carcinoma, grade 3	Scar granulating; radical axillary dissection; no evidence of recurrence	Excision and axillary dissection elsewhere; irradiation postoperatively and orchiectomy	5/27/42: ? 12th D; 1-3-4 L 8/24/42: positive 12th D; 1-2-3 L	5/8/43	Atrophy, mild	Weight increase of 40 pounds; no pain; no evidence; bone regeneration by x-rays
4. A. I. Age 64 White, Irish-Catholic. Married, 1 child. Date of admission, 6/1/43. Meadowbrook Hospital	Primary operable, left	Breast lump, 3 weeks; bilateral hydrocele, 3 years	6/12/43: local excision: adenocarcinoma	Left breast lump 2 cm.; no nodes	Local excision only; axillary dissection; orchiectomy	Negative chest; no symptoms of bone metastasis	6/12/43	Testes normal	10 months after excision axilla was dissected; no metastasis
5. E. S. Age 39 White, Irish-Catholic. Married, 2 children. Date of admission, 10/15/43	Primary inoperable, right	Right breast lump 2×1.5 cm., 6 months; 8 lb. weight loss; axillary nodes, bilateral	10/18/43: aspiration biopsy; carcinoma	Lesion having skin attachment; many nodes; pain in back	Orchiectomy only	10/15/43: ribs 11/22/43: skull and pelvis 12/30/43: widespread 2/21/44: increase 3/20/44: increase	12/8/43	Testes essentially normal	Died of disease 4/4/44
6. A. P. Age 63 White, German-Catholic. Married, 2 children. Date of admission, 2/1/43	Primary inoperable, left	Left breast lump 7 months, 5×4 cm.; ulcer of nipple, slight; cutaneous nodules; mass in axilla 5×4 cm.	12/1/53: aspiration biopsy; carcinoma	Primary 5×4 and axillary mass 5×4; cutaneous nodules	Orchiectomy only	10/1/43: pulmonary, more evident on right 3/ 1/44: increase 3/31/44: decrease ? 5/24/44: pelvis positive; lung not so well defined	1/19/44	Atrophy slightly tubular; spermatogenesis noted; normal interstitial cells	Breast tumor somewhat smaller; no change in nodes; less pulmonary disease; no increase in pelvic metastases present on admission

SURGICAL CASTRATION

The 31 patients surgically castrated may be analyzed in the same way as those having radiation castration.

The first of 2 patients improved who were surgically castrated when uterine fibromyomas were removed had the operation and radium castration. The second had surgical castration less than a year after treatment of the cancer of the breast. The patient listed as possibly improved had surgical castration three years after treatment of an early carcinoma of the breast and therefore may have been well ten years later. It may be noted that none had improvement of bone metastases

except the one who also had ovarian metastases and is therefore listed under that heading.

The 7 patients considered to have possibly benefited by castration are all living and well at this time but were too recently castrated to have scientific significance.

THE STUDY ON ORCHIECTOMY FOR BREAST CARCINOMA

In 1942 Farrow and Woodard,[21] working in our Breast Department, were led to observe the effects of the administration of androgens and estrogens on the serum calcium in patients with skeletal metastases from breast cancer. Impressed by the favorable results obtained in the retardation of the growth of osseous metastases in mammary carcinoma by radiation castration, they studied the effects of "Chemical castration" by the injections of testosterone propionate. They found that the 3 patients who received such therapy had increased blood calcium levels as well as an increased output of calcium in the urine. The chemical changes were accompanied by clinical and roentgenographic evidence of increased activity in the metastatic disease in bone. They inferred that the ability of the male and female sex hormones to cause hypercalcemia in such cases was due to the stimulation by the hormones.

TABLE 5.—*Results in 31 Cases of Surgical Castration*

Indication	Course of Disease: Improved	Possible Improvement	Not Improved	Totals
Bone metastases	0	2	4	6
Primary castration	0	4	3	7
Ovarian metastases	2	0	6	8
Primary carcinoma or sarcoma of ovary	0	0	2	2
Fibromyomas of uterus	2	1	4	7
Recurrent carcinoma of breast	0	0	1	1
	4 (13%)	7	20	31

The use of androgens for such therapy, the numerous recent favorable results reported in treating inoperable and metastatic carcinoma produced by x-ray castration and the older reports on surgical castration for inoperable breast cancer in females suggested that a similar procedure be tried in males. Farrow and Adair[22] observed the results of orchiectomy on metastatic osseous metastases. Four months later the case was reported. At that time only the clinical effects could be interpreted. That case is now reported fully, together with 5 additional cases (table 4).

At the time at which orchiectomy was performed the clinical classification of these six cases was primary operable 1, recurrent inoperable 1, primary inoperable 3 and prophylactic 1.

The consent for orchiectomy, even in elderly men with advanced breast cancer, was most difficult to obtain. It appears to be a triumph of medical persuasion to obtain permission for this operation. Even 1 elderly man with intense pain from osseous metastases was unwilling to undergo castration.

The effects of orchiectomy may be illustrated by the following abstract on the first case history:

M. S., aged 72 when he was admitted to the Breast Clinic of Memorial Hospital on April 28, 1941, had a mass in his left breast which had ulcerated four months prior to his admission to the clinic.

The patient was fairly well preserved. The physical examination revealed a sloughing ulceration which had destroyed the left nipple and areola. There was a crater measuring 3 cm. in diameter, beneath which was a stony hard mass about 5 cm. in diameter. The tumor was fixed to the chest wall. There were several small axillary nodes.

It was difficult to obtain the patient's cooperation. He did not return for any treatment until February 1942. At this time the lesion was still movable over the chest wall but the ulceration had increased (fig. 1). In addition to the original findings, he had pain in the lumbar spine and pelvis. There were numerous areas of osteolytic bone destruction involving especially the ribs (fig. 2), fourth lumbar vertebrae, the pelvis and the upper femurs.

A formal incisional biopsy was obtained at the time of bilateral orchiectomy. The pathologic report was "infiltrating mammary carcinoma, grade 2." There was decided regression in the primary lesion, the ulceration having healed and the tumor regressing much in size. In March 1942 the lesion of the left breast appeared only as a scar (fig. 3). The patient experienced considerable relief from pain within two weeks after orchiectomy. There was regression in the osteolytic areas with metastases, and the pathologic fractures of the ribs noted in the initial film had healed (fig. 4).



FIG. 1.—Ulceration and destruction of the left nipple and areola by mammary carcinoma in a male breast.

The case represents a satisfactory and unusual regression for a two and a half year period of a primary cancer of the male breast which had widely metastasized to bone.

We may summarize the clinical results of this study by stating that bilateral orchiectomy is responsible for the regression of the primary lesion in 2 instances, quite strikingly in 1 of the cases. It has possibly prevented recurrence in the primary operable case treated

21. Farrow, J. H., and Woodard, H. Q.: Influence of Androgenic and Estrogenic Substances on Serum Calcium in Cases of Skeletal Metastases from Mammary Cancer, J. A. M. A. **118**: 339 (Jan 31) 1942.
22. Farrow, J. H., and Adair, F. E.: Science **95**: 654, 1942.

only by local excision and may have prevented local recurrence in 1 other instance. The procedure has caused regression and repair in the secondary deposits in bone as well as in lung. The clinical regressions in this study compared with those reported for inoperable and metastatic carcinoma of the prostate have had the same dramatic cessation of metastatic bone pain as well as the spectacular immediate feeling of well-being. The clinical improvement has been most striking and as permanent. In fact, we think this procedure for male breast cancer at least parallels the results of orchiectomy for the advanced cases of prostatic cancer. One patient with advanced cancer has now survived two years and four months after castration, 1 thirteen months. Both are in excellent states of nutrition and are free from pain. Two have lived for nearly six months with



Fig. 3.—Resulting cicatrization of the primary mammary tumor two years and four months after orchiectomy.

regression of their disease, giving clinical promise of survival for equally long periods. Two of the patients have shown definite reparative changes in metastatic deposits in bone, while 1 with a solitary area of bone involvement has shown no evidence of progression of the disease, nor have other areas developed since castration. The latter patient has had regression in the extent of his pulmonary metastases. In 2 instances the primary lesions have greatly diminished. The patient with longest survival shows only a cicatrix of what was formerly a large ulcerating carcinoma; another patient shows regression in the ulceration and in the cutaneous nodules. The latter patient has not survived long enough to make it possible to evaluate the ultimate effect of orchiectomy on the breast tumor.

We must call attention to the relatively small number of male patients with mammary cancer available for such a study. However, the value of this type of therapy is most striking. The duration of the good effects yet remains to be determined. From our studies it would appear that the young men with breast cancer do not get the same spectacular improvement that the elderly men obtained from castration.

SUMMARY

It would appear that x-ray castration and surgical castration give improvements in approximately 13 to 15 per cent. In our studies there seems to be no appreciable difference in percentage of improvement between x-ray castration and surgical castration, although our series of surgical castrations is not sufficiently large to state this for a certainty. It would appear that castration in general has a temporary duration of improvement rather than a permanent one. It appears to retard the growth process materially for a duration, in cases which are improved, of about two years. It holds the cancer process in check but, in general, is not curative. The most striking effects in castration are those of male breast cancer, and here the work has been nothing less than spectacular. The change of the disease processes seems to be immediate in the cases of male castration, and the patients obtain the same striking improvement in general health as is shown in cases of carcinoma of the prostate which received castration.

75 East Seventy-First Street.

ABSTRACT OF DISCUSSION

DR. LAWRENCE A. POMEROY, Cleveland: My discussion of this paper will be based on the experience of Dr. E. P. McNamee and myself in the x-ray treatment of 73 patients with carcinoma of the breast. We follow the routine of the Tumor Clinic at Cleveland City Hospital in not treating the breast fields and axilla if the surgical removal has been adequate and if there is no microscopic evidence of involvement of the axillary lymph nodes. We have been surprised at the number of patients on whom a complete breast operation has been performed without any previous x-ray examination of the chest and of the bones most likely to be involved. Such an operation in the presence of metastasis is not justifiable and every effort should be made to exclude the presence of lung and bone metastases before operation. We have given ovarian irradiation irrespective of the age of the patient, the youngest being 33 and the oldest 83. We have done this because we have not known at what age to withhold the treatment and because ovarian irradiation adds only a few days to the usual postoperative x-ray series. We do not know whether to omit ovarian irradiation on patients who have ceased to menstruate or who have attained the age of 50 or 55 or of 60. We are not dermatologists. We are interested only indirectly in the dose that arrives on the skin. We are much interested in giving an accurate dose to the region of the ovaries. We have given at least 800 tissue roentgens to the region of the ovaries. The pelvic measurements (for x-ray therapy purposes) have varied from 15 to 24 cm. Taking the site of the ovaries as midway between the anterior and posterior pelvic walls, we have a depth dose of 57 per cent for the smallest pelvis and 38 per cent for the largest. The same x-ray dose to the skin delivers 50 per cent more to the ovaries in the small than in the large pelvis. This dose to the ovaries, expressed in tissue roentgens, should always be stated no matter what other factors of the x-ray dose are enumerated.

DR. J. SHELTON HORSLEY, Richmond, Va.: In the April 1944 issue of *Surgery* I reported a series of 25 cases in which bilateral oophorectomy with radical mammectomy was done for cancer in women in the premenopausal stage. These patients

have been traced. The last patient in this series was operated on Sept. 22, 1943; the first on Nov. 19, 1937. Two recurrences were reported. Since then there have been two other recurrences. As stated by Leo Loeb and others, mammary cancer after reaching a certain stage of development appears capable of growing under its own metabolism and is not dependent on estrogen. However, in the few cells sometimes left behind after a radical mammectomy and which may result in recurrence, it is probably necessary to have an estrogenic aid for them to grow. As emphasized by the authors, the relationship of the endocrines and their balance is not always constant There have been cases in which erection and copulation have occurred after removal of the testicles. Likewise after removal of the ovaries a biologic product from the other endocrines, as the adrenals, may possibly substitute for the estrogen of the ovaries. Such cases, however, must be quite rare, and it would seem that removal of the estrogenic stimulation for the few isolated cancer cells left after a radical mammectomy would render them inert and would greatly increase the chances of cure Probably many other surgeons have removed the ovaries in connection with a radical mammectomy, but I am unaware of any considerable number of cases in which this has been done and followed up for several years. Schinzinger of Germany had suggested this procedure in 1905 (Carcinoma of the Mammary Gland, *Munchen. med. Wchnschr.* **52**:1724, 1905), but according to the records he does not seem to have performed the operation. X-ray treatment of the ovaries undoubtedly is helpful, but according to Huggins it does not destroy the interstitial cells in the testis and he advises orchiectomy for cancer of the prostate; so it would seem difficult permanently to destroy the functions of the ovary by irradiation without in some instances damaging the surrounding tissues. Some of these patients have exaggerated menopausal symptoms which might be relieved by estrogen products, but such treatment would, of course, be absolutely contraindicated.

DR. W. E. CHAMBERLAIN, Philadelphia Patients with mammary cancer may and frequently do derive great benefit from having their ovaries irradiated. But who has definite answers to such questions as the following? "Is bilateral oophorectomy sometimes (or never, or always) superior to roentgen castration?" "Could it be that roentgen castration is better than oophorectomy because of some selective effect on the endocrines?" "Should roentgen castration (or oophorectomy) be used only in young women, or is there a possibility of benefit even in postmenopausal patients?" "When skeletal metastases from mammary cancer regress spectacularly after irradiation of the ovaries, why are the benefits so frequently short lived?" "Should the pituitary be irradiated in these cases? If so, when should that be done and what technical factors should be used?" Dr. Adair and his collaborators have contributed much toward the answers to such questions. A woman whose ovaries were removed at the age of 21 developed a particularly vicious and fast growing breast cancer at 48. Histologically it was undifferentiated in the highest degree. Axillary metastases were present when the breast tumor was first discovered. At radical mastectomy the gross findings, like the histopathology, pointed to early, rapid recurrence. But this woman had been receiving injections of estrogens (and latterly of diethylstilbestrol by mouth) for over twenty years. We discontinued this and now, more than a year later, she remains apparently well! Such a case enhances our interest in Dr. Horsley's proposal—routine prompt bilateral oophorectomy in premenopausal women with breast cancer In the choice between oophorectomy and irradiation, consideration must be given to the fact that in a certain percentage of young women even very large amounts of radiation may fail to put an end to ovarian function. Jacox has given quantitative data on this point. In at least a dozen instances in young women I have seen skeletal metastases from breast cancer regress following ovarian irradiation, recur or progress after an interval of from three months to a year, and then regress a second time after a second ovarian irradiation. Would these women have been better off with surgical castration? I have not been able to find the answer to that question either in my own records or in the reports of others

DR. NORMAN TREVES, New York: The use of estrogens to inhibit osseous metastases from mammary cancer is an unwarranted and dangerous procedure. It stimulates their growth. The use of androgens to check secondary bone deposits in breast carcinoma in women is an equally bad therapeutic measure. The patients do not do well on any type of endocrine therapy when malignant tumors of the breast have invaded bone. There is great difficulty in obtaining consent for castration in males; women consent to bilateral oophorectomy with less reluctance. The male feels that his sexual life is never over, while a woman approaching the climacteric usually realizes that there is a physiologic cessation of her reproductive functions. Consequently the number of male castrations is appreciably smaller. Dr. Adair did not have time to emphasize the finding that there were a number of cases in the present study in which the breast carcinoma had metastasized to the ovary. In the 6 cases in which the testes were examined after orchiectomy there was no evidence of metastases to the testes It has frequently happened that carcinoma of the breast metastatic to the ovary may bring about pathologic castration. An Italian was the only patient on whom Farrow and Adair had made a preliminary report. He refused castration until the metastases to bone caused him so much pain that he then consented to the procedure. It is now twenty-eight months since orchiectomy was performed. He had widespread metastases to the pelvis, lumbar spine, scapula and humerus, and these showed definite regression following castration. The second patient, an elderly man with associated cirrhosis of the liver, had a radical mastectomy and then was treated after a recurrence in the scalp was noted seven months after removal of the breast. Then he was treated with estrogen and there was wide dissemination of his mammary disease. He finally consented to orchiectomy. His death, three days after operation, was probably due to the associated cirrhosis of the liver and not to the effects of the operation. The third patient, an elderly man with recurrence, had definite relief from bone symptoms following orchiectomy and he has now remained well sixteen months after operation. The fourth patient, an elderly man with a localized tumor in the left breast and associated bilateral hydrocele, had an excision of the tumor. In repairing the hydrocele the procedure was simplified by performing a bilateral orchiectomy. It is now a year after this procedure and he has had no metastatic nodes in the axilla. It is possible that this tumor, 2 cm. in diameter, might have been taken care of by the local excision and we shall know only by the follow-up whether local excision with associated orchiectomy will control mammary cancer in the male. The fifth patient had pulmonary and osseous metastases. He was castrated in December 1943, yet he has had regression in the pulmonary metastases, and one area of bone metastases in the right ilium has not progressed since his operation. The youngest patient in this group, aged 39, failed to respond to castration. His disease progressed rapidly and he died four months after orchiectomy. Why castration for cancer of the breast in elderly males seems to be a much more satisfactory procedure than in young men cannot be explained at the present time and merits further studies.

Medical Institutions in Thailand.—The most important medical institution in Thailand was the medical department of the Chulalankarana University. The medical department, which had existed as a school since 1889, became a part of the aforementioned university in 1923, at which time a four year course was inaugurated. Two years of collegiate work were required before the candidate could begin the four year medical course. In 1929 the first class of 19 students was graduated. Both men and women were admitted, and 166 persons had been graduated with the degree of doctor of medicine by 1937. The medical department, at the time of the last report, had 44 instructors and professors and a library of 3,600 volumes.—Simmons, James S.: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

THE INADEQUACY OF A STANDARDIZED DOSAGE OF PENICILLIN

IN THE TREATMENT OF GONOCOCCIC URETHRITIS

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Reports of the efficacy of penicillin in the treatment of gonococcic urethritis have appeared. Previous studies [1] of clinical trials with this type of therapy have demonstrated its curative value. Later reports [2] on the rapidity of its therapeutic effect on gonococcic urethritis have further suggested that it approaches a 100 per cent clinical and bacteriologic cure. Reported failures with penicillin therapy are very rare.

The literature, to date, contains no report of a study which actually reveals the rapidity of bacteriologic cure based on serial cultures following each dose of penicillin. This study was set up to determine the exact point of bacteriologic cure within the limits of the units of penicillin used.

It has been our experience after culture study of several thousand cases of gonorrhea that clinical cure is not a definite indication of bacteriologic cure. Except in frank cases of gonococcic urethritis, smears are not a very reliable means of establishing diagnoses. Determination of bacteriologic cure necessarily varies with the ability to culture the gonococcus organism. It has been clearly demonstrated that cultures are far more reliable than smears as diagnostic aids and that some cultural methods are far superior to others.

For some time it had been noted that a good number of patients with gonococcic urethritis were being readmitted to our naval hospital and center dispensaries after having received 100,000 units of penicillin. Every one of these individuals had been previously discharged as clinically and bacteriologically cured. None of these cases were reinfections, since all of them had been under restriction for twenty-one days following penicillin therapy without possible reexposure. All had reported back within this twenty-one day period. Since this observation was at variance with another report [3] indicating that the total amount of penicillin required did not exceed 100,000 units and that all cases responded to penicillin and were cured from a clinical and bacteriologic standpoint within forty-eight hours, a preliminary attempt was made to test these observations. In 73 cases cultures were taken on a whole blood hemolyzed blood plasma agar medium.[4] In all of these cases 100,000 units of penicillin had been injected intramuscularly in doses of 20,000 units every three hours. A culture was taken in each case two days after therapy, seven days later and fifteen days later. Our experience in this preliminary study revealed that there were 13 (17.8 per cent) bacteriologic failures at varying periods of time following therapy. Accordingly, a carefully controlled series of cases were placed under study to verify these preliminary observations.

METHODS

One hundred and thirteen patients with gonococcic urethritis who were either sulfonamide sensitive or harbored sulfonamide resistant strains of the gonococcus were treated with penicillin in doses of 20,000 units given intramuscularly every three hours until each patient had received a complete dosage of 100,000 units. On being admitted to the ward and before penicillin therapy was initiated, a prostatic culture was taken on each patient to verify the diagnosis. Urethral cultures were taken in each case three hours following the initial dose and before each succeeding dose of 20,000 units. A prostatic culture was taken on each patient three hours following the injection of the fifth or final dose of penicillin. If the final prostatic culture was negative and the patient appeared to be clinically cured, the patient was discharged to duty. Each discharged patient received a slip permitting him only light duty for a period of ten days. In addition, each patient was recalled for prostatic cultures on three successive weeks but on varying days. Since each patient was under restriction

TABLE 1.—*Summary of Statistical Analysis of Penicillin Therapy in 113 Cases of Gonococcic Urethritis* *

Units of Penicillin Required for Cure	White Males			Negro Males			Total		
	No.	%	Cumulative %	No.	%	Cumulative %	No.	%	Cumulative %
20,000	6	8.24	8.24	4	10.00	10.00	10	8.85	8.85
40,000	17	23.25	31.49	13	32.50	42.50	30	26.60	35.45
60,000	14	19.18	50.67	5	12.50	55.00	19	16.80	52.25
80,000	7	9.59	60.26	2	5.00	60.00	9	7.96	60.21
100,000	5	6.85	67.11	6	15.00	75.00	11	9.74	69.95
120,000	6	8.24	75.35	4	10.00	85.00	10	8.85	78.80
140,000	0	....	75.35	2	5.00	90.00	2	1.77	80.57
160,000	4	5.49	80.84	0	....	90.00	4	3.54	84.11
180,000	4	5.49	86.33	0	....	90.00	4	3.54	87.65
200,000	1	1.37	87.70	1	2.50	92.50	2	1.77	89.42
220,000	5	6.85	94.55	0	....	92.50	5	4.44	93.86
240,000	0	....	94.55	0	....	92.50	0	....	93.86
260,000	2	2.74	97.29	2	5.00	97.50	4	3.54	97.40
280,000	0	....	97.29	0	....	97.50	0	....	97.40
300,000	0	....	97.29	0	....	97.50	0	....	97.40
320,000	1	1.37	98.56	0	....	97.50	1	0.88	98.28
340,000	0	....	98.56	0	....	97.50	0	....	98.28
360,000	0	....	98.56	1	2.50	100.00	1	0.88	99.16
380,000	0	....	98.56	0	....	.....	0	....	99.16
400,000	0	....	98.56	0	....	.....	0	....	99.16
420,000	0	....	98.56	0	....	.....	0	....	99.16
440,000	0	....	98.56	0	....	.....	0	....	99.16
460,000	1	1.37	100.00	0	....	.....	1	0.88	100.00

* Amount of sulfonamide administered before penicillin therapy instituted = range 135 to 5,300 grains (8.75 to 325 Gm.).

TABLE 2.—*Effect of 100,000 Units of Penicillin on 106 Patients in Outlying Dispensaries* *

	Number	Per Cent
Cured with 100,000 units	70	66.1
Not cured with 100,000 units	36	33.9

* Amount of sulfonamide administered before penicillin therapy = range 33 to 3,561 grains (2.15 to 230 Gm.).

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

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3. Miller, C. P.; Scott, W. W., and Meller, V.: Studies on the Action of Penicillin, J. A. M. A. **125**: 607-610 (July) 1944.

4. Weckstein, A. M.: Isolation of Neisseria Diplococci and Hemolytic Streptococci, Hosp. Corps Quart. **17**: 77-78 (July) 1944.

for twenty-one days, without possibility of reexposure, a constant supervision of each case was possible. If a patient had a positive bacteriologic culture, the same procedure of therapy and serial cultures was followed until each patient was judged bacteriologically cured after having three negative prostatic cultures over a

TABLE 3.—*Day of Appearance of Positive Culture Following Penicillin Therapy in Varying Dosages Greater Than 100,000 Units* *

Day	Number	Per Cent
1	..	.....
2	10	20.00
3	5	10.00
4	5	10.00
5	2	4.00
6	1	2.00
7	2	4.00
8	1	2.00
9	4	8.00
10	2	4.00
11	1	2.00
12	5	10.00
13	0	0.00
14	1	2.00
15	2	4.00
16	5	10.00
17	0	0.00
18	3	6.00
19	1	2.00

* Range two to nineteen days.

period of twenty-one days following the last dose of penicillin. All of these persons were treated in a single ward and were directly under our supervision.

Penicillin was also being administered for cases of gonococcic urethritis in several dispensaries in the Naval Center. Arrangements were made to take cultures of 106 cases following therapy of 100,000 units of penicillin administered in the same way but without serial cultures. Prostatic cultures were taken on each patient during the period of their twenty-one day restriction. Three negative cultures over a period of twenty-one days were required before these patients were considered bacteriologically cured. If the patient yielded a positive prostatic culture, he was returned to a dispensary for additional therapy. These positive cases

TABLE 4.—*Day of Appearance of Positive Culture Following Penicillin Therapy of 100,000 Units in 106 Patients in Outlying Dispensaries* *

Day	Number	Per Cent
1	2	5.56
2	4	11.12
3	3	8.34
4	1	2.78
5	3	8.34
6	1	2.78
7	1	2.78
8	0	0.00
9	6	16.67
10	0	0.00
11	2	5.56
12	2	5.56
13	0	0.00
14	3	8.34
15	2	5.56
16	5	13.83
17	0	0.00
18	1	2.78

* Range one to eighteen days.

were then dropped from this study. This group of 106 cases was followed in order to check the findings on the experimental groups of 113 cases. All cultures were done under the supervision of one of us. The swab used in taking the cultures was fashioned from an applicator with one end tapered and bound with a small amount of tightly adherent absorbent cotton. The use of this type of swab is of paramount importance in taking cultures in a male patient. The penis was first thoroughly cleansed with tincture of green soap and water followed by 70 per cent alcohol. All prostatic and urethral cultures were taken by inserting a sterile swab for a distance of 2 centimeters into the anterior urethra and then rotated to collect the expressed fluid. The culture material was streaked on the whole blood hemolyzed human blood plasma agar medium, which has proved so very effective in growing the gonococcus. The swab was carefully rotated, so that all parts of its surface came in contact with the culture medium. All cultures were incubated in candle jars for forty hours and the colonies were then examined macroscopically and by the oxidase method. Smears and Gram stains were made of all oxidase positive colonies. No cases were considered positive unless the oxidase reaction was typical and typical staining and morphology were demonstrated microscopically.

In this study no attempt is made to determine the value of continued uninterrupted therapy with units of penicillin in excess of total doses of 100,000 units.

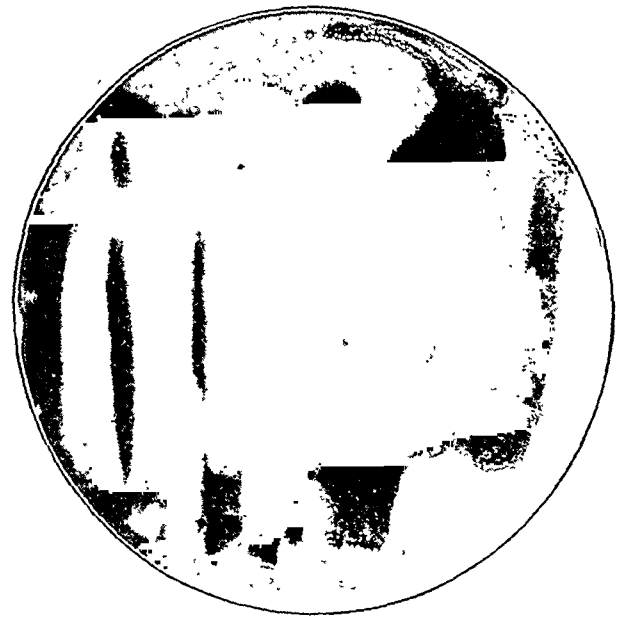


Fig. 1.—Culture plate of a typical case of gonococcic urethritis before penicillin therapy is instituted.

This investigation was set up to test the efficacy of the 100,000 units total dosage of penicillin which had been reported in previous studies.

OBSERVATIONS AND RESULTS

The results of the experimental study in the serial culturing of the 113 patients with gonococcic urethritis are shown in tables 1 and 3. These results reveal that, contrary to some reports of previous experimental studies, the dosage of 100,000 units of penicillin will not insure a 100 per cent bacteriologic cure. These figures reveal that only 70 per cent of the patients were bacteriologically cured with 100,000 units, 89 per cent with 200,000 units and 97 per cent with 300,000 units. One case required 460,000 units. No bacteriologic failures were observed after use of adequate doses of penicillin.

In the three month period during which this study was carried on, there was not a single readmission from this experimental group for gonococcic urethritis following the three negative cultures over a period of twenty-one days.

between the American republics to the end that there might be a steady and continuing improvement in health and welfare throughout the Western Hemisphere.

The resolution was not taken solely out of a spirit of pure humanitarianism. The constant aim of all the enlightened leaders of the nations of the Western Hemisphere is to achieve economic development and prosperity for the peoples of their respective countries. It was realized that, in order to bring about that effect, greater weight must be given to medicine and public health and close attention must be focused on them, not only, in the sense of controlling epidemic diseases, but also from the aspect of bringing about conditions appropriate to the development of healthy people able to cope with the economic problems of reconstruction —the bitter problems which will emerge to plague and harass all of us during the peaceful years when we are rebuilding in the ashes of this devastating war. It was recognized that there must be uniformity of procedures and practices throughout the hemisphere. It was foreseen that all the American republics must work together and apply in close collaboration and harmony tested health measures for the mutual benefit of all.

It must be emphasized that progress in health is international and hemispheric in scope. By its nature it cannot today be merely national. It follows that improvement of health services will be of distinct benefit to the United States of America and to all of the other American republics because it will be a factor in the economic development and prosperity of each country and thus, in turn, to the prosperity of the rest of the hemisphere.

The Institute of Inter-American Affairs has three divisions, namely the Health and Sanitation, Food Supply and Training divisions. The activities of the first two divisions are financed by appropriations from the United States and the governments of each of the eighteen republics now participating and through cooperative agreements with representatives of each government. The work is carried on through an intermediary organization composed of United States and national personnel and serving as an integral part of the national departments of health.

The training program is financed by the institute. Through the health and sanitation grants 165 students have completed their work and 145 are now in training. The total of 310 includes 172 trainees in public health, 73 in sanitary engineering and 65 in the medical sciences. These include a number of men who are returning to teach in the medical schools.

In a recent report from one of the trainees, the comment is made that the prestige of United States medical science is apt to be ascribed to the lack of material difficulties in accomplishment of work. Familiarity with North American hospitals discloses other factors responsible for the degree of success attained by medicine in this country, notably the fact that the American doctor is a tireless worker and is possessed of a high degree of scientific honesty and spirit of collaboration. This visitor sees medicine here as a series of teams that function with clocklike precision.

Such observations indicate that training programs not only are directly beneficial in promoting Latin American medicine and public health but also are believed to be providing one of the strongest links in the union of the Americas. Collaboration among medical men of the Americas is being furthered not only by the provision of fellowships but also in the actual execution of the cooperative health work in the southern countries.

The provision of medical and public health services for persons directly engaged in the war effort is an important function of the Cooperative Health Services. The control of malaria has received major emphasis. General activities include such features as physical examinations, vaccination, emergency medical care, the distribution of medicines and the provision and supervision of elementary sanitation. In this fashion an attempt has been made to improve the health and efficiency of the workers in rubber areas, on cinchona and sisal plantations, in the tin mines and in the rich, diversified mining regions of Brazil, as well as of highway and railroad workers in several of the countries. Sanitation and other public health measures have been intensified around air bases and in areas where our armed forces are stationed.

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INTRAVENOUS HISTAMINE IN THE TREATMENT OF MIGRAINE

PRELIMINARY OBSERVATIONS

STUYVESANT BUTLER, M.D.
AND
WILLIAM A. THOMAS, M.D.
CHICAGO

One of the theories regarding the mechanism of migraine comes from observations made by Sir Thomas Lewis in 1926.[1] He showed that there is a threefold reaction to local skin irritation: (1) local reaction at the site of the irritant, (2) local release of histamine at the site causing a wheal immediately around it and (3) a further release of free histamine into the circulating blood. It is well known that the intradermal injection of histamine in certain individuals will cause this second phenomenon of wheal formation, which is essentially a vasodilatation. It is generally believed that the phenomenon of migraine is precipitated by the release of histamine into the blood stream as the result of an allergic reaction and that the major attack of migraine develops only in those individuals whose tolerance to histamine is low and who would be hyperreactors at one phase of the syndrome to the intradermal injection of histamine. This is the third phenomenon described by Lewis as the response to local irritation.

From the Presbyterian Hospital

Read before the Chicago Society of Internal Medicine

1. Lewis, Thomas: The Blood Vessels of the Human Skin, Brit. M. J. 2:11, 1926

2. Sheldon, C. H., and Horton, B. T.: Treatment of Meniere's Disease with Histamine Administered Intravenously, Proc. Staff Meet., Mayo Clin. 15:17 (Jan. 10) 1940. Horton, B. T.: The Use of Histamine in the Treatment of Certain Specific Types of Headaches, J. A. M. A. 116:377 (Feb. 1) 1941; The Use of Histamine in Meniere's Disease, Surg., Gynec. & Obst. 72:417 (Feb.) 1941.

Early in 1940 Horton and Sheldon[2] discussed the mechanism of Ménière's syndrome, believing it to be a local vasodilatation in the inner ear, and successfully treated a number of cases by subcutaneous and later intravenous histamine injections.

It should be clearly understood that these clinical phenomena are not due to allergy to histamine in the commonly accepted sense of the word but rather to a lowered tolerance of the organism to histamine present in the circulating blood as the result of an allergic stimulation. Histamine is present in all cells but in only minute quantities in the blood; it is only the individual with lowered tolerance to histamine who thus responds to its release into the circulation, whatever the mechanism of that release may be. The release of histamine into the circulation regardless of its cause is only momentary, since it is immediately taken up by the cells, where vasodilatation then occurs. Because of this very brief period when histamine is present in the circulating blood it seemed reasonable to us to assume that the tolerance of an individual would be raised more effectively by the long continued injection of histamine than by individual doses of increasing strength.

Our interest in the problem of the treatment of migraine with intravenous injections of histamine arose from two articles which appeared at almost the same time in 1943. Miles Atkinson[3] in May discussed the similarity of migraine and Ménière's syndrome, their relation to allergy and histamine production. In July Rainey[4] described a number of cases of Ménière's syndrome previously unsuccessfully treated by subcutaneous injection of histamine but which were greatly benefited by prolonged administration of intravenous histamine. With these two papers in mind it seemed to us that there might be therapeutic value in applying this technic to the treatment of migraine.

The criteria used to determine whether a headache was migraine or not are as follows:

The headaches are paroxysmal and unilateral, usually postorbital. They are frequently preceded by auras or prodromes which involve many of the cranial nerves, especially vision, hearing, taste, smell and various cutaneous sensations, as well as frequent disturbances of equilibrium. The history often shows a familial tendency and there is frequently evidence of allergy, especially to certain foods such as chocolate. The attacks usually involve nausea and vomiting, and characteristic of migraine is a freedom from any symptoms between attacks. Migraine equivalents frequently alternate with more typical attacks, especially in the case of paroxysmal tachycardia.

TREATMENT

We have used no patients in this series who could conceivably have headaches from any other cause such as sinusitis, neuralgia of the face or scalp, hypertension, skull injury, eye strain or brain tumor. Thirty-four patients with severe or moderately severe "pure" migraine remain who have been treated by the intravenous injection of 1 mg. of histamine as 2.75 mg. of histamine acid phosphate. This is diluted in 500 cc. of isotonic solution of sodium chloride and injected very slowly, the speed of injection usually starting at about

3. Atkinson, Miles: Ménière's Syndrome and Migraine: Observations on a Common Causal Relationship, Ann. Int. Med. 18:797 (May) 1943.

4. Rainey, J. J.: Histamine in the Treatment of Ménière's Syndrome, J. A. M. A. 122:850 (July 24) 1943.

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One of the theories regarding the mechanism of migraine comes from observations made by Sir Thomas Lewis in 1926.[1] He showed that there is a threefold reaction to local skin irritation: (1) local reaction at the site of the irritant, (2) local release of histamine at the site causing a wheal immediately around it and (3) a further release of free histamine into the circulating blood. It is well known that the intradermal injection of histamine in certain individuals will cause this second phenomenon of wheal formation, which is essentially a vasodilatation. It is generally believed that the phenomenon of migraine is precipitated by the release of histamine into the blood stream as the result of an allergic reaction and that the major attack of migraine develops only in those individuals whose tolerance to histamine is low and who would be hyperreactors at one phase of the syndrome to the intradermal injection of histamine. This is the third phenomenon described by Lewis as the response to local irritation.

Early in 1940 Horton and Sheldon[2] discussed the mechanism of Ménière's syndrome, believing it to be a local vasodilatation in the inner ear, and successfully treated a number of cases by subcutaneous and later intravenous histamine injections.

It should be clearly understood that these clinical phenomena are not due to allergy to histamine in the commonly accepted sense of the word but rather to a lowered tolerance of the organism to histamine present in the circulating blood as the result of an allergic stimulation. Histamine is present in all cells but in only minute quantities in the blood; it is only the individual with lowered tolerance to histamine who thus responds to its release into the circulation, whatever the mechanism of that release may be. The release of histamine into the circulation regardless of its cause is only momentary, since it is immediately taken up by the cells, where vasodilatation then occurs. Because of this very brief period when histamine is present in the circulating blood it seemed reasonable to us to assume that the tolerance of an individual would be raised more effectively by the long continued injection of histamine than by individual doses of increasing strength.

Our interest in the problem of the treatment of migraine with intravenous injections of histamine arose from two articles which appeared at almost the same time in 1943. Miles Atkinson[3] in May discussed the similarity of migraine and Ménière's syndrome, their relation to allergy and histamine production. In July Rainey[4] described a number of cases of Ménière's syndrome previously unsuccessfully treated by subcutaneous injection of histamine but which were greatly benefited by prolonged administration of intravenous histamine. With these two papers in mind it seemed to us that there might be therapeutic value in applying this technic to the treatment of migraine.

The criteria used to determine whether a headache was migraine or not are as follows:

The headaches are paroxysmal and unilateral, usually postorbital. They are frequently preceded by auras or prodromes which involve many of the cranial nerves, especially vision, hearing, taste, smell and various cutaneous sensations, as well as frequent disturbances of equilibrium. The history often shows a familial tendency and there is frequently evidence of allergy, especially to certain foods such as chocolate. The attacks usually involve nausea and vomiting, and characteristic of migraine is a freedom from any symptoms between attacks. Migraine equivalents frequently alternate with more typical attacks, especially in the case of paroxysmal tachycardia.

TREATMENT

We have used no patients in this series who could conceivably have headaches from any other cause such as sinusitis, neuralgia of the face or scalp, hypertension, skull injury, eye strain or brain tumor. Thirty-four patients with severe or moderately severe "pure" migraine remain who have been treated by the intravenous injection of 1 mg. of histamine as 2.75 mg. of histamine acid phosphate. This is diluted in 500 cc. of isotonic solution of sodium chloride and injected very slowly, the speed of injection usually starting at about

From the Presbyterian Hospital.
Read before the Chicago Society of Internal Medicine.

1. Lewis, Thomas: The Blood Vessels of the Human Skin, Brit. M. J. 2:11, 1926.

2. Sheldon, C. H., and Horton, B. T.: Treatment of Ménière's Disease with Histamine Administered Intravenously, Proc. Staff Meet., Mayo Clin. 15:17 (Jan. 10) 1940. Horton, B. T.: The Use of Histamine in the Treatment of Certain Specific Types of Headaches, J. A. M. A. 116:377 (Feb. 1) 1941; The Use of Histamine in Ménière's Disease, Surg., Gynec. & Obst. 72:447 (Feb.) 1941.

3. Atkinson, Miles: Ménière's Syndrome and Migraine: Observations on a Common Causal Relationship, Ann. Int. Med. 18:797 (May) 1943.

4. Rainey, J. J.: Histamine in the Treatment of Ménière's Syndrome, J. A. M. A. 122:850 (July 24) 1943.

five drops per minute, the rate being increased as rapidly as is tolerated by the patient. Too rapid an injection will result in first a flushing of the face, often tachycardia and finally a typical severe headache which may be relieved by slowing the rate of injection or administration of epinephrine or ascorbic acid. The entire injection usually takes from four to eight hours. The blood pressure is taken hourly and any decided drop is considered an indication for cessation of treatment. Gastric analysis has been done in half our cases and has shown a high degree of secretion with very high acid values. The patients often complain of heartburn during histamine administration, but it is promptly relieved by mild alkaline powders. The onset of urticaria or asthma during the treatment is an indication for slowing the rate of injections or giving ascorbic acid. Patients have been given from three to four treatments with a day of rest after each one.

Certain precautions must necessarily be taken in the long continued use of a drug having such effects on the circulation and acid gastric secretion. No cases were used in which hypertension or cardiac or renal impairment was found to exist or in which there was evidence of mental or central nervous system disease. No patients with a history of peptic ulcer were given intravenous therapy, although 1 developed a duodenal ulcer twelve weeks after treatment.

Thirty-four patients with "pure migraine" were selected having an average age of 43 (table 1). The average age of onset of headaches was 18 and attacks had lasted from six to forty-eight years, an average of twenty-five. Not including 3 cases of status migrainicus the headaches lasted about nineteen hours and occurred twice a month.

No patients were used whose attacks were mild enough not to interfere with their regular life. The remaining ones were divided into moderately severe and very severe, the latter group (23) including only those who were incapacitated for more than eighteen hours or whose headache was so severe as to require opiates for relief.

We have found three different types of response as far as relief was concerned: (1) those whose relief was immediate, complete and apparently permanent, (2) those whose relief was immediate and complete but whose headaches recurred, usually in milder form, after weeks or months, and which were subsequently relieved by subcutaneous injections of histamine, (3) those who were not given immediate relief after the intravenous histamine but were relieved by one or more later subcutaneous injections and (4) those who obtained no relief.

TABLE 1.—*Summary of Cases*

Number of cases	34
Average age (32 to 63)	43 years
Age at onset (8 to 39)	18 years
Years symptoms present (6 to 48)	25 years
Duration of attacks *	19 hours
Frequency of attacks *	17 days

* Not including 3 cases of status migrainicus.

RESULTS

In a study of this group symptomatic relief from headaches as described by the patient was the only criterion which could be used; but this seemed of value in view of an average duration of twenty-five years of severe headache occurring every fortnight (table 2). Only 3 patients experienced no relief. Seven were improved either in severity of headaches or in decreased frequency or duration. Twenty-four were free from symptoms when last seen. All patients have been observed for at least six months since intravenous histamine therapy, 17 from twelve to eighteen months and 8 for more than eighteen months.

TABLE 2.—*Results*

Severity	Total Cases	Unimproved	Improved	Symptom Free
Moderately severe	11	2	2	7
Very severe	23	1	5	17
Totals	34	3	7	24

REPORT OF CASES

Four cases have been selected as characteristic: the first is one of great severity with complete relief most typical of our series; the second of very great severity having unusual features and with eventual relief; the third a case of moderate severity, complete relief, but with later development of a duodenal ulcer, and the last a case of great severity in which no relief was obtained.

CASE 1.—*Very severe headaches; complete relief from intravenous histamine.*

Mrs. H., aged 32, stated that the headaches began at 17, the menarche at 13. Her mother, father and twin sister had headaches. Three brothers had none. Since onset at 17 the headaches occurred only at menstrual periods until she was 23; on admission they occurred two or three times weekly, lasting from twelve hours to two days. They were unilateral and occipital, accompanied by photophobia, nausea and constant retching. During a headache her speech was indistinct. Morphine injections would often give no relief. She had had no headache during her two pregnancies. She was given three intravenous injections of histamine, having mild headache and heartburn during the first; for the latter she received 100 cc. of milk every half hour with relief. She has had no return of headache for fourteen months.

CASE 2.—*Very severe headaches; temporary relief from intravenous histamine; relief from further subcutaneous histamine.*

Mrs. P., aged 63, stated that the headaches began at 15, the menarche at 14. Her mother had headaches of such severity with "triple vision" that she committed suicide; one sister had headaches so severe that she developed melancholia. There were no living children. The headaches had been present for forty-eight years except during her two pregnancies. They are temporal and occipital, always unilateral. The headache was preceded by an aura of dimness of vision, when "everything was blurred and darkened but with spots of light like fireworks." The aura lasted thirty minutes and the headache began lasting one to six days; during this period she had double vision. The attacks occurred once to twice weekly and had been present so much of the time that she had been examined repeatedly for eye or brain disease. There was no relief from any medication, including morphine. Chocolate caused a skin rash and diarrhea. Examinations of the retinal and visual fields were normal. Four intravenous injections of histamine were given, the first preceded by 500 mg. of ascorbic acid intravenously in order to relieve the existing headache. One hour after beginning the second injection flushing of the face and neck occurred, relieved by intravenous ascorbic acid in the other arm. During each of the last two intravenous injections 500 mg. of ascorbic acid was added to the histamine salt solution. She was free from any

headache or visual disturbance for six weeks but then had two mild attacks two weeks apart, lasting about three hours each. She was then given subcutaneous injections of histamine weekly for six weeks without recurrence for seven months

CASE 3.—*Moderately severe headaches, relief, later a duodenal ulcer developed.*

G, a man age 40, married, stated that the headaches began at 17. His mother and his mother's mother had sick headaches. There were no siblings. The headaches occurred every three to fifteen days, averaging once a week They were temporal, occipital and always unilateral. They were associated with blindness, nausea and often vomiting He also had urticaria from eating eggs and would always get a headache from chocolate. The headache lasted typically about twelve hours. Gastric analysis with an Ewald meal revealed free acid 40, total acid 65. Three intravenous injections of histamine were given. The patient developed urticaria during the first two injections, which was relieved by slowing the rate of the first injection and by intravenous ascorbic acid (500 mg.) during the second. Three months later he developed a penetrating duodenal ulcer, which healed rapidly on medical management Gastric acid findings were unchanged during the second hospital admission He has had no headache for seventeen months

CASE 4.—*Very severe headache; no relief after four intravenous and many subcutaneous injections*

Mrs. H, aged 34, stated that the headaches began at 13, the menarche at 13. Her mother, two maternal aunts and two sisters had severe sick headaches For seven years the headaches occurred only at her menstrual periods, after 20 they increased in frequency, occurring every eight or nine days, lasting approximately thirty hours and causing her to go to bed During her two pregnancies at 26 and 30 years she was completely free during the second and third trimesters, and during lactation her headaches were infrequent and mild However, after the children had been weaned the attacks recurred with their same frequency and severity. Her only relief was from injections of ergotamine tartrate. Four intravenous doses of histamine followed by subcutaneous injections of increasing strength have failed to alleviate in any degree the pattern of the attack

SUMMARY AND CONCLUSIONS

1. Thirty-four patients with severe migraine were treated with intravenous histamine injections. Seven were improved and twenty-four became symptom free.

2. Intravenous histamine should not be given to patients with peptic ulcer or vascular disease and may be dangerous if indiscriminately used

3. Histamine is nonantigenic, and the body does not become sensitized in an allergic manner either spontaneously or by repeated injections, as may be the case in the higher protein aggregates which are capable of producing antibodies by injection or other routes of assimilation.

4. The observations recorded suggest a new method of attack on many problems which may be due to allergy.

Sectarian Medicine Unwanted.—Your timorous citizen with a backache may still choose to have his vertebrae adjusted; but if his boy is going to stop a bullet he wants him to have a good orthodox surgeon and plenty of penicillin There are sects and parties now only in those fields in which science has not yet been able to provide general principles, for example in psychiatry and medical sociology. The judgments of everyday doctors, of the health officers and of the military medical staffs are being accepted everywhere with astonishing confidence and no effective sectarian opposition.—Corner George W.: The Gifts of the Good Physician, University of Rochester, N. Y., 1944.

STREPTOMYCIN FOR TYPHOID

A PHARMACOLOGIC STUDY

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In the search for antibiotic substances which are more bacteriostatic or bactericidal for gram negative bacilli than penicillin, Waksman and his associates isolated two apparently related substances, streptothricin [1] and streptomycin,[2] from the genus Streptomyces, which includes the soil actinomycetes. Of the two, streptomycin, obtained from a strain of Actinomyces griseus, is somewhat more active against certain pathogenic gram negative bacilli, including Eberthella typhosa, and is less toxic for the host.[3] It is also effective in controlling experimental infection in animals with a mixture of Proteus vulgaris and anaerobic streptococcus,[4] and with Pasteurella tularensis, Myocobacterium tuberculosis and Klebsiella pneumoniae.[4a] An opportunity to test the therapeutic effect of streptomycin on typhoid and to study its pharmacology in patients came during a local epidemic which began in December 1944. About 60 cases with eight deaths were reported, all arising from a carrier in a bakery. Because of the limited amounts of streptomycin available, only 5 patients with severe or moderately severe attacks were selected for treatment and study.

Streptomycin hydrochloride was supplied by Merck & Co., Inc., of Rahway, N. J. The potency of the first lots used varied from 110 to 130 units per milligram. A subsequent lot had a potency of 300 units per milligram and the last lot received was increased in potency to 430. The unit of potency is the amount necessary to inhibit the growth of a strain of Escherichia coli in 1 cc. of broth or agar.[5] The unit value seems out of proportion with the unit value of penicillin as measured against a standard strain of staphylococci, so that unitage as now expressed in millions may be readjusted later at a lower level or preferably established on the basis of milligrams of crystalline substance. An average daily dose of 100,000 units of penicillin with a potency

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From the Jefferson Medical College and Hospital
From the Wyeth Institute of Applied Biochemistry (Dr Elias).
Merck & Co, Inc, supplied streptomycin and outlined the methods for its assay.

1. Waksman, S. A, and Woodruff, H B Streptothricin: A New Selective Bacteriostatic and Bactericidal Agent, Particularly Active Against Gram Negative Bacteria, Proc Soc Exper Biol. & Med **49**: 207 210 (Feb) 1942 Waksman, S A: Production and Activity of Streptomycin, J. Bact. **46**: 299-310 (April 24) 1943

2 Schatz, A; Bugie, E, and Waksman, S A: Streptomycin: A Substance Exhibiting Antibiotic Activity Against Gram Positive and Gram Negative Bacteria, Proc. Soc. Exper. Biol & Med. **55**: 66 69 (Jan) 1944 Jones. Metzger, Schatz and Waksman [5] Waksman, Bugie and Schatz [4]

3 Robinson, H J; Graessle, O E, and Smith, D G: Studies in the Toxicity and Activity of Streptothricin, Science **99**: 540 541 (June 30) 1944 Robinson, H J, Smith, D. G., and Graessle, O. E: Chemotherapeutic Properties of Streptomycin, Proc Soc Exper. Biol & Med **57**: 226 231 (Nov.) 1944

4 Waksman, S. A.; Bugie, E, and Schatz, A Isolation of Antibiotic Substances from Soil Micro Organisms, with Special Reference to Streptothricin and Streptomycin, Proc. Staff Meet, Mayo Clin **19**: 537 548 (Nov 15) 1944.

4a Heilman, F. R Streptomycin in the Treatment of Experimental Tularemia, Proc Staff Meet., Mayo Clin. **19**: 553 559 (Nov 29) 1944 Feldman, W. H, and Hinshaw, H. C. Effects of Streptomycin on Experimental Tuberculosis in Guinea Pigs, ibid **19**: 593 599 (Dec 27) 1944. Heilman, F. R. Streptomycin in the Treatment of Experimental Infections with Micro Organisms of the Friedlander Group (Klebsiella), ibid **20**: 33 39 (Feb 7) 1945

5. Jones, D.; Metzger, H. J.; Schatz, A, and Waksman, S. A.: Control of Gram Negative Bacteria in Experimental Animals by Streptomycin, Science **100**: 103 105 (Aug. 4) 1944

of 800 units per milligram weighs about 125 mg., but a daily dose of 4 million units of the best streptomycin of about 400 units per milligram used in this study weighed 10 Gm.

Sterile solutions for intramuscular injection were prepared in distilled water so that each cubic centimeter contained 50,000 units. Accordingly, 2.5 cc. (125,000 units) was injected intramuscularly in different areas at three hour intervals, making a total of 1 million units daily in patients 1 and 2. For patient 3 the amounts were doubled and then quadrupled. Injections of large amounts were painful and required the addition of 1 cc. of 1 per cent procaine hydrochloride solution. Patient 4 received streptomycin intravenously and patient 5 orally. Blood samples were obtained from each patient before treatment, every hour after the first dose for three hours, then every three to six hours for twenty-four hours, and thereafter every twelve to twenty-four hours, to measure the amounts of streptomycin present. Samples were taken from 2 patients every hour for three hours after the last dose and a few subsequent ones at three hourly intervals to determine the rate of disappearance from the blood. The amounts of streptomycin excreted in the urine were measured in daily twenty-four hour collections of urine. In patient 4 the units per gram of feces were measured, and in patient 5 the total output in the feces and its effect on the flora were studied.

The technic of measurement of streptomycin in the blood, urine and stool was based on the agar cylinder-plate diffusion method, using Bacillus subtilis, of Robinson and Smith.[6] Although B. subtilis was the test organism, the unitage in this study is expressed in E. coli units. A detailed report will be given elsewhere.[7]

REPORT OF CASES

CASE 1.—C. G., a man aged 31, noted malaise and chilly sensations beginning about Jan. 7, 1945. He remained at work for a week until the increasing severity of symptoms with severe chills, headache and fever confined him to bed. A remission of symptoms occurred about January 20, but fever, chills and drenching sweats recurred two days later. Slight deafness and sordes appeared. He was admitted to the hospital January 25 on the nineteenth day of the disease. The temperature was 105 F., the leukocytes numbered 6,700 and a blood culture contained five colonies of E. typhosa per cubic centimeter of blood, but typhoid bacilli were not cultivated from the stool until later. Sordes and rose spots were present. He was regarded as having a severe attack of typhoid. On the twenty-fifth day his temperature rose to higher level (chart 1) and he became more toxic, with mental confusion and somnolence.

Treatment with streptomycin began on the twenty-fourth day; 125,000 units was injected intramuscularly every three hours, a total of 1 million units a day. There was tenderness at the site of each injection about an hour or so afterward which persisted for several hours, but otherwise no untoward effects were noted. For a short period only 500,000 units was injected over a thirty-six hour period, but the original dosage was resumed during the rest of the ten day period, making a total of about 10 million units. The estimated amounts of streptomycin in the blood increased to about 5 units within six hours and maintained that level. The amounts rapidly diminished several hours after the last injection. From 13 to 56 per cent of the total daily doses was recovered daily from twenty-four hour collections of urine. Traces of streptomycin, estimated as between 2 and 3 units per cubic centimeter, were demonstrable in the spinal fluid on the ninth day of treatment.

Between thirty-six and forty-eight hours after treatment was begun the temperature began to decline steadily and reached normal on the thirty-seventh day. Symptoms and signs abated proportionately. Typhoid bacilli were present in the blood

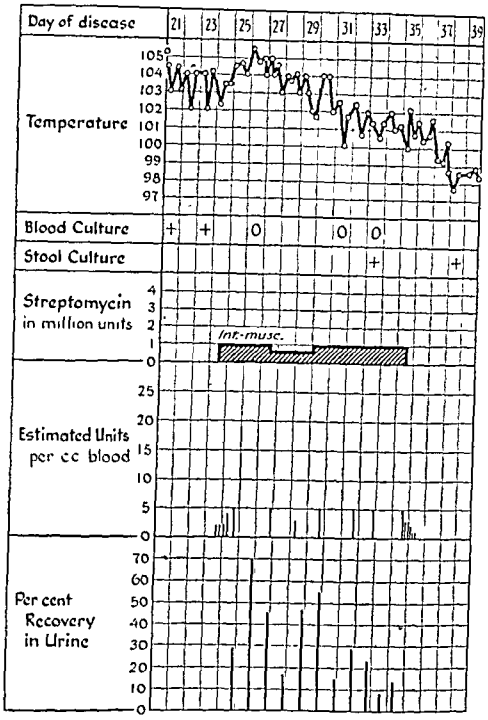


Chart 1 (case 1).—Intramuscular injection, 1 million units daily. Gradual decline of fever during therapy, with disappearance of bacteremia. Amounts of streptomycin in the blood are theoretically bactericidal.

before but not after treatment was begun. They were recovered from the stool on the thirty-third and thirty-eighth days, unchanged in their resistance to streptomycin.

Recovery in this patient may have been spontaneous or induced by streptomycin. At any rate the symptoms increased in severity before treatment, and recovery was synchronous with therapy.

CASE 2.—M. B., a waitress aged 49, went to bed about January 4 thinking she had a cold because of headache, fever and chills. A few days later diarrhea occurred with several bloody stools. There were rhinorrhea and epistaxis. The general condition became worse and she was admitted to Temple University Hospital as a patient of Dr. John Lansbury[8] on about the twenty-first day of the disease. She had a severe form of typhoid. The leukocytes numbered 4,700, and E. typhosa was present in the stool.

Streptomycin was injected intramuscularly beginning on the twenty-fourth day in doses of 125,000 units every three hours, or 1 million units daily, and continued for about nine days, a total of about 9 million units (chart 2). No clinical improvement occurred during therapy or for several weeks afterward. No evidence of toxicity from streptomycin was noted, but soreness was complained of for a few hours at the injected sites. The amount of streptomycin in the blood increased to 12 units per cubic centimeter within twelve hours after the first injection and remained at approximately that level during treatment. The blood cultures, sterile at first, became positive for E. typhosa during treatment despite the presence of 14 units of streptomycin per cubic centimeter of blood, or double the amount needed to kill the germ in the test tube. After

6. Robinson, H. J., and Smith, D. G.: J. Pharmacol. & Exper. Therap., to be published. Description of an improved method using a strain of staphylococci will be published by Dr. R. B. Stebbins.
7. Elias, W. F., and Durso, J.: Science, to be published.

8. Drs. J. Lansbury and L. W. Whitney allowed us to study this patient and cooperated in her management.

treatment was stopped, streptomycin rapidly diminished and after nine hours could no longer be demonstrated in the blood. From 10 to 28 per cent of the daily dose was excreted in the urine. Streptomycin disappeared from the urine forty-eight hours after the last dose.

Treatment with streptomycin had no beneficial effect and bacteremia persisted probably because of insufficient dosage, although the amount present in the blood was more than enough to kill E. typhosa in broth, or because of some unknown factors which interfere with the action of the drug or protect the bacilli from its effects.

CASE 3.—R. H., a maid aged 24, ate food from the suspected bakery about January 5. A stool culture made during a survey revealed E. typhosa on January 24. The patient was well until January 27, when she noted severe headache, later chilliness which lasted twenty-four hours and malaise for three days, although she continued to work. On February 1 fever, malaise, constipation and nosebleed occurred. She was admitted to the Graduate Hospital of the University of Pennsylvania as a patient of Dr. H. L. Bockus [9] on February 2, the sixth day of the disease. Her temperature was 103 F., the pulse rate was 110 and the leukocytes numbered 4,500. Blood culture made on February 2 and four made thereafter were all sterile. E. typhosa was cultivated from the stool on occasions, as shown in chart 3. During the first four days of observation the patient was not toxic and the attack was regarded as moderately severe.

Streptomycin in larger doses was injected intramuscularly every three hours in 5 cc. (250,000 units) amounts, a total of 2 million units a day, as shown in chart 3. Because of the

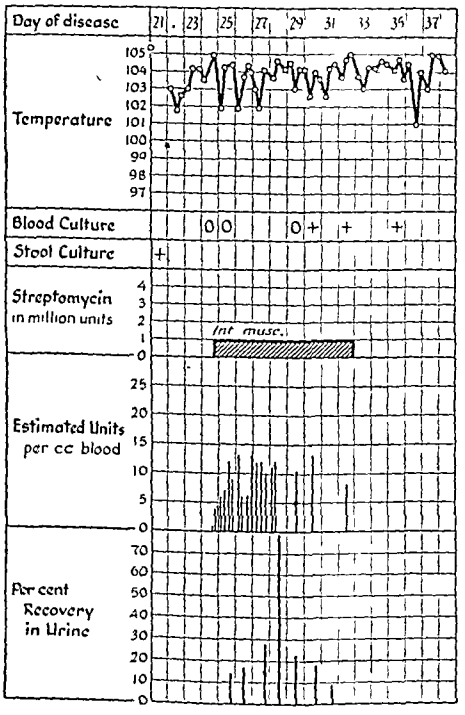


Chart 2 (case 2).—Intramuscular injection, 1 million units daily. No clinical effect from therapy; bacteremia present despite amounts of streptomycin in the blood more than the theoretical bactericidal level.

pain at the site of injection the amount was divided and injected into two places at once. Since no evident clinical improvement occurred, the dose after two days was doubled to 500,000 units every three hours, or 4 million units daily, and injected with 1 cc. of 1 per cent procaine hydrochloride solution. On the nineteenth day of the disease, or the seventh day of treatment, after about 24 million units had been given, the temperature dropped abruptly to normal and recovery ensued. Treatment was stopped one day later because of pain at the sites of injection after a total of about 30 million units had been given. Tender indurated masses at the sites of injection

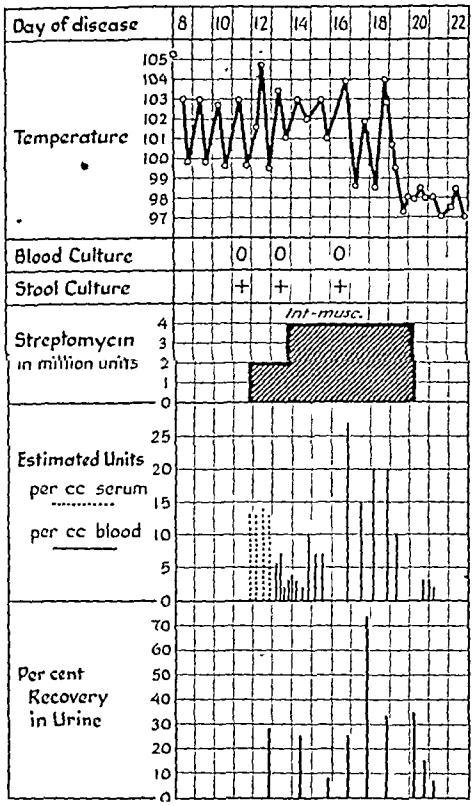


Chart 3 (case 3).—Intramuscular injection with 2 million, then 4 million units daily. Gradual decline of fever after start of therapy and crisis-like end with clinical recovery on the eighth day of treatment. E. typhosa persisted in the feces during treatment.

remained for several days, but no evidence of toxicity was noted. E. typhosa was cultivated from the stool during treatment.

Streptomycin was present in the blood one hour after the first injection. The first four measurements were made of serum in which the estimated amounts of streptomycin, 13 units, were about double those in the whole blood, as may have been expected. The estimated amounts in the blood during the first three days of therapy averaged about 7 units. After increased dosage larger amounts appeared, as high as 27 units. Amounts at levels higher than 12 units are subject to more accurate measurement.[7] After treatment was stopped streptomycin disappeared from the blood in eighteen hours. Streptomycin appeared in the urine in amounts similar to those in cases 1 and 2, averaging 25 per cent of the amount injected. None was detected in the urine forty-eight hours after the last injection.

Treatment with streptomycin seemed to precipitate a crisis-like termination in this case, although it took seven days to do it. Abrupt recovery is unusual in typhoid.

CASE 4.—M. M., a man aged 60, had typhoid fifty years ago. About Dec. 12, 1944 mild illness thought to have been grip began. The symptoms gradually became worse until severe chills and fever obliged bed rest. He was admitted to the hospital on Jan. 12, 1945 on about the twenty-first day of the disease with fever of 101 F., leukocytes 5,000. A blood culture was sterile. He did not appear to be very sick at first but soon did, with repeated shaking chills and fever of 104 F.

9. Drs. H. L. Bockus and E. Jobb allowed us to study this patient and cooperated in her management.

He was given empirically a total of 200,000 units of penicillin intramuscularly on January 15 and 16 and a course of sulfadiazine January 18, both without effect. On January 19 a massive intestinal hemorrhage occurred. The patient came under our care January 25. E. typhosa was isolated from the stool on this date and from several later ones. Blood cultures and the Widal test gave negative results. The patient's condition remained about the same until about the forty-fifth day, when toxicity became severe. There were restlessness and delusions alternating with somnolence. The stupor deepened by February 24, the sixty-fourth day of the disease, and his condition was critical. Intestinal bleeding recurred.

At this time streptomycin for intravenous use was made available. A daily dose of about 4 million units was injected by the continuous drip method. Streptomycin hydrochloride 1,350,000 units was dissolved in 1,000 cc. of isotonic solution of sodium chloride and allowed to run into a vein in eight

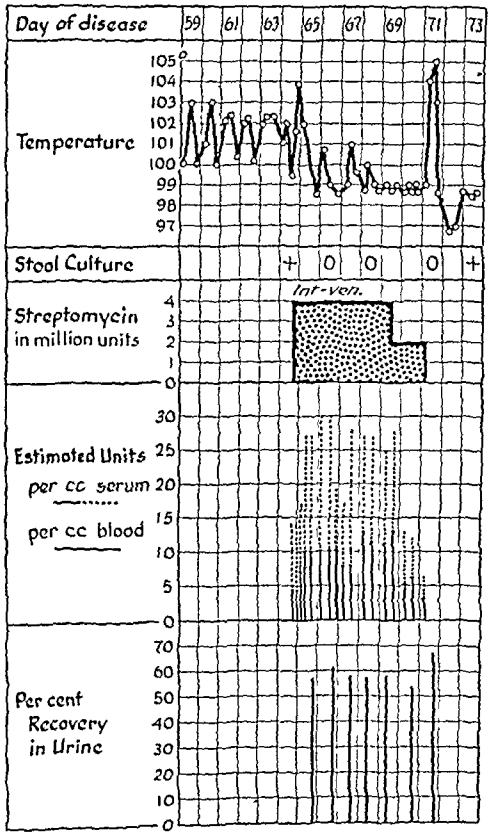


Chart 4 (case 4).—Intravenous injection with 4 million, then 2 million units daily. Abrupt drop of fever twenty-four hours after injection was begun and rapid recovery. Febrile reaction on the seventy-first day may have been caused by impurities in the drug. High levels of streptomycin in the blood and 130 units per gram of feces (not shown in the chart) were present. The feces were free of typhoid bacilli until four days after treatment, when only 40 units per gram was present.

hours, then replaced by similar second and third preparations during twenty-four hours. For every third thousand cubic centimeters 10 per cent glucose solution was substituted for the salt solution to reduce the danger of edema. A slight chill occurred about five hours after the injection was begun, but this had also occurred after many previous injections of blood or of fluid with salt, sugar or amino acids. As noted in chart 4, a few hours after the injection was begun the temperature rose as it had many times before, but twenty-four hours later it touched 98.6 F., coincident with a fall in pulse rate from 120 to 95 per minute. Striking clinical improvement occurred in the next thirty-six hours, the temperature declined and the patient became cooperative, oriented and alert. By the fifth day of treatment recovery seemed established and the daily dose was reduced to 2 million units to conserve the supply. A slight recrudescence occurred on the eighty-fourth day, lasting three days.

After seven days of treatment and apparent recovery the patient had a chill, followed by fever rising within a few hours to 105 F., restlessness and stupor. Intravenous therapy was stopped after about 23 million units had been injected. The temperature returned to normal after twelve hours, became subnormal and was accompanied with a shocklike state lasting about twelve hours, followed by recovery. Since there had been about fourteen similar but less severe episodes during the ten weeks of sickness it was impossible to decide whether the last one was a similar one or if it was a reaction to streptomycin. A sample of the streptomycin used when injected into 2 rabbits by the standard U. S. P. XII method caused fever in both, indicating the presence of a pyrogen.

With intravenous therapy the amount of streptomycin in the blood rose to an estimated 4.5 units one hour after the injection was begun and within twelve hours reached 10 units, a level maintained while the dosage was 4 million units. The amounts recorded in the serum were consistently higher, up to 30 units per cubic centimeter. After the dosage was reduced to 2 million units the amounts in the blood fell rapidly, as shown in chart 4. About 60 per cent of the daily dose was excreted in the urine.

Because of difficulty in collection the total daily stool was not weighed, but measurements on samples showed streptomycin in amounts of 105 units and 130 units per gram (0.1 to 0.13 unit per milligram) on the fourth and fifth days of treatment with 4 million units. The amount dropped to 80 units when the dosage was reduced and to 40 units two days after treatment was stopped. At this time typhoid bacilli reappeared in the feces, suggesting that too little streptomycin was present to suppress their growth and that some factors interfered with the action of the drug on the bacilli.

The recovery of this patient seemed to have been caused by streptomycin because of the large amounts of streptomycin in the blood, feces and urine and the apparent relationship of the decline of fever and symptoms with therapy. He became worse before treatment was begun and improved greatly in the next thirty-six hours.

Case 5.—P. F., a woman aged 21, noted chilly sensations, malaise and headache about January 4 but was not obliged to remain in bed until January 9. Remission occurred January '13, but the symptoms returned six days later and became severe. She was admitted to the hospital on the fifteenth day of the disease with fever of 106 F., rose spots, cough, deafness, bradycardia, mental confusion and diarrhea. The leukocytes numbered 7,000, and E. typhosa was present in the blood and feces. She was severely sick.

Streptomycin was not available for treatment until the fifty-seventh day of the disease. At this time there was temporary spontaneous improvement. The substance was given orally, 125,000 units every three hours or 1 million units a day for five days. The temperature, which had fallen somewhat before treatment, rose again and reached 102 F. during therapy with 1 million units. The dosage was doubled on the sixth day and doubled again to 4 million units on the seventh day, but no measurable streptomycin appeared in the blood, only traces (0.8 to 1.2 per cent) of the daily dose appeared in the urine and no clinical improvement occurred. During oral therapy almost all of the ingested streptomycin was excreted in the stools. On the fifth day of therapy 72 per cent was present (4 units per milligram) and on the sixth day 110 per cent, the latter probably due to accumulation from the previous day which was recovered by enema. With 4 million units given orally, the amounts in the stools increased to 10 and 19 units per milligram. At the same time, striking changes occurred in the flora of the feces as determined by Dr. G. H. Warren. In a specimen cultured before therapy, E. typhosa and E. coli were present in large numbers. After one day of oral therapy E. typhosa disappeared and E. coli was greatly lessened.

After several days of oral therapy E coli was almost completely eliminated and the stools lost much of their fecal odor.

The temperature continued to rise and oral therapy was replaced by intravenous injection in amounts of 2 million units for two days and 4 million units for four days, when the supply was exhausted.

Within a few hours after continuous intravenous injection streptomycin appeared in the blood and urine in amounts comparable to the preceding cases (chart 5), but the amounts in the feces diminished until only a trace, 145 units per gram, was present after four days. At this time typhoid bacilli reappeared, E. coli increased in numbers and on test the former were found to be just as sensitive to streptomycin as those isolated before treatment.

The result of therapy with streptomycin in this case is difficult to judge. Oral therapy was ineffective. The temperature, after intravenous injection was begun, rose even higher for a few days and then declined at a time when, unfortunately, no more drug was available. It rose again after treatment was interrupted, although the patient had no complaints. Several explanations may be offered: (*a*) The fever may represent the natural course of the relapse, (*b*) the temperature may have been increased from the sixty-fifth to the seventieth day by pyrogenic impurities in the drug and (*c*) it rose again on the seventy-second day because insufficient amounts of streptomycin were given or therapy was stopped too soon. Perhaps, as in other systemic infections, specific therapy to be effective must be given earlier in the disease, yet in case 4 a favorable effect seemed to follow treatment on the sixty-fourth day.

It is assumed that E. typhosa recovered from each patient was of the same strain, since all five were apparently infected from the same source. The bacillus obtained from both blood and feces of patients 1, 2 and 3 and from the feces of patients 4 and 5 was killed by 6 units, but not by 4 units when standard suspensions of 1,000 bacilli per cubic centimeter were incubated at 37 C. for forty-eight hours in the test tube. A laboratory stock strain of E. typhosa was found to be more sensitive to streptomycin; growth was inhibited by 1 unit.

Attempts were made to discover why in case 2 no clinical improvement occurred and E typhosa was still present in the blood, which contained 10 to 13 units of streptomycin per cubic centimeter, or twice the bactericidal amount necessary (6 units) in the test tube. The sensitivity to streptomycin of bacilli obtained before treatment began was compared with that of bacilli obtained from the blood after nine days of treatment, but both were killed by 6 units and not by 4 units. Exposure to streptomycin in the body, therefore, did not increase their resistance. A similar test of bacilli from patients 1, 4 and 5 gave the same result.

Further trial was made to see if 10 per cent normal human serum in broth interfered with the bacteriostatic effect of streptomycin as it does with penicillin,[10] but in this medium as little as 2 units but not 1 unit caused inhibition. If anything, serum enhanced the bacteriostatic effect. It is probable that other inhibitory factors are operative in the body.

Toxic Effects.—Except for a brief rise in fever a few hours after beginning intramuscular or intravenous injection in each case, which may have been caused by extraneous pyrogenic impurities, there were no other toxic effects of streptomycin. The severity of the disease may have masked mild toxic symptoms had they occurred. It is possible that the late reaction in case 4 was due to pyrogen. No exanthem developed, the erythrocytes, leukocytes and blood pressure changed no more than would be expected in typhoid, and no abnormalities appeared in the urine or feces. The urea clearance tests in each case after therapy and again two weeks later gave normal results.

Routes of Therapy.—Intramuscular injection in cases 1, 2 and 3 caused enough streptomycin to enter the blood and urine to inhibit, theoretically, the growth of E. typhosa in either fluid but failed to sterilize the blood in case 2. E. typhosa was present in the feces in all 3 cases during treatment. Traces of streptomycin estimated as between 2 and 3 units per cubic centimeter

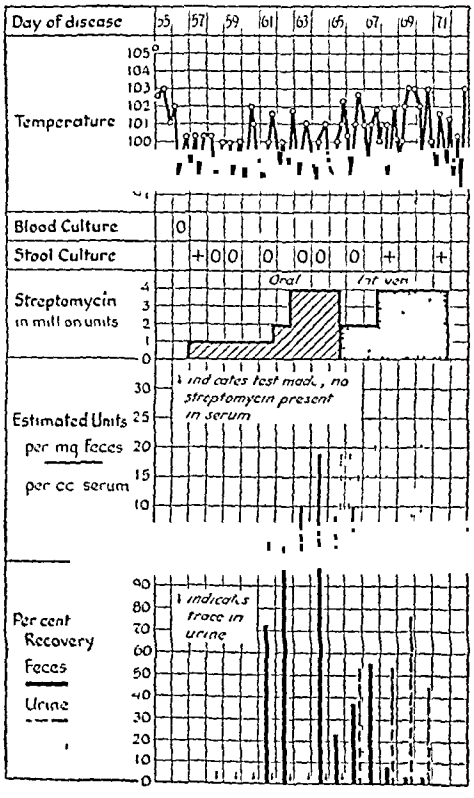


Chart 5 (case 5).—Oral therapy, 1 to 4 million units for nine days, then intravenous injection 2 million and 4 million units daily for six days. During oral therapy almost all streptomycin was excreted in the stool; only traces were present in the blood and urine. During intravenous injection the amounts rapidly increased in the blood and urine and disappeared from the stool after four days. Treatment was begun during a relapse on the fifty sixth day. It is possible that the temperature may have become normal on the seventy third day had more streptomycin been available

appeared in the spinal fluid of 1 patient given 1 million units daily.

Intravenous injection of large amounts in case 4, as expected, promptly caused large amounts in the blood and the excretion of 60 per cent of the daily dose in the urine. From 19 to 30 units per cubic centimeter of serum and from 400 to 1,000 units per cubic centimeter of urine were present. The amount in the blood was at times more than double the amount needed to kill typhoid bacilli in the test tube, and in the urine one hundred times more. These amounts are about the same as those obtained during intramuscular therapy in cases 2 and 3 and during intravenous injection in case 5. From 105 to 130 units per gram (0.1 to 0.13 unit per

10 Bigger, J. W.: Inactivation of Penicillin by Serum, Lancet 2: 400-412 (Sept. 23) 1944.

milligram) appeared in the feces. This quantity freed the feces of E. typhosa; but three days after therapy was stopped, while 40 units per gram (0.04 unit per milligram) of streptomycin was still present, the bacilli were again isolated. Apparently more than 40 units per gram of feces is necessary to inhibit growth.

Oral therapy in case 5 resulted in the excretion of almost all the streptomycin in the stool, the elimination of E. typhosa and a great reduction in the numbers of E. coli and of the odor of the feces. With doses of 1 million units, 4,000 units per gram (4 units per milligram) appeared in the feces, and with 4 million units, 19,000 units per gram (19 units per milligram). Soon after oral therapy was stopped the amounts fell rapidly and only traces were present in the feces four days later. Typhoid bacilli then reappeared and colon bacilli increased to their former numbers. The recovery of so large a percentage of the active substance proves the stability of streptomycin hydrochloride in the gastrointestinal tract. Traces appeared in the blood after oral doses of 1, 2 or 4 million units and only 0.8 to 1.2 per cent of the daily doses was excreted in the urine. In this respect the streptomycin compound used differs from certain preparations of penicillin, which when given orally may appear in adequate therapeutic strength in the blood and urine.[11]

The pharmacologic data suggest that, with the preparations of streptomycin now available, intramuscular or intravenous injection of from 1 to 4 million units daily is necessary to obtain minimal adequate bacteriostatic or bactericidal amounts (6 units per cubic centimeter) in the blood and urine for the treatment of systemic infection or urinary tract infection with E. typhosa. Oral administration of 1 million units daily apparently provided the minimal amount necessary to suppress the growth of E. typhosa and E. coli in the feces. It may be advisable in the treatment of typhoid and perhaps of other bacillary infections of the intestinal or urinary tract to give streptomycin both parenterally and orally, the latter during the disease and also in the convalescent period, to prevent reinfection and to prevent the carrier state. No data are available by which to prescribe the desirable length of time to prolong therapy after recovery. Oral administration of streptomycin may be useful as a prophylactic method under certain circumstances to prevent typhoid or other bacillary infections.

It is unsafe to judge the therapeutic value of streptomycin in the study of only 5 cases of typhoid, a disease of unpredictable severity and duration. But the presence of streptomycin in the blood, urine and feces in amounts more than enough to kill typhoid bacilli in the test tube, and the clinical improvement during therapy of 3 patients selected because of the severity of their attack, strongly suggest that the substance contributed to their recovery, if it did not actually cause it.

In case 1 gradual recovery coincided with the period of treatment and the drug may or may not have been curative. The failure of therapy in case 2, in which bacteremia persisted, cannot be explained except on the probable basis of inadequate dosage or by the presence in the body of substances inhibiting the effect of the drug. Streptomycin in the blood during bacteremia was in double the amount necessary to kill typhoid bacilli in broth culture. E. typhosa from the patients studied did not become resistant to streptomycin by exposure to it nor did serum protect the bacteria in test tube experiments. In cases 3 and 4 the abrupt end of the fever and recovery seemed to be brought about by the presence of large amounts of streptomycin in the blood. Spontaneous crisis-like recovery is unusual in typhoid. In case 5 treatment started orally on the fifty-seventh day at the beginning of a relapse had no clinical effect but cleared gram negative bacilli from the feces. Intravenous therapy caused large quantities of streptomycin to appear in the blood and was first accompanied by a rise of fever and then its fall toward normal. Its subsequent rise perhaps occurred because treatment could not be continued.

From the evidence at hand in 5 treated typhoid patients it can be said at present that streptomycin offers much promise as a substance capable of sterilizing the blood stream and urinary tract when injected in sufficient amounts parenterally, and of eliminating typhoid bacilli from the feces when given orally. Recovery of 3 patients during therapy suggests the therapeutic effectiveness of streptomycin for typhoid. In the present study streptomycin was not available until the epidemic was advanced and treatment was begun late in the disease. Perhaps earlier treatment in adequate parenteral and oral dosage would have provided better results.

Preparations of streptomycin are more stable than of penicillin, but in comparison with penicillin its umitage and bulk are far greater. When it is further purified or concentrated, streptomycin will probably not be any more toxic than penicillin. It is probable that substances are present in the body which inhibit to some extent the influence of streptomycin on E. typhosa.

SUMMARY

Streptomycin, a nontoxic antibiotic substance derived from Actinomyces griseus, when injected intravenously or intramuscularly in doses of from 1 million to 4 million units daily appears in the blood and urine in patients with typhoid in amounts theoretically sufficient to kill E. typhosa. Small quantities are excreted in the feces. When given orally, only traces appear in the blood and urine, and most of it is excreted unchanged in the feces in quantities excessive to suppress E. typhosa and E. coli. Both parenteral and oral therapy seem to be desirable in treating typhoid, the one to control systemic and urinary tract infection, the other to sterilize the feces, to prevent reinfection and to avoid the carrier state. There is evidence that different strains of E. typhosa vary in their resistance to streptomycin, but there is no evidence here of the development of increased resistance to streptomycin during exposure to it in the body.

Of 5 patients treated parenterally with streptomycin, recovery took place in 3 during treatment.

11. Libby, R. L.: Oral Administration of Penicillin in Oil, Science **101**: 178-180 (Feb. 16) 1945. György, P., and others: Administration of Penicillin by Mouth, J. A. M. A. **127**: 639-642 (March 17) 1945.

Sneezing.—Aristotle wrote that a sneeze was regarded as divine, and the Greeks of that age said "Zeus preserve you" to a sneezer. The corresponding Latin expression, according to Petronius Arbiter, was "Salve." The old Jewish formula is "Chayim Tobim" ("Good Life"), and the Moslem says "Sihhaten" ("twice health"). The modern "God bless you," "A vos souhaits," "Gesundheit," "Salud" and the like are relics of ancient superstition based on the idea that spirits are hovering everywhere.—Gordon, *Benjamin Lee: The Romance of Medicine*, Philadelphia, F. A. Davis Company, 1944.

PREGNANCY COMPLICATING DIABETES

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Recent published reports indicate that obstetric and diabetic clinics now agree that whereas the maternal mortality in diabetic pregnancies has been low fetal mortality has been high. The past fetal mortality rates have ranged from 30 to 60 per cent, depending on the length of pregnancy observed. If the study has been limited to the third trimester, the usual rate has been 30 per cent. If the entire period of pregnancy has been reported, it has been as high as 60 per cent.

The long period of observation of diabetic pregnancies by obstetricians and internists has revealed four salient abnormalities. These four abnormalities may be classified simply as first, maternal; second, obstetric; third, chemical, and fourth, fetal. My purpose in this discussion is to evaluate these abnormalities as they have occurred in a series of 181 consecutive diabetic pregnancies studied at our clinic between January 1936 and June 1944. In this series of cases there were one maternal and twenty-nine fetal deaths.

The prepregnancy abnormalities are two: vascular disease and hypo-ovarianism. Vascular disease is almost inevitable in young diabetic patients in whom the duration of diabetes exceeds fifteen years. Such patients comprise a large percentage of our own obstetric group and will soon comprise obstetric diabetic groups generally. It is now well established that arteriolar sclerosis as well as atherosclerosis occurs in diabetes. We find such involvement in the kidneys and eyes, as well as the better known lesions in the heart, aorta, the vessels of the extremities and the brain. Today nephritis has replaced sepsis and is replacing coma as a cause of death of young diabetic patients.

Ovarian failure is indicated by an increase in the serum level of follicle stimulating hormone, by amenorrheas and metrorrhagias. All of these are observed more and more frequently in young diabetic women. Atrophy of the ovary with poor follicular development is the only consistent pathologic change reported in the endocrine glands other than the changes observed in the pancreas itself. Thus, in spite of an outward appearance of youth and well-being, in obstetric diabetes we are dealing too often with a physically and gynecologically aged individual.

The abnormal obstetric course of pregnant diabetic patients is well known. The striking abnormalities are five: the easy, early spontaneous interruption of the pregnancy occurring in at least 25 per cent of the cases, the high incidence of preeclamptic toxemia occurring in 36 per cent, breech presentation in 33 per cent, uterine inertia common and failure of lactation in nearly 100 per cent. A normal obstetric course in patients with diabetes of long duration is almost conspicuous.

The chemical abnormalities which concern us here are (1) the low renal threshold for glucose, (2) water retention and (3) the imbalance of the sex hormones of pregnancy. The low renal threshold for glucose, which is physiologic for pregnancy, complicates the disease diabetes. The loss of glucose in the urine may exceed 100 Gm. per day, even with nearly normal levels of blood sugar. If uncorrected, this predisposes the patient to acidosis and, if overcorrected, to insulin hypoglycemia. Profound disturbance of water balance characterizes pregnancy in diabetic patients. This is shown clinically by the great gain in weight, visible maternal edema, hydramnios and fetal edema. An imbalance of the sex hormones of pregnancy, fall of pregnandiol and rise of chorionic gonadotropin has occurred in 70 per cent of the 181 cases under discussion here.

Fetal abnormalities are physical, chemical and pathologic. A birth weight above the average for the period of gestation has been found in 80 per cent of the infants of diabetic mothers. The size of the infant appears to be due to three distinct factors: obesity, edema and splanchnomegaly, the liver, spleen and heart being especially involved. The second physical abnormality is the high incidence of congenital defects usually involving tissue which is mesenchymatous in origin.

On the first postnatal day respiratory, sugar and temperature regulatory difficulties may be encountered, and forty-eight hours after delivery the universal occurrence of jaundice.

The pathologic characteristics of the infants of diabetic mothers are almost diagnostic of maternal diabetes. They are enlargement of the liver, spleen and heart, excessive hemopoiesis of the liver and spleen and islet hyperplasia.

All of these four abnormalities, maternal, obstetric, chemical and fetal, contribute to the complications of obstetric diabetes. Some of them we can exclude as not being of prime importance and others we can include as being of prime importance. Thus the diabetic emergencies coma and hypoglycemia have played no role in the unfavorable fetal outcome in this series of patients, and congenital anomalies contributed to a fetal death *but once*. *In this series imbalance of the sex hormones* of pregnancy appears to be the most important single harmful factor. In this series it is related to premature delivery, toxemia, disturbance of water balance and the abnormal fetus. Thus, when the hormonal balance was normal, as it was in 52 of our 181 cases, the incidence of premature deliveries was zero, the incidence of toxemia of pregnancy 2 per cent, and the *fetal survival* approached that of nondiabetic pregnancies, 96 per cent. In contrast to this experience, in 38 cases in which an abnormal hormonal balance was observed premature delivery occurred in 40 per cent, preeclamptic toxemia occurred in 50 per cent and the fetal survival was 50 per cent. Since the imbalance of the sex hormones of pregnancy occurred in abnormal clinical cases with poor fetal survival and the production of a characteristic fetus, an attempt was made in 91 cases to correct the imbalance, to see if premature deliveries could be prevented, toxemias altered or averted, fetal survival raised and a normal fetus produced. In the group so treated the incidence of premature delivery fell to 15 per cent, preeclamptic toxemia appeared to be altered and prevented and fetal survival rose to 90 per cent. It is difficult to measure the effect of hormonal correction on the incidence of toxemia in this series of cases, for the early ones were treated only after symptoms of toxemia had developed. In the past few years the therapy has been inaugurated on chemical evidence only and the incidence of toxemia in the latter group has fallen to 5 per cent.

From this study the rules for the management of the pregnant diabetic patient in our clinic have been evolved. Obviously not all of our cases have been treated in the same fashion. This management is

From the George F. Baker Clinic of the New England Deaconess Hospital, Elliott P. Joslin, medical director.
Read before the Section on Obstetrics and Gynecology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

diabetic, obstetric, endocrine and pediatric. The diabetic diet should be liberal in calories, 30 per kilogram of actual body weight, high in protein, 2 Gm. per kilogram of body weight, and adequate in carbohydrate, up to 200 Gm. daily, 150 for the mother and 50 for the fetus. Because of the low renal threshold multiple small doses rather than a single large dose of insulin have been employed. Sodium chloride intake is restricted and in abnormal cases ammonium chloride is administered.

The delivery in the abnormal cases is premature, the time of choice being the latter part of the thirty-seventh or the early part of the thirty-eighth week. Cesarean section for this particular group is my personal choice. The anesthesia is spinal and sedation is prohibited.

Various forms of endocrine therapy and various routes of administration have been used in this series of 181 cases. The best and most economical to date is diethylstilbestrol intramuscularly and progesterone intramuscularly. The average daily dose of each is 15 mg. The infant requires more than average drainage, mechanical stimulation, dehydration, heat and oxygen.

COMMENT

The reason for the abnormal clinical course of diabetic pregnancies may be sought in the abnormal physical, endocrine and chemical background of the diabetic woman. It does not seem illogical to argue that these make her liable to a disturbance of the sex hormones of pregnancy, which imbalance accounts for the high incidence of early, spontaneous, interrupted pregnancies, preeclamptic toxemia, uterine inertia and failure of lactation. Not only does this hormonal disturbance alter the course of pregnancy, but it may be responsible for the production of the abnormal fetus, contributing to fetal edema, splanchnomegaly and excessive hemopoiesis. The fetal survival and the clinical course have undergone a profound change with substitutional estrogen and progesterone therapy. Spontaneous correction of the imbalance can occur. Many women without diabetes can probably compensate and correct such an imbalance. The diabetic patient with a suboptimal hormonal production and metabolism can rarely correct this imbalance spontaneously.

CONCLUSION

Maternal survival in a series of 181 consecutive diabetic pregnancies was 99.5 per cent. Fetal survival for the total series was 84 per cent, but it varied with the occurrence of normal or abnormal balance of the sex hormones of pregnancy. If the sex hormones of pregnancy were abnormal and uncorrected, fetal survival was 50 per cent; if they were abnormal but corrected, 90 per cent; and if they were normal, 96 per cent.

81 Bay State Road.

ABSTRACT OF DISCUSSION

Dr. Henry Dolger, New York: I am not an obstetrician, but anybody who has treated diabetes has been appalled by the fetal mortality among diabetic patients. At the Mount Sinai Hospital the results in the clinic in the past four years have been most unsatisfactory, with not a single fetal survival. None of the patients received endocrine therapy and despite careful control of the diabetes they all went on to ultimate eclampsia or to spontaneous delivery of a macerated fetus. Dr. White's paper is important for two reasons: First, it is a remarkably large series to be produced by one group (I believe that Dr. White and the obstetrician and pediatrician attended each one of the patients). Second, so many of these patients have been delivered spontaneously. There are some who feel that most diabetic patients will deliver spontaneously with little or no attention to the diabetes. In Chicago some claim they can deliver a living baby to any diabetic patient just by cesarean section in the thirtieth week, which is quite radical. On the other hand Miller, Hurwitz and Kuder published a most pessimistic article regarding pregnancy in diabetes. They stated that the fetal and neonatal mortality among diabetic patients was four to five times that among nondiabetic women and that this increased fetal and neonatal mortality was evident even twenty years before the onset of the diabetes. This could not be corroborated by analysis of our clinic material. We found that before patients developed the clinical picture of diabetes they did not have any increased fetal or neonatal mortality, and this, I believe, agrees with Dr. White's data indicating that women are normal in their childbearing capacity until they develop diabetes. The concept of hormonal imbalance is not yet generally accepted as the etiologic factor in abnormal diabetic pregnancy. Nevertheless Dr. White's successful results speak for themselves and have not been duplicated anywhere. It may be that there is more to this than just endocrine therapy—I believe that an important factor is the close cooperation of internist, obstetrician and pediatrician, which exists so uniquely in Dr. White's clinic.

Dr. William J. Dieckmann, Chicago: I am familiar with the work from Dr. White's and Dr. Joslin's clinic, and I have no question as to their treatment of diabetes. I do question the termination of pregnancy early. My associates and I have not been practicing it, and while our fetal mortality is rather high in diabetes, it is not as high as 50 per cent, as I recall Dr. White gave in the untreated cases. We have not used any endocrine therapy for our patients. When Dr. White some years ago, working with the Smiths, first suggested the use of endocrine therapy, I believe I asked her if it was not the excellent antepartum care which she and the obstetricians in charge were giving these patients rather than the endocrine therapy. I believe she will answer in the negative, but I hope in closing that she will elaborate on this point. I believe the only other clinic in the country that feels as she and her group do with regard to premature termination of pregnancy is Dr. Wilder of the Mayo group. If we find severe toxemia developing in the diabetic patient we do terminate prematurely, but in the well treated diabetic patient who presents no evidence of toxemia we do not terminate before term, and then we prefer the patient to go into labor of her own accord.

Dr. R. Carrasco-Formiguera, Puebla, Mexico: There is only one point I wish to stress, about people being or not being normal and the correction of diabetes before pregnancy. It has been my experience (and I shall be glad to know what Dr. White's experience and opinions are in these people) that the fact has been observed of abnormally big babies having been born to a great number of diabetic patients. That was noticed so far back as twenty or more years before diabetes was discovered. This happens in such a large proportion of the cases that it cannot be devoid of significance. I am almost sure that this significance has something to do with the relation between the diabetes and the endocrine balance.

Dr. Priscilla White, Boston: As far as the good results or relatively good results in our clinic being due to the patients' antepartum diabetic care, I do not really think that is the answer because at regular intervals, for financial reasons, I am forced into a control period when the patients will receive exactly the same medical and obstetric care without endocrine treatment, and our statistics fall back to the lower levels we observed prior to 1938. Whatever produces diabetes is probably a long, slowly acting mechanism, so that it is logical to believe that some diabetic women will have abnormal pregnancies prior to diabetes probably for much the same reason that exists after the onset of diabetes. I cannot make a comparison of such statistics in our own series of patients because our obstetric practice is largely derived from our former juvenile diabetic patients, and so the first pregnancy is usually a diabetic pregnancy.

Clinical Notes, Suggestions and New Instruments

SEVERE ASTHMA: DELAYED SENSITIZATION TO PENICILLIN

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Penicillin has been widely acclaimed for its lack of unpleasant or dangerous side effects, so that occasional reactions probably due to it may be overlooked as coincidental. Several references to allergic manifestations accompanying or following the administration of penicillin call attention to the occasional simulation of serum sickness.[1] From the published accounts it appears that not one of these reactions has been alarming. It is our purpose in reporting the following case to describe an allergic reaction of unusual severity:

G. L. S., a white man aged 24, was admitted to the Hampton Roads Medical Center, Norfolk, Va., on July 28, 1944 for the treatment of primary syphilis. Aside from the penile ulcer and inguinal adenitis, the complete physical examination was normal. Family and past histories revealed that neither he nor any close relatives had suffered from allergic disease, even in mild form. On admission, dark field examination of the lesion disclosed Treponema pallidum, and the Kahn standard precipitation test for syphilis was positive (80 Kahn units). The hemoglobin and the white blood cell count were normal, and no eosinophils were reported in the differential count. The urine was cloudy and contained a trace of albumin, 45 pus cells and 1 red blood cell per high power field but no casts. The cerebrospinal fluid was normal.

The patient was treated for eight days with penicillin dissolved in 5 per cent dextrose in distilled water. The total dose was 2,400,000 units divided into sixty doses of 40,000 units administered intramuscularly at intervals of three hours. Two batches of penicillin were used, each the product of a different manufacturer, and the solvent was a solution commercially prepared for parenteral use. At the end of treatment the penile ulcer was epithelized, the urine normal and the serologic test for syphilis positive (20 Kahn units). The patient had experienced no unpleasant symptoms during the treatment and was discharged from the hospital on Aug. 7, 1944 clinically and symptomatically improved.

Forty-eight hours later, on August 9, he was readmitted because of asthma, giant urticaria, fever and malaise which had begun that morning. He was very uncomfortable, complaining chiefly of the intense pruritus. There were large wheals scattered over the entire body, including the palms and soles, so that he could not make a fist and walking was painful. Auscultation revealed generalized wheezing rales throughout both phases of respiration. The heart sounds were not clearly heard because of the asthma but did not seem abnormal. The temperature was 102 F., pulse rate 110 and respiratory rate 20.

Epinephrine in oil 1 cc. intramuscularly twice daily on August 9 and August 10 produced a gratifying subsidence of symptoms except for a very mild exacerbation each evening. There was a remarkable association between the height of the fever and the intensity of urticaria and asthma. On the evening of August 11 the symptoms were worse and the temperature was rising. Reexamination at that time disclosed patches of urticaria, a reddened tongue and injected pharynx, but no abnormality of the tonsils, the chest full of musical rales, generalized adenopathy and tenderness of the entire upper abdomen. The spleen was not identified. Following additional epinephrine and sedation the patient spent a comfortable night and throughout the next day appeared to be improving rapidly and desired to return home.

Suddenly, shortly before 8 p. m. on August 12 he had a seizure of coughing and when examined a few minutes later was found to have breath sounds obscured by wheezing rales. The temperature was 103 F. and the pulse rate 104. He rapidly became weak, the pulse rate rose to 150 and the blood pressure could not be measured. He became comatose and mildly cyanotic and the rectal temperature rose to 105 F. He was not expected to survive the attack but responded dramatically to 1 cc. of aqueous epinephrine followed by 50 cc. of 50 per cent dextrose intravenously. Oxygen was not used because it was not available at that time. By 10 p. m. he was fully responsive, the temperature had begun to decline and the blood pressure was 140/80. His only complaint was weakness and intense thirst. He slept well the remainder of the night, and in the morning the temperature and pulse were normal and there was only an occasional rale on deep inspiration. The heart sounds were normal. The patient felt well and from then until discharge on August 15 he had no further allergic symptoms but was given phenobarbital ½ grain (0.032 Gm.) and ephedrine sulfate ⅜ grain (0.024 Gm.) prophylactically. Laboratory work was not available during the worst of the attack, but several hours after it the only unusual feature was an eosinophilia of 8 per cent.

On August 14 a scratch test was performed. Neither of the two lots of penicillin with which the patient was treated was still available for use in skin testing, but the product of a third pharmaceutical company, in a concentration of 20,000 units per cubic centimeter, gave a negative result.

One cannot infer from this experience that the sensitizing agent was the active principle of the commercial penicillin. It does suggest that there are substances in commercial penicillin which are capable of producing sensitization leading to allergic manifestations of alarming intensity. We were impressed by the delay in development of sensitivity and the remarkable resemblance of the clinical picture to that of serum sickness. As pointed out by Feinberg,[2] refinements in manufacture will allow the production of the active therapeutic agent freer from foreign substances, so that sensitization may be still more unusual in the future.

1. Crieg, L. H.: Allergy to Penicillin, J. A. M. A. **126**: 429 (Oct. 14) 1944. Lyons, C.: Penicillin Therapy of Surgical Infections in the U. S. Army, ibid. **123**: 1007 (Dec. 18) 1943. Feinberg.[2]

2. Feinberg, S. M.: Penicillin Allergy: The Probability of Allergic Reactions in Fungus-Sensitive Individuals, J. Allergy **15**: 271 (July) 1944.

DELIVERY OF QUADRUPLETS BY CESAREAN SECTION UNDER CONTINUOUS SPINAL ANESTHESIA

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The incidence of quadruplets varies in different countries. Guzzoni in 1889 published an analysis of 50,000,000 births in which quadruplets occurred once in 757,000 births. In 1895 Hellin, whose work was based on South German statistics, suggested the following easily remembered ratios: twins once in 80 births, triplets once in 80 × 80 (6,400 births and quadruplets once in 80 × 80 × 80 (512,000) births. Greulich [1] published in 1930 a study of more than 120,000,000 births reported from twenty-one countries between 1915 and 1925. He found that quadruplets occurred once in 670,734 (87.5 [2]) births. According to these statistics about five sets a year should be born in the United States. The report here is of quadruplets born on Nov. 1, 1944 by cesarean section. A survey of the literature fails to reveal any previous quadruplets in which cesarean section was performed.

The history of the mother is important, as it reveals the indication for the cesarean operation. Mrs. K. C., white, aged 31, was delivered by cesarean section two years before, following a severe, rapid abruptio placentae. She had a normal antepartum course in this, her first, pregnancy. On Sept. 8, 1942, when only two weeks from term, she developed severe pain

From the Lying-In Unit of the Pennsylvania Hospital.

1. Greulich, W. W.: The Incidence of Human Multiple Births, Am. Naturalist **64**: 142 (Jan.-Feb.) 1930.

in the abdomen. Despite immediate cesarean section the baby was stillborn, and the placenta separated with a large retroplacental clot and much infiltration of blood throughout the uterus, both tubes and ovaries, and extending out to the lateral pelvic walls. The uterus contracted well and was closed without complications.

Her postpartum period was quite stormy and her temperature remained elevated from 104 to 106 F. for twelve days. She eventually recovered and was discharged four weeks after operation.

In this pregnancy the last menstrual period was March 12, 1944, with the expected date of confinement Dec. 19, 1944. During the first four months of the antepartum period there was considerable nausea and vomiting and it was necessary to hospitalize the patient for a week in June for pernicious nausea. She responded well and was discharged improved

In August the uterus was found to be larger than normal for the duration of pregnancy, the fundus extending three

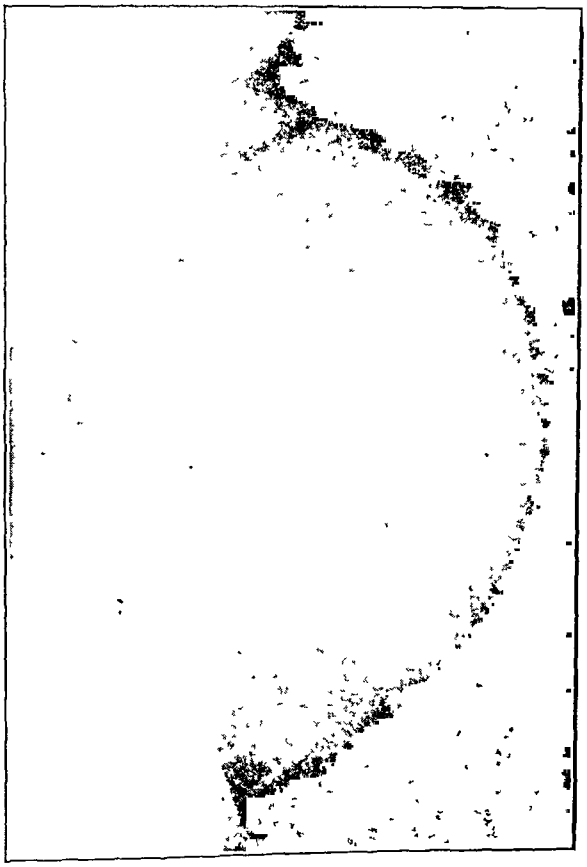


Fig. 1.—Appearance of four fetuses

fingerbreadths above the umbilicus, and x-ray examination revealed the presence of four fetuses (fig. 1). She was immediately hospitalized and remained there until three weeks after her delivery. During this time her uterus enlarged rapidly, until near the termination it was difficult for her to turn from side to side. She was given a high vitamin diet and progesterone 5 mg. every other day, plus iron and extra vitamins.

On October 24 she began to have some irregular uterine contractions and the uterus became quite tense. This continued for several days, and repeated x-ray examinations gave the estimated weight of the babies as approximately 3 pounds (1.3 Kg.) each. Because of the previous cesarean section and the stormy convalescence, it was felt that possible rupture of the uterus might be imminent and that any labor might precipitate this condition. Another cesarean section offered the safest procedure to avert it.

The choice of anesthesia was considered important, and continuous, fractional, spinal was chosen for its low toxicity and safety and as it does not cause narcosis or anoxemia to the baby. This was especially important, as one of the great causes of death of premature infants at birth is anoxemia from narcotizing anesthetics.

Accordingly, on November 1 an initial dose of 40 mg. of procaine hydrochloride was injected into the second lumbar interspace in 2 cc. of spinal fluid. The anesthetic was prompt and of the rapidly ascending type, reaching the clavicles in a period of five minutes. The maternal blood pressure dropped from 120/80 to 80/60 (fig. 2). At this moment 4 cc. of spinal fluid was withdrawn through the continuous spinal apparatus. Fifty mg. of ephedrine sulfate was administered intravenously along with a simultaneous clysis of glucose in isotonic solution of sodium chloride. The pressure promptly returned to 110/70 in eight minutes. A classic cesarean section was then performed. One placenta was on the anterior wall, and it was necessary to go through it to reach the babies. The first baby was delivered as a bilateral footling, the second also as a double footling, and the third as a vertex. These were all female babies and were enclosed in a single sac. The fourth infant was a male and was in a separate amnion with a small separate placenta (fig. 3). It was delivered as a double footling. The intravenous administration of 1 cc. of pitocin in 5 cc. of isotonic solution of sodium chloride allowed the uterus to contract well and the placentas were removed, with a measured blood loss of 300 cc. A routine closure of the uterus in three layers with continuous sutures then followed. The abdominal wall was also closed with continuous sutures in the peritoneum and fascia, and the skin was closed with clips. The maternal blood pressure remained at 120/80 throughout the operation.

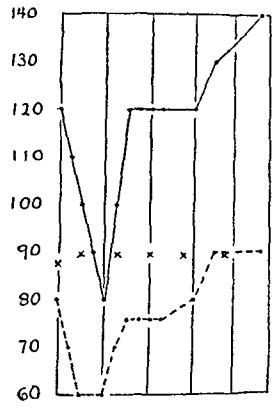


Fig. 2.—Systolic blood pressure (solid line), diastolic (broken line) and pulse (X's) Fifteen minute spaces

The birth weights of the babies were 3 pounds 14 ounces (1,758 Gm.), 3 pounds 9 ounces (1,616 Gm.), 3 pounds 1 ounce

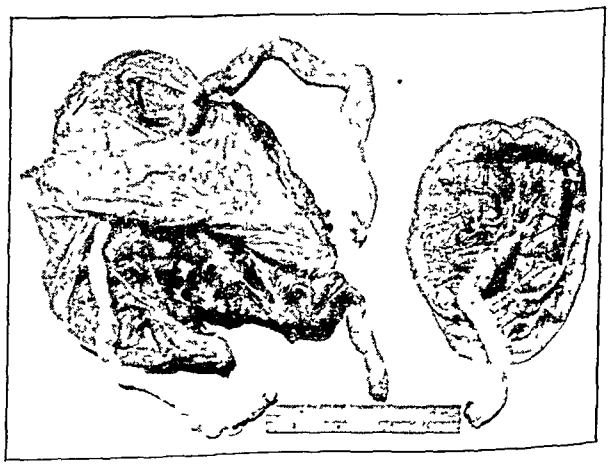


Fig. 3.—Separate amnion and placenta of male fetus and amnion and placenta of three female fetuses.

(1,389 Gm.) and 2 pounds 14 ounces (1,304 Gm.). They all breathed and cried instantly on removal from the uterus and showed good muscle vigor. They were placed in separate incubators at once and kept there for one month. Gradually the oxygen was turned off and the incubators were opened and then the babies were placed in premature hot beds. At the end of six weeks their respective weights are 4 pounds 15 ounces (2,240 Gm.), 4 pounds 14 ounces (2,211 Gm.),

4 pounds 6 ounces (1,984 Gm.) and 4 pounds (1,814 Gm.). Their feedings have consisted of breast milk from a milk bank stationed in the hospital.

COMMENT

The birth of quadruplets is reported here because of the unusual type of delivery and for the interest attached to the anesthetic employed. The safety factor of the continuous spinal anesthesia is emphasized, as shown by the prompt withdrawal of 4 cc. of spinal fluid containing some of the procaine, and the return of the maternal blood pressure to normal. In addition, the lack of narcosis or anoxemia was a vital factor in the healthy condition of the babies at birth and enabled them to breathe and cry at once without resuscitation Likewise the anesthetic contributed in a large measure to the rapid convalescence of the mother. She was able to eat a soft diet of food a few hours after delivery and showed no nausea or postoperative abdominal distention.

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Special Articles

The following article is republished from the Epidemiological Information Bulletin *of the Health Division of the United Nations Relief and Rehabilitation Administration. It represents the best present opinion on the outlook for the development of epidemics in Europe.*—EDITOR.

THE EPIDEMIC OUTLOOK IN EUROPE

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The war in Europe is apparently drawing to a close. During the more than five years of destruction and privation accompanied by forcible or voluntary displacement of a large fraction of a populous continent's inhabitants there has been no pandemic of first magnitude. Gratifying though this is, the fact must not be taken to mean that the epidemic situation is as satisfactory as it was before the war, nor as indicating a favorable outlook for the first years of transition to stable peace. The absence of real disasters may be traced to the low endemic level of most diseases during the years preceding the war in conjunction with the advance of preventive medicine and the application on a large scale of its principles. On the other hand, caution against over optimism is dictated by the disastrous aftermath of World War I.

During the four years of World War I Europe witnessed a rise of the endemic level of infectious diseases, and there were various pestilential outbreaks, such as that of cholera in Galicia in 1915, which caused over 17,000 deaths. A devastating typhus epidemic broke out in Siberia in 1915, causing 150,000 deaths in six months, and there were severe typhus epidemics in Egypt. Moreover, typhus caused several hundred thousands of deaths in Rumania during the winter of 1917-1918. There were extensive smallpox epidemics in various countries. Nevertheless it was after the cessation of hostilities and following the disintegration of established government over wide areas that typhus, relapsing fever, cholera, smallpox, malaria, dysentery and typhoid swept across eastern Europe, leaving millions of victims, and made serious inroads also in southern and central Europe. Whether directly due to conditions of war or not, it was at the time of the armistice that the influenza pandemic struck, causing in less than half a year twenty million deaths throughout the world.

With World War II entering its final stage, civil administration is now in a fluid state in many areas and refugee movements are gathering momentum. These conditions, propitious to the propagation of epidemics, are likely to grow worse during the current year. They will further complicate the return to their native countries of millions of prisoners of war, shanghaied laborers, forcibly displaced people and other uprooted men, women and children, in themselves constituting grave potentialities as far as epidemics are concerned.

Appreciation of the problems at hand may be based on (1) the trend of epidemic diseases in recent years in areas for which fairly accurate epidemiologic data are available, (2) fragmentary information regarding the areas where no precise records of recent date exist and (3) various estimates of displaced persons. The latter problem, which has other angles than the epidemiologic, will not be dealt with in this summary.

It may be said at once that among the five pestilential diseases covered by the International Sanitary Conventions only louse borne typhus presents an immediate and grave danger to Europe. Cholera, which is a serious problem in Asia, has not appeared within recent years west of India and Afghanistan. Yellow fever seems hardly to have spread during the war and has not been observed north of the North African desert belt. It should be added however that, had no precautions been taken, the extension of these diseases would probably have been different.

As far as we know, plague has not been introduced into any European port during the war. Nevertheless this may happen at any time, as it did after World War I, because several large ports in North Africa and the Near East have become infected. The most important nearby foci are in the Suez Canal Zone and at Dakar. Although they are quiescent at present on account of the season, these foci may flare up again. Meanwhile infection has spread to other ports, such as Haifa and Jaffa in Palestine, Ferryville in Tunis, and Algiers and Oran in Algeria. The old plague centers in Morocco, especially at Casablanca, and in the Azores Islands have also shown renewed activity in recent years. The outbreak in the Suez Canal Zone from November 1943 to September 1944 was the worst on record, 712 cases being reported as against 359 in 1917. There were over 500 plague cases at Dakar in 1944, which is equal to the number notified in 1931, the worst year since 1920.

Europe has remained practically free from smallpox during the war except for the 1944 outbreak in Sicily and southern Italy and an extension of the Near East epidemic into European Turkey and the neighboring parts of Greece. The latter epidemic, which was of the classic type, has now come to an end. The Italian epidemic, the first case of which appeared in March 1944, has centered at Palermo and at Naples and vicinity. Although there have been some 1,500 cases all told, the epidemic is apparently not of prime importance because all cases have been of the mild type. Only six deaths were reported, all among debilitated children.

In this connection it may be of interest that mild type smallpox seems to have gained ground in French North Africa, while the classic type still prevails in the Near East. In the Iberian peninsula, where smallpox was widespread during the early years of the war, there are now only sporadic cases of variola minor.

The most encouraging element in the whole epidemic situation is that there were only 3 cases of smallpox in 1944 (7 cases in 1943) among the more than 200 million inhabitants of continental Europe outside the Soviet Union and the Mediterranean peninsular areas. In 1919 there were nearly 50,000 cases of smallpox in this area.

Typhus presents a far greater danger than smallpox. In certain areas severe epidemics are already under way, and in much larger areas the danger is potential because for several years there has been an insidious spread of sporadic infection throughout central Europe. It should also be remembered that North Africa and the Near East are just emerging from an epidemic wave extending from Morocco to Iran, which has been among the worst on record in several of the countries.

The Soviet Union was the principal sufferer from typhus following World War I but has apparently succeeded in keeping this disease under close control during the present war. The publication of records was discontinued, however, a couple of years before the outbreak of the war. In Poland, typhus is known to have been on the increase during the German occupation, but numerical indications are not available for the last four years.

Cases of Certain Epidemic Diseases Reported in Twelve Continental European Countries

Disease	Median, 1928-1938	Cases, 1943	1943 Incidence in Units of Pre-war Level
Cerebrospinal meningitis*	2,561	7,99	3.1
Poliomyelitis	4,546	11,292	2.5
Typhoid	28,681	44,316	1.5
Dysentery**	10,965	23,110	2.1
Diphtheria	168,354	501,911	3.0
Scarlet fever	176,276	566,398	3.2

* In fifteen countries.
** In eight countries.

There are three main epidemic foci of typhus in southeastern Europe: the Rumanian with center in Bessarabia and eastern Moldavia; the Subcarpathian with center in Subcarpathian Ruthenia and extending into northeastern Hungary; the Croatian with center in Bosnia and probably extending into Serbia. All of these foci were in rapid evolution last spring, and there was a serious epidemic in Croatia and Bosnia extending late into the summer. Information for recent winter months is not available for the Subcarpathian area. An epidemic reminiscent of the World War I disaster has broken out in Rumania. Unofficial information gives 30,000 cases in Moldavia alone, and the epidemic is likely to increase up to April or May. So far, this is undoubtedly the most serious epidemic outburst of any disease during the present war.

In recent years the endemic level has been rising also in Bulgaria and Greece, and typhus was epidemic in Turkey in 1943. On the other hand, the typhus epidemic which visited Spain in 1941 and 1942, causing over 11,000 cases, has now been reduced to an endemic level. The outbreak in and around Naples during the winter of 1943-1944 (somewhat over a thousand cases all told) was brought under control in the course of a few months, and at present there is hardly any typhus in Italy.

In Germany, where typhus was formerly unknown, there were over 5,000 cases in 1943, mostly among foreign workers. The cases were spread over the entire area of the reich as far west as Rhineland. Information for recent months is not available, but present conditions obviously favor the spread of infection.

The typhus free area of the European continent now consists only of the three Scandinavian countries, Finland, Switzerland and, aside from relatively rare sporadic cases, the Netherlands, Belgium and France.

With the exception of an outbreak in Tunis in March and April 1944 and the tick borne cases in Spain, relapsing fever, which followed on the great typhus epidemics of 1919-1921, has not been heard from during the present war.

The aforementioned diseases specially dealt with in the Sanitary Conventions, namely cholera, yellow fever, plague, smallpox and typhus, are international quarantine diseases not merely because they are the most dangerous but also because they are of limited geographic extension and their introduction into uninfected areas is consequently feared. Various other epidemic diseases, such as typhoid, diphtheria, scarlet fever and influenza, are numerically more important in Europe, but they are normally endemic in all countries. International transmission thus becomes of importance only when they develop particularly virulent strains locally or attain an unusually high incidence.

Apart from the menace of typhus, the most significant fact of the epidemic situation is that the incidence of all the common infectious diseases has doubled or trebled in that part of the European continent for which statistics are available, and this means chiefly among the resident population of the less desperately afflicted countries. The accompanying table, which covers mainly central, northern and western Europe, is based on the regular official returns of twelve countries where the public health services have never ceased to function and where the statistics may be considered reasonably accurate. Returns for 1943 have been used because the 1944 data are not yet complete. The prewar data used for comparison cover a period sufficient to include unfavorable years.

The significant fact brought out by the table is that there has been a heavy increase in the incidence of not merely some but of all these diseases. It is unusual that entirely unrelated diseases should reach a peak during the same year and on a whole continent. The increase has probably been even greater than shown because reporting is likely to have deteriorated in most countries, fewer physicians being available to notify civilian cases than in peacetime. Furthermore, there are excluded from the statistics the huge number of men in the armed forces and, in several countries, also certain categories of nonresident population. There is thus a greatly increased amount of infection of all kinds, which doubtless results also in an increased ratio of carriers. It is in this polluted atmosphere that the war will have to be wound up.

Efforts to control typhoid have been partly successful, and the increase of this disease has been the least spectacular among those shown in the table. However, the table does not include Italy, which in 1942 was responsible for one half of the typhoid cases reported in all of Europe outside the Soviet Union and the Iberian peninsula. The rate of increase is further lowered by the returns for Hungary, where the prewar level has been maintained by systematic vaccination. In other central European countries the incidence of typhoid has doubled, and in France it has almost trebled.

Typhoid remains as rare in the Scandinavian countries as in the United Kingdom; in a general way its incidence increases from north to south. While in Denmark and Sweden there was less than 1 case per hundred thousand inhabitants in 1943, there were 6 in the Netherlands, 10 in the prewar Germany, 27 in Bohemia-Moravia, 36 in France (highest in the south), over 200 in Spain and probably not less in Italy, and 133 in Greece, with only a fraction of the actual cases reported. Switzerland remained an area of low incidence. The problem of typhoid will naturally become more acute in areas where actual fighting has caused destruction of water supplies and the herding of refugees.

Paratyphoid fevers, on the other hand, are at least relatively more prevalent in the northern part of Europe, where cases are from two to five times more numerous than typhoid cases. In prewar Germany the score is about even. In southern Europe, on the other hand, paratyphoid cases are only a small fraction of the total enteric fever group.

Dysentery is perhaps to be feared even more than typhoid fever during the immediate postwar period. The figures for this disease in the table represent only the cases actually reported in greater Germany, Bohemia-Moravia, Hungary, Switzerland, the Netherlands and the three Scandinavian countries, and reporting of this group of diseases is everywhere defective. The fourteen-fold increase of dysentery cases over the prewar level which took place in the Netherlands suggests that only a fraction of the cases occurring elsewhere in central Europe have been notified. Fortunately the type most commonly encountered among the resident civilian population is the mild Sonne E. In the German army, however, Flexner and Hiss Y have prevailed, and there have been outbreaks of the Shiga type among prisoners of war. Their return from central Europe may therefore give rise to epidemics of severe types, especially should such return occur in the autumn. The spread of winter dysentery for some years past in the North Sea and Scandinavian areas is a new development the significance of which is not yet clear. Amebic dysentery seems nowhere to have attained epidemic proportions and is unimportant in northern and central Europe.

The "new" disease of this war has been epidemic jaundice (infectious hepatitis). From an obscure existence among the garrison of Malta and in a few German army units, it assumed proportions to interfere occasionally with military operations and spread among the civilian population from the Libyan desert to the North Cape. The disease was really not new but was known already from World War I, when at times it was confused with Weil's disease. It occurred also among civilians in various countries but had never been considered capable of setting up veritable epidemics. The reported incidence has for each of the last two years been as high as 1 per cent of the civilian population in Norway and 4 per cent in some of the provinces. Even higher rates of incidence have been reported in certain military units in North Africa. It appears to have been widespread in Germany, but, if it has been made notifiable, the number of cases has remained a secret. Epidemic jaundice is notifiable only in the three Scandinavian countries, Finland and Switzerland. About 65,000 cases were reported in these five countries in 1943, and returns for 1944 are, on the whole, not lower. The case mortality rate has fortunately, at least hitherto, been fairly low, usually ranging from 1 per thousand to 1 per cent, but there is some evidence that it increases with age. Epidemic jaundice is clearly a virus disease of an extremely high degree of infectivity and capacity for covering distances, which may have to do with the long period of incubation (three or four weeks). Since its potentialities are unknown and means of combating it have not so far been devised, this disease deserves to be closely watched.

Among other diseases of Mediterranean origin pappataci or sandfly fever has given some trouble in the Balkans and in Italy. Undulant fever, whether of the Mediterranean or the Bang type, does not seem to have increased to any noteworthy extent during the war.

During the twenty years between the two world wars poliomyelitis has slowly spread from north to south in Europe, moving by patches of varying intensity. During the war years this spread has apparently become accelerated. The incidence is considerably higher on the continent than in the British Isles. The most important poliomyelitis epidemics of 1943 occurred in Sweden, the Netherlands and central France. In 1944 Denmark, Sweden and Switzerland were the principal sufferers, and in the two former countries the outbreaks reached their peaks only in November.

As might be expected, cerebrospinal meningitis has been much above its normal level ever since the beginning of the concentration of troops leading up to the war. Since 1941, however, there has been a gradual decrease of the incidence, which, with minor exceptions, has constantly remained lower on the continent than in the British Isles.

Encephalitis lethargica has not been heard from, except for the usual sporadic cases.

So far diphtheria has turned out to be the leading epidemic disease of the war on the European continent as a cause both of morbidity and of mortality. It is estimated that there were at least one million cases in 1943 outside of the Soviet Union, and the case mortality rate can at present not be set at less than 5 per cent. In Germany alone nearly 300,000 cases were reported in 1943, with the rise continuing also in 1944, and there were 15,000 deaths from diphtheria in 1942. The incidence of carriers has increased enormously. The rise of diphtheria in Germany has been steady over a number of years, while in several other countries, and especially in Norway and the Netherlands, it has been explosive, attaining in 1943 respectively twenty-four and fourteen times the normal level. During the last three years there have been about 150,000 cases of diphtheria in the Netherlands. With a case mortality rate in that country of nearly 7 per cent, diphtheria has thus become one of the leading causes of death, running not very much behind tuberculosis in spite of the rapid increase of the latter disease. A severe epidemic is prevailing also in Finland. The contrast with the experience in England, where diphtheria has actually been reduced during the war years, is most striking. On the continent a reduction has been attained —through vaccination—only in Hungary. Denmark, Sweden and Switzerland have also maintained a relatively low incidence.

The most serious development of diphtheria, however, is not so much its spread as the change in type and its increasing gravity. The proportion of severe croupous cases has increased, and particularly noteworthy is the increase of cases refractory even to early serum treatment. In a series of diphtheria autopsies

performed in Germany 64 per cent showed interstitial myocarditis, while this condition had formerly been found in only one fourth of the postmortems. There has also been a shifting of the age incidence. At Rostock, in 1943, 30 per cent of the diphtheria deaths were over 15 years of age (6 per cent before 1940) and 9 per cent over 60. Diphtheria has been among the most important causes of fatal illness in the German army, and it has also proved a fatal complication of typhus as well as of chest wounds.

Scarlet fever has spread almost as much as diphtheria and with few exceptions its incidence is from two to five times the prewar level. Nevertheless there has been no explosive epidemic comparable to the diphtheria outbreaks in the Netherlands and in Norway. There seems to have been no change in type or gravity of the disease. A heavy increase of measles has also been noted, especially during the earlier years of the war.

The only important epidemic disease which seems to have remained unaffected by the war is influenza. The usual winter waves have come and passed, the most recent reaching its peak during the early part of the winter 1943-1944. In spite of abnormal living conditions, none of them attained the gravity of the three or four most serious interwar epidemics. The change from influenza B to influenza A reported to have taken place in England between the 1942-1943 outbreak and that of 1943-1944 does not seem to have had any visible effect on the mortality. Nevertheless the danger of major epidemics cannot be entirely disregarded.

In addition to the epidemic perils, the increasing incidence of endemic diseases, such as malaria, syphilis and tuberculosis, must be carefully considered. Malaria is the leading cause of morbidity in a large part of the Mediterranean basin, and it is reported to have assumed epidemic proportions in Greece during the last couple of years. The areas of high endemicity in the Balkans and in Italy have probably by this time returned to their lamentable precontrol state, and further spread must be counted on, especially in view of the forced migrations. Falciparum infection predominates in autumn in the truly Mediterranean countries, while farther north vivax malaria prevails. The latter form may extend northward into Europe as it did after the last war.

Reports relating to the Scandinavian countries, Finland, France and Germany indicate that the incidence of syphilis has increased from three to nine fold, and the achievements of the twenty years of peace in venereal disease control have practically been wiped out. While the spread of gonorrhea was checked for some years by successful sulfonamide treatments, virulent sulfonamide resistant strains are now reported to be developing and spreading. Penicillin treatment has not yet become generalized.

Infectious skin diseases, such as scabies, have also spread at an extraordinary rate, but the removal of soap from the list of luxuries should bring about a downward trend.

The war had no effect on the tuberculosis mortality in 1939 and 1940, but an increase began in 1941 in several countries and became more or less general from 1942 and on. The situation is now much the same as during and immediately after World War I, except that the increase this time started from a lower level. The part of the improvement gained from 1920 to 1939 which has been lost varies greatly. Great Britain, the Scandinavian countries and Switzerland have withstood the years of trial remarkably well, although their tuberculosis problems may require increased attention during the first postwar years. The number of tuberculosis cases has increased greatly in France, Belgium, the Netherlands, Germany, Austria, Czechoslovakia and Hungary, and it has doubled in many parts of this area. Among these countries the Netherlands is undoubtedly the worst sufferer. The Balkans, where the tuberculosis mortality was high also before the war, are probably back to the conditions of twenty-five years ago. In Italy the situation is likely to become worse than ever before, and Poland faces an unprecedented calamity.

In general, the epidemic outlook is not unlike the forecast which might have been made this day twenty-seven years ago. As then, the general endemic level of nearly every kind of infection has risen and serious epidemics have already appeared. In February 1918 no one could have forecast the influenza pandemic, but other developments might have been foreseen had sufficient information been currently available. Unpredictable epidemics may occur, war or no war, but our knowledge of the existing situation is far more complete and up to date than then. In several ways the outlook is darker than in 1918 because destruction of buildings and displacement of persons are far more widespread than during World War I. On the other hand, the endemic level was lower to start with in 1939 than it was in 1914, and the world is now better equipped to deal with many of the important infectious diseases.

On the public health front World War I lasted not four but more nearly ten years. However, it was gloriously won. Many years of effort in combating infectious diseases have once more been lost as far as Europe is concerned. To make up for backsliding will take several years after the cessation of active hostilities, but the public health profession and services can win their war now as then.

The foregoing summary, although cursory for reasons of space, is based entirely on reliable official information, and no representations by unqualified informers having an interest in magnifying the plight of their countries have been taken into account. Reviews dealing in greater detail with each disease will appear in subsequent numbers, as will also the statistics relating to these diseases. One of the tasks of this bulletin is to make accessible in one place the records gathered in different parts of the world and by various national and international services. Beginning to appear in the next number, these statistics will be gradually developed so as to cover in the end all infectious diseases of interest. The reviews will be informal and unrelated to any action under the International Sanitary Conventions, as they are prepared solely for the convenience of health officers and others concerned with the rise and fall of infectious disease.

In 1918, beyond the notification of plague, cholera and yellow fever, there was no international clearing house for epidemiologic information and no publication giving current records of epidemic diseases. This task was taken up by the Epidemiological Intelligence Service of the League of Nations only in 1922, that is, after the postwar epidemics had passed their peaks. Epidemiologists realized already then that such a service would have been still more helpful had it been established early in that war. It is the hope of the UNRRA Health Division that this new venture, which will reach its full development only in the course of some months, will complete and coordinate existing undertakings in this field.

THE SURGICAL TREATMENT OF MALFORMATIONS OF THE HEART

IN WHICH THERE IS PULMONARY STENOSIS OR PULMONARY ATRESIA

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Heretofore there has been no satisfactory treatment for pulmonary stenosis and pulmonary atresia. A "blue" baby with a malformed heart was considered beyond the reach of surgical aid. During the past three months we have operated on 3 children with severe degrees of pulmonary stenosis and each of the patients appears to be greatly benefited. In the second and third cases, in which there was deep persistent cyanosis, the cyanosis has greatly diminished or has disappeared and the general condition of the patients is proportionally improved. The results are sufficiently encouraging to warrant an early report.

The operation here reported and the studies leading thereto were undertaken with the conviction that even though the structure of the heart was grossly abnormal, in many instances it might be possible to alter the course of the circulation in such a manner as to lessen the cyanosis and the resultant disability. It is important to emphasize the fact that it is not the cyanosis, per se, which does harm. Nevertheless, since cyanosis is a striking manifestation of the underlying anoxemia and the compensatory polycythemia, a brief discussion of the causes of cyanosis and the factors operative in congenital malformations of the heart is essential in order to understand the principles underlying the present operation.

Cyanosis is due to the presence of reduced hemoglobin in the circulating blood. It is a well established fact that there must be at least 5 Gm. of reduced hemoglobin per hundred cubic centimeters of circulating blood for cyanosis to become apparent. It has long been recognized that one of the principal factors in the production of cyanosis in malformations of the heart is the direct shunting of venous blood into the systemic circulation. Lundsgaard and Van Slyke [1] in their classic studies on the causes of cyanosis showed that there were four important factors in the production of cyanosis: the height of the hemoglobin, the volume of the venous blood shunted into the systemic circulation, the rate of utilization of oxygen by the peripheral tissues and the extent of the aeration of the blood in the lungs. Their studies demonstrated the great importance of pulmonary factors. The extent of the oxygenation of the blood in the lungs clearly depends on the vital capacity of the individual, the rate of the flow of blood through the lungs, the partial pressure of the oxygen in the inspired air and also on specific pulmonary factors, which these authors designated as the a factor. These investigators showed that in most, if not in all, cases in which there was a pronounced polycythemia, secondary changes occurred in the lungs of such a nature that all of the blood that passed through the lungs was no longer in effective contact with the oxygen in the alveoli. The importance of this factor can be demonstrated by the prolonged inhalation of oxygen. In almost every case in which there is polycythemia, cyanosis can be greatly lessened by the prolonged inhalation of oxygen. The fact that all of the blood which circulated through the lungs is not fully oxygenated made it seem improbable that if more blood circulated through the lungs a larger proportion of the blood would be oxygenated. Thus the demonstration of the a factor completely overshadowed another vitally important factor, namely the volume of blood which reaches the lungs for aeration.[1a]

Expressed in the simplest terms, the circulation of the blood through the lungs after birth is essential for life; any one deprived of such circulation dies. Indeed there is a point at which, even though none of the other pulmonary factors are operative in the production of cyanosis and all of the blood that passes through the lungs is fully oxygenated, the volume of blood that reaches the lungs for aeration and hence the volume of oxygenated blood returned to the systemic circulation is insufficient for the maintenance of life. For example, in all cases of pulmonary atresia in which the circulation to the lungs is by way of the ductus arteriosus the closure of the ductus arteriosus renders the condition incompatible with life.

Undoubtedly the importance of the diminution of flow of blood to the lungs has not been fully appreciated, mainly because studies on the nature of cyanosis have been made on older children and young adults, and it is only when this factor is not of vital importance that the individual has survived to that age. All infants with pulmonary atresia with or without a right ventricle and with or without dextroposition of the aorta, in whom the closure of the ductus arteriosus cuts off the circulation to the lungs, die at an early age. In cases of complete pulmonary atresia death occurs before the complete cessation of circulation of blood through the lungs; hence in such cases there is always slight patency of the ductus arteriosus. In cases of a tetralogy of Fallot with an extreme pulmonary stenosis, the ductus arteriosus may become entirely obliterated before death.

There are two different types of congenital malformations which illustrate the importance of the volume of the pulmonary circulation in the production of cyanosis. The first is that of a single ventricle with a rudimentary outlet chamber in which it is common to find that one great vessel is given off from the common ventricle and one from the rudimentary outlet chamber. Usually the vessel which arises from the common ventricle is of normal size and that from the rudimentary outlet chamber is diminutive in size.[2] If the great vessels occupy their normal positions, the aorta arises from the common ventricle and is of large caliber, whereas the pulmonary artery which arises from the rudimentary outlet chamber is of small caliber. Under such circumstances a large volume of blood goes to the systemic circulation and only a small volume of blood goes to the lungs. Consequently a large volume of unoxygenated blood is mixed with a small volume of oxygenated blood and cyanosis is intense.[3] When, however, the great vessels are transposed and the pulmonary artery is large and the aorta is small, a large volume of blood goes to the lungs for aeration. Under these circumstances a large

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1. Lundsgaard, C., and Van Slyke, D. D.: Cyanosis, Medical Monographs, vol. 2, Baltimore, Williams and Wilkins Company, 1923.

1a. The relative importance of this factor and of the a factor will be discussed in a forthcoming paper by Taussig and Blalock.

2. Taussig, H. B.: Clinical Analysis of Congenital Malformations of the Heart, to be published by the Commonwealth Fund, New York.

3. Taussig, H. B.: A Single Ventricle with a Diminutive Outlet Chamber, J. Tech. Meth. & Bull. I. A. M. M. 19: 120-127, 1939.

volume of oxygenated blood is mixed with a relatively small volume of venous blood and cyanosis is minimal or absent, as in the case reported by Glendy and White.[4]

The same phenomenon is also seen in cases of truncus arteriosus. When the pulmonary arteries are given off directly from the aorta there is adequate circulation to the lungs, and cyanosis is minimal or absent. In contrast to this, if the pulmonary artery fails to arise from the heart or connect with the aorta and the circulation to the lungs is by way of the bronchial arteries only a small volume of blood reaches the lungs for aeration, and cyanosis is intense.[5]

The importance of adequate circulation to the lungs is further illustrated in the anomalies of the venous return in which all of the pulmonary veins drain into the right auricle; consequently within this chamber there is complete admixture of venous and arterial blood. In such cases a large volume of blood goes to the lungs for aeration and a large volume of oxygenated blood is returned to the right auricle. There is great right-sided cardiac enlargement but no cyanosis until the terminal collapse of the circulation.[6]

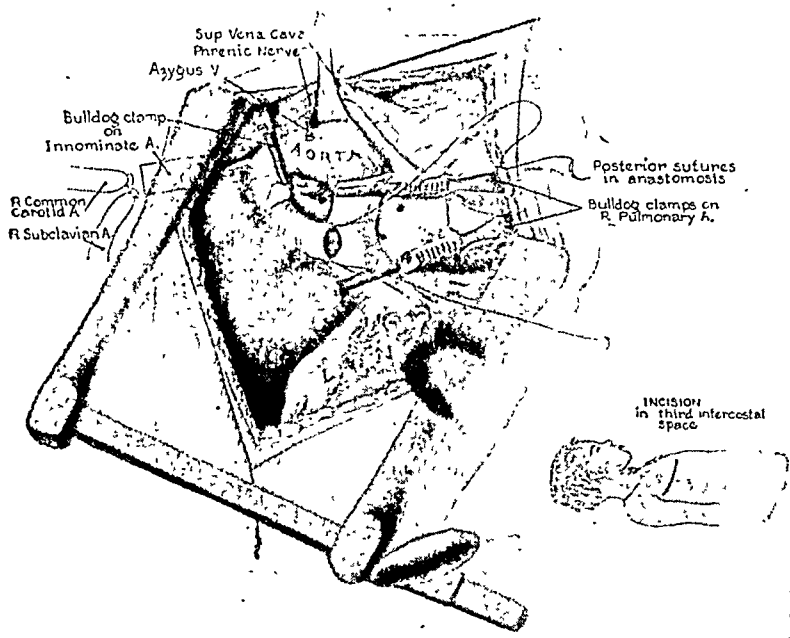


Fig. 1.—General exposure of the operative field on the right side. The end of the innominate artery is being anastomosed to the side of the right pulmonary artery. The posterior row of sutures is complete. The anterior row has not been inserted.

These observations clearly indicate that many gross malformations of the heart are compatible with life provided there is adequate circulation to the lungs, and furthermore that lack of circulation to the lungs is the primary cause of death in many infants with congenital malformations of the heart. Furthermore, one of us (H. B. T.) has seen several infants with pulmonary stenosis in whom cyanosis was not apparent until the ductus arteriosus closed. In other words, there was no "visible" cyanosis while the circulation to the lungs was adequate. It was an appreciation of these facts (H. B. T.), together with an extensive previous experience with the experimental use of large arteries for the purpose of conducting blood to sites not usually supplied by such vessels, that led to the development of the clinical work recorded in this paper.

The feasibility of anastomosing a systemic artery to one of the pulmonary arteries in experimental animals has been demonstrated by Levy and Blalock.[7] As far as we are aware, this was the first time that both the course and the function of a large artery were altered. Similar experimental alterations were produced subsequently by Eppinger, Burwell and Gross[8] and by Leeds.[9] Blalock and Park[10] have reported the suturing of the severed proximal end of the subclavian artery to the aorta as a means for conducting blood beyond the point of an experimental coarctation of the aorta. In unreported observations by Kieffer and Blalock the divided proximal end of the splenic artery has been connected to the distal end of the divided left renal artery and there has been no evidence of renal failure even though the right kidney was removed. In other words, arterial anastomoses have been performed in animals for the purpose of conducting blood to sites other than those ordinarily supplied by these vessels.

Before undertaking the operations on patients, many experiments were performed in an effort to produce pulmonic stenosis in dogs. This work met with little success. Finally, in an effort to cause a significant decrease in the oxygen saturation of arterial blood, one or more lobes of the lungs were removed from each side of the chest, and the main arteries and veins of these lobes were connected end to end by suture. In other words, bilateral pulmonary arteriovenous fistulas were produced. These procedures resulted in some instances in a pronounced reduction in the oxygen saturation of the arterial blood. As the result of an artificial patent ductus arteriosus made in two such experiments, there was a significant increase in the arterial oxygen saturation. Although this experimentally produced condition is quite different from that seen in patients, it is of interest that the making of an anastomosis between systemic and pulmonary arteries caused an increase in the oxygen saturation of the arterial blood despite the fact that several lobes of the lungs had been removed.

Since the present operation was devised to compensate for an inadequate flow of blood to the lungs, it seemed desirable that the anastomosis be made in such a manner that the blood from the systemic artery would be able to reach both lungs. It is obvious that the suture anastomosis could not be made to the main pulmonary artery since occlusion of this vessel for more than a few minutes causes death. It appeared, therefore, that the anastomosis should be made just distal to the division of the main pulmonary artery and, furthermore, that the side of the chosen vessel should be used in order that the blood might flow to both lungs.

It was our original idea that the subclavian artery would be the ideal systemic vessel and that after division

4. Glendy, Margaret M.; Glendy, R. E., and White, P. D.: Cor Biatriatum Triloculare, Am. Heart J. **28**: 395-401, 1944.
5. Taussig, H. B.: Clinical Findings in Cases of Truncus Arteriosus, to be published.
6. Taussig, H. B.: Clinical and Pathological Findings in the Anomaly of Venous Return in Which All of the Pulmonary Veins Drain into the Right Auricle, to be published.
7. Levy, S. E., and Blalock, A.: Experimental Observations on the Effects of Connecting by Suture the Left Main Pulmonary Artery to the Systemic Circulation, J. Thoracic Surg. **8**: 525-530, 1939.
8. Eppinger, Eugene C.; Burwell, C. Sidney, and Gross, Robert E.: The Effects of the Patent Ductus Arteriosus on the Circulation, J. Clin. Investigation **20**: 127-143 (March) 1941.
9. Leeds, S. E.: The Effects of Occlusion of Experimental Chronic Patent Ductus Arteriosus on the Cardiac Output, Pulse and Blood Pressure of Dogs, Am. J. Physiol. **139**: 451-459 (July) 1943.
10. Blalock, A., and Park, E. A.: The Surgical Treatment of Experimental Coarctation (Atresia) of the Aorta, Ann. Surg. **119**: 445-455 (March) 1944.

of this artery its proximal end should be anastomosed to the side of the left pulmonary artery. The fortunate experience to be reported in regard to the second patient has led us to prefer the use of the innominate artery in patients with a severe degree of anoxemia. This patient had a right aortic arch, and the innominate artery was directed to the left side of the chest and neck.

Although there were slight variations in each of the operations, the major features were as follows: Light general anesthesia was produced by the inhalation of ether or cyclopropane. The patient was placed on the table on his back with a slight elevation of that side of the chest which was to be exposed. The patient's arms were strapped in place along his sides. The operation was performed on the right or left side depending on the position of the great vessels and the artery to be used in the anastomosis. The incision was made in the third interspace and extended from the lateral border of the sternum to the axillary line. The pleural cavity was entered and the third and fourth costal cartilages were divided. A rib spreader was introduced and a good exposure of the upper half of the pleural cavity was obtained. This area is shown in figure 1. The right or left pulmonary artery was then exposed and the vessel was dissected from the adjacent tissues for as great a distance as possible. This was more difficult on the right side than on the left and it was necessary to ligate and divide the azygos vein and to retract the superior vena cava medially. Nothing further was done to the pulmonary artery at this time. Attention was then focused on the systemic artery which was to be anastomosed to one of the pulmonary arteries. The subclavian or innominate artery was dissected free of the adjacent tissues and the vessel chosen was occluded temporarily at the point where it arose from the aorta by the use of a bulldog arterial clamp. In cases in which the innominate artery was chosen, its branches (subclavian and common carotid) were ligated at their origins and the innominate artery was cut across just proximal to the ligatures. In the 1 case in which the left subclavian artery was used for the anastomosis to the pulmonary circulation it was necessary to divide the thyrocervical trunk, the vertebral artery and the internal mammary artery in order to gain access to a sufficient length of the vessel. After the removal of some of the adventitia from the systemic vessel the pulmonary artery was further prepared for the anastomosis. A bulldog arterial clamp was placed on the left or right pulmonary artery just distal to the point of division of the main pulmonary artery. A second bulldog arterial clamp was placed on the left or right pulmonary artery just proximal to the point where the vessel gave off a branch to the upper lobe of the lung. A transverse opening was made into the side of the pulmonary artery approximately midway between these two arterial clamps. This opening was of about the same diameter as that of the end of the systemic vessel which was to be anastomosed to it. It must be emphasized that the pulmonary artery was not occluded until all preparations for the anastomotic procedure had been made.

The anastomosis between the end of the systemic artery and the side of the pulmonary artery was carried out in the following manner: Fine silk on a curved needle was used as suture material. Before placing the posterior row of sutures, a stay suture was placed at one end. This was followed by the insertion of a running suture, which was not drawn taut until the greater part of the posterior row had been placed. The stay suture was then tied and the running suture was in turn tied to the stay suture. The posterior row was completed and was tied to another stay suture. The anterior row consisted of a simple through and through

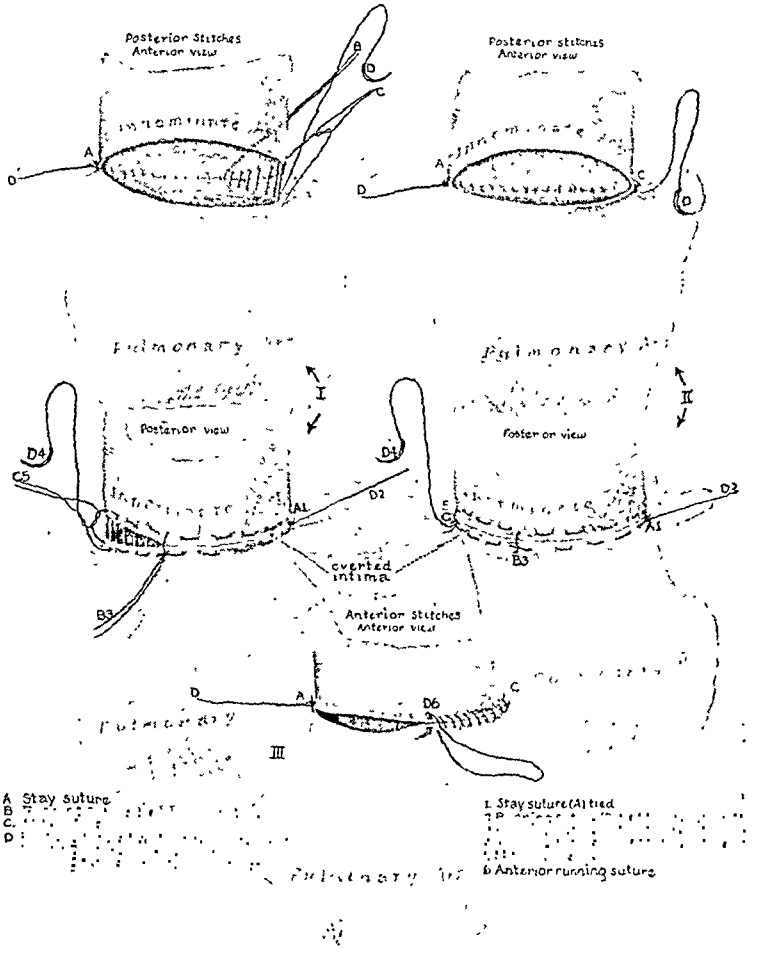


Fig. 2.—Details of the method by which the end of a systemic artery is anastomosed to the side of one of the pulmonary arteries.

continuous suture which approximated intima to intima. The anastomosis is shown diagrammatically in figure 2. The bulldog clamps were then removed from the pulmonary artery, and this was followed by removal of the clamp from the systemic vessel. If bleeding from the suture line did not cease spontaneously, it was stopped by the use of additional sutures. The lung was reexpanded and the incision in the chest wall was closed. Two encircling sutures of braided silk were used for approximating the third and fourth ribs. The soft tissues of the chest wall were closed in multiple layers with interrupted silk sutures.

There follows a detailed report of the 3 cases in which such an operation has been performed.

REPORT OF CASES

CASE 1.[11]—*History.*—E. M. S., a girl, was born prematurely in the obstetric service of the Johns Hopkins Hospital on Aug. 3, 1943. Her birth weight was 1,105 Gm. A systolic murmur was noted shortly after birth. Slight cyanosis was noted on the fourth and fifth days of life; this subsequently disappeared. The baby gained weight slowly and was finally discharged at 4 months of age weighing 2,900 Gm. After discharge the baby was followed in the dispensary. She was at first thought to have a simple interventricular septal defect, because the heart was normal in size and there was no cyanosis.

At 8 months of age the baby had her first attack of cyanosis, which occurred after eating. It was then for the first time that we thought she had a tetralogy of Fallot and not a simple interventricular septal defect. It soon became evident that cyanosis was increasing. It seemed probable that this increase in cyanosis was due to the fact that the ductus arteriosus was undergoing obliteration and thereby lessening the circulation to the lungs. By March 1944 it was obvious that the baby had a serious congenital malformation of the heart. After eating she would become deeply cyanotic, roll up her eyes, lose consciousness and appear extremely ill. Fluoroscopy showed that the heart was slightly enlarged; there was no fulness

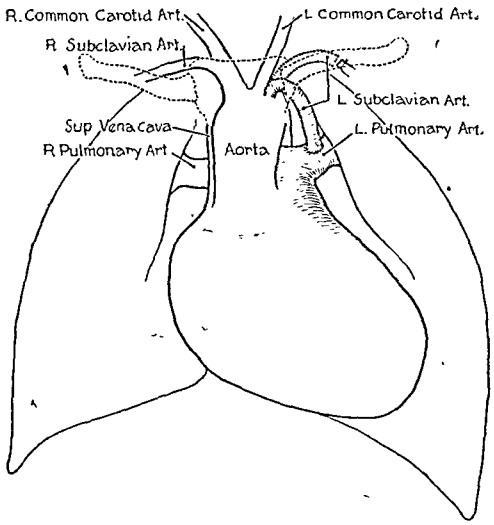


Fig. 3 (case 1).—Procedure used. The end of the left subclavian artery was anastomosed to the side of the left pulmonary artery.

in the region of the pulmonary conus. In the left anterior oblique position the right ventricle appeared slightly enlarged and the pulmonary window was abnormally clear. The clinical diagnosis was tetralogy of Fallot with a severe degree of pulmonary stenosis.

On June 25, 1944 she was first admitted to the Harriet Lane Home. Physical examination showed that she was poorly nourished and poorly developed. She had a glassy stare. Her lips were cyanotic. The heart was slightly enlarged and there was a harsh systolic murmur best heard along the left sternal border. The liver was at the costal margin. The baby was given oxygen and phenobarbital but remained very irritable and would become intensely cyanotic when taken out of the oxygen tent. During her three weeks' stay in the hospital she gained 200 Gm. and weighed 4.66 Kg. on discharge. She was sent home because it was felt that her condition was hopeless.

She was followed in the cardiac clinic for three months, during which time she showed increasing cyanosis and failed to gain weight. She was readmitted on October 17 because of increasing spells of cyanosis, coma and great venous distention of the head and body.

The weight on admission was 4.6 Kg. The venous distention was so great that the possibility of a subdural hydroma or hematoma was considered. Subdural tap was performed, with the removal of 8 cc. of clear fluid from the right side and a small amount of bloody fluid from the left.

The size of the heart as seen in the anteroposterior view was essentially the same as noted previously. There was still a harsh systolic murmur. In the left anterior oblique position the contour of the heart appeared as a little round ball with a narrow aorta and a clear pulmonary window (fig. 4); this, we believe, is characteristic of a very severe tetralogy of Fallot with a functional pulmonary atresia, that is, a pulmonary stenosis which is so extreme that the condition is not long compatible with life.[2] It was questioned at that time whether in addition to the malformation of the heart she suffered from mental retardation.

During the next six weeks she refused most of her feedings she lost weight and just before operation weighed only 4 Kg. The red blood cell count, which had been 7,000,000 on admission, had fallen to 5,000,000. Cyanosis was proportionally less conspicuous; indeed, at times while lying quietly, cyanosis was not visible. The clinical diagnosis was again tetralogy of Fallot which was so severe that the baby's condition was becoming critical.

Operation.—This was performed on November 29. The procedure consisted in the anastomosis of the divided proximal end of the left subclavian artery to the side of the left pulmonary artery, as shown diagrammatically in figure 3. The anesthetic agent was administered by Dr. Merel Harmel.

Under ether and oxygen anesthesia, administered by the open method, an incision was made on the left side of the chest extending from the edge of the sternum to the axillary line. The pleural cavity was entered through the third interspace. The left lung appeared normal. No thrill was felt on palpating the heart and pulmonary artery. The left pulmonary artery was identified and was dissected free of the neighboring tissues. It appeared to be of normal size. The superior pulmonary vein, on the other hand, seemed considerably smaller than normal. The left subclavian artery was identified and was dissected free of the neighboring tissues. In order to secure access to a sufficient length of this vessel it was necessary to ligate and divide the vertebral artery, the internal mammary artery and the thyrocervical axis. A bulldog arterial clamp was placed on the subclavian artery at a point just distal to its origin from the aorta. The subclavian artery was ligated distal to the point at which the thyrocervical trunk had been ligated and divided, and the vessel was cut across just proximal to this ligature. Two bulldog clamps were placed on the left pulmonary artery, the first clamp being placed at the origin of the left pulmonary artery and the second clamp being placed just proximal to the point where the pulmonary artery entered the lung. There was ample space between these two clamps for our purpose. A small transverse incision was made in the wall of the pulmonary artery at a point approximately equidistant between the two clamps. By the use of china beaded silk on fine needles an anastomosis was performed between the end of the left subclavian artery and the side of the left pulmonary artery. There was practically no bleeding following the removal of the clamps.

From a technical point of view the anastomosis seemed to be satisfactory. The main cause for concern was the small size of the left subclavian artery. It was somewhat disturbing that one could not feel a thrill in the pulmonary artery. We were confident, however, that the anastomosis was patent. A small quantity of sulfanilamide was placed in the left pleural cavity and the incision in the chest wall was closed. The patient was given 200 cc. of isotonic solution of sodium chloride and 50 cc. of blood during the operative procedure. The operation required slightly less than an hour and a half and the left pulmonary artery was occluded for approximately thirty minutes. The patient's condition at the end of the operation seemed moderately good.

Postoperative Course.—This was stormy. The patient's left arm and hand were observed frequently. The radial pulse was not palpable and this extremity was cooler than the opposite one, but it was apparent that the circulation was adequate to maintain life of the part. The child suffered from repeated bilateral pneumothoraces, and frequent aspirations were required.

11. This case was discussed briefly at the meeting of the Southern Surgical Association, Dec. 5, 1944, in a paper by Dr. Arthur Blakemore.

Probably the pneumothorax on the right was due to the use of too great pressure in the reexpansion of the left lung at the completion of the operative procedure. As it was found to be a positive pressure pneumothorax, constant suction was exerted through a needle inserted into the right pleural cavity. Had it not been for the excellent care given by the pediatric house staff, particularly Dr. Kaye, Dr. Whitemore, Dr. Steinheimer, Dr. Hammond, Dr. Gilger and Dr. Helfrick, in all probability the child's life would not have been saved.

The child's condition began to improve two weeks after operation. Thereafter further aspirations of the pleural cavity were not required. The occasions on which the patient would become cyanotic became less frequent. Otitis media developed and responded to treatment. The systolic murmur became somewhat louder, but a continuous murmur could not be heard in the pulmonary area.

The patient was discharged from the hospital on Jan. 25, 1945, almost two months after the day of operation. Her condition was considerably better than it had been before operation. More recent follow-up studies have shown that she is gaining weight and that she is only occasionally cyanotic. If the cyanosis increases, it may be necessary to perform a similar operation on the opposite side. Roentgenograms of the patient's heart both before and after operation are shown in figure 4.

It is unfortunate that we do not have a quantitative degree of improvement such as might have been afforded by determinations of the oxygen saturation of the arterial blood. In view of the small size of the child we did not feel warranted in doing arterial punctures. The clinical improvement, however, has been striking. The baby takes her feedings well, is alert and active and has gained a kilogram in weight (that is, 25 per cent of her former body weight).

CASE 2.—*History.*—B. R., a white girl born July 9, 1933, was first seen at the Harriet Lane Home at 9 years of age, referred by Dr. Dexter Levy of Buffalo. The patient was cyanotic at birth. The birth weight was 6½ pounds (2,955 Gm.). She was breast fed for six months. In infancy she gained extremely slowly. She had erysipelas at 1½ years of age, a septic sore throat at 4½ years of age, chickenpox at 7 years, measles at 8 years and mumps at 9 years.

The patient was first seen in the Harriet Lane Home on Feb. 13, 1943. She was intensely cyanotic, became dyspneic on slight exertion and would constantly squat to get her breath. There was intense cyanosis and clubbing of the fingers and the toes. The buccal mucous membranes were of a deep mulberry color. There was suffusion of the conjunctiva. The chest was barrel shaped. Her heart was within normal limits in size. There was no thrill over the precordium. On auscultation there was a harsh systolic murmur which was maximal low down in the third and fourth interspaces. The murmur was much louder in the recumbent position than in the erect position, and louder when she bent forward than when she tried to sit erect. The murmur was not widely transmitted and was not audible in the back. The second sound at the base was pure. The lungs were clear. The liver was at the costal margin and the spleen was not palpable. The femoral arteries were readily palpable. The extremities, as previously mentioned, showed intense cyanosis and pronounced clubbing. At this time she climbed half a flight of stairs and walked, almost ran, leaning forward, 60 feet to her room, and then fell forward on the bed and lay in a knee-chest position, panting heavily and without speaking for half an hour.

The red blood cell count was 8,700,000; the hemoglobin was 25 Gm.; the hematocrit reading was 78.

The electrocardiogram showed a normal sinus mechanism, PR interval of 0.16 second, normal upright T waves in all four leads, and considerable right axis deviation.

X-ray examination and fluoroscopy showed the heart to be of normal size with a concave curve at the base to the left of the sternum (fig. 6). To the right of the sternum the superior vena cava cast a wide ribbon-like shadow. After the administration of barium, the aorta was seen to indent the esophagus to the left on its right margin. Examination in the left anterior oblique position showed that the right ventricle was not greatly enlarged; indeed, the left ventricle appeared larger than the right ventricle. The esophagus was seen to be indented by the aorta in the left anterior oblique position; in the right anterior oblique position its descent was independent of the aorta. There was no enlargement of the left auricle.

The clinical diagnosis was an extreme tetralogy of Fallot with a right aortic arch.

On Jan. 6, 1945 the patient returned for a check-up and because her parents wished to discuss the possibility of operation. The physical findings were essentially the same as previously noted but she was even more severely incapacitated. She could not walk 30 feet without exhaustion, and she panted when she moved from a wheel chair to the examining table. The fluoroscopic findings were essentially the same as noted previously except that the shadows at the hili of the lungs were more conspicuous. There were, however, no pulsations visible in this region.

The patient returned on January 29. Studies on the arterial blood are recorded in table 1.

A sample of venous blood showed that the red blood cell count was 7,500,000, the hemoglobin was 24 Gm., the hematocrit reading was 71 (Wintrobe) and the white blood cell count was 5,200. The electrocardiogram was essentially the same as that taken in 1943. A roentgenogram of the heart showed a small heart with a right aortic arch. The maximal right diameter was 4 cm. and the maximal left was 7 cm. The total transverse diameter was 26 cm. The cardiothoracic ratio was 42.4.

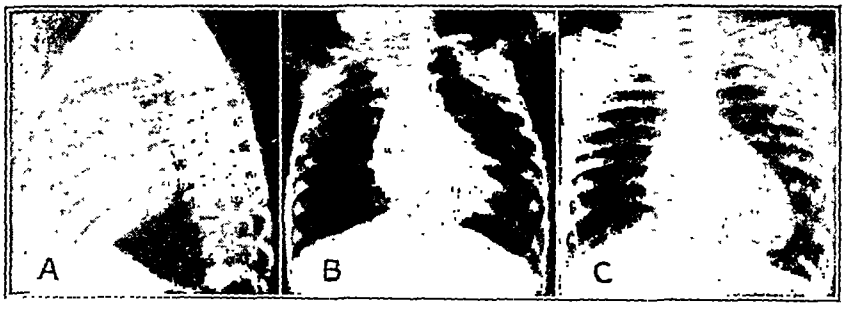


FIG. 4 (case 1).—Appearance before and after operation: *A*, left anterior oblique view before operation; *B*, anteroposterior view before operation; *C*, anteroposterior view after operation.

Operation.—This was performed on February 3. The procedure consisted in anastomosing the divided proximal end of the innominate artery to the side of the left pulmonary artery. This is shown diagrammatically in figure 5. The anesthetic agent was administered by Dr. Austin Lamont.

TABLE 1.—*Studies on Arterial Blood (Case 2)*

Dates	Arterial Oxygen Content, Volumes per Cent	Arterial Oxygen Capacity, Volumes per Cent	Arterial Oxygen Saturation, per Cent	Arterial Carbon Dioxide Content, Volumes per Cent
2/ 1/45	11.7	32.3	36.3	34.9
2/ 3/45	Innominate artery anastomosed to left pulmonary artery			
2/12/45	20.3	27.5	73.8	37.8
3/ 1/45	19.8	23.9	82.8	37.2

Cyclopropane with a high percentage of oxygen was administered through an endotracheal tube. The incision extended from the left costal margin to the anterior axillary line. The pleural cavity was entered through the third interspace. There were no adhesions between the lung and the chest wall, and the lung looked normal. Although the surgeon had been informed by his pediatric colleague that this patient almost

certainly had a right aortic arch, no special thought was given to the fact, and it caused some surprise when it was noted that the aorta was not on the left side. It was fortunate, however, that the incision had been made on the left because this allowed the use of the innominate artery rather than the subclavian artery. There was a very tortuous artery, which

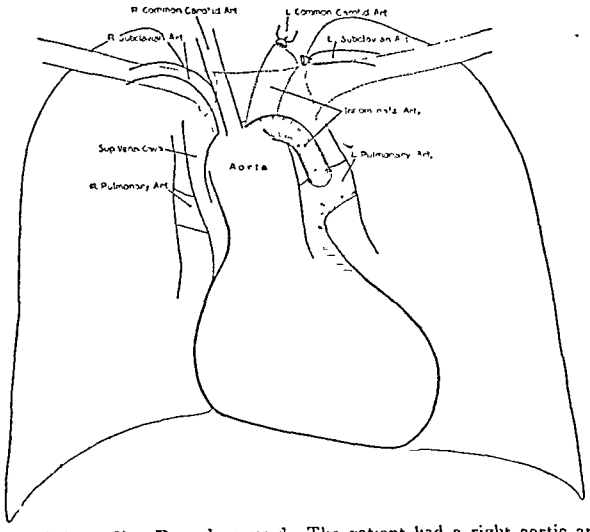


Fig. 5 (case 2).—Procedure used. The patient had a right aortic arch, and the innominate artery was directed to the left. The end of the innominate artery was anastomosed to the side of the left pulmonary artery.

was lying anterior to the vertebral column and which appeared to run from the region of the hilus of the lung toward the upper part of the left pleural cavity. Compression of this vessel indicated that the blood was flowing from above downward. It is believed that this vessel was a large accessory bronchial artery. It was estimated that the lumen of this artery was approximately 3 mm. in diameter. Still another abnormal finding was the large size of the posterior portions of the intercostal arteries. It seems likely that these vessels were also supplying blood to the hilus of the lung. The evidence of extensive collateral circulation led us to believe that we were probably dealing with a case of complete pulmonary atresia.

The innominate artery was located and dissected free of the surrounding tissues. The encouragement of the first assistant, Dr. William Longmire, played no small part in the continued effort to find a large systemic artery. A bulldog arterial clamp was placed on the innominate just distal to its origin from the aorta. The subclavian and common carotid arteries were ligated near their points of origin from the innominate. The innominate artery was divided just proximal to these ligatures. It was estimated that the diameter of the lumen of the innominate artery was approximately 1.3 cm. The left main pulmonary artery was then prepared for the anastomosis. A bulldog clamp was placed just distal to the origin of this vessel from the main pulmonary artery, and a second clamp was placed proximal to its entrance into the lung. A transverse opening was made into the lumen of the vessel midway between the two clamps. A suture anastomosis was performed between the end of the innominate artery and the side of the left pulmonary artery. The length of time that the left pulmonary artery was occluded was fifty to sixty minutes. The bulldog clamps were removed. There was bleeding from one point, which was controlled by an additional suture. An easily palpable thrill was felt in the pulmonary artery both proximal and distal to the anastomosis. The pulmonary artery seemed to be considerably larger than before this new current of systemic blood was admitted to it. The systemic arterial pressure was 110 systolic and 70 diastolic at the time that the arterial clamps were removed. Immediately following the removal of the clamps the systemic pressure declined 30 mm. of mercury. There followed a rise in systolic pressure of 20 mm. of mercury, but the pressure then declined gradually during the next thirty minutes until it reached 60 systolic and 30 diastolic. The pulse rate during this time rose from 72 to 120 per minute.

After the completion of the anastomosis and the removal of the clamps, several grams of sulfanilamide were placed in the pleural cavity. The left lung was partially inflated by the use of positive pressure, and the incision in the chest wall was closed. The patient was given a slow continuous intravenous drip of isotonic solution of sodium chloride during the operation and her condition at the end of the operation appeared to be satisfactory.

The operation required two hours and forty minutes. A considerable part of this time was consumed in studying the tortuous vessel which was seen above the hilus of the lung and also in trying to locate the innominate artery.

The patient awakened from the anesthesia a short time after the closure of the incision. She could move the left arm without difficulty. The left arm and hand were slightly cooler than the right, but it was evident that the circulation was adequate to maintain life. There was no evidence of a cerebral disturbance as the result of the ligation of the common carotid. No pulse could be felt in the left arm or the left side of the neck and face.

Postoperative Course.—This was smooth. There was no vomiting following operation, and fluids were taken by mouth. She was placed in an oxygen tent. The administration of penicillin was started immediately after operation and was continued for nine days. The left pleural cavity was aspirated twenty-four hours after operation; 250 cc. of air and 70 cc. of blood were removed. There were no other thoracenteses. Although a thrill was palpable at the site of the anastomosis immediately on release of the bulldog clamps, no murmur was audible immediately after the chest was closed. By the second evening a faint diastolic murmur was audible over the base and at the apex. By the third postoperative day an extraordinarily loud continuous murmur was audible throughout the chest on both the right and the left side. The oral administration of dicumarol was begun on the fourth postoperative day; 50 to 200 mg. was given daily for several weeks. Prothrombin determinations were performed daily. The dose of dicumarol was such as to keep the clotting time of the patient's blood approximately twice that of the normal control.

Femoral arterial punctures were performed on the ninth and twenty-sixth postoperative days. The results of the analyses are given in table 1. Before operation the red blood cell count was 7,500,000, the hemoglobin 24 Gm. and the hematocrit reading 71. Three days after operation the red blood cell count had decreased to 6,000,000, the hemoglobin to 19 Gm. and the hematocrit reading to 61. By the twenty-first day the red blood cell count was 6,000,000, the hemoglobin was 17.5 Gm. and the hematocrit reading was 55.

A roentgenogram of the heart taken ten days after operation showed that the heart had increased in size; that taken twenty-one days after operation revealed no further increase in size.

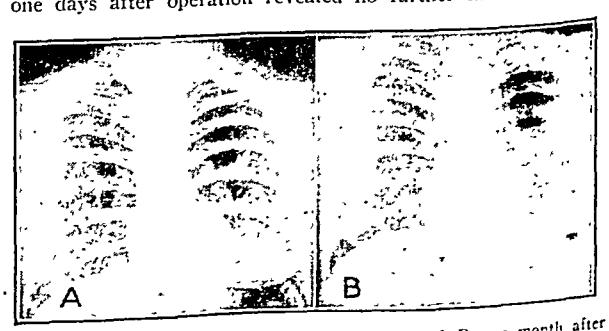


Fig. 6 (case 2).—Heart *A*, before operation and *B*, one month after operation.

Indeed, the heart was a trifle smaller than on the previous date. Roentgenograms of the heart before and after operation are shown in figure 6. Before operation the cardiothoracic ratio was 42.4 and three weeks after operation it was 44.7. The electrocardiogram showed no change (fig. 7). The stethocardiogram showed a continuous murmur (fig. 8). There was a significant increase in the pulse pressure. The preoperative arterial pressure had been 110 systolic and 90 diastolic. On

the thirty-seventh postoperative day the arterial pressure was 98 systolic and 66 diastolic.

An appreciable diminution in the cyanosis of the lips and fingernails was apparent several days after operation. The patient was allowed to walk, beginning two and a half weeks after operation. This exercise resulted in a slight increase in the cyanosis, but it was evident that cyanosis was much less than it had been preoperatively. By the end of the third week she could walk 60 feet in an erect posture without panting, whereas before operation, stooping and leaning forward, she could walk only 30 feet and would then stop and pant. There has been a slow but steady recession of the clubbing of the fingers and toes. The patient was discharged from the hospital on the thirty-eighth postoperative day.

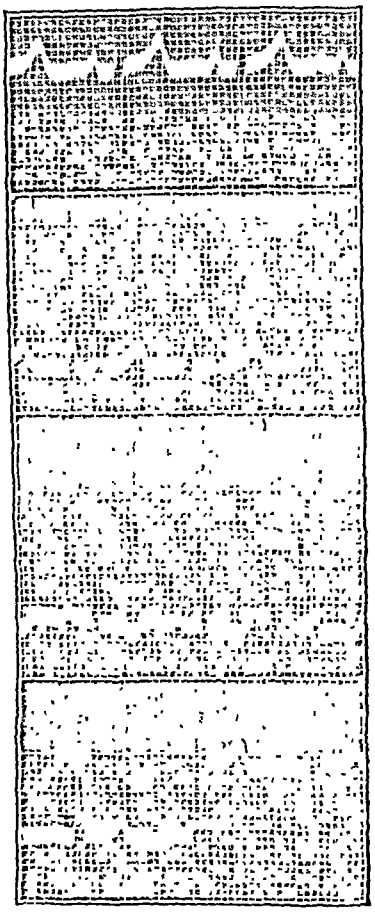


Fig. 7 (case 2).—Electrocardiogram.

CASE 3.—*History.*—M. M., a boy born July 15, 1938, was first seen at the Harriet Lane Home at 8 months of age with the complaint of heart trouble.

The family history is of importance in that the maternal grandfather was known to have heart trouble and had had a heart murmur throughout his life. The mother's brother and sister are both reported to have dextrocardia; both have refused examination.

The past history stated that the patient was a full term baby. The birth weight was 6½ pounds (2,955 Gm.). Development was slow; he held his head up at 5 months and sat alone at 6½ months. At 8 months the patient weighed 13½ pounds (6 Kg.). When lying quietly he showed slight persistent cyanosis, which became intense when he cried. On examination of the heart there was no thrill but a very definite systolic murmur, which was audible all over the precordium and well heard in the back. Fluoroscopy showed that the heart was within normal limits in size. There was a wide shadow above the heart which was interpreted as a large thymus. There was no fulness of the pulmonary conus, and the shadow at the base of the heart was concave. The clinical diagnosis was tetralogy of Fallot.

The patient was followed in the cardiac clinic until January 1940, when the family moved to California. They returned to Baltimore in the fall of 1944 and the patient was again brought to the clinic on September 29. At that time the boy, 6 years of age, was thin and undernourished, intensely cyanotic and dyspneic on slight exertion. The temperature was 99.2 F., weight 34½ pounds (15.6 Kg.), height 42 inches (107 cm.), pulse 140, respirations 20 and blood pressure 90 systolic and 60 diastolic.

There was manifest suffusion of the conjunctiva. The lips were purple and the buccal mucous membranes were a deep mulberry color. The teeth were in bad condition; the tonsils were not unduly enlarged. The chest was barrel shaped. The increase in the size of the heart was in proportion to the growth of the child. There was a systolic thrill at the apex and a harsh systolic murmur, which was maximal along the left sternal border in the third interspace. The second sound at the base of the heart was clear, but not accentuated. The lungs were clear. The liver was at the costal margin; the spleen was not palpable. The femoral arterial pulsations were easily felt. The extremities showed deep cyanosis and pronounced clubbing. Although the patient had learned to walk by November 1944, he was so incapacitated that he was unable to walk and even refused to try to take a few steps. The diagnosis was tetralogy of Fallot with a severe degree of pulmonary stenosis.

The patient was referred to the dental clinic, where several teeth were extracted. Sulfadiazine was given for two days. One month later the patient returned to the cardiac clinic with a rectal temperature of 100.4 F. and with numerous petechiae on his legs, which the mother said were of two days' duration. A blood culture taken at this time was sterile and no further petechiae appeared.

TABLE 2.—*Studies on Arterial Blood (Case 3)*

Dates	Arterial Oxygen Content, Volumes per Cent	Arterial Oxygen Capacity, Volumes per Cent	Arterial Oxygen Saturation, per Cent	Arterial Carbon Dioxide Content, Volumes per Cent	Comment
2/ 8/45	7.3	31.2	23.4	27.5	Patient struggling
2/ 9/45	10.7	30 2	35.5	29 3	Patient quiet
2/10/45	Innominate artery anastomosed to right pulmonary artery				
2/19/45	17.7	22.2	79.7	37.4	Patient crying
3/ 6/45	17.7	21.1	83.8	35.2	Patient quiet

The family was desirous of prompt operation and the patient was admitted to the hospital on Feb. 7, 1945. The results of analyses of blood obtained by arterial puncture are shown in table 2. With venous blood the red blood cell count was 10,000,000, the hemoglobin 26 Gm. and the hematocrit reading 81. The patient continued to have a daily elevation of temperature.

An electrocardiogram showed a normal sinus mechanism, a normal PR interval of 16, high *P* waves in L_2, and normal upright T waves in leads 1, 2 and 4, and T_3 inverted and an apparent right axis deviation.

X-ray examination (fig. 10) showed that the maximal right diameter of the heart was 2.1 cm., the maximal left 7 cm. and the total transverse diameter 18.8 cm.; the cardiothoracic ratio was 47.5. There was no fulness of the pulmonary conus. Fluoroscopy showed that the aorta descended on the left, and there were no visible pulsations in the lung fields.

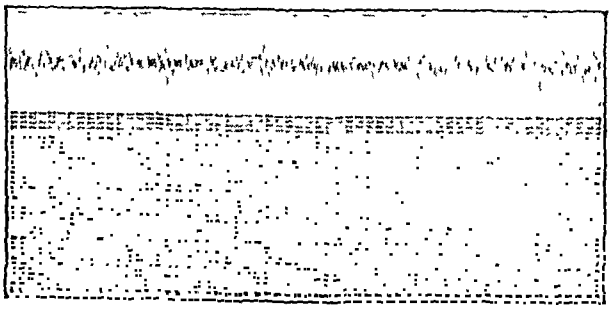


Fig. 8 (case 2).—Stethocardiogram.

Operation.—This was performed on February 10. The procedure consisted in anastomosing the divided proximal end of the innominate artery to the side of the right pulmonary artery. This is shown diagrammatically in figure 9. The anesthetic agent was administered by Dr. Merel Harmel.

Anesthesia was produced by cyclopropane with a high concentration of oxygen. It is of interest that the patient's color was much better under anesthesia than it had been previously.

This patient did not have a right aortic arch. In view of the great improvement in the second case we wished to use the innominate artery, and therefore the incision was made on the right side. There were no adhesions between the lung and the chest wall, and the lung appeared normal. The right upper lobe was retracted downward and the azygos vein was visualized. It was doubly ligated and divided. The superior vena cava and phrenic nerve were retracted medially, and the artery to the right upper lobe of the lung was seen. This was followed medially and the main right pulmonary artery was exposed. This exposure was considerably more difficult than that on the left side. Attention was then turned to the innominate artery. By dissecting under and medial to the superior vena cava the innominate artery was exposed and was dissected free of the surrounding tissues. This vessel was occluded temporarily by the use of a lung tourniquet which was equipped with a catheter overlying a piece of braided silk. The subclavian artery and the common carotid artery were ligated just distal to their origins from the innominate artery. The innominate artery was cut across proximal to these ligatures. Two bulldog clamps were placed on the right main pulmonary artery, and a transverse incision was made into the vessel between these clamps. The proximal bulldog clamp was not of sufficient length to secure entire control of the flow of blood. This resulted in a moderate loss of blood, and another clamp was substituted.

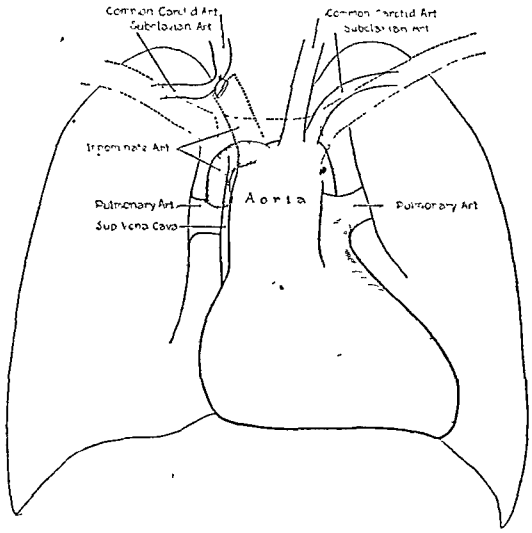


Fig. 9 (case 3).—Procedure used. The end of the innominate artery was anastomosed to the side of the right pulmonary artery.

With 5-0 silk on a small curved needle an anastomosis was made between the divided proximal end of the innominate artery and the side of the right main pulmonary artery. This anastomosis was more difficult than that in the previous cases because the exposure was less satisfactory. Following the removal of the bulldog clamps from the pulmonary artery there was a rather copious flow of blood from one point along the anterior row of sutures. The clamps were reapplied, and this opening was closed with a mattress suture. Subsequent removal of the clamps did not result in further bleeding. The patient's condition up to the time of this blood loss had been excellent. Occlusion of the right pulmonary artery had not seemed to increase the cyanosis. There was an increase in the cyanosis and a decline in pressure when this loss of blood occurred. It was estimated that at least 250 cc. of blood was lost.

The anastomosis seemed to be a satisfactory one. An easily palpable thrill could be felt in the pulmonary artery both proximal and distal to the anastomosis. It was estimated that the lumen of the innominate artery was slightly less than 1 centimeter in diameter. The right lung was partially inflated and the incision in the chest wall was closed.

The patient received 500 cc. of a mixture of isotonic solution of sodium chloride and glucose and 200 cc. of plasma during the operative procedure. The operation required a total of three hours, the greater part of this time being consumed in making the anastomosis. It was obvious that a better instrument for occluding the pulmonary artery proximal to the site of the anastomosis is needed. The right pulmonary artery was occluded for approximately ninety minutes.

The patient's condition at the completion of the operation was very good. He was conscious a few minutes after the incision had been closed, was asking for water and was moving his right arm. This arm was slightly cooler than the left. Pulsations could not be felt in the right arm or in the right side of the neck and the face. There was, however, no evidence of cerebral damage, and it was obvious that the circulation of the arm was adequate to maintain life.

Postoperative Course.—This was remarkably smooth. The patient was placed in an oxygen tent for several days. The circulation to the right arm remained adequate. Aspiration of the chest was not necessary. Immediately after operation the child's color improved. It was seen on the fourth postoperative day when the administration of oxygen was discontinued that the cyanosis of the lips had disappeared. The cyanosis of the fingertips decreased more slowly. The administration of penicillin was started the day before the operation and was continued for three weeks postoperatively. Dicumarol was given by mouth, beginning on the third postoperative day. The usual daily administration was 25 mg. Prothrombin determinations were performed daily, and the drug was continued for three weeks.

Although a thrill was palpable at the site of the anastomosis after the arterial clamps had been released, no murmur was audible immediately after the chest had been closed. By the first evening a faint murmur was audible, which gradually increased in intensity. By the fourth postoperative day a continuous murmur was audible over the site of the anastomosis and posteriorly throughout both lungs.

The child's compensation has remained excellent. In contrast to a preoperative arterial pressure of 85 systolic and 65 diastolic, the arterial pressure postoperatively was usually 106 systolic and 52 diastolic. The heart increased somewhat in size during the first ten days after operation, but there did not appear to be a further increase in the subsequent two weeks. Roentgenograms of the heart both before and after operation are shown in figure 10.

Arterial punctures were performed on the 9th and 24th postoperative days. The results of the analyses are given in table 2. On comparing the preoperative studies with those performed twenty-four days after operation, samples of venous blood showed that the red blood cell count decreased from 10,000,000 to 6,000,000, the hemoglobin from 26 to 20 Gm. and the hematocrit reading from 81 to 53 (Wintrobe).

The patient had had a preoperative daily elevation of temperature to 100 F., and this continued for three weeks after operation. For this reason he was not allowed out of bed despite his vigorous protests until three and a half weeks after operation. When permitted to do so, the child walked 40 feet with ease. He was then allowed to be up for several hours each day and has walked and played in his room. He did not develop either cyanosis or dyspnea on this activity. The patient was discharged from the hospital on the thirty-eighth postoperative day.

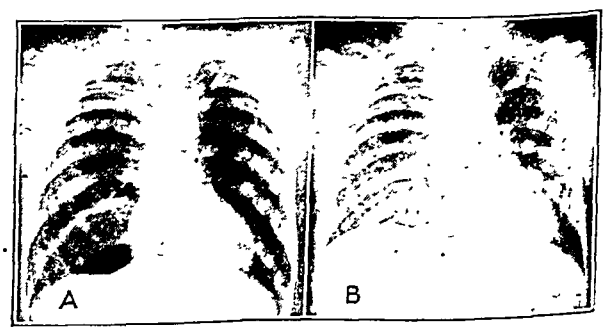


Fig. 10 (case 3).—Heart *A*, before operation and *B*, two weeks after operation.

COMMENT

Each of these 3 patients suffered from such a severe degree of pulmonary stenosis that there was inadequate circulation to the lungs. Although the three operations differed in detail, in each instance the operation greatly increased the volume of blood which reached the lungs.

In the first case the end of the left subclavian artery was anastomosed to the side of the left pulmonary artery. As the baby was small and weak, extensive laboratory studies were not performed. Before operation the baby had been steadily losing ground. She had ceased to be able to sit alone; she had refused her feedings and had lost weight. The red blood cell count had declined from 7,000,000 to 5,000,000; consequently the cyanosis had diminished considerably. After operation her clinical improvement was remarkable. The appetite improved, she gained weight and she is now starting to learn to walk.

The second patient had a right aortic arch; hence it was possible to anastomose the innominate artery to the left pulmonary artery. The patient was deeply cyanotic and severely incapacitated and could not walk 30 feet without panting. Two and a half weeks after operation she walked 60 feet, rested a short time and walked 60 feet back to her room and sat down quietly. The seriousness of her condition and the extent of the improvement are shown by the changes in the oxygen saturation of the arterial blood, which was 36.3 per cent before operation and which rose to 82.8 per cent three weeks subsequently. The red blood cell count dropped from 7,500,000 to 6,000,000, the hemoglobin from 24 Gm. to 17.5 Gm. and the hematocrit reading from 71 to 55.

The success of the second operation led us to perform the same operation in the third case Since the aorta was in the normal position, in order to use the innominate artery the operation was performed on the right side. The end of the innominate artery was anastomosed to the side of the right pulmonary artery. The patient was younger, and improvement was even more dramatic. Before operation he was intensely cyanotic, the lips were a dark purple, and the child was unable to take even a few steps. The day after operation he lay in an oxygen tent with cherry red lips. When taken out of the tent his color remained good. His disposition has changed from that of a miserable whining child to a happy smiling boy. We were slow to permit him to walk because of a persistent low grade fever, but at the end of the third postoperative week he could walk 40 feet without panting and without becoming cyanotic. The oxygen saturation of the arterial blood rose from 35.5 to 79.7 per cent in nine days, and it reached a saturation of 83.8 per cent twenty-four days after operation. The red blood cell count fell from 10,000,000 to 6,000,000; the hemoglobin decreased from 26 Gm. to 20 Gm. and the hematocrit reading from 81 to 53.

There are a number of features of the operative procedure which merit discussion. We were fearful that an intensely cyanotic child would not tolerate a long operative procedure in which it was necessary to open the pleural cavity and to occlude temporarily one of the pulmonary arteries. For this reason our first clinical attempt to increase the circulation to the lungs was postponed almost a year after it was decided that the procedure was a sound one, with the hope that some method of administering oxygen in addition to inhalation might prove satisfactory. This seemed particularly important since it was obvious that a new and untried procedure should be performed first on patients with a severe degree of anoxemia whose outlook without aid of some sort was hopeless. Although the use of intravenous oxygen has been reported by Ziegler [12] and may prove to be of benefit in this operation, it was impossible during wartime to procure the necessary equipment. Therefore this method could not be studied.

From our limited experience it appears that this type of patient can tolerate the use of inhalation agents for general anesthesia. We have been fortunate in this respect in that the anesthetic agents were chosen and administered expertly by Dr. Austin Lamont and Dr. Merel Harmel.[13] The first of these 3 patients was only 14 months of age and weighed less than 9 pounds. Ether by the open drip method was used during the major part of the procedure for the reason that a sufficiently small closed system was not available. In the anesthetization of the second and third patients, cyclopropane with a high concentration of oxygen was employed. Fortunately the administration of oxygen apparently increased the oxygen content of the arterial blood and cyanosis was definitely lessened. Although in only 1 patient was there any serious hemorrhage, the precaution was taken of having both blood and plasma readily available. Indeed, a slow continuous drip of plasma is advisable so that at a moment's notice if necessary the patient can be given large quantities of plasma. With these precautions no great difficulty was encountered in spite of the fact that two of the three operations required three hours.

The next question which arose was whether a patient who was already suffering from a severe degree of anoxemia would tolerate the occlusion of one of the main pulmonary arteries for the period during which the anastomosis was being performed. These periods of occlusion were approximately thirty, sixty and ninety minutes in the three operations. It is a remarkable fact that the cyanosis did not appear to be greatly increased during the occlusion period. It may be that the decreased flow of blood to the lungs caused by the congenital deformity rendered it possible for the opposite artery and lung to utilize this reduced volume almost as effectively as could the two lungs. Be that as it may, the 3 children tolerated occlusion of the left or the right main pulmonary artery for periods ranging from approximately thirty to ninety minutes.

Another question which arose was whether ligation and division of the left subclavian artery or the innominate artery would result in serious impairment of the circulation to the arm and the brain. In most instances heretofore these vessels have been occluded because of preexisting disease such as aneurysm, and it is possible under such circumstances that there has been a prolonged stimulus for the formation of collateral arterial pathways. It was gratifying, therefore, to note in our patients that there was little evidence of impairment of circulation to the parts deprived of their major arterial pathway. It is true that the pulse was absent for some time postoperatively and the part was slightly cooler than that of the opposite part of the body, but immediately after operation it was evident that the circulation was adequate to maintain life of the part. It may prove desirable to perform an upper dorsal sympathectomy at the time of operation. This would not add to the gravity of the operative procedure, since one has an excellent exposure of this region in perform-

12. Ziegler, E. E.: Intravenous Administration of Oxygen, J. Lab. & Clin. Med. **27**: 223-232 (Nov.) 1941.
13. Drs. Lamont and Harmel will deal with this subject in a subsequent communication

ing the arterial anastomosis. In future cases the circulation of the arm will be studied more carefully.

The operation has not been attempted before on patients and there are many operative as well as clinical features which are still under investigation. The first of these is concerned with the type of anastomosis which is to be performed. This will undoubtedly depend on many factors, especially the age of the patient and the degree of anoxemia. As stated previously, in our patients the anastomosis was performed between the end of the subclavian artery or innominate artery and the side of the left or right pulmonary artery. This type of anastomosis appears to be sound in that it allows the blood to flow from the systemic circulation to both lungs. The fact that the continuous murmur which results from the operation is readily audible on both sides of the chest indicates that the anastomosis does direct blood to both lungs. It was this type of anastomosis which was used by Eppinger, Burwell and Gross [8] in their studies on the cardiac output of dogs with an artificial ductus arteriosus.

The easiest of the end to side arterial anastomoses in this region is that between the end of the left subclavian artery and the side of the left pulmonary artery. On the other hand, the subclavian artery is so small in an infant that the chances of the occurrence of thrombosis at the anastomotic site are great. This is particularly true if the patient has extreme polycythemia. Even though the anastomosis remains patent, the size of the vessel is a limiting factor in the flow of blood to the lungs which may not be sufficient to overcome the high degree of anoxemia from which some of these patients suffer. In an older patient with only a moderate degree of cyanosis the subclavian artery would appear to be the ideal vessel. The left common carotid is somewhat larger than the left subclavian artery, and its employment under some circumstances seems to be warranted. When dealing with the degree of anoxemia which was present in our patients, the innominate artery is much to be preferred to the left subclavian artery or the left common carotid artery. The performance of the anastomosis is not very difficult when the left pulmonary artery can be used. The anastomosis of the innominate artery to the left pulmonary artery is possible only in patients with a right aortic arch and hence an innominate artery on the left. With the innominate artery in its normal position the anastomosis of this vessel to the right pulmonary artery is more difficult because so much of the latter artery lies behind the aorta and the superior vena cava. Improvements in the designs of instruments will facilitate this procedure.

It is important to bear in mind that the degree of impairment in the flow of blood to the lungs varies from patient to patient, and the selection of the vessel to be used depends on the extent of the need of the patient for an increase in the circulation to the lungs. Experimental observations and clinical trial and error will undoubtedly shed additional light on this subject. It is obvious that the vessel chosen and the size of the anastomosis itself should not be larger than is necessary for the relief of anoxemia because of the danger associated with excessive shunting of blood to the lungs.

There are other methods in addition to union of an end of a systemic artery to the side of a pulmonary artery by which an anastomosis between the two circulations may be made. Included among these are (1) anastomosis of the divided proximal end of one of the vessels which arise from the aortic arch (innominate, left common carotid, left subclavian) to the divided distal end of one of the two pulmonary arteries, (2) anastomosis of the divided proximal end of the subclavian artery or the common carotid artery to the divided proximal end of the pulmonary artery to an upper lobe of one of the lungs, (3) anastomosis of the side of the aorta to the side of the left pulmonary artery and (4) anastomosis of the side of the aorta to the side of the left pulmonary artery. These will be considered in the order in which they are enumerated.

The results of the use of the first method, in which the divided proximal end of the left subclavian artery is anastomosed to the divided distal end of the left main pulmonary artery, were reported in 1939 by Levy and Blalock.[7] It was stated that "dogs which have been observed for several months following this procedure appear entirely normal. The left lung was aerated and the respiratory movements were unaltered. The systemic arterial blood pressure was not affected by this operation. The blood pressure in the pulmonary artery only a short distance beyond the anastomosis was less than half of that in the systemic arteries. This was due to the relatively low peripheral resistance in the pulmonary bed. Since only arterial blood entered the left lung, the quantity of oxygen consumed by this lung was very small. However, when anoxemia was caused, a larger quantity of oxygen was taken up by the incompletely oxygenated arterial blood. The left lung appeared pinker than the right on gross examination during life. Microscopic examination revealed no noteworthy alteration in either the left pulmonary artery or lung." Some of these animals have now been observed over periods ranging up to six years. The only disturbing finding has been that a few of the animals at autopsy have shown a thickening of the left pulmonary artery. It was noted by Dr. Arnold Rich that this was found only in instances in which the anastomotic site was partially occluded as a result of thrombosis. The discrepancy in the size of the left subclavian artery and that of the left pulmonary artery may have accounted in part for this finding. Furthermore, this discrepancy in size may be responsible in part for the sudden diminution in the arterial pressure just beyond the point of anastomosis. At any rate, it is improbable that the anastomosis of the subclavian artery to the end of the left pulmonary artery would be the procedure of choice in the treatment of pulmonic stenosis. If this type of anastomosis should be performed, the innominate artery would be a better choice than the subclavian because it is more nearly the size of the pulmonary artery. It may be found that an end to end anastomosis is more apt to remain patent than an end to side one; certainly it is technically easier to perform. If, in the process of performing an anastomosis between the end of the innominate artery and the side of one of the pulmonary arteries, the latter vessel should be torn beyond repair, it should be borne in mind that an anastomosis may still be performed between the end of the innominate and the distal end of the pulmonary artery. Experimental studies are being carried out on the relative virtues of end to end and end to side anastomoses.

A second alternative method consists in anastomosing the proximal end of the divided subclavian or carotid artery to the proximal end of the divided pulmonary artery to one of the upper lobes. Since it is technically easier to perform an end to end than an end to side anastomosis, one may consider the advisability of using

this procedure for a patient with only a slight degree of cyanosis. The proximal end of the pulmonary artery is specified because this would conceivably allow blood to gain access to all the lobes except the one supplied by the artery which was used for the anastomosis. This procedure has been performed in the laboratory and is not difficult.

The third possible operative procedure is concerned with an anastomosis of the side of the aorta to the side of the left pulmonary artery. That such a procedure is possible in dogs has been shown by Leeds [9] in his studies on patent ductus arteriosus. We considered the use of this method in our patients but were discouraged by the experience of Blalock and Park [10] in studies on experimental coarctation of the aorta. In these experiments the aorta was divided just distal to the ligamentum arteriosum, the two ends of the aorta were closed, the left subclavian artery was divided at some distance from the arch of the aorta, and the proximal end of the divided subclavian artery was anastomosed to the side of the distal end of the aorta just below the point at which it had been divided. Thus the subclavian artery was used for the conduction of blood beyond the point of division of the aorta. The discouraging feature of these experiments was that in approximately half of the animals the hind legs were paralyzed at the completion of the operative procedure. In 1 dog in which we occluded the aorta for forty minutes for the purpose of making an anastomosis between the side of the aorta and the side of the left pulmonary artery the hind legs became paralyzed. It is impossible to make an accurate anastomosis between the aorta and the left pulmonary artery without interrupting temporarily the circulation through the two vessels. We were fearful of causing a paralysis of the lower extremities and hence did not use this method with our patients. Another difficulty associated with the use of the aorta is that its walls are thick and rather friable and it is difficult to obtain an accurate approximation of the intimal surfaces.

The fourth method to be considered is that of an anastomosis of the aorta and the main pulmonary artery. It is obvious that occlusion of these vessels for the length of time that is required for an open suture anastomosis would result in death. If such a union was to be secured, it would have to be done by some other method. Fortunately the first portions of the medial walls of the aorta and the pulmonary artery are intimately adherent to each other. The ascending aorta and the main pulmonary artery are contained within the pericardial cavity and are enclosed in a tube of serous pericardium common to the two vessels. We have been able to produce a fistula between the two vessels in dogs by inflicting a stab wound in this region. The knife blade was introduced through the opposite free wall of the pulmonary artery, the walls of the pulmonary artery and aorta which were in intimate contact were pierced, the knife was withdrawn, and the opening in the free side of the pulmonary artery was closed by sutures. The establishment of the fistula required only a few seconds. This method is mentioned because it may be necessary to use the major blood vessels and to employ considerable speed if newborn infants with pulmonary stenosis or atresia are to be saved. It would not be at all surprising if this experimental method should prove to be a useful one in patients.

It remains to be proved whether a communication between the two circulations should be brought about by direct anastomoses between blood vessels such as we have employed or by the use of tubes such as those devised for other purposes by Blakemore, Lord and Stefko.[14] It is our impression that the suture method is preferable when it can be accomplished without undue tension. This method obviates the necessity for leaving a large foreign body in the tissues; furthermore, there is at least a possibility that the opening will increase in size with the growth of the child. Studies on the latter point are in progress. These comments are in no sense a criticism of the Blakemore method, which is of great value in those instances in which part of a blood vessel has been destroyed and the ends cannot be united by direct suture.

One of the possible complications which causes concern is the danger of thrombosis at the anastomotic site. The improvement of our 3 patients indicates that thrombosis has not occurred. Furthermore, in cases 2 and 3 loud continuous murmurs developed after operation. As mentioned previously, partial occlusion of the anastomotic site has been found in some of the dogs in which such anastomoses were performed. Partial occlusion of the opening and emboli in the lungs were found at autopsy in 1 animal in which the end of the subclavian artery had been anastomosed to the side of the left pulmonary artery. This experiment was complicated by the previous creation of bilateral pulmonary arteriovenous fistulas. The sizes of the vessels used and the size of the communication between the two vessels are, of course, of prime importance in the determination of whether or not the opening will remain patent. This consideration is another point in favor of using a large vessel such as the innominate artery. Because of the difference in pressure on the two sides of the anastomotic site between the systemic and pulmonary circulations, it would be more likely that such an anastomosis would remain open than communications of similar size between two systemic arteries or two systemic veins.

As previously stated, most patients with the type of malformation of the heart under consideration have a decided polycythemia and an increased viscosity of the blood. This condition undoubtedly increases the danger of thrombosis. Indeed, cerebral thromboses are of not infrequent occurrence in these patients. Therefore the question arose as to whether these patients should receive heparin shortly after the termination of the operation. After much deliberation it was decided that the possible dangers were greater than the possible advantages. This opinion, however, is subject to change. By way of compromise, it was decided to give dicumarol during the period of convalescence. Therefore, beginning respectively on the fourth and third postoperative days the second and third patients were given dicumarol in small quantities. Prothrombin determinations were made daily and the dose of dicumarol was regulated so as to keep the clotting time approximately double that of the normal control. This medication was continued for a period of approximately three weeks. It is impossible to state whether this therapy has been of importance in the maintenance of the patency of the fistulas.

In order to understand the changes produced by the operation and its application to other malformations, it is essential to understand the nature of this malformation and the course of the circulation. The four features which constitute the tetralogy of Fallot are pulmonary stenosis, dextroposition of the aorta, an inter-

14. Blakemore, A. H.; Lord, J. W., Jr., and Stefko, P. L.: Restoration of Blood Flow in Damaged Arteries: Further Studies on Nonsuture Method of Blood Vessel Anastomosis, Ann. Surg. 117: 481-497, 1943.

ventricular septal defect and right ventricular hypertrophy. The pulmonary stenosis consists in a narrowing of the pulmonary orifice, and it is usual to find that the constriction also involves the pulmonary conus of the right ventricle. Dextroposition of the aorta means that the aorta rises from the left ventricle and partially overrides the right ventricle. Whenever this occurs, the aortic septum cannot meet the ventricular septum; consequently there is a high ventricular septal defect. Such is the nature of an interventricular septal defect in the tetralogy of Fallot. The malformation renders it difficult for the blood to be expelled from the right ventricle; hence there is hypertrophy of that chamber. The structure of the heart and the course of the circulation are diagrammatically shown in figure 11.

The degree of incapacity in a tetralogy of Fallot depends on the severity of the pulmonary stenosis and the degree of the overriding of the aorta. It is well known in cases in which the pulmonary stenosis is not extreme that the malformation is compatible with relative longevity. However, with extreme degrees of pulmonary stenosis and greatly diminished circulation to the lungs, the condition causes severe incapacity and death occurs at an early age.

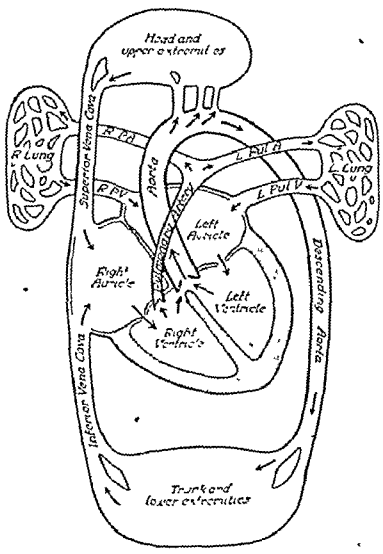


Fig. 11. Diagram of the course of the circulation in the tetralogy of Fallot. In this malformation there is pulmonary stenosis, the aorta is dextroposed and hence receives blood from both ventricles, the ductus arteriosus undergoes normal obliteration and the foramen ovale is closed. The blood from the right auricle flows into the right ventricle; hence part of the blood is pumped through the stenosed pulmonary orifice into the pulmonary artery and part of the blood is pumped directly into the aorta. Only that portion of the blood from the right ventricle which is pumped into the pulmonary artery goes to the lungs for aeration and is returned to the left auricle and the left ventricle. All of the blood from the left ventricle and some of the blood from the right ventricle is pumped out into the aorta to the systemic circulation and is returned by the superior vena cava and the inferior vena cava to the right auricle. There the cycle starts again.

The anastomosis of the innominate artery to the pulmonary artery directs a large volume of blood from the systemic circulation into the pulmonary circulation. By this means the volume of blood which reaches the lungs for aeration is increased; it follows that a greater volume of oxygenated blood is returned by the pulmonary veins to the left auricle and the left ventricle; consequently a greater volume of oxygenated blood is pumped out into the systemic circulation. As some blood from the aorta is diverted to the pulmonary circulation, the volume of blood to the systemic circulation is decreased and less blood is returned to the right auricle and the right ventricle. Thus the volume of blood which is returned to the right ventricle is lessened and that which is returned to the left side of the heart is increased. The alteration in the course of the circulation as influenced by the operation is shown in figure. 12.

In short, the operation enables some blood to bypass the obstruction to the pulmonary circulation. Hence the operation should be of value in all malformations in which the primary difficulty is due to lack of adequate circulation of the blood to the lungs; that is, in all cases of the tetralogy of Fallot and complete pulmonary atresia, in cases in which the right ventricle is absent or defective in its development, in cases of truncus arteriosus with bronchial arteries, or even a single ventricle with a rudimentary outlet chamber in which the pulmonary artery is diminutive in size.

Complete pulmonary atresia is, of course, compatible with life only as long as the ductus arteriosus remains open unless the bronchial arteries dilate and establish sufficient collateral circulation for the maintenance of life. This, we believe, happened in case 2, as at operation large aberrant vessels were found in the region of the hilus of the left lung. However, in the great majority of cases of pulmonary atresia the closure of the ductus arteriosus is so rapid that adequate collateral circulation does not develop and consequently the condition is fatal in early infancy. In all such cases the operation, if performed early, may be life saving. The same is true in cases of a defective development of the right ventricle in which all of the blood from the right auricle is directed to the left auricle and hence to the left ventricle and out by way of the aorta, and the only circulation to the lungs is by way of the ductus arteriosus.[15] The operation should be equally valuable in cases of truncus arteriosus with bronchial arteries because the bronchial arteries never become sufficiently large to provide adequate circulation to the lungs.

In every instance there is, of course, an admixture of venous and arterial blood. It would be impossible, therefore, to bring the oxygen saturation of the arterial blood to normal; nevertheless, it is conceivably possible to bring the oxygen saturation of the arterial blood sufficiently high so that there would be no "visible" cyanosis. Certainly in the 2 older children there has been an increase in the oxygen content of the arterial blood, a decrease in the oxygen capacity, an increase in the oxygen saturation of the arterial blood, a decrease in the red blood cell count, a diminution in the hemoglobin and the hematocrit reading, a striking decrease in the patients' disability and a great improvement in the patients' ability to exercise.

In cases of the tetralogy of Fallot the heart is either normal in size or relatively small. Following the creation of an artificial ductus, the increased volume of blood which reaches the pulmonary circulation undoubtedly increases the work of the left side of the heart. In our patients the heart has definitely increased in size but compensation thus far has remained excellent. Sir Thomas Lewis[16] has emphasized that in cases of coarctation of the aorta prolonged overwork does not cause cardiac failure. Palmer[17] in his studies on cardiac enlargement showed that, in essential hypertension, cardiac enlargement occurs with the gradual rise in blood pressure and that progressive enlargement does not easily occur after the blood pressure level has become stabilized. Therefore it is our hope and expectation that in this operation, although the heart immediately increases in size in response to the altered blood flow, the condition will not lead to progressive cardiac enlargement. It is encouraging that in both cases 2 and 3, although the heart increased in size in the first ten days, there was no further increase in the second ten days.

15 Taussig, H. B.: The Clinical and Pathological Findings in Congenital Malformations of the Heart Due to Defective Development of the Right Ventricle Associated with Tricuspid Atresia or Hypoplasia, Bull. Johns Hopkins Hosp. 59: 435-445, 1936

16. Lewis, T.: Material Relating to Coaretation of the Aorta of the Adult Type, Heart 16: 205-261, 1933

17. Palmer, J. H.: The Development of Cardiac Enlargement in Disease of the Heart: A Radiological Study, Medical Research Council Special Report Series, No. 222, 1937.

It is important to emphasize that the operation is not of value to all patients with persistent cyanosis. It is of value only in malformations in which the primary difficulty is lack of circulation to the lungs. The operation would be of no use in cases of complete transposition of the great vessels or in the so-called "tetralogy of Fallot of the Eisenmenger type" and probably not in aortic atresia.

In complete transposition of the great vessels the pulmonary artery arises from the left ventricle and the aorta from the right ventricle. The blood from the left ventricle is pumped out through the pulmonary artery to the lungs and is returned by the pulmonary veins to the left auricle and thence to the left ventricle. The blood from the right side of the heart is pumped out into the aorta to the systemic circulation and is returned by the superior vena cava and the inferior vena cava to the right auricle and the right ventricle. The primary difficulty in this malformation is not in the volume of blood which reaches the lungs but in the mechanism by which the blood which has been oxygenated in the lungs can reach the systemic circulation.

In the Eisenmenger complex cyanosis appears to be due to secondary changes in the alveolar wall or in the pulmonary vascular bed of such a nature as to hinder the aeration of the blood as it passes through the lungs; it is even possible that the high pressure in the lesser circulation may increase the right to left shunt and thereby increase the volume of reduced hemoglobin in the arterial blood. In any event, in this malformation there is no lack of circulation to the lungs and, furthermore, only rarely, if ever, is there deep cyanosis in early childhood.

In aortic atresia[18] not only is there difficulty in pumping blood to the systemic circulation but also the blood which does reach the systemic circulation is pumped through the ductus arteriosus before it has been to the lungs for aeration. Under such circumstances the creation of an additional ductus arteriosus would act to direct a larger volume of blood to the body; but it must be borne in mind that this blood has the same oxygen content as that directed to the lungs.

It is worthy of note in almost all patients with much polycythemia that all of the blood which circulates through the lungs is no longer fully oxygenated. Whether the size of the capillary bed in the lungs varies with the plasma volume and not with the number of red blood cells is not known, but there is clear evidence to show that even in patients in whom the primary difficulty is lack of circulation to the lungs the oxygen saturation of the arterial blood can be appreciably raised by the prolonged inhalation of a high concentration of oxygen. The potency of this factor was demonstrated by the great improvement in the peripheral cyanosis during operation when the patients were receiving oxygen. The importance of the volume of blood which reaches the lungs for aeration is demonstrated in our patients by the extent of the rise in the oxygen saturation of the arterial blood which resulted from the operation; in 1 instance it rose from 36 3 to 82 8 per cent and in the other from 35.5 to 83 8 per cent.

It may be that, with prolonged meager flow of blood to the lungs, secondary changes occur so that the pulmonary capillary bed is no longer capable of complete expansion and restoration to normal Our 6 year old child showed prompter improvement than did the 12 year old girl. Hence the operation may prove less beneficial to older persons than to young children. For this reason the ideal age for operation appears to be after the systemic pressure has risen sufficiently high to permit the continuous flow of blood from the aorta to the pulmonary artery and before the condition has persisted long enough to cause irreversible changes in the lungs. We believe that the optimal age of patients is probably between 4 and 6 years, however, in all cases in which the closure of the ductus arteriosus renders the malformation incompatible with life the operation must be performed in early infancy.

Since the operation should be of value to all patients in whom the primary difficulty is lack of circulation to the lungs, it behooves the clinician to recognize this condition.[19] The two outstanding features, both of which should be present, are (1) roentgenographic evidence that the pulmonary artery is diminutive in size and (2) clinical and roentgenographic evidence of absence of congestion in the lung fields.

The size of the normal pulmonary artery is not difficult to determine by roentgenography. The striking feature in the roentgenogram is the absence of the fulness of the normal pulmonary conus. The shadow at the base of the heart to the left of the sternum is concave and not convex. A concave shadow in this region in patients with persistent cyanosis always means that the pulmonary artery is misplaced, absent or diminutive in size.[2] When the pulmonary artery is absent or diminutive in size, there is the additional finding in the left anterior oblique position of an abnormally clear pulmonary window.[2]

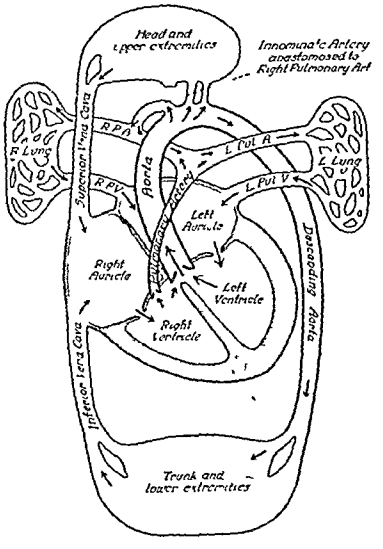


FIG. 12.—Diagram of the course of the circulation in the tetralogy of Fallot after the anastomosis of the innominate artery to the pulmonary artery. Under these circumstances the blood from the right auricle flows into the right ventricle and, as before, part of the blood from the right ventricle is pumped directly into the aorta Now, in addition to the blood which is pumped through the pulmonary orifice into the pulmonary artery, some of the blood from the aorta is diverted through the anastomosis to the lungs Thus the volume of blood which reaches the lungs is increased and the volume of oxygenated blood which is returned to the left auricle and the left ventricle is proportionately increased. All of the blood from the left ventricle and also some blood from the right ventricle is pumped into the aorta Some of the blood from the aorta is directed to the lungs, and the remainder goes to the systemic circulation and is returned by the superior vena cava and the inferior vena cava to the right auricle Thus the left ventricle receives more blood than before operation and the right side of the heart receives less The operation has bypassed the obstruction in the circulation of the blood to the lungs

Absence of clinical and x-ray evidence of congestion in the lungs is highly important in reaching a decision. When circulation to the lungs is inadequate, the diminished blood flow to the lungs lessens the chances of congestion in the lungs and congestion rarely occurs.[2] When congestion does occur, it suggests that the circulation to the lungs is adequate or excessive. The operation should never be attempted when x-ray exam-

18 Taussig, H. B.: Clinical and Pathological Findings in Aortic Atresia or Marked Hypoplasia of the Aorta at Its Base, Bull Johns-Hopkins Hospital, to be published

19 The following discussion is based mainly on original unreported observations which are dealt with in detail in chapters II and III of Taussig's forthcoming book on "The Clinical Analysis of Congenital Malformations of the Heart," to be published by the Commonwealth Fund.

ination shows a prominent pulmonary conus or when there are pulsations at the hili of the lungs. These pulsations should be looked for by careful fluoroscopic examination after one's eyes are fully accommodated.

Virtually the only malformation in which there is absence of the normal shadow cast by the pulmonary artery in the presence of adequate circulation to the lungs is complete transposition of the great vessels. In this condition the pulmonary artery lies behind the aorta; therefore, in the anteroposterior view there is a narrow aortic shadow and a concave curve at the base of the heart to the left of the sternum. In the left anterior oblique position the two vessels lie side by side; hence the shadow cast by the great vessels increases in width [20] and the pulmonary window is not abnormally clear. The condition does not cause pulsation at the hili of the lungs but frequently leads to congestion in the lung fields. These observations, together with evidence of relatively rapid progressive cardiac enlargement,[2] should aid in the establishment of the correct diagnosis.

The operation should be performed on the right or left side, depending on which vessel is to be used and on which side the aorta descends. Furthermore, it is important to bear in mind that the occurrence of a right aortic arch is by no means rare in congenital malformations of the heart which cause persistent cyanosis. Bedford and Parkinson [21] have shown that the determination of the course of the aorta is not difficult, provided fluoroscopy is carefully performed and the esophagus delineated with a barium opaque mixture. Normally the aortic knob is visible on the left, the esophagus lies in the midline and is indented by the aorta on the left margin, and in the right anterior oblique position the esophagus is seen to be slightly displaced backward by the aorta. In cases of a right aortic arch the aortic knob frequently is hidden within the shadow cast by the superior vena cava. In the anteroposterior view the esophagus is indented on the right and is displaced backward in the left anterior oblique position.

It remains to be seen whether these patients will develop heart failure. Even if this occurs, the intervening period appears to be one of great clinical improvement. It may well be that, if more patients with congenital malformations of the heart survive, more will develop subacute bacterial endocarditis. Certain it is that there is nothing in persistent cyanosis which renders an individual immune from subacute bacterial endocarditis. The condition is less frequently encountered in cyanotic persons only because a comparatively small number of patients survive long enough to be liable to contract the disease. The fear of subacute bacterial endocarditis in the future is no justification for allowing a patient to die of anoxemia in the present. Even the possibility of future cardiac failure does not weigh heavily against present extreme incapacity and the danger of early death from anoxemia or cerebral thrombosis.

SUMMARY

An operation for increasing the flow of blood through the lungs and thereby reducing the cyanosis in patients with congenital malformations of the heart consists in making an anastomosis between a branch of the aorta and one of the pulmonary arteries; in other words, the creation of an artificial ductus arteriosus. Thus far the procedure has been carried out on only 3 children, each of whom had a severe degree of anoxemia. Clinical evidence of improvement has been striking and includes a pronounced decrease in the intensity of the cyanosis, a decrease in dyspnea and an increase in tolerance to exercise. In the 2 cases in which such laboratory studies were performed there has been a decline in the red blood cell count, in the hemoglobin and in the hematocrit reading, an increase in the oxygen content of the arterial blood, a fall in the oxygen capacity, and most significantly a decided rise in the oxygen saturation of the arterial blood.

The types of abnormalities which should be benefited by this operation are the tetralogy of Fallot, pulmonary atresia with or without dextroposition of the aorta and with or without defective development of the right ventricle, a truncus arteriosus with bronchial arteries, and a single ventricle with a rudimentary outlet chamber in which the pulmonary artery is diminutive in size. The operation is indicated only when there is clinical and radiologic evidence of a decrease in the pulmonary blood flow. The operation is not indicated in cases of complete transposition of the great vessels or in the so-called "tetralogy of Fallot of the Eisenmenger type," and probably not in aortic atresia. It must be emphasized that the operation should not be performed when studies reveal a prominent pulmonary conus or pulsations at the hili of the lungs.

20. Taussig, H. B.: Complete Transposition of the Great Vessels, Am. Heart J. **16**: 728-733, 1938.

21. Bedford, D. E., and Parkinson, J.: Right-Sided Aortic Arch, Brit. J. Radiol. **9**: 776-798, 1936.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following article. HOWARD A. CARTER, *Secretary.*

THERAPEUTIC AND REMEDIAL EXERCISES

FRANK H. EWERHARDT, M.D.
ST. LOUIS

It is my purpose to confine myself to the practical application of physical exercise as related to the health of the human body rather than to discuss problems involved in the physiology of exercise.[1]

Almost all of the bodily movements done by a normal person throughout the day's routine, such as sitting, walking, eating and dressing, consist essentially of a successive recurrence of simple reflex acts. However, the matter of learning new movements has an entirely different significance and involves a review of the phenomenon of muscular control. It is interesting to syllogize on the subject of what happens when a boy learns to swim, a girl to knit or an athlete to pole vault. The answer is found in an understanding of the classification, action and coordination of muscles.

Skeletal muscles are classified as prime movers (protagonists or agonists), antagonists and synergists or fixers.

1. For studies on the physiology of exercise the reader is referred to Lipovetz (Applied Physiology of Exercise, Minneapolis, Burgess Publishing Company), who concisely interprets studies on the phenomenon of muscle contractions; the chemical changes of contraction; the phenomenon of muscular action, control and movement; equilibrium, postural tonus and tonus reflexes; nerve mechanism of the heart; innervation and chemistry of respiration, and the localization of brain function and the process of learning.

Prime movers (protagonists, agonists) are the muscles which actually produce an intended movement. The antagonists are those which tend to oppose the action of the prime movers. The synergists so modify the action of the first two that the intended movement is performed smoothly, free from shocks or jolts and with the least expenditure of energy. Without collaboration of these various groups the apparently simple act of bringing a glass of water to the mouth would indeed be awkward and conceivably impossible, much as the infant finds it difficult to convey a spoonful of food into his mouth.

Still another motivating force which contributes smoothness and grace in the process of performing an active exercise is the process of relaxation. Whenever a group of muscles contract normally, the respective antagonists are made to relax at the same time. Thus, when the elbow flexors are made to contract, causing flexion of the elbow, the movement is accompanied by a relaxation of the normal muscle tone of the extensors. This is a positive and not a negative action, known as Sherrington's law of reciprocal innervation.

Muscular activity falls into two main divisions, active and passive. The raising of a patient's arm in abduction is an active movement if performed by the sole efforts of the patient himself; it is a passive movement if applied by the assistant to the patient without the latter offering any assistance or resistance. The active group is further subdivided into various minor groups.

Active, voluntary purposeful movements are initiated by mental processes. They affect the upper and lower neurons, the motor and sensory nerves, the myoneural junction and the muscle itself. Neither passive movements nor muscular action initiated by an electrical impulse can so exclusively and favorably influence the neuromuscular arc. This intricate mechanism is so complete that when the command for movement is given by the brain cells there is always a clear mental picture of the intended movement. For a movement impulse to express itself, it must be controlled by the sensory nerves, for the will and the sensibility are functions inseparably connected with each other. Because of this intimate relationship between brain and muscle, voluntary purposeful movements are of vital importance in restoring various nerve-muscle disturbances to normal.

Occupational therapy permits and may augment active exercise. Skills and crafts can be taught and learned by the use of hands and legs. In this manner function can be more quickly restored by the patient continually repeating the desired active movements. By this means the monotony of a routine gymnastic exercise is avoided by appealing to the creative instinct of the patient. Patients with little or no interest in life may be stimulated frequently to an entirely different outlook by this form of active exercise.

Passive movements are performed by an operator without the assistance or resistance of the patient. This action must not be confused with manipulation of a joint limited in motion due to fibrous adhesions of extracapsular or intracapsular origin. Neither should it be recognized as a synonym for the term relaxing movements, since passive movements are in no way concerned in releasing tension of muscular tissue. Passive is a descriptive term meaning the opposite of active. In passive movements the sensory association motor neuron synapse is in no way involved, whereas this unit is definitely and vitally concerned in the phenomenon of relaxation.

The significance of passive movement will be more fully appreciated by noting its practical application in physical medicine:

(*a*) To be used preliminary to active movement when the latter may be harmful; i. e., in the treatment of fractures or when active movements may be harmful or actually impossible.

(*b*) To improve the return lymph and blood circulation by virtue of compression and joint motion.

(*c*) To retain full amplitude of joint motion by the prevention of contractures, shortening of muscles and the formation of adhesions.

(*d*) To maintain conscious proprioception.

(*e*) To maintain nerve power by stimulation through stretching and shortening of muscles.

Resistive movements are those in the course of which the technician resists the efforts of the patient, or vice versa. The technician offers just as much resistance as the patient is able to overcome. In certain pathologic conditions these movements have distinct advantages over the active voluntary type of exercise.

(*a*) Single muscles or groups of muscles can be caused to function to an optimal degree because of a more complete relaxation of the prime movers and a consequent lessened resistance. This phenomenon is due to the operation of Sherrington's law of reciprocal innervation. The technician resists to a degree permitting the greatest range of motion [page 26 (*a*) resistive movements].

(*b*) By the same token protective spasm may be lessened. For example, resistance to knee flexion relaxes the overactive quadriceps.

(*c*) The work done by the muscles can be graduated to any amount desirable.

(*d*) By virtue of *a* and *c* resistive movements offer an excellent method of studying muscular action and relative strength.

Assistive movements, as the name implies, are useful in supplementing voluntary effort where normal muscle power is deficient. For example, a patient with a weak deltoid in the supine position is asked to bring the arm to a 90 degree abduction.

During the range of motion, assistance is offered by the technician for the first and third part of the movement while the patient alone performs during the second part.

Isometric muscular contraction currently has been unsatisfactorily termed "muscle setting." The muscle is contracted but does not involve joint action. It is admirably adapted to conditions of fracture or joint injury to arm or leg. Though the patient's leg may be encased in a plaster cast, still he is able to carry on muscular contractions, thus improving the circulation and the muscle tone.

AIDS IN MUSCLE TRAINING

In treating weak muscles by means of active exercise there is always a danger of overtaxing and causing exhaustion which would hinder the progress of the recovery. So as to minimize this danger it has been found helpful to employ certain procedures with an aim to lessen the factors of gravity and friction. I

will mention those commonly employed, which in turn may suggest others to the reader:

(*a*) *Postural.*—The aim is to place the body in a favorable position, thereby eliminating gravity to a greater or lesser extent. For example, in treating a weak deltoid muscle the patient is placed on his back with the arm to the side resting on a smooth board covered with talcum powder. The arm may then be brought to a 90 degree angle, which the patient could not do in a standing position without a severe strain on the deltoid muscle. Similarly in treating a leg the heel may be placed on a roller skate, a piece of board with gliders underneath or a thin rubber sponge. The patient is now able to abduct and adduct the leg and flex the knee, gravity having been eliminated and friction having been reduced to a minimum.

(*b*) *Sling Suspension.*—Still another method is to suspend the extremity in a sling about 6 inches from the bed or table, thus removing the element of gravity. Again in this position the leg may be abducted and adducted and the knee flexed with comparative ease and without straining the muscles involved. In my experience I have found it helpful to attach to the lower end of the sling a 1 inch band of inner tubing, which gives opportunity for increased amplitude of motion. It also adds the element of resistance, which is desirable.

(*c*) *Underwater Exercises.*—These movements are performed in therapeutic pools or a tank constructed for home use.[2] Exercise in the pool must not be confused with swimming. It is useful because the buoyancy of the water lessens gravity and makes possible the application of therapeutic exercise.

(*d*) *Muscle Testing.*—In preparing a plan of muscle reeducation it becomes essential (*a*) to learn to what extent the muscles have been damaged in order to ascertain their capacity for work and (*b*) to keep in mind certain characteristic muscle reactions. As an aid to the former the following classification of muscles may be used or modified by giving each group a numerical value:

1. A normal muscle: patient can overcome gravity and resistance.
2. A good muscle: patient can overcome gravity and resistance, but less than normal.
3. A fair muscle: patient can overcome gravity only.
4. A poor muscle: patient can produce movement only with gravity eliminated.
5. A trace: contraction of muscle can be palpated but with only little or no motion.
6. Gone or total paralysis: no contraction felt.

Once the strength of a given group of muscles has been found and properly grouped, the selection and execution of correct remedial movements should be governed by well known principles of muscle action. A muscle group in need of strengthening should not be called on to perform its maximum load at the beginning of training; the capacity for work is greater if at no time the muscle is pushed to its limit; it is more desirable to exercise often for short periods rather than a few times for long periods.

Since it is of great importance to guard against exhaustion, special attention should be focused on the following precepts: Exercise may be carried to the point of fatigue, but not beyond; the greater the frequency of contraction, the more rapid the approach of fatigue; the more complete the exhaustion, mental or muscular, the longer the period necessary for recovery; and the more complex the discriminations required in a performance, the more rapid the onset of fatigue.

600 South Kingshighway Boulevard.

2. The Council on Physical Medicine will send free directions for the construction of a tank. Handbook of Physical Medicine, American Medical Association, 535 North Dearborn Street, Chicago.

Council on Foods and Nutrition

OCTOBER 1944 MEETING OF THE COUNCIL ON FOODS AND NUTRITION

The meeting of the Council on Foods and Nutrition was held in Chicago on Oct. 22, 1944 and was attended by the following members:

Dr. George R. Cowgill	Dr. Irvine McQuarrie
Dr. C. A. Elvehjem	Dr. Lydia Roberts
Dr. Philip C. Jeans	Dr. Russell M. Wilder
Mr. Culver S. Ladd	Colonel John B. Youmans
Dr. James McLester, Chairman	Dr. George K. Anderson, Secretary

In addition to members of the headquarters staff there were present as invited guests Dr. E. M. Nelson of the Food and Drug Administration and Dr. Donald A. Wallace, secretary of the Council on Dental Therapeutics of the American Dental Association. Two members of the Council, Dr. Morris Fishbein and Dr. Howard B. Lewis, were unable to be present.

Among the numerous topics which were discussed at the meeting, the following may be of interest to physicians, manufacturers and others:

Nutritional Aspects of Candy Advertising.—Considerable time was devoted to discussion of the question of candy advertising in publications of the American Medical Association. Advice will be given the Advertising Committee for its guidance in passing on the suitability of the nutritional statements of the candy advertising.

Suggestions were made for revisions in the so-called "Nutritional Platform for Candy." It was the opinion of the Council that the primary purpose of developing a nutritional story in candy advertising should be the education of the public in the judicious use of candy as a food substance rather than to increase the overall consumption of candy. It was felt that recommendations for the use of candy by young children can only be detrimental to their proper nutrition.

Food Comparisons in Advertising.—A technic which has been frequently used in the advertising of certain foods is the comparison of their nutritive values with several other types of foods. This method can be informative and educational or may be misleading to the reader, depending on the manner in which the material is presented. In some cases the impression may be gained that the advertised food supplies all the food values of the foods shown. This is highly undesirable. The Council was of the opinion that the practice of making comparisons in food advertising in general could not be considered desirable. If this type of advertising is used it should not give a misleading impression to the reader, and the comparisons made should not be derogatory to other good foods.

Vitamin A Content of Margarine and Butter.—The Council was informed of the recently determined average values for vitamin A content of winter and summer butters throughout the country. Other figures given by the Committee on Food Composition of the National Research Council show a vitamin A content of 10,000 U. S. P. units per pound for winter butter and 18,000 units per pound for summer butter. All of these figures are higher than previously determined values for butter and higher than the 9,000 units of vitamin A added to each pound of oleomargarine. This newer information on the vitamin A content of butter is of considerable interest because the minimum level of addition to margarine was set by the Food and Drug Administration to approximate that of average butter. The question was raised as to whether it would be advisable to encourage the addition of higher levels of vitamin A to margarine by extending use of the Council Seal to margarines fortified with 15,000 units of vitamin A, the equivalent of the year round average for butter. This was not considered advisable at the present time.

Under existing standards the fortification of oleomargarine with vitamin A is entirely optional. The almost universal fortification of table margarines with vitamin A by manufacturers at present is very commendable. It is felt, however, that provision should be made for the continued fortification of all margarine, since its nutritional value is dependent on an appro-

priate vitamin A content. With this objective a resolution was adopted urging that all margarine contain not less than 9,000 units of vitamin A per pound and that the Food and Drug Administration be requested to hold a hearing for the purpose of considering a proposal to have the present optional fortification of margarine with vitamin A be made a part of the standards of identity and of quality for margarine.

Vitamin A Addition to Milk.—This subject was discussed at the previous meeting and the conclusion reached that fortification of winter milk with vitamin A was not indicated in the interests of the public health. Instead, it was felt, encouragement should be given to those concerned with improving dairy feeding for the purpose of raising the vitamin A content of the milk. There has been some comment since the earlier meeting on the practicability of raising the vitamin A content of milk by improved feeding. It appears that improvement may not be possible to the degree or extent that was suggested earlier. This fact does not alter the position taken by the Council, which reaffirmed its original decision that fortification of winter milk with vitamin A is not necessary from the public health point of view.

Acceptability of Foods with High Natural Vitamin C Content.—Citrus and tomato juices are important dietary sources of vitamin C, and the Council has encouraged their use for the contribution of this vitamin which they make to the diet. Many such canned juices carried the Seal of Acceptance until the limitation of scope to special purpose foods excluded them from consideration. Numerous studies of canned tomato juice have shown a wide variation in values for vitamin C. This is attributed to differences in variety grown, climatic conditions and efficiency in processing methods. At present it is impossible for the consumer to determine the quality of canned tomato juice with respect to vitamin C.

It is the desire of the Council to encourage the marketing of high quality natural foods. This can be done in part by granting acceptance to products which meet high standards set by the Council. Tomato juice was selected as a food in which improvement should be sought by considering granting the Seal of Acceptance to brands which meet a high standard of vitamin C content. The value which was determined on as representing a high natural level was 20 mg. of vitamin C per hundred cubic centimeters. It was decided that this information should be communicated to manufacturers to secure their interest in the proposed program as well as their comments. At the same time a committee of the Council was appointed to work out the details of control necessary to insure that accepted brands meet the standards as well as to give consideration to the application of this policy to citrus juices and other foods.

Resolution for Continuance of Baked Goods Enrichment.—The Council has long been on record in favor of the enrichment of flour and baked goods and has done much to extend this practice. At the present time by order of the War Food Administration all white bread and rolls are enriched, but this requirement is effective only for the duration of the present emergency. Attention is now directed by those interested in providing for the continuance of these nutritional benefits to measures which will assure the perpetuation of enrichment. This can be accomplished by means of legislation in each of the individual states or through adoption of federal standards requiring enrichment. A combination of the two procedures may be the most effective.

To encourage action by the proper federal and state agencies the Council adopted a resolution urging that all white bread offered for sale contain the required quantities of enriching ingredients. It was further resolved that the Food and Drug Administration be requested to hold a hearing to consider a proposal that the present and proposed standards for bread, white bread, enriched bread and enriched white bread under the Federal Food, Drug and Cosmetic Act be merged and recognized as synonymous. At the same time it was recommended that state legislatures, particularly those not now requiring or authorizing recognition of federal food standards, enact legislation to accomplish the desired purpose within their boundaries.

Use of the Term "Pure" in Relation to Evaporated Milk.—It has been the declared policy of the Council to permit use of the term "pure" on labels or in advertising of only those accepted products for which definite standards of purity exist and when the product has been demonstrated to meet these standards. Permission has been sought for use of this descriptive term in connection with evaporated milk manufactured under the sanitary code of the Evaporated Milk Association. Opinions as to adequacy of the requirements of the code for serving as standards of purity for evaporated milk were presented to the Council. Since there was lack of agreement concerning the acceptability of the controls of the sanitary code as suitable standards of purity, the proposal that the word "pure" be permitted was not adopted. It was decided that the matter be held over for further study.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its actions will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

STAPHYLOCOCCUS TOXOID-VACCINE MIXTURE.—A mixture containing in each cubic centimeter 2,000 million killed Staphylococcus aureus and the staphylococcus toxoid derived from 1,000 necrotizing doses of toxin.

Actions and Uses.—Staphylococcus toxoid-vaccine mixture is used in infections of recognized staphylococcic etiology. Such a mixture has been offered to neutralize the toxin and lysis of the invading organism. Local reactions may follow injection.

Dosage.—Ten doses, the first dose being 0.1 cc. (200 million Staphylococcus aureus, staphylococcus toxoid 100 necrotizing doses), the tenth 1.0 cc. Each dose is increased by 0.1 cc. The agent is given subcutaneously at weekly intervals.

THE NATIONAL DRUG CO., PHILADELPHIA

Vatox Staphylococcus Toxoid-Vaccine: 6 cc. vials. Preserved with merthiolate 1:10,000.

PENICILLIN (See Supplement to New and Nonofficial Remedies, 1944, p. 18).

The following dosage forms have been accepted:

MERCK & CO., INC., RAHWAY, N. J.

Penicillin (Calcium Salt): 100,000 Oxford Unit vials.

Penicillin (Sodium Salt): 100,000 Oxford Unit vials.

THE WM. S. MERRELL CO., CINCINNATI

Penicillin Sodium: 100,000 Oxford Units.

ELI LILLY & CO., INDIANAPOLIS

Penicillin (Calcium Salt): 100,000 Oxford Unit *ampuls.*

CHAS. PFIZER & CO., INC., BROOKLYN

Penicillin (Sodium): 100,000 Oxford Unit bottles.

BACTERIAL VACCINE MADE FROM THE CHOLERA VIBRIO (CHOLERA VACCINE) (See New and Nonofficial Remedies, 1944, p. 568).

The following dosage form has been accepted:

ELI LILLY & CO., INDIANAPOLIS

Cholera Vaccine: 20 cc. vial. Each cubic centimeter contains 8,000 million killed cholera vibrios.

BOTULISM ANTITOXIN (See New and Nonofficial Remedies, 1944, p. 536).

The following dosage form has been accepted:

LEDERLE LABORATORIES, INC., NEW YORK

Botulism Antitoxin Bivalent Globulin Modified: Vial containing 10,000 units each of type A and type B botulism antitoxin. Preserved with phenol 0.4 per cent and 1:25,000 phenylmercuric borate.

NIKETHAMIDE (See New and Nonofficial Remedies, 1944, p. 330).

The following dosage form has been accepted:

CARROLL DUNHAM SMITH PHARMACAL CO., ORANGE, N. J.

Solution Nikethamide 25% W/V: 15 cc. vials.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MAY 19, 1945

THE RETURNING MEDICAL OFFICER

Under Medicine and the War in this issue of THE JOURNAL appears a message from Surgeon General Norman T. Kirk indicating that it will be the policy of the Army Medical Department to bring back to the United States medical officers relieved from service in the European theater of operations and to assign them on their return, as long as needed, to service in their specialties in American hospitals and other installations. Medical officers who have not had foreign service and who are found fit for service abroad will be assigned as needed to foreign theaters of operations. This information will answer the questions of many medical officers, some of whom have written and telegraphed to the headquarters of the American Medical Association asking for a definite statement on this subject.

Many physicians have also written to the American Medical Association protesting against the possibility that they may be assigned on their release from service with the armed forces to the Veterans Administration. These letters were brought before the Committee on Postwar Medical Service at its meeting in Chicago May 12. That committee took prompt action, adopting the following statement, which was sent to the Secretary of War, Secretary of the Navy and the Committees on Military Affairs of the House of Representatives and the Senate:

In November 1944 the Army Medical Department was directed to transfer at least 300 medical corps officers to the Veterans Administration, this number to include those officers in the zone of the interior who were formerly employed by the Veterans Administration as civilians. Apparently about 100 men meeting the latter classification were so assigned and in addition some 200 others selected largely from among men who had been marked "limited service." Many of those thus assigned have protested and others are now protesting bitterly against these assignments on the ground that their enlistment was distinctly for military service and that assignment to the Veterans Administration cannot be thus characterized. Many physicians who have served with distinction in both the European and the Pacific theaters of operation are now indicating by communications addressed to the headquarters of the American Medical Association the fear that they may be assigned on their return to the United States to service with the Veterans Administration. The unwillingness to serve with the Veterans Administration is based not only on their belief that this cannot be considered military service but also on the point of view that competent, scientific medical care is difficult under the conditions that prevail in the veterans' hospitals.

The Committee on Postwar Medical Service, which includes representatives of the American Medical Association, the American College of Surgeons, the American College of Physicians, the American Hospital Association, the Federation of State Medical Licensing Boards, the Association of American Medical Colleges, the Catholic Hospital Association, the Advisory Board for Medical Specialties and many other groups, after careful consideration of the problems involved urges that the Secretary of War, the Secretary of the Navy and all others concerned with the activities of physicians voluntarily enlisted in the armed forces recognize the righteousness of the protests made by these medical officers against assignment to the Veterans Administration. It is further urged that the needs of the Veterans Administration for physicians be met either by voluntary enrolment of men in the armed forces at the time of their release from the service or by recruitment of medical personnel from civilian sources.

The American Medical Association—and this statement is made wholly in explanation of a fact that should be obvious to every one—does not have authority to determine in any way the assignments of physicians in the armed forces. The officers of the Association would be hesitant to interfere in the making of decisions as to the assignments or transfer of men in the armed forces. The decisions as to how military personnel are to be utilized must rest with those who carry the responsibility for the ultimate results. This statement is made because many a medical officer has written to the headquarters of the American Medical Association actually demanding that the Association exert its influence to determine the decisions, not only of those responsible for the medical departments of the armed forces, but even of the Secretaries of War and Navy, of the Committees on Military Affairs of the legislative bodies and even of the President. The Board of Trustees and the officers of the Association have felt keenly, nevertheless, the responsibility that rests on them to present to those in authority the facts that should be given serious consideration in the making of decisions concerning medical personnel.

Unfortunately, steps have not yet been taken by the Selective Service System for a continuing supply of physicians for the future. The medical schools are confronted at this moment with an insufficient number of men to fill their freshman classes in the years immediately to come. The Committee on Military Affairs of the Senate, having given serious and extended hearings to the Ellender bill, has failed to issue a statement of its reaction to that proposal. The time may yet come when those with the authority and the responsibility will have to answer to the people of the United States for a critical situation in the supply of medical service.

NUTRITIONAL EDEMA

A characteristic edema appears widespread during war and famine. This war is not an exception. None of the usual designations, as famine edema, war edema, hunger edema and nutritional edema, express adequately the nature of the disease Until recently biochemical and nutritional knowledge has been inadequate to determine a more specific cause than nutritional deficiency.

The relationship of lowered blood protein to the development of edema was pointed out by Starling in 1896; the protein factor has received increasing attention in the last decade. Edema from lack of thiamine occurs in the wet type of beriberi. One or both of these factors may be involved in the development of the edema observed during famine.

In some persons with this edema the serum protein was determined [1] and an average value of 5.39 per cent was found, compared with 8.07 for the normal or average. Other reports describe only the presence of edema and the effect of various therapeutic agents in causing it to disappear or body weight to decrease. The efficacy of high protein foods in raising the serum protein values and in causing the edema to disappear is generally acknowledged. Casein and soy flour in amounts of 150 and 300 Gm. respectively added to a standard 1,700 calory diet were found effective in causing edema to disappear.[2] The addition of 2.5 liters of milk to the daily diet of 11 patients resulted in some recoveries. Vallejo successfully treated cases of malnutrition edema with the addition of 1.5 liters of milk daily to a 1,900 calory diet containing 35 Gm. of protein. The addition of butter to the basic diet was helpful in relieving edema; the authors attribute this effect to the protein sparing action of this fat Investigators who study these patients caution against the relapse that often occurs if treatment with protein is discontinued soon after the edema is lost. This observation supports the concept that lowered serum proteins indicate a depletion of protein reserves of the body which must be restored before cure can be effected

The results of attempts to relieve nutritional edema by administration of vitamins of the B complex are conflicting. Several workers report that improvement of the edema does not follow the use of parenteral injections of as much as 75 mg. of thiamine or 1 Gm. of niacin daily for ten days.[2] Crismer [3] found that the urinary excretion of thiamine in 6 patients with hunger edema was the same as that of healthy persons with normal thiamine excretion after saturation tests. Such symptoms of thiamine deficiency as numbness and paresthesias were usually absent. In contrast are the reports of Simonart,[4] in which the claim that thiamine is effective in relieving the edema and has an influence on the protein level of the blood is made repeatedly. Some of the experiments of this investigator are complicated by the fact that the brewers' yeast used as a source of thiamine is a good source of high quality protein as well. The preponderance of evidence points to the dominant role of protein in the etiology of this type of edema.

Opportunity is afforded in the rehabilitation of European countries to study this problem further. The final answer will establish the part played by each of the nutritional factors. When the causative relationship has been determined satisfactorily this condition may be designated by a term which describes the nutritional state accurately.

1. Raynaud, M., and Laroche, C.: Compt rend Soc de biol. **137**: 216 (April) 1943.
2. Gounelle, H.; Bachet, M., and Marche, J.: Bull. et mém. Soc. méd. d. hôp. de Paris, Oct. 16, 1942, p. 349.
3. Chrismer, R.: Scalpel **94**: 1289, 1941.
4. Simonart, E. F.: Acta biologica Belg **4**: 537, Scalpel, Dec. 20, 1941; Jan. 30, 1942.

EPIDEMIOLOGICAL INFORMATION BULLETIN OF THE UNRRA

The Council of the United Nations Relief and Rehabilitation Administration recommended in November 1943 that government and recognized national authorities cooperate fully with the administration in establishing, at the earliest possible date, regional and other emergency agreements and arrangements for the notification, within the limits of military security, of diseases likely to become epidemic, uniformity in quarantine regulations and for other measures of prevention. An Expert Commission on Quarantine was appointed by the Standing Technical Subcommittee on Health for Europe on May 12, 1944 with instructions to draft, for consideration by the Subcommittee on Health, international sanitary agreements of an emergency nature designed to take effect at the earliest possible date and to continue through the immediate postwar period. The two principal existing international treaties relating to quarantine were the International Sanitary Convention, signed at Paris in 1926, and the International Sanitary Convention for Aerial Navigation, signed at The Hague in 1933. After studying the existing conventions and the modifications required to make them conform to the conditions arising from the war, the commission realized that such modifications should also be applied worldwide if they were to be effective. The commission submitted to the Standing Technical Subcommittee on Health for Europe, at its meeting on May 19, 1944 two drafts with an explanatory memorandum for the modification of the International Sanitary Convention, 1926, and the International Sanitary Convention for Aerial Navigation, 1933. Each draft provided that UNRRA would carry out the duties and functions assigned to the International Office of Public Health, Paris, without prejudice to the future status of that body. To give greater amplitude to the amended conventions, governments would notify, in addition to the diseases specifically mentioned in the previous conventions, namely plague, cholera, yellow fever, typhus and small-

pox, other communicable diseases which, in the opinion of UNRRA, constitute a menace to other countries, and would keep the administration regularly informed of the course of the epidemic. In turn, UNRRA would promptly inform all participating governments of the outbreak of any disease which, in its opinion, constitutes a menace to other countries and of the measures which are being taken to prevent the spread of the disease across frontiers.

In January 1945, when the Health Division of UNRRA was entrusted with the execution of the amended international sanitary conventions, the director general of UNRRA requested that the staff of the Health Research Unit of the League of Nations be released for transfer to the UNRRA's Health Division in order to form the nucleus of its epidemiologic information service to be organized within the section of epidemic control. The *Epidemiological Information Bulletin* is to be the medium of information to those concerned. Its first few issues, according to Wilbur A. Sawyer, director of health, will consist pricipally of the authentic texts of the new and amended sanitary conventions. Subsequently the statistical material will be regularly presented and space will be given to reports on epidemic control activities in which UNRRA may be taking part, to certain reports and resolutions of the Standing Technical Committee on Health and its Expert Commission on Quarantine, and to such items of news as may have special bearing on international health.

The *Epidemiological Information Bulletin* will serve to bring about more effective and intimate collaboration between nations in control of disease.

Current Comment

ANTIVIVISECTIONISTS DEFEATED IN BALTIMORE

Nowadays, whenever state legislatures are in session, so-called "dog bills" are introduced through the pressures exerted by the executive secretaries of groups who call themselves antivivisectionists. These sentimentalists have adopted the dog as the symbol of their approach to an antiscientific crusade against medical research involving the use of animals. The crusade is based on the claim that research involving animals is needlessly cruel and should therefore be prohibited. Moreover, the benefits to medical science and therefore to sick human beings are said to be fictitious. Our legislators are drawn largely from nonmedical groups and are likely to be uninformed about medical research. From the antivivisectionists' point of view they are ripe for the picking. Most legislators, however, are definitely susceptible to facts when well presented. According to the Baltimore *Sun*, April 10, the city council adopted an unfavorable report of its committee on legislation with respect to a proposed ordinance which would have prohibited the use of live dogs for experimental purposes in medical schools and laboratories in the city of Baltimore. The action of the committee was adopted by the council without discussion. Previously there had been a three hour hearing in which the matter was exhaustively explored. The council chamber was filled with proponents and opponents of the ordinance. Many of Baltimore's leading physicians, including the deans of the faculties of medicine of Johns Hopkins and the University of Maryland, the city health commissioner and many others, attended. These physicians told of the use of animals and the necessity for their use in connection with much modern progress in medicine, such as establishing the dosages of the sulfonamide drugs, testing of epinephrine and the treatment of shock with plasma. The most effective testimony was the introduction of two children and the mother of a third whose lives had been saved through blood vessel surgery by Dr. Alfred Blalock of Johns Hopkins. The *Sun*, in addition to publishing a lengthy report of the council action, made it the subject of an editorial comment in its next issue, April 11. Significant statements from the editorial are the following:

> On Monday night the city council killed the proposed antivivisection ordinance. . . . In so doing the council did the intelligent thing. . . . The campaign to prohibit the use of dogs in medical experiments is particularly vicious because it appeals to unthinking sentimentality. . . . Such an ordinance as that which the council just killed would be a fearful blow to scientific research and, indeed, would stop research entirely in many lines. It is an attack on enlightenment and on the humane objectives of research. *The antivivisection movement is inhumane in the deepest sense.* . . . Baltimore is one of the world's great centers of medical research, and the men engaged in it decided to lay their case before the city council fully and frankly. Like good scientists, they placed their faith in the power of reason to convince all men of good will . . . and the council by its prompt decision fully justified their faith.
>
> Many morals might be drawn from this episode. One is that, in the defense of enlightenment, there must be a never ceasing vigilance and that no man, however remote he may feel himself from the turmoil of politics, can properly consider himself above the fight. Another is that reason—in which so many, confronted by the power of unreason in this turbulent world, seem to have lost faith—is still a shining weapon.

Baltimore is to be congratulated on this victory for reason and science over the sinister forces arrayed against medical research and the progress of medical science. The tragedy is that the fight in Baltimore will have to be made again and again before state legislatures, city councils and the Congress. Ignorance, fanaticism, false sentimentalism and cynical irresponsibility are diseases for which science has thus far failed to find a remedy, even with the use of experimentation on animals that has yielded so much good to both animals and man.

MEDICINE AND THE WAR

ARMY

CIVILIAN COMMITTEE TO AID ARMY IN REHABILITATING BLIND SOLDIERS

The War Department recently announced that, in its efforts to rehabilitate blinded soldiers of the present war, the Army will be assisted by an honorary civilian advisory committee selected by the Surgeon General from among leaders in work among the blind throughout the United States. Addition of the advisory services of this committee emphasizes the determination of the Surgeon General that no blinded soldiers of this war will be returned to their communities without maximum adjustment and aid in the resumption of a normal and useful life in their respective communities.

Services of the members of the committee will be available to Dibble General Hospital at Menlo Park, Calif., and Valley Forge General Hospital at Phoenixville, Pa., which are the medical and surgical centers for blinded servicemen, and to Old Farms Convalescent Hospital, Avon, Conn., the Army's center for rehabilitation training for blinded veterans.

Function of the committee will be to advise the Army in the technic used in civilian organizations for the blind, to offer suggestions which may be adapted to army use and to be of general assistance to those in charge of the Army's program, so that effective liaison with the civilian agencies for the blind may be maintained.

Three members of the committee, Peter J. Salmon, Brooklyn; W. L. McDaniel, Washington, D. C., and Henry Johnson, Tampa, Fla., have been appointed special consultants to the Surgeon General and will make a field survey of the Army's program for the Medical Department.

The other members of the committee are Robert B. Irwin, chairman, New York; Josef G. Cauffman, secretary, Overbrook, Pa.; Gabriel Farrell, Watertown, Mass.; Eber L. Palmer, Batavia, N. Y.; Roma S. Cheek, Raleigh, N. C.; Mrs. Lee Johnson, Jefferson City, Mo.; E. A. Baker, Toronto; Thomas J. Carroll, Newton, Mass., and Philip N. Harrison, Harrisburg, Pa.

Rotation and Redeployment of Medical Officers

The policy of the War Department and of my office is that when medical officers are returned to the United States on rotation or redeployment they will be assigned to duty according to their specialties. They will replace officers with similar qualifications who have not had opportunity for foreign service.

KIRK
Office of the Surgeon General
Washington, D. C.

TWO WOMEN DOCTORS ASSIGNED TO SURGEON GENERAL'S OFFICE

Among the medical officers recently assigned to the Surgeon General's Office are two women doctors, Capt. Gladys Osborne, M. C., Waynesville, N. C., and 1st Lieut. Audrey A. Bill, M. C., Wayland, Mass.

Captain Osborne is assigned to temporary duty with the Nutrition Division. She graduated from Vanderbilt University School of Medicine, Nashville, Tenn., in 1932, was commissioned in the Medical Corps in 1943 and has been a medical ward officer at Lawson General Hospital, Atlanta, Ga., and prior to her present assignment was admitting and dispensing officer and chief of the outpatient service at Foster General Hospital, Jackson, Miss.

Lieutenant Bill is assigned to the Preventive Medicine Service. She graduated from Boston University School of Medicine in 1941 and entered the service July 29, 1943. Her army assignments have included duty at the Station Hospital, Fort Devens, Mass., and Waltham Regional Hospital, Waltham, Mass., where she was in the surgical service.

EXHIBIT ART WORK CREATED BY ARMY DOCTORS

The première exhibit of more than two hundred and fifty oil paintings, water colors and sketches depicting the war role of army doctors, nurses and enlisted men of the Army Medical Department was held at the Corcoran Galleries, Washington, D. C., May 13.

The pictures are the work of several of the country's foremost artists. They make up the Army Medical Department War Art Project, which was authorized by the War Department two years ago and launched at the same time by the Surgeon General's Office. Many of the artists, who worked on the project under the direction of the Associated American Artists in New York, were sent to American battle fronts in the South Pacific, Europe and the Mediterranean. Others confined their activities to training centers in the United States and to zone of interior hospitals.

The idea for a collection of Army Medical Department war paintings was first projected in September 1942 by Lieut. Col. Howard Baer, executive officer of the Army Medical Purchasing Department Office, New York branch of the Surgeon General's Office. With the aid of his commanding officer, Col. Howard F. Currie, currently executive officer, Supply Service, Office of the Surgeon General, approval of the undertaking was obtained from Major Gen. Norman T. Kirk, Surgeon General of the United States Army, and the office of the Secretary of War. Colonel Baer was charged with the duty of propelling the project to a successful conclusion.

The project was sponsored by Abbott Laboratories. Known as the Abbott Collection of Paintings of Army Medicine, the canvases will be donated to the War Department.

The entire collection will be exhibited in several large cities. Although the exhibiting itinerary has not been completed, the collection will move from Washington to St. Louis in June. Other cities in which the pictures are scheduled for exhibition include New York, Seattle, Chicago, Cleveland, San Francisco and New Orleans.

INTRASTERNAL PLASMA SAVES CREWMAN'S LIFE

The life of a B 29 crew man was recently saved when comrades gave him blood plasma through a new type of needle. The successful injection showed that the new intrasternal method of administering plasma can be used safely by airmen. The intrasternal method is being taught to the entire crew even before they start on bombing missions, so that this method can be resorted to when the patient is suffering from shock and his veins have collapsed.

SANITARY CORPS OFFICER AWARDED LEGION OF MERIT

Major Joseph A. Calamari, Sn. C., was recently awarded the Legion of Merit for determining through personal investigation the causes of corrosion of stainless steel and plated carbon steel surgical instruments, both in storage and in the field, causing failure or impairing the usefulness of the instruments. As a result of the investigation, Major Calamari devised a method of prevention which will protect the maximum usefulness of surgical and dental instruments.

MEDICAL DEPARTMENT WOMEN RETURN FROM INSPECTION

The heads of the three professional women's corps of the Medical Department have recently returned from an extensive tour of inspection of hospital and nurses' facilities in the European and Mediterranean theaters of operations. Those on the trip were Col. Florence A. Blanchfield, superintendent of the Army Nurse Corps; Major Emma E Vogel, chief of the Physio-Therapy Division, and Major Helen C. Burns, chief of the Dietetic Branch.

DENTAL CORPS OFFICER WINS AWARD

Major Victor H. Dietz, formerly of St. Louis and now in the Army Dental Corps, was recently awarded the Legion of Merit in recognition of his work in perfecting a plastic substitute for making artificial eyes.

ARMY AWARDS AND COMMENDATIONS

Colonel Benjamin J. Birk

Col. Benjamin J. Birk, formerly of Milwaukee and now surgeon of headquarters of the CCC near Kunming, China, was recently awarded the Legion of Merit "for exceptionally meritorious conduct in the performance of outstanding services." For a time before arriving in India in February 1944 Dr. Birk was commanding officer of a hospital troop ship. Flown over the Himalayan "hump" to China in April 1944, he served as medical officer with an American liaison group attached to Chinese combat forces in the fighting about Kweilin, Changsha, Henyang, Chaun Shien and Luichow in the spring, summer and early fall of 1944. Dr. Birk graduated from Rush Medical College, Chicago, in 1919 and entered the service in April 1942.

Colonel Robert S. Brua

The Legion of Merit was recently awarded to Col. Robert S. Brua, formerly of Los Angeles. According to the citation "he served as division surgeon of the Alaskan Division, Air Transport Command, from July 1943 to October 1944. With rare ability he made plans for, established and maintained a medical department that contributed in great measure to the highly successful operations carried out by the Alaskan Division. Surmounting the obstacles of climate, terrain and transportation difficulties, he established dispensaries in isolated localities and organized all medical aspects of the search and rescue work. Under his supervision the water problems which threatened the health of the personnel were effectively solved and a well coordinated system instituted for the air evacuation of the wounded and sick from the widely scattered areas." Dr. Brua graduated from Washington University School of Medicine, St. Louis, in 1931 and entered the service July 1, 1934.

Captain Shermer H. Stradley Jr.

The Legion of Merit was recently awarded to Capt. Shermer H. Stradley Jr., formerly of Wilmington, Del. The citation commends Captain Stradley for "exceptionally meritorious conduct in the performance of outstanding service in North Africa, Sicily and Italy from March 13, 1943 to Aug. 26, 1944. From the activation of the battalion he organized, trained and constantly supervised the medical detachment including regular and emergency aid men in all companies. The excellent state of general health and extremely low time lost for disease and malaria in highly infected areas kept the effective manpower of the battalion at such a high percentage that the unit was able to lead or equal all similar transportation battalions in ton-miles of essential war supplies through three different campaigns. Captain Stradley attained these results through constant study of newest methods, through personal and energetic inspection and supervision of all health and sanitary measures, by constant instruction and supervision of preventive measures, and through the building up of complete confidence in all the personnel of the battalion. His actions are in keeping with the highest traditions of the United States Medical Corps." Dr. Stradley graduated from Hahnemann Medical College and Hospital of Philadelphia in 1934 and entered the service in June 1942.

Colonel Francis J. McGowan

The Bronze Star was recently awarded to Col. Francis J. McGowan, formerly of New York, "for meritorious achievement in connection with military operations against the enemy on Leyte, Philippine Islands," and five days later he was awarded the Oak Leaf Cluster to the Bronze Star for his actions, including performance of operations under fire as a volunteer on Luzon, Philippine Islands, where he was attached as an observer with the forces commanded by Major Gen Charles P. Hall. The Luzon citation states, in part, "Owing to a critical shortage of qualified surgeons, Colonel McGowan volunteered his services and was on four occasions assigned to different portable surgical hospitals where his services were most needed. During this entire period he was on duty extremely long hours performing many delicate and serious operations and, through his knowledge and skill, was instrumental in saving many lives. In many instances he was working very near the enemy lines and was exposed to enemy sniper, machine gun and mortar fire. His devotion to duty, his calm and efficient manner under the strain of combat and his superior surgical skill contributed in a large degree to the success of the operation and was an inspiration to his comrades. His actions were in keeping with the highest traditions of the military service." Dr. McGowan graduated from Columbia University College of Physicians and Surgeons, New York, in 1921 and entered the service Oct. 2, 1942.

Major Sylvester W. Rennie

Major Sylvester W. Rennie, formerly of Wilmington, Del., was recently commended by his commanding officer, Major Gen. R. G. Breene. The commendation read, in part, "During the evacuation of wounded troops from Guadalcanal through the 27th Station Hospital this officer displayed extraordinary ability as a surgeon and extreme resourcefulness in coping with situations which at the time, owing to limited equipment, seemed hopeless. By his untiring energy and devotion to duty he set an example for the enlisted men and was one of the four surgeons who went without rest or sleep for eighty-six hours. As a result of the cooperation and skill of this officer over 140 badly injured soldiers were given expert surgical care. Wounds of the extremities, chest and abdomen were all operated on successfully and most of these men were evacuated by troop ship to the United States for further care within seven days." Dr. Rennie graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1930 and entered the service in June 1942.

Major Robert W. Robertson

Cited many times for his performances as a surgeon at the battle front, Major Robert W. Robertson, formerly of Paducah, Ky., was recently decorated as an Honorary Officer of the Military Division of the Most Excellent Order of the British Empire. The honor came from His Majesty, the King of England, and it is the first of its kind to be presented to an American medical officer. The decoration was bestowed "in testimony of Major Robertson's outstanding performance while on duty for four and a half months as operating surgeon in a British Field Hospital at the Anzio beachhead." An appropriate ribbon was presented to Major Robertson by the com-

manding officer of the Second Auxiliary Surgical Group, in lieu of the insignia and the medal which will be presented at a later date by a high ranking British official. It was stated that King George notified General Alexander to present the medal formally when the tactical situation permits. Dr. Robertson graduated from Loyola University School of Medicine, Chicago, in 1932 and volunteered for service in September 1942.

Major Joseph M. Greene

The Purple Heart was recently awarded to Major Joseph M. Greene, formerly of Chicago, who is now somewhere in Germany attached to the 105th Evacuation Hospital, which was bombed by enemy aircraft Dec. 31, 1944. Dr. Greene graduated from Rush Medical College, Chicago, in 1927 and entered the service June 1, 1942.

MISCELLANEOUS

MILITARIZATION OF THE AMERICAN HOSPITAL IN PARIS

THEODORE C. MERRILL, M.D.
Ancien associé en médecine de l'Hôpital américain de Paris

The American Hospital in Paris on Neuilly-sur-Seine has temporarily suspended its functions as a civic hospital. At present it is governed by the military authorities of the United States as represented by Lieut. Col. Edmund O. Gates, chief medical officer. A few officials of the old régime will continue their functions alongside the personnel belonging to the Army of the United States. From now on the hospital will accept only members of the American forces.

The hospital was created in 1906 and conforms to the regulations pertaining to hospitals in France. It received its first patient on March 30, 1910 and was formally recognized in 1913 by a federal legislative decree of the United States. This first American hospital had a capacity of between 40 and 50 patients only. It rendered efficient service to the organization and work of the American Ambulance Hospital during the war of 1914-1918. After this war the necessity for an American hospital in Paris became more and more evident. A new building, commenced in 1922, was opened on Jan. 30, 1926, the inaugural ceremony having been held on May 12 of the same year. Subsequent to that date the hospital functioned in Paris until the entry of the United States into the present war. In 1941, following the departure of the American officials, the hospital was occupied by the French Red Cross and was used largely as the center of rehabilitation of the wounded, occasionally admitting a certain number of civilian patients. The hospital was incorporated to function as an American hospital in France for a term of fifty years, thirty-one of which have already elapsed. What will be its existence in the remaining nineteen years? Who knows? Perhaps it will be converted into a French hospital and perhaps its charter will be renewed and prolonged. In any case it will always be a part of the medical history of Paris.

We salute, therefore, the hospital under its new name—"Station hospital numéro 365 de l'armée des Etats-Unis" (Base Hospital No. 365 of the American Army) and wish it and its chief a future full of honor and usefulness.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced.

California

Birmingham General Hospital, Van Nuys. Traumatic Surgery of the Abdomen, Dr. Charles E. Phillips and Comdr. Gaylord Bates, May 23.

U. S. Naval Hospital, Santa Margarita Ranch, Oceanside: Malingering Tests, Dr. John Mackenzie, May 24.

U. S. Naval Hospital, Corona: Tumor Pathology, Comdr. John W. Budd, May 24.

U. S. Naval Hospital, Mare Island: Uremia Following Urologic Surgery, Dr. Donald Smith, June 8; The Surgical Approaches to the Knee Joint, Dr. LeRoy C. Abbott, June 15.

Station Hospital, Fort Ord: Psychosomatic Medicine, Dr. Karl Bowman, June 2; Abdominal Surgery, Dr. Thomas F. Mullen, June 16; Injuries to the Knee Joint, Dr. Frederic C. Bost, June 23.

Station Hospital, Stockton Army Air Base: Early Ambulation of Surgical Patients, Dr. H. Glenn Bell, June 13; Diagnosis and Treatment of Arthritis, Dr. Hans Waine, June 20; Injuries to the Knee Joint, Dr. Carl E. Anderson, June 27.

Station Hospital, Camp Roberts: Severe Infections of the Hand, Dr. Edmond D. Butler, June 16; Experiences with Infectious Diseases in Army Camps in England, Dr. Gordon E. Hein, June 23.

U. S. Naval Hospital, Treasure Island: Experiences with Infectious Diseases in Army Camps in England, Dr. Gordon E. Hein, June 1.

Hammond General Hospital, Modesto: Subacute Bacterial Endocarditis, Dr. William J. Kerr, June 13.

Kansas

A. A. F. Regional Hospital, Smoky Hill Army Air Field, Salina: X-Ray Findings in Abdominal Pathology, Dr. Ira H. Lockwood, June 14; Shock Burns and Blood Derivatives, Dr. Vincent T. Williams, June 1.

New York

Station Hospital, Mitchel Field: Treatment of Thyrotoxicosis, Dr. David P. Barr, June 4; Diagnosis and Treatment of Malaria, Dr. Henry E. Meleney, June 5.

Virginia

A. A. F. Regional Hospital, Langley Field: Gastroenterology, Dr. Lay Martin, June 29; Traumatic Surgery of the Abdomen, Lieut. R. C. Wood, June 29.

West Virginia

Newton D. Baker General Hospital, Martinsburg: Chest Injuries in War, Dr. I. A. Bigger, June 4; Shock, Dr. E. I. Evans, June 4; Liver Diseases Seen in the Present War, Col. Balduin Lucke, June 18.

Wisconsin

Station Hospital, Camp McCoy: Blood Dyscrasias, Malaria, Filariasis, Dr. O. O. Meyer, May 23.

Station Hospital, Truax Field: Brain and Spinal Cord Injuries, Dr. T. C. Erickson, May 23.

ONE TON ELECTRON MICROSCOPE

Surgeon Gen. Thomas Parran of the Public Health Service recently announced that a 1 ton electron microscope, powerful enough to magnify the windpipes of mosquitoes to a size of approximately 2 inches, was recently added to the arsenal of scientific instruments for the study of cancer at the National Cancer Institute, Bethesda, Md. Although installed in the National Cancer Institute, the microscope will not be restricted to the study of cancer but will be available to other divisions of the National Institute of Health.

The microscope was built by the Radio Corporation of America at a cost of $13,000 and is the ninetieth in this country. It uses electrons instead of light rays, and magnetic fields instead of glass lenses, to peer into submicroscope worlds. It has revealed for the first time how disease-fighting organisms in the blood attack disease-producing viruses. The highly magnified photographs—or electron micrographs, as they are termed—show how the body protects itself from infantile paralysis, smallpox, influenza, the common cold, yellow fever and other diseases. These micrographs are important factors in determining the effectiveness of various methods of treatment. The machine will also enable scientists to compare diseased tissues with healthy tissues under direct magnifications of 10,000 to 75,000 diameters.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

May 14, 1945.

Week of June 2 Proclaimed National Rehabilitation Week

Although overshadowed by the announcement of VE day at the White House, a proclamation was issued by President Truman making the week of June 2 National Rehabilitation Week. It will be the twenty-fifth anniversary of the national program for rehabilitating men and women returning from the armed forces with disabilities. President Truman called on all churches, educational institutions, health and welfare services, civic organizations, chambers of commerce, industry, radio, press and the public to join in the program.

Federal Security Administrator Paul V. McNutt announced that specially arranged clinics for the examination and treatment of disabled men and women would be held throughout the country between the 2d and 8th of June. Michael J. Shortely, director of the Office of Vocational Rehabilitation of the Federal Security Administration, will unite all cooperating state agencies in the program.

Possible Replacement of General Hines

Capital Hill sources say that President Truman may dismiss 66 year old Brig. Gen. Frank T. Hines as Veterans Administrator and replace him with his former Missouri Senate colleague Bennett Champ Clark, a veteran and former commander of the American Legion. Furthermore, Mrs. Edith Nourse Rogers, Republican of Massachusetts, ranking Republican on Representative John Rankin's House Veterans Committee, says that President Truman is "definitely interested" in her bill to create a new Department of Veterans Affairs, headed by a Secretary of Veterans Affairs in the cabinet. General Hines meanwhile has stated that the problem in veterans' hospitals today is not beds but personnel. He states that 1,000 more beds could be added if 100 more nurses could be found.

Medical Testimony Against Animal Experiments Sought

Representative Lemke, Republican of North Dakota, sponsor of the Lemke bill prohibiting experiments on live dogs or other animals in Washington, is seeking personal testimony or written statements against animal experiments from leading medical men. He revealed that hearings scheduled before a House District subcommittee have been deferred to about May 20 to enable him to get this testimony. Expressing confidence that the House will enact the legislation during this session, Representative Lemke said "Our witnesses, many of them among the best known practitioners in the nation, will show that most of the claims made for the scientific value of experiments on animals are baseless and unverified."

Studies in United States by Brazilian Health Official

Enrique Da Rocha Lima, superintendent of the Biologic Institute of São Paulo, stated on his arrival here from Rio de Janiero on invitation of the Department of State that he will make a thorough study of prevention and cure of typhoid and malaria. He will attend classes at Columbia University in New York and other colleges in the North and East. He will study animal and plant diseases at the Department of Agriculture in Washington. The Brazilian government, he said, is concentrating on a campaign against spread of all tropical diseases.

Probe of Government Spending for Research

Senator Homer Ferguson, Republican of Michigan, has started a one man investigation to determine whether government spending for research is justified. As a member of the Senate Appropriations Committee he wishes to know how much is being spent, whether there is waste or overlapping, and whether people are getting value for money spent. He found on checking through committee files a total government research budget of more than half a billion dollars. "I don't want to do anything to stand in the way of developing the most modern and efficient implements of war for the protection of our armed forces and the nation as a whole, but I think it's time to take stock of what we are doing" he said.

Doctors Maintain Health Despite Shortages

The District of Columbia Medical Society reports from a survey covering the period from Sept. 1, 1942 to April 1, 1945 that, despite a wartime decrease in private physicians, the remaining doctors are capably serving all patients and could meet an epidemic with the aid of hospital staffs and medical students. The survey was prepared by auditors of the U. S. Public Health Service in cooperation with the medical society for the Procurement and Assignment Service of the War Manpower Commission. The survey showed that the number of private practitioners dropped from 991 to 910 and the segment of population assigned to each rose from 934 to 1,018 in the city and 1,250 in the area. The present potential load is said to be closer to 1,400 at this date. One doctor in 1,250 was said to be the top desirable load but that through an increased effort on the part of practitioners the situation had been handled adequately. Dr. George C. Ruhland, District health officer, said that the general health seems to have increased rather than decreased in the capital.

Russian Hospitals for Amputee Cases

Russian War Relief, Inc., reports that it is spending more than $1,000,000 to equip a system of hospitals in the Soviet Union to handle amputation cases. The organization, an agency in the National War Fund, intends to equip four regional hospitals in different sections of the Soviet Union with artificial limb workshops where final fittings will be made. Dr. Vladimir D. Chaklin, director of the Prosthetics Institute of Moscow, has been in this country for the past five months consulting with American physicians and manufacturers of artificial limbs.

Improved Medical Aid for War with Japan

Experience of medical officers in the European theater will benefit work of service physicians and surgeons in the war against the Japs, it is revealed here. Besides improvements in battle technic, better equipment will be available. Two examples: The Medical Corps has built special portable dental units that can be used as operating rooms, and sterilization units that can be converted into a heating plant large enough to keep a whole hospital warm.

Capital Notes

Although the Catholic clergy have opposed the proposal to legalize sterilization of mental defectives in the District of Columbia, Rev. Edward Oliver Clark, Baptist, has urged in a letter that District commissioners proceed to draft legislation.

More than 200 representatives of five sponsoring groups attended the dedication of the new mental hygiene bureau of the District of Columbia and welcomed its new director, Dr. John F. Owen.

The annual report of the District Social Hygiene Society recommends revision and strengthening of District health regulations to combat venereal diseases now and during the postwar period.

Optometrists have been added to the "health and welfare services" group of industries considered "essential" to the war effort by the War Manpower Commission. Also included was the manufacture of supplies used by morticians.

Agricultural activity is reported by the Veterans Administration to be among the most valuable forms of occupational therapy for certain types of psychotic patients.

Typical of the national trend, deaths from tuberculosis have declined 10 per hundred thousand of population since 1941, Dr. A. Barklie Coulter, chief of the District health department tuberculosis bureau, reports.

The Census Bureau estimates that 7 out of every 100 babies born in the United States last year were unregistered.

The Foreign Economic Administration reports that 16,000 pounds of amigen, a protein substance, was flown from the United States to prevent death for 80,000 persons in the Netherlands, so near starvation that they cannot digest ordinary food.

Isolation cells of the Industrial Home School for children are comparable to conditions in German "horror camps," according to investigators. Representative John M Coffee, Democrat of Washington, has threatened to send his own investigators to report on conditions in Capital institutions for children.

The District Commissioners have sent to Congress a draft of proposed legislation which would give the District health officer authority to remove and detain by force any recalcitrant carrier of a communicable disease.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Selective Training and Service Act

The House of Representatives has passed H. R. 1812, authorizing the award of a certificate and a medal for faithful service to uncompensated personnel of the Selective Service System who have served for more than two years, including local board examining physicians and dentists and members of medical advisory boards. The medal will be known as the Selective Service Medal.

The Senate Committee on Military Affairs concluded hearings, May 1, on the Ellender bill, S. 637, providing for the deferment of premedical and predental students. Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals, and Dr. Harvey B. Stone, a member of that Council, appeared on behalf of the Association in support of the bill. No further action has been taken by the committee.

Medical and Dental Corps

S. 939 and H. R. 3070 have passed respectively the Senate and the House, authorizing the Secretary of War, for the duration of the wars in which the United States is currently engaged and for six months thereafter, to dispense with any part of the examination for promotion in the Regular Army of officers of the Medical, Dental and Veterinary Corps, except those relating to physical examination.

The bill removing the limitation on the right to command of officers of the Dental Corps of the Army which limits such officers to command in that corps, S. 916, has been reported to the Senate by the Committee on Military Affairs with the recommendation that it pass.

Representative Adams, New Hampshire, has introduced, by request, a bill, H. R. 3147, authorizing the appointment of medical technologists as commissioned officers in the Army of the United States and in the Naval Reserve for service with the Medical Department of the Army and of the Navy.

Physically Handicapped Persons

A subcommittee of the House Committee on the Judiciary has ordered favorably reported to the full committee H. J. Res. 23, naming the first week in October as "National Employ the Physically Handicapped Week."

Two recent bills relate to the employment of blind persons. One, S. 987, introduced by Senator Myers, Pennsylvania, proposes to amend the civil service laws of the United States to provide that no person shall be discriminated against in any case because of his or her total or partial blindness in examination, appointment, reappointment, reinstatement, reemployment, promotion, transfer, retransfer, demotion, removal or retirement, unless normal eyesight is absolutely indispensable in the doing of the physical acts to be performed. This bill is pending in the Senate Committee on Civil Service. The other bill, H. R. 3192, introduced by Representative Patrick, Alabama, would encourage and promote the employment of blind persons in public service and in private enterprise by establishing in the United States Employment Service a Division of Blind Placement Agents to stimulate the employment of blind persons.

Veterans Administration

A bill introduced by Senator Downey, California, S. 947, proposes the hospitalization and treatment in Army, Navy and Veterans Administration hospitals of accredited war correspondents who suffer disability as a result of personal injury sustained or illness or disease contracted in the performance of duties outside the continental limits of the United States in time of war.

Two bills, S. 973, introduced by Senator Johnson, Colorado, and H. R. 3115, introduced by Representative Rankin, Mississippi, would liberalize and clarify the laws administered by the Veterans Administration relating to entitlement to domiciliary or hospital care, medical treatment and related services.

Another bill, introduced by Representative Ellsworth, Oregon, H. R. 3166, proposes aid in providing housing for veterans attending educational institutions under the G. I. Bill of Rights.

Representative Bolton, Ohio, has introduced H. R. 3164, to establish the office of adviser to the Administrator of Veterans' Affairs on matters relating to Negro veterans.

S. 974, introduced by Senator Johnson, Colorado, proposes to liberalize and clarify rehabilitation and education and training laws administered by the Veterans Administration. Among other things, this bill would make available under the G. I. Bill of Rights education and training irrespective of whether the education of the veteran was interfered with by entry into service, would make available courses of instruction by correspondence and would increase the amounts payable to veterans undergoing training in pursuance of the rehabilitation program.

Miscellaneous

H. R. 2992 has passed the House extending for a period of one year Public Law 163, 77th Congress, authorizing the Secretary of War and the Secretary of the Navy to establish quarantine boundaries around camps and cantonments and naval bases for the purpose of cooperating with state and local authorities in prohibiting illicit practices calculated to spread venereal diseases. A companion bill, S. 948, is pending in the Senate with a favorable committee report.

A bill introduced by Representative Barry, New York, H. R. 3105, would amend the Federal Trade Commission Act to require publication of facts regarding violations in cases of false advertising of food, drugs, devices and cosmetics. The duty to effect publication will be devolved on the person, partnership or corporation complained of.

Companion bills, S. 962, introduced by Senator Russell, Georgia, for himself and Senator Ellender, Louisiana, and H. R. 3143, introduced by Representative Flannagan, Virginia, propose assistance to the states in the establishment, maintenance, operation and expansion of school lunch programs.

District of Columbia

On April 25 the Senate passed a bill to establish a modern hospital center in the District of Columbia, S. 223. On the following day Senator Ellender entered a motion to reconsider the vote by which the bill was passed, and this motion was considered by the Senate on May 10. After considerable discussion the Senate rejected Senator Ellender's motion to reconsider, and the bill was transmitted to the House of Representatives for further consideration.

Health programs for government employees are proposed by H. R. 2716, which has been reported to the House by the Com-

mittee on Civil Service with a recommendation that it pass. Such health programs, it is contemplated, will be limited to (1) treatment of minor illnesses and dental conditions except in cases of emergency or injury or illness sustained while in the performance of the employee's duty, (2) preemployment and other examinations, (3) referral of employees to private physicians and dentists and (4) education and preventive programs relating to health, including the alleviation of health hazards in the working environment.

The salary of the Executive Secretary, Nurses' Examining Board, District of Columbia, would be increased by a bill that passed the House of Representatives recently, H. R. 2839.

STATE LEGISLATION

Alabama

Bills Introduced.—S. 38 proposes to regulate the manufacture, sale and commercial use of cosmetics and to eliminate from intrastate commerce cosmetics which may be dangerous, injurious or hazardous. S. 12 and H. 116, to amend the narcotic drug act, proposes so to define narcotic drugs as to include isonipecaine. S. 87 proposes to authorize the sexual sterilization of certain socially inadequate inmates of state institutions.

Florida

Bills Introduced.—S. 80 proposes to authorize the establishment of a College of Medicine at the University of Florida. S. 237, to amend the workmen's compensation act, proposes, in effect, to make compensable disability from occupational diseases arising out of and in the course of employment. S. 361, to amend the narcotic drug act, proposes so to define narcotic drugs as to include isonipecaine. H. 400 proposes to require chiropractic licentiates to register annually on or before January 1 with the state board of health and at that time to pay a fee of $1. H. 402 proposes to authorize the establishment of hospital service plan corporations to operate hospital service plans whereby hospital care may be provided at the expense of such corporations to subscribers to such plans by hospitals which have contracts for such care with the corporation.

Illinois

Bill Introduced.—S. 436 proposes to create a commission to investigate the need for developing facilities for the care and treatment of persons who are chronically ill.

Missouri

Bills Introduced.—H. 392 proposes to establish the Southeast Missouri State School for the feebleminded and epileptic. H. 418 proposes to regulate the sale and use of insecticidal or pest control powders containing sodium fluoride, sodium fluosilicate, arsenic or any other poisonous compound. Such substances may be sold only if (1) they are mixed with a coloring substance in sufficient quantity so that the coloring is discernible and (2) the container indicates the poisonous nature of the compound, states the percentage of active ingredient in the mixture and lists one accepted antidote.

Woman's Auxiliary

WINNERS IN THE HYGEIA CONTEST

The American Medical Association offered $400 in cash prizes to the state and county auxiliaries which obtained the largest number of subscription credits to *Hygeia* during the contest, which covered the period from Sept. 1, 1944 to Jan. 31, 1945.

Cash prizes were awarded as follows:

Group 1. Auxiliaries with a membership of 1 to 13:

First prize, $40, to Walla Walla Valley, Wash., Mrs. C. R. Garrett, Hygeia chairman, Walla Walla, Wash.

Second prize, $25, to Cass County, Mo., Mrs. David Long, Hygeia chairman, Harrisonville, Mo.

Third price, $15, to Perry County, Mo., Mrs. J. J. Bredall, Hygeia chairman, Perryville, Mo.

Group 2. Auxiliaries with a membership of 14 to 23:

First prize, $40, to St. Joseph County, Mich., Mrs. A. E. Brunson, Hygeia chairman, Colon, Mich.

Second prize, $25, to Snohomish County, Wash., Mrs. Bernard Berenson, Hygeia chairman, Everett, Wash.

Third prize, $15, to Calhoun County, Ala., Mrs. C. H. Cleveland, Hygeia chairman, Anniston, Ala.

Group 3. Auxiliaries with a membership of 24 to 42:

First prize, $40, to Kitsap County, Wash., Mrs. F. C. Taylor, Hygeia chairman, Bremerton, Wash.

Second prize, $25, to Utah County, Utah, Mrs. W. T. Hasler, Hygeia chairman, Provo, Utah.

Third prize, $15, to Kenosha County, Wis., Mrs. Stephen DeFazio, Hygeia chairman, Kenosha, Wis.

Group 4. Auxiliaries with a membership of 43 to 542:

First prize, $40, to Westmoreland County, Pa., Mrs. A. B. Blackburn, Hygeia chairman, Latrobe, Pa.

Second prize, $25, to Pierce County, Wash., Mrs. J. B. Robertson, Hygeia chairman, Tacoma, Wash.

Third prize, $15, to Buchanan County, Mo., Mrs. C. H. Werner, Hygeia chairman, St. Joseph, Mo.

State winners:

First prize, $40, to state of Washington, Mrs. H. W. Johnson, Hygeia chairman, Everett.

Second prize, $25, to state of Utah, Mrs. Elden Clark, Hygeia chairman, Provo.

Third prize, $15, to state of Missouri, Mrs. D. I. L. Seabaugh, Hygeia chairman, Jackson.

Honorable Mention was given to the following counties:

Prince Georges County, Md., Mrs. Aaron Deitz, chairman, Hyattsville.

Wayne County, Mich., Mrs. W. G. Mackersie, chairman, Detroit.

Jackson County, Mo., Mrs. W. B. Allen, chairman, Kansas City.

Mercer County, Pa., Mrs. John Wassil, chairman, Sharon.

Carbon County, Utah, Mrs. R. W. Robinson, chairman, Kenilworth.

King County, Wash., Mrs. T. T. Robson, chairman, Seattle.

Rock County, Wis., Mrs. H. E. Kasten, chairman, Beloit.

Laramie County, Wyo., Mrs. K. L. McShane, chairman, Cheyenne.

Other counties that have reached or exceeded their quota and had at least 25 subscription credits were Madison County, Ala.; Palm Beach County, Fla.; Richmond County, Ga.; Cook County, Ill.; Rock Island County, Ill.; St. Clair County, Ill.; Sangamon County, Ill.; Vermilion County, Ill.; Cass County, Ind.; Sullivan County, Ind.; Vigo County, Ind.; Dallas-Guthrie counties, Iowa; Dubuque County, Iowa; Central District, Kan.; Saline County, Kan.; Ouachita Parish, La.; Cape Girardeau County, Mo.; Greene County, Mo.; Lafayette County, Mo.; Pettis County, Mo.; Atlantic County, N. J.; Gloucester County, N. J.; Randolph County, N. C.; Stark County, Ohio; Beaver County, Pa.; Blair County, Pa.; Bucks County, Pa.; Lebanon County, Pa.; Mifflin County, Pa.; Venango County, Pa.; Warren County, Pa.; Childress-Collingsworth-Hall counties, Texas; Hunt-Rockwell-Raines counties, Texas; Lamar County, Texas; Liberty-Chambers counties, Texas; Salt Lake County, Utah; Weber County, Utah; Clark County, Wash.; Cowlitz County, Wash.; Spokane County, Wash.; Whatcom County, Wash.; Brown-Kewaunee-Door counties, Wis.; Racine County, Wis.; Washington-Ozaukee counties, Wis.

Other states that reached or exceeded their quotas were Illinois and Wyoming.

This year's contest resulted in 10,894 subscription years as compared to 8,322 subscription years received during last year's contest.

To the state and county Hygeia chairmen, officers and members of the various county and state woman's auxiliaries who have assisted in making this contest a success, Mrs. Arthur I. Edison, national Hygeia chairman, and the circulation manager of *Hygeia* express appreciation.

Bureau of Information

INFORMATION FROM FOURTEEN REPRESENTATIVE COUNTIES IN ILLINOIS

The first summary sheets from counties containing very large cities have been received from the Illinois State Medical Society through its executive secretary, Dr. Harold M. Camp.

The accompanying table gives some of the economic features of fourteen representative counties in Illinois, including rural areas and the large urban area of Chicago.

Economic Features of Fourteen Counties in Illinois

County[1]	Principal Cities[2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone[3]
Bond		13,025	4	3,256	8.6
	Greenville	3,391			
Cook		3,968,320	3,245	1,223	5.8
	Chicago	3,396,808			
	Oak Park	66,015			
	Evanston	65,389			
Cumberland		9,466	2	4,733	11.9
Fayette		23,351	7	3,336	10.4
	Vandalia	5,288			
Grundy		18,282	9	2,031	8.6
	Morris	6,145			
Jasper		10,872	1	10,872	13.7
	Newton	2,347			
Jersey		12,667	4	3,167	12.7
	Jerseyville	4,899			
Jo Daviess		19,529	9	2,181	7.2
	Galena	4,126			
Lee		32,237	11	2,931	6.7
	Dixon	10,971			
Macon		84,638	54	1,567	8.3
	Decatur	59,305			
Pike		20,927	4	5,232	8.5
	Pittsfield	2,884			
Pope		5,668	2	2,834	9.6
Sangamon		113,393	63	1,800	7.5
	Springfield	75,503			
Winnebago		126,110	88	1,433	9.2
	Rockford	84,637			

1. Bureau of census, estimated population 1943.
2. Bureau of census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

Excerpts from the remarks contained on some of the county summary sheets follow:

Lee.—Two or three towns in this county of 600 to 800 population, 12 to 15 miles from a hospital, have one or no doctors.

Macon.—Men now in service plan to return here after the war. In addition there are fifteen to twenty younger men who have never practiced that plan to come back to this, their home town, to practice.

Pike.—Better than average facilities for practice in a county of this size.

Sangamon.—All doctors now in service from this county plan to return. The present prosperity is largely due to war work. After the war this will be a poor location for new doctors, as about fifteen local boys who have not practiced expect to locate here.

Winnebago.—If a maximum of 50 per cent of the doctors who practiced in this community and who are now in the armed forces return to practice here after the war, the medical facilities will be adequate.

Included with the Illinois summary sheets was a list of towns in the state that are now in need of physicians. Many of these communities have good opportunities for physicians desirous of a locality in which to establish a practice. Inquiries from veteran medical officers about these and other areas will be answered so that interested officers will be given helpful information and be referred to the local medical societies concerned for further investigation. Since vacancies are being held open in many communities for doctors now in military service, direct correspondence with the county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Official Notes

REGISTRATION UNDER THE HARRISON NARCOTIC ACT

A Reminder from the Bureau of Legal Medicine

Physicians, other than those in the armed services, who are registered under the Harrison Narcotic Act or under the Marihuana Tax Act must effect registration on or before July 1 to avoid a penalty. Each year, despite the annual warnings in THE JOURNAL, this requirement is overlooked by some physicians and unpleasant consequences follow. Failure to register adds a penalty of 25 per cent to the tax payable and in addition subjects the physician to the possibility of a fine not exceeding $2,000 or to imprisonment for not exceeding five years, or to both. As an act of grace the Commissioner of Internal Revenue has in past years given some tardy registrants the choice between paying sums by way of compromise, a procedure authorized by law, or of accepting criminal prosecution. If this procedure does not produce the required promptness in reregistration, the commissioner will have no other alternative than to institute criminal prosecution.

A physician in the armed forces need not reregister. If he receives an application form for reregistration, it should be returned to the office of the Collector of Internal Revenue together with a statement showing that he is in service and requesting that the registration number previously assigned to him be reserved. A physician on entering service should return all unused order forms to the collector's office and should dispose of all narcotics or cannabis on hand either by returning them to the wholesale concern from which purchased, if the packages are in unbroken form, or by transferring the narcotics or cannabis to another physician after having obtained permission for such transfer from the office of the Collector of Internal Revenue.

A physician entering service also is required to return the special tax stamp to the collector, who will mark the stamp "Business Discontinued" with the date and return the stamp to the physician to be retained in his files for a period of not less than two years. When a physician is discharged from military service and reengages in civilian practice during the same fiscal year for which his registration has been canceled he will not be required to secure another stamp and pay a second tax for the remainder of that fiscal year. Such a physician should notify the office of the Collector of Internal Revenue, within thirty days of resuming practice, of his intentions to reenter the private practice of medicine. He should return the special stamp retained in his files to the collector so that the notation "Business Discontinued" may be crossed out and a proper notation made on it, indicating that private practice has been resumed.

DOCTORS LOOK AHEAD

First topics for the next several weeks of the radio series Doctors Look Ahead are as follows:

May 19. Look Sharp.
May 26. Unfinished Business; speaker, Morris Fishbein, Editor, THE JOURNAL.
June 2. Fit to Live: an appraisal of the nation's health and of its fitness for war and for the peace to come.
June 9. They Shall Hear Again: a program devoted to the interests of all those with hearing defects; speaker, Howard A. Carter, Secretary of the American Medical Association Council on Physical Medicine.
June 16. American Spas; speaker, Walter S. McClellan, New York.

Some stations may record the program and broadcast it at a time which suits their schedule better. Local newspaper radio announcements should be consulted.

It is sometimes necessary to cancel or postpone certain programs because of unforeseen developments due to world events.

When no speaker is announced the summary will be given by Dr. W. W. Bauer, Director of the Bureau of Health Education. Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting company network each Saturday at 4 p. m. Eastern War Time (3 p. m. Central War Time, 2 p. m. Mountain War Time and 1 p. m. Pacific War Time).

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

COLORADO

Refresher Course in Rheumatic Fever.—The University of Colorado School of Medicine, Denver, will conduct a three day refresher course on rheumatic fever June 4-6. The subject will be presented from the standpoint of incidence, epidemiology, diagnosis, treatment and prophylaxis. Presentation of the subject material, much of which will be made available through the Denver Area Rheumatic Fever Diagnostic Service, will involve demonstration clinics and well illustrated lectures. Through the courtesy of the Public Service Company of Colorado an electric stethoscope with loud speaking amplification will be available for the clinical demonstration of heart sounds.

CONNECTICUT

Society News.—Dr. Vladimir Lebedenko, representative in the United States of the Mission of Alliance of Red Cross and Red Crescent Societies of the Soviet Union in the United States, addressed the Yale Medical Society, New Haven, April 11, on "Organization of Russian Medicine in Wartime."

Personal.—Charles-Edward Amory Winslow, Dr.P.H., New Haven, will make a survey of health and hospital facilities in the Washington metropolitan area for the Metropolitan Health Council of Washington, according to *Science*.——Dr. Stanley H. Osborn, Hartford, state health officer, recently was awarded the honorary degree of doctor of public health by Trinity College, Hartford.

DISTRICT OF COLUMBIA

Personal.—Lieut. Col. Leo V. Schneider, M. C., associate clinical professor of medicine, Georgetown University School of Medicine, and chief medical officer of Glenn Dale Sanatorium, Glenn Dale, Md., has been made chief of industrial medicine, New York Port of Embarkation.

Borderline Certificates Continued.—In accordance with action at a recent meeting of the representatives of the Commission on Licensure of the District of Columbia and the Board of Medical Examiners of Maryland, the latter rescinded its action concerning the approval of borderline certificates and voted to continue issuing the certificates for the duration of the war (THE JOURNAL, Dec. 16, 1944, p. 1039).

Captain Newhouser Gives Kober Lecture.—The 1945 Kober Foundation lecture was delivered by Capt. Lloyd R. Newhouser (MC) on "The Role of Whole Blood Plasma and Plasma Fractions in War Medicine." The lecture was given March 28, the birth date of the late Dr. George M. Kober, for many years dean of the Georgetown University School of Medicine and founder of the lecture. Captain Newhouser was presented with an honorarium of $500 by Lawrence C. Gorman, S.J., president of Georgetown University, who stated that the selection had been made this year by the Association of Military Surgeons of the United States. Vice Admiral Ross T. McIntire, Surgeon General of the Navy, presided.

John Owen Named to New Bureau.—Dr. John F. Owen, superintendent of the State Hospital, Raleigh, N. C., has been appointed in charge of the new mental hygiene bureau in the health department of the District of Columbia. Under the supervision of Dr. George C. Ruhland, health officer, he will develop a program of mental hygiene in the District to include the establishment of clinics for school and preschool children, children involved with the Juvenile Court and Detention Home, alcoholic and drug addicts, adults accused of antisocial behavior and patients now in St. Elizabeths Hospital who need only psychiatric supervision. The *Medical Annals of the District of Columbia* states that the project will be financed by an appropriation of $24,340.

GEORGIA

University to Construct Hospital for Indigent.—The Georgia Legislature recently enacted a bill authorizing the board of regents of the University System of Georgia to construct and operate a hospital for the indigent sick and near indigent sick in conjunction with the University of Georgia School of Medicine, Augusta.

Coordinator of Health Education.—Mr. J. M. Gooden, formerly state school supervisor, has been chosen state coordinator of health education to inaugurate a program to coordinate and utilize all available services of the state which can contribute to the promotion of better health among Georgians. Mr. Gooden was chosen by a joint committee from the Georgia Department of Public Health, the state department of education and the University System of Georgia. The program will be confined principally in the beginning to a few selected countries where an intensive health program will be developed in the schools and communities, according to *Georgia's Health*. A grant from the W. K. Kellogg Foundation, Battle Creek, Mich., is financing the project. Mr. Gooden's headquarters are with the Georgia Department of Public Health, Atlanta 3.

IOWA

State Medical Election.—Dr. Robert L. Parker, Des Moines, was chosen president-elect of the Iowa State Medical Society at its meeting in April. Dr. Ransom D. Bernard, Clarion, was installed as president. Dr. John C. Parsons, Des Moines, is secretary and Miss Mary L. McCord, Des Moines, executive secretary. The 1946 meeting will be held in Des Moines, the tentative dates having been set as April 17-19.

Tropical Diseases.—The State University of Iowa College of Medicine, Iowa City, and the state department of health, in cooperation with the U. S. Public Health Service, will conduct a special laboratory course in malaria and other tropical diseases at the state hygienic laboratory, Iowa City, July 23-28. The instructors will be Dr. Milford E. Barnes, professor of hygiene and preventive medicine, and Kenneth MacDonald, Ph.D., assistant professor, both of the college of medicine, and Dr. Irving H. Borts, director of the state hygienic laboratory.

KANSAS

University News.—Mrs. Logan Clendening, Kansas City, Mo., has been appointed by the chancellor of the University of Kansas to be the curator of the library of medical history, which was endowed in the will of the late Dr. Clendening (THE JOURNAL, April 7, p. 934).——The plan to establish a memorial fund in honor of the late Dr. Clarence B. Francisco, Kansas City, Mo. (THE JOURNAL, April 15, 1944, p. 1142), has considerably enlarged into a campaign for a student union building including a dormitory, gymnasium and cafeteria, a special lounging room in the building and library to be set aside as a memorial to Dr. Francisco. According to the *Journal of the Kansas Medical Society* $43,000 of the proposed cost of $300,000 has been subscribed.——Paul G. Roofe, Ph.D., assistant professor of anatomy, University of Louisville School of Medicine, has been appointed professor of anatomy and chairman of the department of anatomy, University of Kansas School of Medicine, effective September 1. ——The recent legislature provided for $350,000 for a new surgical building at the medical school, referred to as a connecting corridor, which will add 70 to 90 beds to the hospital.

NEBRASKA

Personal.—Dr. Chauncey M. Pierce was recently elected president of the Chadron chamber of commerce.——Dr. Leland C. Albertson has resigned as medical director of the Hospital for the Tuberculous, Kearney, effective May 1. Dr. Albertson has been associated with the hospital since 1934 and has served as director since 1940.

Prepayment Sickness Insurance.—The Nebraska State Medical Association has approved the Nebraska Surgical Plan for nonprofit prepayment sickness insurance benefits. The plan, which has been in operation in Douglas County since Nov. 1, 1944, will be integrated with the Blue Cross, which for a small fee pays subscribers' hospital bills within certain limitations. The surgical plan offers subscribers, for a monthly fee, surgical, maternity, x-ray, pathologic and anesthesia benefits. It also provides for treatment of certain minor surgical cases in the physician's office, such as fracture of the wrist, minor lacerations or incision of a boil. It does not cover medical service, such as house visits in the case of ordinary illness for conditions such as infectious diseases, influenza, pneumonia or other medical afflictions. When sufficient experience has been accumulated, benefits for treatment of medical cases confined within a hospital will be added to the surgical-maternity benefits. The benefits now offered would be available to all immediate members of a family for only $2 a month. Without maternity benefits an individual's assessment would be 75 cents a month, and an individual with one dependent

would pay $1.50 a month. To insure a fair cross section of subscribers, the surgical plan, like Blue Cross, is offered only on a group basis. In rural areas it is proposed to enroll farm groups through project clubs, townships, school districts and such cooperative groups as the Farmers Union. The members of the planning committee of the state association which proposed the plan to the association after a year's study are Drs. Floyd L. Rogers, Lincoln, chairman; Albert L. Cooper, Scottsbluff; Morris Nielsen, Blair; Donald B. Steenburg, Aurora, and Arthur J. Offerman, Omaha. The business administration of both the Nebraska Surgical Plan and the Blue Cross will be in charge of J. H. Pfeiffer, Omaha, executive director. Each plan, however, will have its own board of directors.

NEW HAMPSHIRE

New Roentgen Ray Society. — The New Hampshire Roentgen Ray Society was recently organized with Dr. Fred S. Eveleth, Concord, president, and Dr. Richard C. Batt, Berlin, secretary-treasurer. The aim of the society is to maintain and improve radiologic service in the state and to promote cooperation between clinicians, radiologists and hospitals.

NEW YORK

Need of Diagnostic Clinics Studied. — The Medical Society of the State of New York is conducting a survey to determine the need for diagnostic aid centers. The study is being directed by the society's subcommittee on laboratory service and medical care.

New York City

University News.—Dr. John J. H. Keating, 1917 graduate, was chosen president of the Association of the Alumni of the Columbia University College of Physicians and Surgeons at its annual dinner April 21. Other officers include Drs. Bernard S. Oppenheimer, class of 1901, vice president; James A. Corscaden, class of 1906, treasurer; Charles C. Lieb, class of 1906, secretary, and T. Lloyd Tyson, class of 1931, historian.

New Orthopedic Fellowship.—The Mr. and Mrs. Frederick Brown Orthopedic Research Fellowship has been created at the Hospital for Joint Diseases by Mr. Frederick Brown, president of the hospital, with an initial gift of $7,500 on the occasion of his seventy-fifth birthday. Immediately after the war and as soon as young physicians return from military service, the hospital will begin awarding the research fellowship to carefully selected candidates to be nominated by a committee on awards consisting of Mr. Brown, Mr. Max Wilner, chairman of the board; Mr. L. F. Rothschild, treasurer; Dr. Abraham J. Beller, president of the medical advisory board; Dr. Henry L. Jaffe, director of laboratories, and Dr. Jacob J. Golub, medical director of the hospital. Under the terms of the fellowship the recipients of the awards will be chosen without regard to race, creed or color. Applicants must be graduates of approved medical schools and must have completed previous internships and approved residencies. The selection will be made on a merit basis, the qualifications being essentially scholarship, previous training and research tendencies.

Nutrition Clinic Established.—A city-wide nutrition clinic has been established at the lower East Side Health and Teaching Center with Dr. Norman H. Jolliffe as chief of clinic, according to Dr. Frank A. Calderone, acting city commissioner of health. Objectives of the clinic are:

To furnish a diagnostic and treatment center and consultation clinic for patients suspected of having nutritional abnormalities.
To furnish a training center for physicians, nurses and others interested in the diagnosis, treatment and prevention of deficiency diseases.
To develop and correlate diagnostic methods for the detection of early nutritional diseases.
To determine the significance of various manifestations of nutritional diseases.
To determine the most effective methods of treatment and prevention of deficiency diseases.
To obtain information concerning food habits in relation to nutritional disease.
To translate, when indicated, the diagnostic procedures and conclusions of this clinic into practice in other health department units.

Plans are being formulated for the Public Health Research Institute and the nutrition division of the department of health to cooperate with the nutrition clinic so that it will be possible to correlate the dietary and chemical studies with the medical findings.

Gifts to Long Island College of Medicine.—Gifts and grants totaling $127,374.15 were made to the Long Island College of Medicine, Brooklyn, in the year ended January 1 for nine research projects, new college laboratory facilities, scholarships, student aid and a library for the new William Alanson White Clinic. Contributions through the development fund still in progress comprised the largest single item on the report, with a total in gifts secured up to January 1 of $63,784.05. This fund was used to provide new laboratories for the departments of medicine, anatomy, biochemistry and radiology, for which extensive structural alterations have been made in the Polhemus Memorial Building at 350 Henry Street, the Hoagland Laboratory Building at 335 Henry Street and the Polak Laboratory at 123 Pacific Street. The second largest item was a continuation of the six year grant from the Commonwealth Fund, which gave $16,890.83 for the development of the college's new department of psychiatry, which is located in a new building at 88 Amity Street and named after the late Dr. William Alanson White, graduate of the college in the class of 1891, who was director of St. Elizabeths Hospital, Washington, D. C. The initial grant of $5,112.50 for this department was made in 1943. An anonymous contribution of $2,500 was made for the library of this new psychiatric clinic. Another anonymous contribution of $4,900 was made to install new laboratory and library facilities in the college division at Kings County Hospital. When completed this whole project will cost $10,000, with the remainder to come out of development fund contributions. A new endowed scholarship amounting to $5,350 was established in the name of Mrs. Sarah Beinfield Messing, whose son is a graduate of the college and whose grandson is a member of the present senior class. A new prize award was established in 1944 by the late Mrs. Joseph Howard Raymond with a gift of $995 in memory of the late Dr. Joseph Howard Raymond, secretary of the faculty from 1888 to 1915 and professor of physiology from 1873 to 1915.

OHIO

University News.—The Commonwealth Fund has appropriated $8,200 to be used by Dr. Carl J. Wiggers and associates of the department of physiology, Western Reserve University School of Medicine, Cleveland, to continue their studies on the peripheral circulation and shock during 1945-1946.

Graduate Assembly.—The seventeenth annual postgraduate assembly of the Mahoning County Medical Society was conducted at the Pick-Ohio Hotel, Youngstown, April 11, among others, by members of the faculty of Marquette University School of Medicine, Milwaukee. The speakers included:

Dr. Frederick W. Madison, Present Trends in Hemorrhagic Diseases.
Dr. Carl W. Eberbach, Treatment of Biliary Tract Diseases.
Dr. Francis D. Murphy, Diagnosis and Treatment of Nephritis.
Dr. Eben James Carey, The Future of Medicine.

Narcotic Ring Exposed.—On March 30 a $100,000 a year "dope racket" in the Akron area was exposed by federal narcotic agents, according to the Akron *Beacon Journal*. The so-called ring is said to involve 150 addicts. The seven persons arrested included two physicians, Drs. Erich Otten and Roy T. Haskell, both of whom were charged with the "sale of narcotics," pleaded not guilty and were freed under $1,500 bond. Dr. Haskell is reported to have written drug prescriptions in the name of a patient, now dead, and continued to obtain drugs in that patient's name.

Personal.—Dr. Howard Dittrick was reelected president of the Cleveland Medical Library Association at its recent meeting. Dr. Dittrick is also director of the association's museum. Dr. Justin A. Garvin was elected secretary.——Drs. Robert H. Bishop Jr., director of the University Hospitals, and Henry J. Gerstenberger, director of pediatrics, Babies and Childrens Hospital, Cleveland, were given diplomas recently from the Hospital Infantil, Mexico City, in recognition of their work in training physicians and nurses from Mexico City.——Dr. Arthur D. Blackburn, Circleville, health commissioner of Pickaway County, has been elected vice president of the United Roller Club of America, an organization which promotes interest in roller pigeons.——Dr. William Edward Blair, Lebanon, who has completed twenty-five years as health commissioner of Warren County, has been reappointed for an additional two year term.——Dr. Edwin J. Cauffield, Akron, completed fifty years in the practice of medicine, March 25.

TENNESSEE

Enjoined from "Practicing" in Florida—Runs Clinic in Tennessee. — William Estep, who was enjoined from the practice of medicine in what was known in Pensacola, Fla., as a Vita-Ray Clinic, has opened the "Memphis Research Clinic" and was on April 12 advertising the institution as an "x-ray clinic for chronic diseases," according to the Memphis *Commercial Appeal*. It was stated that the injunction restraining Estep from practicing medicine in Florida was decreed last December 4 by Judge Ernest E. Mason of the Escambia County, Fla., Court of Record. The case is now pending before the Florida Supreme Court on appeal, it was stated.

Estep is said to have recorded a license as a naturopathic physician. Dr. Harley W. Qualls, secretary of the Tennessee State Board of Medical Examiners, is reported to have said that there is no doctor with the name William Estep in any state in the United States licensed to practice medicine. On warning by the secretary of the state board that as a naturopathic physician he was not entitled to use x-rays, Estep is supposed to have said that his attorney had told him it was permissible. Dr. Qualls, in a statement to the press, said that he visited the clinic and was surprised to learn, following his examination by Estep, that he had high blood pressure, sinus trouble caused by "pus pockets," and six stomach ulcers. In addition to what Estep said were "vita-ray" and "electromagnetic" treatments for the sinus and ulcers, Dr. Qualls was given prescriptions for drugs to take for each ailment. The Florida State Board of Medical Examiners revoked Estep's license, Nov. 23, 1942 on the grounds that it had been obtained fraudulently from the late Dr. George A. Munch, secretary of the old Eclectic Board, who served a sentence in federal prison for using the mail to defraud.

VERMONT

University News.—Dr. Harold E. Himwich, professor of physiology and pharmacology at Albany Medical College, recently addressed the Osler Clinical Society, the student's organization at the University of Vermont College of Medicine, Burlington, on "Hypoglycemia, Its Physiology, Pathology, Symptoms and Treatment." Capt. Arthur E. MacNeill, M. C., also spoke before the society recently on "The Work of an Army Air Force Flight Surgeon." Dr. John F. McIntosh, secretary to the McGill University Faculty of Medicine, Montreal, Quebec, addressed the society April 4 on the problem of urinary calculi in ancient times and in a modern clinic.

WASHINGTON

Dean Now Sought for New Medical School.—One of the first steps toward the creation of the University of Washington Medical-Dental School will be the selection of a dean who will be the adviser and director of future developments. The school will be confined to teaching the basic sciences of anatomy, physiology, chemistry, pathology and bacteriology, subjects already established in the premedical courses (THE JOURNAL, April 21, p. 1067).

WEST VIRGINIA

Hospital News.—The state legislature has passed a bill designating the state health department as the sole state agency to deal with the federal government concerning a bill pending in Congress appropriating one million dollars for postwar hospital construction and five million dollars to finance state surveys of hospital needs. The bill in the state legislature authorizes the governor to appoint an advisory committee to consult with the state health department in all matters concerned with the new project. The Barboursville unit of the Weston State Hospital (mental), Weston, will hereafter be known as the Barboursville unit of the Huntington State Hospital, Huntington, in accordance with a recently passed bill.

GENERAL

Actions on 1945 Conventions.—Reports received by the American Medical Association indicate the following action for the 1945 sessions of the respective organizations:

American Ophthalmological Society, canceled.
Maine Medical Association, canceled.
Utah State Medical Association, canceled.

Dr. McQuarrie Named Editor of Brennemann's Practice of Pediatrics.—Dr. Irvine McQuarrie, professor and head of the department of pediatrics, University of Minnesota Medical School, Minneapolis, has been appointed editor of Brennemann's Practice of Pediatrics, published by W. F. Prior Company, medical publishers, Hagerstown, Md.

Facts About Tuberculosis.—The United States Public Health Service has made available a second presentation in graphic form of the statistics regarding tuberculosis in the United States. It is devoted to proportionate mortality statistics for the states in geographic divisions. Deaths are classified according to age, sex and race and are comparative for the last three decades.

Research Council to Act as Adviser to Cancer Society.—The National Research Council has agreed to act as adviser to the American Cancer Society in its proposed comprehensive research program on the entire cancer problem. About one third of the five million dollars now being sought in the society's campaign for funds is to be devoted to cancer research. The role of adviser will be carried out through the division on medical sciences of the National Research Council, which will establish a committee on growth of fifteen members.

Medical Advisory Committee Named for Compensation Commission.—A medical advisory committee has been appointed to the United States Employees' Compensation Commission to advise on special medical problems incident to the handling of cases of silicosis reported under the federal workmen's compensation laws. Members of the committee include Dr. Royd R. Sayers, director of the Bureau of Mines, U. S. Department of the Interior, Washington, D. C.; Dr. Leroy U. Gardner, Saranac Lake, N. Y.; Lieut. Col. Anthony J. Lanza, M. C., and Dr. Clarence D. Selby, Detroit. The first meeting was held May 10 in New York.

Biometrics.—The American Statistical Association has recently brought out a *Biometrics Bulletin*, official organ of the biometrics section of the association. It is designed primarily for biologists who see in statistics a potent tool for their work and will be developed to meet the needs of the membership. The biometrics section of the American Statistical Association was established in 1938. The first issue includes a discussion of the new bulletin, an article on "Some Uses of Statistical Methods in Medicine" by John R. Miner, Sc.D., Rochester, Minn., abstracts, queries and news items. The new bulletin will be published six times a year by the association, 1603 K Street N.W., Washington 6, D. C. Material for the bulletin should be sent to Gertrude M. Cox, M.S., chairman of the editorial committee, North Carolina State College, Raleigh, N. C.

Improvement in Cancer Control.—Noticeable progress has been made in combating cancer, particularly among women, according to the statisticians of the Metropolitan Life Insurance Company. Among the insured white females aged 1 to 74 years the standardized cancer death rate dropped as much as 11 per cent in the decade 1934 to 1944, and even for the preceding quarter of a century the death rate from this cause stayed fairly stable or showed a downward trend for women in every age group below 65 years. "The net result of these developments," the statisticians say, "has been to bring the current death rates from cancer among the white women in the broad age of 25 to 64 years to the lowest levels on record in this third of a century of insurance experience; it is a striking fact that in the ages 35 to 54 the mortality dropped one fifth between 1911-1913 and 1942-1944. Even among white male policyholders the situation has shown slight improvement in recent years. The distinctly upward trend in the mortality from cancer which was manifest during the first quarter century of this insurance experience has been stemmed, if not reversed. During the past decade, at no age period beyond 25 years has the cancer death rate among these insured men increased; in fact, it appears that at some age periods the mortality has tended downward recently." The gain in the control of cancer mortality is attributed by the statisticians to a number of factors. Among these are the organized movement for such control, which has caused people to seek diagnosis and treatment earlier in the course of the disease, prevention of the disease itself by more attention to personal hygiene, and in women through better obstetric and postpartum care. Added to these factors aiding in the control of cancer are the constantly increasing number of physicians trained to deal effectively with the disease, the increase in the public and private facilities for the treatment of cases and the development of new and improved technics. Significant this year, the statisticians point out, is the fact that 1945 not only marks the one hundredth anniversary of the birth of Wilhelm Konrad Roentgen, born March 27, 1845, but also the fiftieth anniversary of his discovery of the x-rays, "which have proved invaluable in the diagnosis and treatment of cancer as well as of many other diseases."

PUERTO RICO

Legislation Affecting Pharmacy.—Under a bill passed by the legislature of Puerto Rico and waiting the governor's signature, the Board of Pharmacy of Puerto Rico would have the power to regulate the practice of pharmacy. Under the bill the "assistant pharmacists," or "practical pharmacists" as they are called in Puerto Rico, would have legal recognition but would be subject to legal regulation, and they would be required to perform their work under the supervision of registered pharmacists all the time.

Proposed Health Grants.—According to Dr. Antonio Fernos Isern, San Juan, commissioner of health of Puerto Rico, an appropriation of about $2,000,000 from federal funds will be given Puerto Rico for different health projects during

the fiscal year 1945-1946. The money would come from part of the $100,000,000 appropriation bill now pending in Congress for health and sanitation work in the states and territories, according to an announcement. Priorities have been obtained for the construction of twenty-five additional health units in Puerto Rico, for which the legislature appropriated funds recently. Dr. Fernos Isern stated that the federal money would be used for the construction of hospitals and public health centers to fight malaria, tuberculosis and venereal diseases in the island.

FOREIGN

The Harveian Lecture.—Sir Alexander Hood, director-general of the Army Medical Services will deliver the Harveian lecture at the Royal College of Surgeons, England, May 28. His subject will be "Total Medicine."

Treatment Centers for Rheumatism.—The British Empire Rheumatism Council plans to cooperate in the establishment in Britain of a national chain of treatment centers to enable comprehensive tests under full control conditions to be made for evaluating present and proposed new means of treatment of rheumatism.

Appointment to New Chair of Industrial Health.—Dr. Ronald E. Lane, who has been lecturer in factory hygiene and lecturer in medicine at the University of Manchester, has been appointed to a new chair of industrial health, which was created recently by the Nuffield Foundation under a grant of £70,000. According to *Science* Dr. Lane is expected to take up his new work next September.

Personal.—Dr. James Mackintosh, dean of the London School of Hygiene and Tropical Medicine, has been lecturing in Sweden for the British Council on "Housing and Medicine" and "Nutrition and Medicine."——Dr. H. A. Krebs, who graduated in medicine at the University of Hamburg in 1925, has been appointed to the newly established chair of biochemistry in the University of Sheffield, Yorkshire, England, where some years ago he, as lecturer, founded a school of biochemical research which has received support from the Medical Research Council and the Rockefeller Foundation.

First Health Inspector General Named for South Pacific.—Dr. John C. R. Buchanan, formerly deputy director for medical services in Uganda, has been named the first health inspector general of the South Pacific in line with a new plan to create a Pacific public health service planned by the British Empire. According to the New York *Times* the decision to adopt the plan, which envisages joint public health and medical services for Fiji, the British western Pacific territories and New Zealand Island territories in Oceania was made in conjunction with London and Wellington. It followed an investigation of existing services in Fiji by New Zealand officials. The headquarters of the setup will be located in Suva Fiji, which is conveniently situated for training the necessary personnel and for expansion.

Growing of Herbs in Russia.—One hundred thousand acres on ten thousand collective farms in Russia are planted to medicinal herbs, and in the near future thirty new stations of the All-Union Medicinal Trust will begin gathering wild herbs and assisting in their cultivation on collective farms, as well as in their processing, the Russian Information Bureau reports, as published in the New York *Times*. Eight thousand tons of herbs was gathered in 1944 by the trust. Each summer groups of botanists explore all parts of the country to find new varieties. An expedition to the Tian-Shan mountains discovered vast growths of termopsis, the seeds of which are used in the production of medicines for treatment of ailments of the respiratory tract. From the Turkmenian desert came a plant from which salsolin, used for lowering blood pressure, is obtained, it was stated.

Joint OSE Medical Mission to Yugoslavia.—The Union of OSE, Geneva, cabled the OSE in New York City through the United States Legation in Bern on April 4:

> Joint OSE Medicosocial Relief Mission consisting of 6 physicians and 8 other staff members along with 7 tons of supplies, medical and restorative, left Switzerland March 17 for Yugoslavia via Marseilles. Its aim is emergency relief to displaced persons, particularly Jews liberated from camps and diffused throughout newly liberated territories. Received cabled news that our previous mission, consisting of 6 persons, left Naples for Hungary accompanied by American Jewish Joint Distribution Committee delegate Israel Jacobsohn. Joint OSE Polish Mission has now been provided with necessary supplies, is ready to start and is expecting visas shortly.

According to the information of the American Jewish Joint Distribution Committee its representative, Mr Jacobsohn, went to Yugoslavia. Whether he will join the mission to Hungary and whether that mission will gain admission is still problematic.

Health Campaign in Sweden.—The Medical Association of Sweden and the Swedish Gymnastics League are sponsoring a general health campaign throughout the country. Physicians are giving lectures and demonstrations, and educational printed material is being distributed. Health weeks will be observed. On the initiative of the head of the new School Hygienics Bureau Dr. Carl W. Herlitz, Stockholm, Sweden, has adopted a uniform system of health registration in the schools. It is hoped to tie up this registration at school with the health registration of the Swedish conscripts. About $150,000,000 a year is expended in the treatment for diseases alone. In addition, losses in working hours and productive capacity cost about $250,000,000. This information is revealed in a recent survey by Dr. Sven Rydenfelt, Lund University, during the years 1940 and 1941. The bulk of these costs is paid by the state in the form of costs for public health and the care of the sick, benefit funds and invalidity relief. The remainder may be regarded as social-economic expenditure disbursed by the citizens, for example, for dental and medical treatment, medicine and payments to sick benefit funds, according to the Swedish International Press Bureau.

Air Ambulance Pilot Honored.—An air ambulance pilot of the Royal Swedish Air Force, Sergeant Major Allan Norberg, was recently awarded the prize for the most noteworthy Swedish flying feat of the year, instituted by the newspaper *Stockholms-Tidningen* and consisting of a gold medal and a grant of money. During a 950 kilometer flight to a remote place in the mountainous wilds of Lapland in order to save two Norwegian refugees, Sergeant Major Norberg was forced by bad weather to fly not more than 300 feet over the treetops. For seven years Norberg has been active as an air ambulance pilot, and during 1944 he transported in all 164 persons from isolated parts of Lapland to hospitals in the coastal towns, often under the severe weather conditions of arctic cold and heavy snowstorms. The Swedish air ambulance service was started in 1923 with support by the state and the Swedish Red Cross. It is now incorporated in the Swedish air force, which places aircraft and personnel at disposal. The ambulance planes are stationed at three airports in northern and central Sweden: at Boden, just below the arctic circle, at Östersund in the province of Jemtland, and at Hägernäs in the Stockholm archipelago. During the war years planes especially from the first mentioned station have been engaged in rescuing refugees who have crossed the border in northernmost Sweden.

CORRECTION

Minutes of Board of Trustees.—In the fourth line of the third paragraph, under "Appointments," in the abstract of minutes of the meeting of the Board of Trustees held Feb. 15 and 16, 1945 (THE JOURNAL, March 24, p. 719), "American Pediatric Society" should read "American Academy of Pediatrics."

Government Services

Industrial Hygiene Division Moves

On April 6 the outlying offices of the industrial hygiene division of the U. S. Public Health Service moved into building three of the National Institute of Health, Bethesda, Md. According to the Industrial Hygiene *News Letter* the move brings the entire division, with the exception of the chemical unit, in one building.

Consultant Services Extended by Industrial Hygiene Division

Dr. Walter E. Doyle, Surgeon (R), chief of the industrial hygiene division of the U. S. Public Health Service, recently completed the first of a series of tours planned in a program of extending the consultative services to the states. The first tour was carried on in U. S. Public Health Service District number 7, comprising the industrial hygiene units of Minnesota, Iowa, Missouri, Arkansas, Oklahoma and Kansas. According to *Industrial Medicine*, Dr. Doyle plans to visit every state and every local industrial hygiene unit in the state and in the nation. He is making the annual evaluation conducted by the industrial hygiene division in the units he visits, although major emphasis is placed on giving aid in the medical control of occupational disease.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 14, 1945.

Postgraduate Training of Medical Officers on Release from the Forces

The government recognizes that many medical officers who joined the armed forces during the war were unable to complete the postgraduate training usually received before entering into civilian practice and that others have had their normal professional experience interrupted or curtailed in certain respects over a period of years. The government thinks that every opportunity should be given to medical officers when released from the forces to continue their training or to bring down to date their professional knowledge in those branches of medicine required in civilian practice. Accordingly, after consultation between the Ministry of Health, the universities and other interested bodies, arrangements are being made by which officers on release will avail themselves of further training or refresher facilities.

The following are the classes of officers concerned: 1. Those who joined the forces within a year or so of obtaining a medical qualification, including those who would have proceeded further to take a university medical degree but were prevented by recruitment from doing so. 2. Those who had become established in general practice before joining the forces. 3. Those who were training for a specialist career when they joined the forces or are accepted as suitable for such training on release. Class 1 will be offered salaried resident posts for up to six months at teaching hospitals or other hospitals approved by the universities, where they will have access to suitable clinical material and work under the guidance of senior members of the visiting staffs. For class 2 refresher courses will be arranged at hospitals approved by the universities. For class 3 there will be posts of the "registrar" type in teaching and other hospitals approved by the universities, where they can continue their specialist training.

The posts available to class 1 will carry a salary of $1,750 plus board and lodging. For those with family commitments further assistance will be available. The refresher courses for class 2 will be free of cost. Traveling and subsistence expenses, together with the expense of a locum tenens when necessary, will be repayable up to a specified maximum. The posts available for class 3 will carry a salary of $2,750 plus board and lodging.

Typhus Causes a Truce

By negotiations between British and German officers, British troops took over from the S. S. and the Wehrmacht the task of guarding the vast concentration camp at Belsen, a few miles northwest of Celle, which contains 60,000 prisoners, many of them political. This has been done because typhus is rampant in the camp and it is vital that no prisoners be released until the infection is checked. The advancing British agreed to refrain from bombing or shelling the area of the camp, and the Germans agreed to leave behind an armed guard which would be allowed to return to their own lines a week after the British arrival. The story of the negotiations is curious. Two German officers presented themselves before the British outposts and explained that there were 9,000 sick in the camp and that all sanitation had failed. They proposed that the British should occupy the camp at once, as the responsibility was international in the interests of health. In return for the delay caused by the truce the Germans offered to surrender intact the bridges over the river Aller. After brief consideration the British senior officer rejected the German proposals, saying it was necessary that the British should occupy an area of 10 kilometers round the camp in order to be sure of keeping their troops and lines of communication away from the disease. The British eventually took over the camp.

Medical Delegations to Britain from Liberated Europe

It was stated in a previous letter (THE JOURNAL, March p. 610) that the doctors and scientists of liberated Eur are eagerly looking to Britain for a cultural lead to repl the hegemony hitherto exercised by Berlin. Signs of t movement are already evident. A French medical delegati is now visiting this country as guests of the British Coun and the Royal College of Physicians. Representing the Ac démie de médecine is Prof. A. Baudouin, dean of the Facul de médecine, Paris, Prof. A. Lemierre and Dr. P. F. Arman Delille; the Conseil supérieur de médecine, Dr. Ravina, D A. Laporte and Dr. H. Descomps; the provinces, Prof. Soula of Toulouse, Professor Gernez-Rieux of Lille, Prof. Roche of Marseilles and Dr. M. Nédelec of Angers. Durin the blight of the German occupation of France not only di all progress in medicine and science cease but the countr was cut off from the outside world, so that advances mad remained unknown. Even foreign medical journals could not be obtained.

Arrangements have also been made for the visit to Britain of four groups of Belgian professors in the next three months. The first group will be here from April 16 to 30 and will include N. Goormaghtigh of Ghent and Prof. P. Govaerts of Brussels.

SWITZERLAND

(From Our Regular Correspondent)

GENEVA, April 15, 1945.

Swiss Tropical Institute

It is now one year since the Swiss Tropical Institute was founded in Basle. It has witnessed a considerable development under the direction of its president, Professor R. Geigy. There are now more than a hundred students following different courses on tropical subjects. A special section has been created for the documentation and the bibliography of all tropical matters. This section serves scientists or businessmen by furnishing required information about publications concerning the tropics. The library is enlarging every day and comprises at present four hundred books, fifty periodicals and more than a thousand pamphlets, articles and other items. The institute also publishes a review, the *Acta tropica*, of which four issues appeared in 1944. The institute has created, at the Basle Auxiliary Hospital, a special section for tropical diseases. The immediate purpose of this clinic, which is under the direct control of the institute, was to receive Italian and Yugoslavian military internees suffering from malaria. During the last six months of 1944, 163 patients were treated. The observations made enabled the doctors and students to start research on hematology, serology and medical entomology. The director of the clinic is Dr. A. Perret-Gentil, medical adviser of the institute, assisted by Dr. M. Lauterburg-Bonjour.

The Fight Against Cancer

It is estimated that 1 person out of 7 dies of cancer in Switzerland. Therefore the Swiss Association for the Fight Against Cancer has started a vast propaganda action throughout Switzerland to make people conscious of the danger of the disease. To give to this action the greatest efficiency, the association has had a documentary film made about cancer. The film was done with the help of Swiss specialists and the laboratories of medical schools. It enables the public to witness operations at which only doctors are usually present. The actor

Biberti, who impersonates a professor of pathology, explains to his students (and therefore for the public in the cinema) the theories concerning cancer and the different therapeutic methods now in use. The film lasts one hour, and the audience can become acquainted with the appearance of different kinds of cancer and the stages of their evolution. It shows the principal methods of treatment: removal of the cancer focus, destruction of the cancer cells with roentgen rays and radium therapy. As it is essential for a good prognosis to be able to diagnose very early the formation of a focus, the film emphasizes the value of a complete medical examination at least once a year.

Center for Types of Bacteria in Lausanne

A special laboratory has just been established at the Institute for Hygiene and Bacteriology of the Lausanne Medical School where specimens of all organisms pathogenic for man, animals and plants will be kept. This laboratory will function with the help of well known Swiss and foreign workers, and the specimens will be sent to any doctor doing research who asks for them. A detailed catalogue will help him to choose the exact variety of germs he wishes to have. The Swiss Academy of Medical Sciences has given its approval to this new center, and Dr. P. Hauduroy, professor of bacteriology, has been appointed as its director.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, April 18, 1945.

Observations on the BCG Immunization Campaign

The campaign for the immunization of Rio de Janeiro infants against tuberculosis by the BCG vaccine under the direction of Dr. Arlindo de Assis has been reported in several previous letters. Dr. Assis has just published a general report of his work begun in 1927, which includes, up to 1944, a total of 161,152 immunized children. At the same time the report includes the vaccination of more than 3,000 anallergic persons of other age groups. The immunizing strain used was obtained in 1927 from Dr. E. Moreau of Montevideo, Uruguay, the material having been originally furnished by Dr. Calmette from the Pasteur Institute in Paris. As a rule the immunizations were performed through the ingestion of the material, but in some cases subcutaneous and intradermal inoculations were used as well. In 1934 Dr. Assis began to immunize anallergic children of preschool and school ages, for which he used the total dose of 10 centigrams. All this immunization work has been accompanied by extensive laboratory researches, which in part have been reported in previous letters.

The Moreau strain of BCG, studied in animals since 1925 and in human beings since 1927, has maintained, up to now, the original attenuated virulence and the capacity of producing tuberculin and tuberculinic allergy. When killed by heat and administered intradermally to nontuberculous individuals in the dosage of one tenth of a milligram, the strain may cause minimal nodules, sometimes followed by suppuration or transient local caseation, associated or not with late tuberculinic allergy (after the third week). Sometimes it may stimulate only the appearance of this late tuberculinic allergy, without the production of local nodules. In about 45 per cent of the cases it may cause no change at all. The same dosage of killed BCG, in tuberculous patients during the preallergic stage, or in tuberculinized individuals who have already lost their allergy, or in BCG immunized individuals also apparently anallergic, the intradermal inoculation shows a quite different picture, causing the early appearance of intense nodular reaction and the state of cutaneous tuberculinic allergy during the first week. This ability to produce what Dr. Assis calls "infratuberculinic allergy" (THE JOURNAL, Nov. 28, 1942, p. 1053) is comparatively stronger than the same effect caused by the common human virulent tubercle bacillus.

A High Standard School of Nursing

A new high standard school of nursing has been founded in Nicteroy, state of Rio de Janeiro. This is the third nursing school of this type in Brazil and the second one founded with the cooperation of the Special Service of Public Health. As reported in a previous letter (THE JOURNAL, Aug. 14, 1943, p. 1140), a school of nursing of high standard was founded in June 1943 in connection with the University of São Paulo. For the establishment of this school the Special Service made large contributions. It is interesting to point out that the first school of nursing of high standard—the one now belonging to the University of Rio de Janeiro—was founded in 1923 with the cooperation of a mission of American nurses supported by the International Health Board of the Rockefeller Foundation.

Dr. Leo Eloesser

Dr. Leo Eloesser, professor of Surgery at the Stanford University, spent a few days in Rio de Janeiro, commissioned by the Rockefeller Foundation to study some aspects of surgery and its teaching in Brazil and in other South American countries. Dr. Eloesser visited the department of surgery of the Hospital Moncorvo Filho, under the direction of Dr. Alfredo Monteiro, where he delivered a lecture on the modern evolution of pulmonary surgery. He was also received at the Brazilian College of Surgeons and at the Brazilian Tuberculosis Association, where he spoke respectively on war surgery of the thorax and on the treatment of tuberculous lung cavities.

American Penicillin in Brazil

The use of penicillin is rapidly developing in Brazil, although the drug is mainly distributed as a solution, the form in which it is prepared and furnished by the Institute Oswaldo Cruz of Rio de Janeiro. However, since June of last year American dried sodium penicillin has been available. To insure the regular distribution of the drug throughout the whole country, a control of the use was established by the National Health Department, but this measure is being suspended gradually, as the importation of American penicillin has increased rapidly.

Personal

Dr. Hercilio Marroco has been appointed president of the Sociedade Medica São Lucas for 1945-1946.

Dr. Antonio Murtinho Nobre, well known Brazilian homeopathist, died suddenly in Rio de Janeiro on April 1, aged 66.

Dr. Eurico Branco Ribeiro, director of Sanatorio São Lucas of São Paulo, has been elected corresponding member of the Academia de Letras do Paraná.

Marriages

BENJAMIN FRANKLIN MONTAGUE Jr., Charleston, W. Va., to Miss Mary Louise Aylor of Chatham, Va., March 3.

WILLIAMS MCIVER BRYAN Jr., Cleveland, to Miss Anne (Nancy) Gantt Snowden of Columbia, S. C., April 10.

THEOPHILUS HENRY BOYSEN III, Egg Harbor, N. J., to Miss Jean Danaher of Philadelphia, February 10.

HARRY EUGENE EZELL Jr., Corsicana, Texas, to Miss Miriam Jordan Akin of Franklin, Tenn., March 9.

ROBERT DUDLEY PILLSBURY, Omaha, to Miss Margaret Jane Schwab of Washington, D. C., January 27.

FRANCIS A. MARZONI, Durham, N. C., to Miss Florence Dick of Paris, Ky., in Durham, April 6.

LEO M. BASHINSKY, Durham, N. C., to Miss Betty Louise Riddle in Burlington, April 1.

HAROLD D. HILL to Miss Marjorie Ellen McCain, both of Richmond, Ind., February 11.

JOSEPH D. BELLEVILLE to Miss Marilyn Scott, both of St. Louis, March 1.

Deaths

Martin Henry Dawson, New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; instructor in pathology and bacteriology at the University of Louisville School of Medicine, Louisville, Ky., 1924-1925; in 1926 joined the Rockefeller Institute, New York, as research fellow, becoming an assistant in 1928; later served as associate professor of clinical medicine at the Columbia University College of Physicians and Surgeons; associate physician at the Presbyterian Hospital; won the military cross for service during World War I as a captain in the Trench Mortar Battery of the Canadian army; specialist certified by the American Board of Internal Medicine; member of the Association of American Physicians, American Society for Clinical Investigation, American Rheumatism Association, American Association of Pathologists and Bacteriologists, American Society for Experimental Pathology and the Society of American Bacteriologists; executive secretary of the International Congress on Microbiology and editor of its transactions; during World War II director of the Commission on Streptococcal Infections under the War Department and consultant on infectious diseases to the Secretary of War; directed a comparative research program which included the treatment of bacterial endocarditis with penicillin and the use of gold salts in the treatment of rheumatoid arthritis; said to be first in the United States to prepare and use penicillin for treatment of human beings; research included infectious diseases, the transmutation of strains of pneumococci and biologic variants of the streptococcus and other microorganisms and the nature and treatment of arthritis; died in the Harkness Pavilion, Columbia-Presbyterian Medical Center, April 27, aged 48.

Milton Weston Hall ⊕ Lieutenant Colonel, U. S. Army, retired, Palma Sola, Fla.; S.B., Massachusetts Institute of Technology, in 1900; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; Army Medical School, advanced course, 1921; served during World War I; entered the medical corps of the U. S. Army as a major in 1920; promoted to lieutenant colonel in August 1937; retired Jan. 31, 1942; was placed on active duty Feb. 1, 1942, serving as associate professor of military science at the State University of Iowa College of Medicine, Iowa City; returned to the inactive retired list about April 15, 1944; member of the Medical Association of the Isthmian Canal Zone, American Society of Tropical Medicine and the Association of Military Surgeons of the United States; his service included three years' work on dengue fever with the research board on tropical diseases in the Philippines and with General Hospital laboratories in this country and in Panama; died March 26, aged 67, of myocardial insufficiency, influenza and arteriosclerosis.

Marion Whitmell Ransone ⊕ Captain, U. S. Army, retired, Washington, D. C.; Medical College of Virginia, Richmond, 1926; interned at the Walter Reed General Hospital; Army Medical School and Medical Field Service School in 1928; served during World War I; entered the medical corps of the U. S. Army as a first lieutenant in August 1927; promoted to captain in August 1929; retired on April 30, 1937 for disability in line of duty; assistant professor of pathology at the Georgetown University School of Medicine; on the staffs of the Georgetown University and Gallinger Municipal hospitals; died in the Alexandria Hospital, Alexandria, Va., March 17, aged 47, of coronary thrombosis.

Robert DuVal Jones, New Bern, N. C.; University of Maryland School of Medicine, Baltimore, 1896; member of the American Medical Association and the Southern Surgical Association; served as president of the North Carolina Hospital Association and as district president of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; a lieutenant commander in the U. S. Navy serving overseas during World War I; at one time county physician; formerly associated with the U. S. Public Health Service; manager of St. Luke's Hospital, in which he was part owner until he retired; died March 2, aged 71, of heart disease.

John McEwen Foster, Denver; University of Tennessee Medical Department, Nashville, 1891; member of the American Medical Association and the American Laryngological, Rhinological and Otological Society; honorary member of the Colorado State Medical Society; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; professor of otolaryngology emeritus at the University of Colorado School of Medicine; member of the consulting staff, St. Luke's Hospital; consulting ophthalmologi at the Children's Hospital; died March 24, aged 84, of cardi renal failure and anemia.

Henry Clarence Lochte, New Orleans; Tulane Universi of Louisiana School of Medicine, New Orleans, 1914; serv as instructor in clinical medicine at his alma mater; an offic in the medical corps of the U. S. Army during World War I for many years associated with the bureau of war risk insuran of the Veterans Administration; formerly assistant bacteriologi for the city board of health; chief of the outpatient division the Veterans Administration Facility in Bay Pines, Fla., fro 1933 to 1938, when he retired; died March 25, aged 53, hypertensive cardiovascular disease.

Andrew John Aird, Carterville, Ill.; Barnes Medical Co lege, St. Louis, 1898; served during World War I; died i the Veterans Administration Facility, Marion, Ind., March 1 aged 77, of hypertensive heart disease.

Einer Bjarne Andersen ⊕ Iron Mountain, Mich.; Univer sity of Michigan Medical School, Ann Arbor, 1919; fellow o the American College of Surgeons; secretary-treasurer of th Dickinson-Iron Counties Medical Society; staff member, Iro Mountain General Hospital; died April 22, aged 52, of hear disease.

Robert Bailin, Brooklyn; New York Homeopathic Medica College and Flower Hospital, New York, 1917; member o the American Medical Association; died February 12, age 52.

Will Lake Beach ⊕ Painesville, Ohio; Ohio State Univer sity College of Medicine, Columbus, 1920; died March 13 aged 54.

Aubry C. Belcher, Richmond, Va.; Medical College of Virginia, Richmond, 1916; member of the American Medical Association; died February 18, aged 55.

Stephen Albert Bergin, Worcester, Mass.; Harvard Medical School, Boston, 1900; member of the American Medical Association; obstetrician at St. Vincent Hospital, where he died February 21, aged 72, of arteriosclerotic heart disease, chronic nephritis and diabetes mellitus.

Abram Louis Blanding, Fountain Inn, S. C.; University of Maryland School of Medicine, Baltimore, 1881; died February 25, aged 86.

George Dorsey Boone, Erin, Tenn.; University of Nashville Medical Department, 1899; served as mayor of the town of Erin; died in the Nobles Memorial Hospital, Paris, March 6, aged 73, of cerebral hemorrhage.

Albert Ubald Bourcier, Springfield, Mass.; University of Montreal Faculty of Medicine, Montreal, Que., Canada, 1927; member of the New England Society of Psychiatry; captain in the medical corps, Army of the United States, from Aug. 21, 1942 until Nov. 28, 1942, when he was relieved from duty; served on the staffs of the Northampton State Hospital and the Cooley Dickinson Hospital, Northampton, and the Mercy Hospital, where he died March 5, aged 47, of skull fracture and subdural hemorrhage caused by a fall.

Augustus A. Bradley, Cookeville, Tenn.; University of Tennessee Medical Department, Nashville, 1901; member of the American Medical Association; died February 15, aged 78.

Devillo N. Bulson, Rockville Centre, N. Y.; Eclectic Medical College of the City of New York, 1886; member of the board of education; one of the members of the board of trustees who founded the Rockville Centre Public Library; founder and for many years president of the Nassau County National Bank; died March 22, aged 89, of heart disease and pneumonia.

William Taylor Center ⊕ Hazel Green, Ky.; Hospital College of Medicine, Louisville, 1907; died February 25, aged 63.

Peter David Cholodny, Elizabeth, N. J.; Universität Leipzig Medizinische Fakultät, Saxony, Germany, 1921; plant physician for the U. S. Metals Refining Company at Carteret; interned at the Alexian Brothers Hospital, where he died March 4, aged 51, of coronary thrombosis.

John William Christensen, Dayton, Ohio; Milwaukee Medical College, 1902; served during World War I; served on the staff of the Veterans Administration Facility, where he died March 18, aged 70, of coronary occlusion due to hypertensive heart disease.

John Henry Francis Connor, Wrentham, Mass.; College of Physicians and Surgeons, Boston, 1907; assistant physician at the Wrentham State School; for many years an examiner for the Massachusetts Boxing Commission; died March 8, aged 63.

Francis M. Corry, Menasha, Wis.; Milwaukee Medical College, 1900; died in St. Elizabeth Hospital, Appleton, April 7, aged 69, of coronary thrombosis.

Frank Adams Daugherty, Independence, Ky.; University of Louisville School of Medicine, 1925; member of the American Medical Association; interned at the Good Samaritan Hospital in Cincinnati; a member of the Students Advanced Training Corps during World War I; on the courtesy staff of the William Booth Memorial Hospital in Covington, where he died March 16, aged 47, of malignant hypertension.

John Franklin Davis ⊕ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; served in the medical corps of the U. S. Army during World War I; for many years physician for the Chicago Bears football and the Cubs baseball teams; surgeon for the Rapid Transit Lines; member of the attending staff of the Illinois Masonic Hospital, where he died April 6, aged 69, of bundle branch block and coronary thrombosis.

William Eugene Dickinson, Canistota, S. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; served during World War I; veteran of the Spanish-American War; died January 28, aged 67.

John Wesley Dill, Los Angeles; University of Michigan Homeopathic Medical School, Ann Arbor 1879; Civil War veteran; died April 2, aged 102, of pneumonia.

Abraham Wilson Dods, Fredonia, N. Y.; the Hahnemann Medical College and Hospital, Chicago, 1878; member of the American Medical Association; examining physician for the local draft board during World War I; an honorary member of the Rotary Club, the Fredonia chamber of commerce, of which he served once as president, and the Chautauqua County Medical Association; served as surgeon at the Brooks Memorial Hospital, Dunkirk, and with the New York Central Railroad Company; died April 6, aged 91, of senility.

William Evans ⊕ West Chester, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1885; served as physician at the Pennsylvania Industrial Home for Blind Women and the Home for Aged and Infirm Colored Persons; member of the board of directors of the Elwyn Training School in Elwyn, and the Y. M. C. A. in West Chester; member of the College of Physicians of Philadelphia; died in the Chester County Hospital March 18, aged 83, following a prostatectomy.

Carlos Sager Fenton, North Bloomfield, Ohio; University of Wooster Medical Department, Cleveland, 1891; died March 15, aged 79.

George Horace Gilbert, Austin, Texas; University of Texas School of Medicine, Galveston, 1903; member of the American Medical Association; served during World War I; died in St. David's Hospital February 17, aged 65, of encephalitis.

Heber M. Goodsmith, Evanston, Ill.; College of Physicians and Surgeons of Chicago, 1887; formerly member of the medical staff of the Metropolitan Life Insurance Company and medical director of the Illinois Bell Telephone Company in Chicago; died April 9, aged 79, of chronic myocarditis.

George DeWayne Hallett, New York; New York Homeopathic Medical College and Hospital, New York, 1889; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staffs of the Jamaica Hospital, Jamaica, and the Flower and Fifth Avenue Hospitals; died March 14, aged 78, of heart disease.

William C. Harris, Lawrenceburg, Tenn. (licensed in Tennessee in 1889); died in Nashville March 6, aged 86, of cerebral hemorrhage.

Robert Galloway Henderson ⊕ Memphis, Tenn.; Memphis Hospital Medical College, 1900; died February 9, aged 69.

Clare Fredric Hoover ⊕ Topeka, Kan.; Kansas Medical College, Topeka, 1899; on the staffs of the Stormont Hospital and Christ's Hospital, where he died February 9, aged 70, of auricular fibrillation and gangrene of the leg from embolism.

Walter Dennis Hough, Los Angeles; New York Homeopathic Medical College, New York, 1881; Long Island College Hospital, Brooklyn, 1883; died January 13, aged 86.

William C. Hunt, Rochester, Ky.; University of Louisville Medical Department, 1889; died in Browder March 26, aged 86, of angina pectoris.

Andrew Jackson Hunter, Eureka, Mont.; the Hahnemann Medical College and Hospital, Chicago, 1883; died January 26, aged 93, of arteriosclerosis.

Martin Bushnell Jelliffe ⊕ Springfield, Ill.; University of Illinois College of Medicine, Chicago, 1917; served during World War I; interned at the Cook County Hospital in Chicago; on the staffs of the Memorial Hospital and St. John's Hospital, where he died March 5, aged 55, of diabetes mellitus and coronary occlusion.

Brinley John, Morgantown, W. Va.; Jefferson Medical College of Philadelphia, 1924; member of the American Medical Association; served as president of the Monongalia County Medical Society in 1935; interned at the South Side Hospital in Pittsburgh; died April 21, aged 45, of coronary thrombosis.

Joseph Frasia Jones, Richmond, Va.; Medical College of Virginia, Richmond, 1906; member of the American Medical Association; at one time demonstrator of anatomy at his alma mater; formerly assistant surgeon for the Seaboard Air Line Railway; on the staff of the Johnston-Willis Hospital; died March 11, aged 66, of coronary occlusion.

Edward F. Katzman, Louisville, Ky.; Louisville Medical College, 1902; member of the American Medical Association; died in St. Joseph Infirmary March 15, aged 64, of hypertensive heart disease.

Joseph Lemuel Kershner, Effingham, Ill.; Marion-Sims College of Medicine, St. Louis, 1892; died in St. Anthony's Hospital March 13, aged 86, of chronic cardiovascular sclerosis.

Emanuel Klaus ⊕ Cleveland; Western Reserve University Medical Department, Cleveland, 1902; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served in the medical corps of the U. S. Army during World War I; executive secretary of the International Anesthesia Research Society and member of other associated groups; member of the staff of the Lutheran Hospital, where he died March 21, aged 69, of arteriosclerotic heart disease and pulmonary infarction.

Oscar Kenneth Lang, New York; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1906; died March 10, aged 63.

Henry Austin Macheca, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1921; served on the teaching staffs at his alma mater and the Louisiana State University Medical Center; interned at the Touro Infirmary, where he served on the staff; formerly on the staff of the Charity Hospital; died March 19, aged 48, of heart disease.

Arthur Morgan MacWhinnie, Seattle; Baltimore Medical College, 1897; member of the Pacific Coast Oto-Ophthalmological Society; died February 28, aged 70, of arteriosclerosis and cardiorenal disease.

Anna Manning, Jersey City, N. J.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1893; died February 7, aged 85.

Edward Earl Marsh, Wilkes-Barre, Pa.; Medico-Chirurgical College of Philadelphia, 1916; member of the American Medical Association; served during World War I; died January 25, aged 51.

Lewis Martin, Newton, Ill.; Eclectic Medical Institute, Cincinnati, 1894; died February 12, aged 85.

John George Maurer ⊕ Saginaw, Mich.; Saginaw Valley Medical College, 1902; died March 9, aged 67, of coronary occlusion.

Charles F. Mayer, Burr, Neb.; John A. Creighton Medical College, Omaha, 1904; member of the American Medical Association; on the courtesy staff of the Bryan Memorial Hospital, Lincoln, where he died January 23, aged 65.

William Hayes McCarty, Marion, Va.; Medical College of Virginia, Richmond, 1924; member of the American Medical Association and the American Psychiatric Association; served during World War I; interned at the George Ben Johnston Memorial Hospital, Abingdon; for many years a member of the staff of the Southwestern State Hospital; died January 26, aged 47.

Robert Lane McCrady ⊕ Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1912; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; professor of gynecology and obstetrics and member of the library committee and advisory committee to the dean at his alma mater; member of the board of commissioners and surgical staff of the Roper Hospital; found in the creek near his summer cottage on James Island, April 3, aged 55.

Thomas Francis McDermott, New York; Medical College of Virginia, Richmond, 1924; on the staff of St. Vincent's Hospital; died February 11, aged 52.

Herbert Edmund McLean ⊕ Jersey City, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1923; on the staff of the Christ Hospital; died January 9, aged 47.

Caleb Gleni McNaul, Altoona, Pa.; Jefferson Medical College of Philadelphia, 1890; served as medical inspector in the Juniata schools for twenty years; died in the Altoona Hospital January 21, aged 79.

Archie Levy Oberdorfer, New York; University of Virginia Department of Medicine, Charlottesville, 1901; member of the American Medical Association; served on the staffs of the Mount Sinai and Harlem Eye and Ear hospitals; died March 12, aged 67.

James C. Paxson, Charleston, Ill.; Medical College of Ohio, Cincinnati, 1883; died in the M. A. Montgomery Memorial Sanitarium March 9, aged 89, of toxemia and carcinoma of the penis.

Thorvald Petersen ⊕ Minneapolis; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; fellow of the American College of Surgeons; member of the surgical staff of the Fairview Hospital; died January 22, aged 62, of cerebral thrombosis.

Fred Saul Richmond, Bluefield, W. Va.; University of Louisville Medical Department, Louisville, Ky., 1911; member of the American Medical Association; died in the Bluefield Sanitarium April 9, aged 61, of cerebral hemorrhage.

Hugh Fay Ringo, Milwaukee; University of Louisville Medical Department, Louisville, Ky., 1907; member of the American College of Chest Physicians; died February aged 60.

Douglas H. Roberts, Lincoln, Neb.; Lincoln Medical College of Cotner University, 1896; for many years president of the board of education and formerly mayor of Bethany; died February 4, aged 84.

Samuel Jacob Schwaup, Osborne, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1906; member of the American Medical Association; died February 4, aged 65.

Claude Martin Walker ⊕ Kellerton, Iowa; St. Louis College of Physicians and Surgeons, 1898; served as a member of the board of health; died in March, aged 71, of carcinoma

John Alexander Williams, Walton, Fla. (licensed in Indiana in 1899); for many years a practitioner in Fort Wayne, Ind.; died February 16, aged 83, of chronic valvular heart disease and generalized anasarca.



LIEUT. WALTER GEORGE EPPLY
(MC), U.S.N.R., 1916-1944



LIEUT. AKIN MATHIEU
(MC), U.S.N.R., 1917-1944



CAPT. ORVILLE DONALD THATCHER
M. C., A. U. S., 1913-1944

Daniel Warren Poor, Narrowsburg, N. Y.; College of Physicians and Surgeons, New York, 1894; associated with the department of health of New York City for more than twenty-five years, retiring in 1929 as assistant director of the bureau of laboratories; died March 29, aged 75.

Julius Wollitzer ⊕ Johnstown, Pa; University of Kolozsvar, Hungary, 1906; interned at St. Luke's Hospital in Bethlehem; a captain in the Hungarian army medical corps during World I; died in the Conemaugh Valley Memorial Hospital February 11, aged 64, of carcinoma of the sigmoid

KILLED IN ACTION

Walter George Epply, Manchester, N. H.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1941; interned at the Vancouver General Hospital, Vancouver, B. C., Canada; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on Aug. 7, 1942; left the United States about June 20, 1943; spent some time in New Caledonia; on Aug. 14, 1943 assigned to the U. S. S. *President Adams;* promoted to lieutenant on Oct. 1, 1943; awarded the Silver Star Medal posthumously; the citation accompanying the award read "for conspicuous gallantry and intrepidity as officer in charge of the medical section of a beach party during the assault on enemy Japanese-held Asan Point, Guam, Marianas Islands, on July 21, 1944"; he was killed in the action for which he received the medal, aged 27.

Akin Mathieu, Portland, Ore.; University of Oregon Medical School, Portland, 1942; served an internship at the Robert Packer Hospital, Sayre, Pa.; commissioned a lieutenant (jg) in the medical corps, U. S. Naval Reserve, on June 12, 1942; promoted to lieutenant on Nov. 1, 1944; died in the Asiatic area Oct. 25, 1944, aged 27, of extreme multiple injuries

Orville Donald Thatcher, Fort Dodge, Iowa; State University of Iowa College of Medicine, Iowa City, 1937; interned and served a residency at the University Hospitals, Iowa City; member of the American Medical Association; commissioned a first lieutenant in the medical corps, Army of the United States, on June 29, 1942; began active duty on July 11, 1942; a flight surgeon assigned to the 386th Bombardment Group (M) of the Ninth Air Force based in England; promoted to captain, awarded the Purple Heart posthumously; killed in action in France June 22, 1944, aged 31.

Correspondence

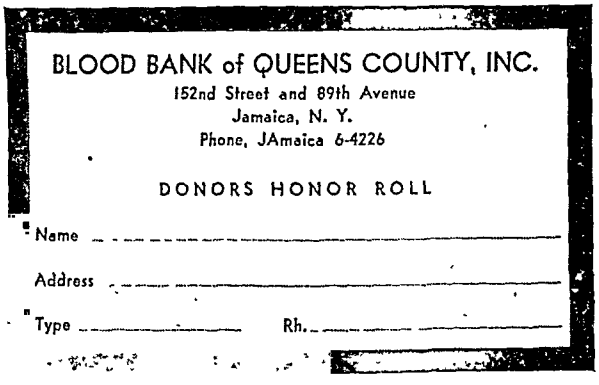
IDENTIFICATION CARD FOR BLOOD DONORS

To the Editor:—As director of the Blood Bank of Queens County it seems to me quite necessary that every person should know his blood type and Rh factor and carry a card with the information on his person at all times.

In the work we started here in 1942 we have typed more than 5,000 people in and around Queens County. Several large business concerns have a list of these types in their files so that in an emergency one or more compatible donors may be sent to the hospital when the patient is admitted.

We have determined the Rh factor on the last 2,000 and have a voluntary list of 185 Rh negative donors of all types available on call for emergencies.

All persons typed have in addition to their own type and Rh factor the names of six persons of their acquaintance of the same type and Rh factor on their identification card. All of this saves valuable time at the critical moment and does away with the unnecessary confusion and loss of time trying to locate a donor of the proper type.


BLOOD BANK of QUEENS COUNTY, INC.
152nd Street and 89th Avenue
Jamaica, N. Y.
Phone, JAmaica 6-4226

DONORS HONOR ROLL

Name _____

Address _____

Type _____ Rh. _____

Identification card, showing blood type and Rh factor. On the back of the card, under the heading "Persons of My Type and Rh Factor," are blank lines for six names.

This is a nonprofit organization and all blood and plasma is given free on the replacement plan of two donors for each unit when we can get it. No patient is denied blood or plasma regardless of ability to send in replacements.

We are doing a typing program for the New York City Police Department so that it may have in addition to its regular typing list a list of Rh negatives of all types.

Such a plan as this could be adopted nationally by the Red Cross as a postwar project.

We are soon to start an enlarged program of this kind in Brooklyn under the auspices of the Kings County Medical Society.

EDWARD J. MADDEN, Jamaica, N. Y.

PRIORITY IN REFRIGERATION

To the Editor:—The paper of Blakemore and his collaborators in THE JOURNAL, March 24, continues the misstatement of their former publication (*Ann. Surg.* **117**:481 [April] 1943) crediting the introduction and demonstration of the refrigeration principle to Brooks and Duncan. The following facts should scarcely be overlooked: (*a*) The prior work of F. M. Allen was acknowledged in the very paper of Brooks and Duncan which Blakemore et al. cite, and Allen's experiments were much greater in number and scope and are well known as the origin of current interest in this method. (*b*) The Brooks and Duncan experiments have subsequently been interpreted (Brooks, discussion, *Ann. Surg.* **115**:626 [April] 1942. Large and Heinbecker, *ibid* **120**:707 [Nov.] 1944) as adverse to the preservation of tissue demonstrated by Allen and with emphasis on alleged destructive effects of cold, thus making the position of Blakemore et al. all the more unreasonable. (*c*) Allen has recently (*Arch. Phys. Med.* **26**:92 [Feb.] 1945) pointed out the errors in the methods and interpretation of the Brooks-Duncan and Large-Heinbecker experiments and interpretations. This treatment of the recorded literature is called to attention because of my impression that it is not an isolated incident.

LYMAN WEEKS CROSSMAN, M.D., New York.

CENTENARY CELEBRATION OF LAWSON TAIT

To the Editor:—Lawson Tait was born on May 1, 1845. Arrangements are being made in Birmingham, England, where his life's work was done, to celebrate his centenary in 1945.

We should be grateful for any matter of interest concerning Lawson Tait from American medical men, many of whom visited him at the Crescent, Birmingham, in the latter years of last century and by whom credit for his pioneer work in abdominal surgery was generously given.

It is hoped to arrange a meeting of the profession in Birmingham and perhaps also to arrange a small exhibition representative of his life and writings.

FAUSET WELSH.
F. SELBY TAIT.
Birmingham Medical Institute,
154, Great Charles Street, Birmingham 3.

Honorary Secretaries, Midland Medical Society
Section of the Birmingham Medical Institute.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Service Plans Not Insurance nor the Corporate Practice of Medicine.—California Physicians' Service was incorporated as a nonprofit membership corporation in 1939 under the applicable laws of California. It is composed of beneficiary members, professional members and administrative members. A beneficiary member is entitled on the payment of stated monthly dues and when the necessity for medical or surgical service for him arises to select any professional member to render those services to him at the cost of the corporation. Professional members are such physicians as agree to abide by the rules of the corporation, and any physician licensed to practice medicine in California is eligible to become a professional member. A professional member agrees that in return for the services he renders a beneficiary member he will accept compensation "upon a pro rata basis out of the monthly funds collected from the beneficiary members." The administrative members comprise physicians and others in whom is vested the administrative control of the corporation. Shortly after its incorporation the corporation undertook to operate a medical service plan throughout the state. In 1941 a law was enacted in California (Civil Code, Sec. 593a) which, in effect, authorized the organization and operation of a corporation such as the California Physicians' Service if, among other things, one fourth of the licensed physicians in the state became professional

members and if the corporation was licensed by the Board of Medical Examiners.[1] Following the enactment of this law the corporation obtained a license from the board of medical examiners. Nevertheless the insurance commissioner believed it necessary for the corporation to qualify under the insurance laws of the state and apparently threatened legal action. Thereupon the corporation instituted against the insurance commissioner an action for a declaratory judgment that its operations did not "constitute insurance under the supervision of the commissioner nor the corporate practice of medicine." There was a judgment for the corporation, and the commissioner appealed to the district court of appeal, first district, division 2, California.

The insurance commissioner contended, first, that the corporation was illegally engaged in the practice of medicine, citing *Painless Parker* v. *Board of Dental Examiners,* 216 Cal. 285, 14 P. (2d) 67; *People ex rel. State Board of Medical Examiners* v. *Pacific Health Corporation,* 12 Cal. (2d) 156, 82 P. (2d) 429, 119 A. L. R. 1284; *Benjamin Franklin Life Assur. Co.* v. *Mitchell,* 14 Cal. App. (2d) 654, 58 P. (2d) 984, which cases hold that a corporation may not lawfully engage in the practice of law, medicine or dentistry. The corporation did not dispute the rule enunciated in those cases, but it contended that its practices were expressly sanctioned by the 1941 law previously referred to. It also relied on certain statements in the *Pacific Health Corporation* case, supra. There it was said that the rule prohibiting the corporate practice of medicine did not apply to the furnishing of medical services to members by fraternal, religious, hospital, labor and similar benevolent organizations. That case further said that the distinguishing feature was whether an association or corporation was organized for profit. Further, in the words of the court in that case the activities of these nonprofit organizations were "not comparable to those of private corporations operated for profit and, since the principal evils attendant upon corporate practice of medicine spring from the conflict between the professional standards and obligations of the doctors and the profit motive of the corporation employer, it may well be concluded that the objections of policy do not apply to nonprofit institutions. This view almost seems implicit in the decisions of the courts, and it certainly has been the assumption of the public authorities, which have, as far as we are advised, never molested these organizations." In answer, the commissioner argued that the law relied on by the corporation cannot have the effect of validating its activities since it merely authorized the incorporation for the purposes stated whereas the California Physicians' Service was organized two years prior to the enactment of the law. If this case, answered the court, involved prosecution for the acts committed before the statute was passed there would be some merit in the argument. But it is concerned only with a declaration of the right of respondent to continue under the section free from the supervision of the insurance commissioner. Since it is conceded that the legislature intended the statute to apply to California Physicians' Service, it is a fair inference that the legislature had some knowledge of the practice and mode of operation of the corporation and hence the legislative intent was to permit the respondent to continue in those activities under the terms of the law it enacted.

The insurance commissioner contended, finally, that California Physicians' Service was engaged in the insurance business and hence subject to his supervision and control. In answer, the corporation argued that, first, its method of operation is not that of insurance and, secondly, if it is insurance the corporation is not subject to the supervision of the commissioner. Insurance, said the court, is defined in section 22 of the Insurance Code as "a contract whereby one undertakes to indemnify another against loss, damage or liability arising from a contingent or unknown event." St. 1935, p. 498. It is defined in 29 Am. Jur. p. 47 as "an agreement by which one person for a consideration promises to pay money or its equivalent, or to perform some act of value, to another on the destruction, death, loss or injury of someone or something by specified perils." The commissioner cited no authority directly in point. He argued that the obligation to the beneficiary members assumed by California Physicians' Service looks like insurance and should be so interpreted. On the other hand, the corporation argued that it is similar to a producer-consumer cooperative organization, that it does not indemnify or compensate for the cost of an illness or injury, that it does not assume any risk, that its professional members do not assume any risk and that the beneficiary members do not receive any indemnity or compensation. The corporation emphasized that its obligation was that of an agent to collect and administer funds collected from beneficiary members and to pay its professional members on the unit basis out of these funds only, but that the beneficiary members receive the professional services notwithstanding the condition of the treasury. The corporation denied an implication in the commissioner's brief that the beneficiary members must look to the pooled fund for indemnity against medical bills and the corporation emphasized that the beneficiary members merely pay for such services on a periodic basis rather than in a lump sum. As the operations of California Physicians' Service, said the court, are comparatively new there is little authority on the direct question as to whether or not these operations are to be classed as insurance. The decided cases favor the corporation's position. In *Butterworth* v. *Boyd,* 12 Cal. (2d) 140, 82 P. (2d) 434, 126 A. L. R. 838, the facts were these: The San Francisco charter provided, in part, compulsory health service to all municipal employees to be paid for by monthly pay roll deductions on all salaries to maintain a fund to cover medical, surgical and hospital care. Physicians eligible to render service were paid on the unit system similar to that used by the corporation. In an action brought to test the validity of the charter the state insurance commissioner appeared specially to raise the question as to whether the activities in question were a form of insurance and as such subject to the state insurance code. The court there said that the Insurance Code dealt only with the private business of insurance. In *Commissioner of Bank and Insurance* v. *Community Health Service,* 129 N. J. L. 427, 30 A. (2d) 44, the sole question involved was whether or not the corporation was engaged in the insurance business. It was incorporated to provide medical services to its subscribers. It made contracts with licensed physicians to render professional services for a stipulated compensation. The subscribers were entitled to the services whether or not they needed them. The corporation did not, in the words of the California court, undertake to pay such debt as the subscribers might incur and did not indemnify them against any loss. The New Jersey court said:

> Neither as between the corporation and the physician nor as between the physician and the subscriber is the compensation or any other element of the arrangement between them affected by any contingency, hazard or risk.

In holding that the business conducted by the corporation was not one of insurance, the New Jersey court cited with approval *State ex rel. Fishback* v. *Universal Service Agency,* 87 Wash. 413, 151 P. 768, Ann. Cas. 1916C, 1017; *Sisters of Third Order*

1. Specifically this law, so far as is here material, reads as follows:

"A nonprofit corporation may be formed under this article for the purposes of defraying or assuming the cost of professional services of licentiates under any chapter of Division 2 of the Business and Professions Code or of rendering any such services, but it may not engage directly or indirectly in the performance of the corporate purposes or objects unless:

"(1) At least one fourth of all licentiates of the particular profession become members;

"(2) Membership in the corporation and an opportunity to render professional services upon a uniform basis is available to all licensed members of the particular profession;

"(3) Voting by proxy and cumulative voting are prohibited; and

"(4) A certificate has been issued to the corporation by the particular professional board, whose licentiates have become members, finding compliance with the foregoing requirements.

"Any such nonprofit corporation shall be subject to supervision by the particular professional board under which its members are licensed and shall also be subject to the provisions of Section 605c of this code. . . ." [The section 605c mentioned provides for supervision by the attorney general of the conduct of a nonprofit corporation holding property subject to any public or charitable trust.]

of St. Francis v. *Guillaume's Estate*, 222 Ill. App. 543, and *Stern* v. *Rosenthal*, 71 Misc. 422, 128 N. Y. S. 711. In *Jordan* v. *Group Health Ass'n*, 71 App. D. C. 38, 107 F. (2d) 239, a declaratory judgment was sought against the insurance commissioner of the District of Columbia to determine whether the activities of the association were subject to the supervision of the insurance commissioner. The Group Health Association was a nonprofit corporation organized to provide without profit medical services, surgery and hospitalization for its members. Its membership was limited to civil service employees of the executive branch of the federal government. In holding that the Group Health Association was not engaged in the insurance business the Circuit Court of Appeals for the District of Columbia had this to say:

> Although Group Health's activities may be considered in one aspect as creating security against loss from illness or accident, more truly they constitute the quantity purchase of well rounded, continuous medical service by its members. Group Health is in fact and in function a consumer cooperative. The functions of such an organization are not identical with those of insurance or indemnity companies. The latter are concerned primarily, if not exclusively, with risk and the consequences of its descent, not with service, or its extension in kind, quantity or distribution; with the unusual occurrence, not the daily routine of living. Hazard is predominant. On the other hand, the cooperative is concerned principally with getting service rendered to its members and doing so at lower prices made possible by quantity purchasing and economies in operation. Its primary purpose is to reduce the cost rather than the risk of medical care; to broaden the service to the individual in kind and quantity; to enlarge the number receiving it; to regularize it as an everyday incident of living, like purchasing food and clothing or oil and gas, rather than merely protecting against the financial loss caused by extraordinary and unusual occurrences, such as death, disaster at sea, fire and tornado. It is, in this instance to take care of colds, ordinary aches and pains, minor ills and all the temporary bodily discomforts as well as the more serious and unusual illnesses. To summarize, the distinctive features of the cooperative are the rendering of service, its extension, the bringing of physician and patient together, the preventive features, the regularization of service as well as payment, the substantial reduction in cost by quantity purchasing, in short, getting the medical job done and paid for, not, except incidentally to these features, the indemnification for cost after the service is rendered. Except the last, these are not distinctive or generally characteristic of the insurance arrangement. There is, therefore, a substantial difference between contracting in this way for the rendering of service, even on the contingency that it be needed, and contracting merely to stand its cost when or after it is rendered . . . But obviously it was not the purpose of the insurance statutes to regulate all arrangements for assumption or distribution of risk. That view would cause them to engulf practically all contracts, particularly conditional sales and contingent service agreements. The fallacy is in looking only at the risk element to the exclusion of all others present or their subordination to it. The question turns, not on whether risk is involved or assumed, but on whether that or something else to which it is related in the particular plan is its principal object and purpose.

We find in that case the express admission 71 App. D. C. at page 47 (107 F. (2d) at page 248) "that the identical plan and service rendered here would not be 'insurance' or 'indemnity' if offered by an organization owned, operated and controlled by physicians. It would then be a contract 'for service on contingency,' though the same element of risk and avoidance of its possible consequences would be present." Other authorities giving support to these views, in the court's opinion, were *State* v. *Universal Service Agency*, 87 Wash. 413, 151 P. 768, Ann. Cas. 1916C, 1017, supra; and *Commissioner of Bank and Insurance* v. *Community Health Service*, 129 N. J. L. 427, 30 A. (2d) 44.

There is no essential difference, concluded the court, between the Group Health Association, the San Francisco Health Service and California Physicians' Service except that in the first two the administrative management is in a board selected by the beneficiary members, whereas in the latter it is in a board selected by the professional members. All are nonprofit, semi-charitable organizations conducted for the primary purpose of affording necessary medical care to those of small income. None are organized to insure good health or freedom from disease. We are satisfied that on the authorities cited it must be held that California Physicians' Service is not engaged in the insurance business and is not subject to the supervision of the commissioner under the Insurance Code.

The declaratory judgment in favor of California Physicians' Service was, in effect, affirmed.—*California Physicians' Service* v. *Garrison*, 155 P. (2d) 885 (Calif., 1945).

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, May 12, page 153.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. T. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA. Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA.* Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS:* *Eclectic.* Little Rock, June 7. Sec., Dr. C. H. Young, 1415 Main St., Little Rock. *Medical.* Little Rock, June 7-8. Sec., Dr. D. L. Owens, 701 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, May 20. *Written.* San Francisco, July 9-12. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO.* Denver, July 3-7. Final date for filing application is June 18. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT:* *Homeopathic.* New Haven, July 10-11. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical Examination.* New Haven, July 10-11. *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE. *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, June 11. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA:* Jacksonville, June 25-26. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

IDAHO: Boise, July 10. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 26-28. Superintendent of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Kansas City, June 28-29. Sec., Board of Medical Registration & Examination, Dr. J. T. Hassig, 905 N. Seventh St., Kansas City 10.

KENTUCKY: Louisville, June 18-20. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville 2.

LOUISIANA: June. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MARYLAND: *Medical.* Baltimore, June 19-22. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 19-20. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 10-13. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F. State House, Boston.

MICHIGAN:* Detroit, June 26-28. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA:* Minneapolis, June 19-21. Sec., Dr. J. J. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MISSOURI: St. Louis, June 7-9. Sec., State Board of Health, Miss Erma E. Nixon, State Capitol Bldg., Jefferson City.

MONTANA: Helena. Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEW JERSEY. Trenton, June 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 415 S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July. *Examination.* Columbus, June 18-21. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA.* Oklahoma City, June 14-16. Sec., Dr. J. D. Osborn, Jr., Frederick.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blandina St., Columbia.

SOUTH DAKOTA:* Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Galveston, June 4-6. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA:* Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON:* Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

WEST VIRGINIA. Charleston, July 5-7. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN.* Milwaukee, June 26-28. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING. Cheyenne, June 4-5. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, June 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: June 9. Address State Board of Healing Arts, 250 Church St., New Haven 10.

FLORIDA: DeLand, June 1. Final date for filing application is May 17. Sec., Dr. J. T. Conn, John B. Stetson University, DeLand.

MINNESOTA: Minneapolis, June 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

OREGON: Portland, July 7. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

SOUTH DAKOTA: Yankton, June 19. Sec., Dr. G. M. Evans, Yankton.

Council on Medical Education and Hospitals

HOSPITAL MEDICAL LIBRARY SUGGESTIONS

Prepared by the Council on Medical Education and Hospitals of the American Medical Association

An adequate library is essential in hospitals that undertake an educational function. To interns and resident physicians it is especially important as a source of immediate reference in the study of diagnostic and therapeutic problems and in the preparation of reports for staff meetings and clinical conferences. Indeed, to all physicians a medical library plays a significant part in the continuation of their education.

"A medical group which works with little or no reference to books and journals suffers serious limitations. Without knowledge of what others have discovered, daily experience cannot be resourcefully interpreted. Avoidable mistakes, waste and duplication of effort are inevitable. Doctors become victims of empiricism and routine; imagination and initiative lack stimulus; enthusiasm and energy decline; minds grow sterile that under the quickening influence of the recorded experience of others might have been fruitful." [1]

The following are the minimum needs of a reference library as expressed in the Essentials of an Approved Internship:

"There should be a medical library, in charge of a competent librarian, located where it is readily accessible to the interns and staff and containing a useful collection of recent editions of standard text and reference books and current files of not less than ten of the representative medical journals. Interns should be encouraged to use the library in connection with their clinical work and may properly be asked to report on current medical opinion concerning any special case at the bedside or to review current literature on any selected topic more formally at staff conferences or at journal club meetings that may be organized for the purpose of stimulating an interest in reading."

Similarly in the Essentials of Approved Residencies and Fellowships it is stated that "institutions offering graduate training should maintain or provide ready access to an adequate medical library containing modern texts, the *Quarterly Cumulative Index Medicus* and current journals relating to the fields in which residencies and fellowships are offered."

These standards serve as a guide to the establishment of a working library for the house staff where material will be available for general reference. For special needs it is usually possible to obtain additional material from outside sources.

ORGANIZATION

The usefulness of a medical library depends largely on its accessibility, the scope and quality of reference material, and the ability of the librarian and the staff to stimulate an interest in the review of medical literature. It is especially important that the medical staff should take an active interest in the development and maintenance of a suitable library, its financial support, technical supervision, the selection of books and periodicals, and the establishment of appropriate rules and regulations.

A committee of the staff should be appointed to maintain general supervision. Technical direction, however, can be assigned to a librarian who has had adequate training and experience in this work. In the absence of an experienced librarian a competent person from the record department or administrative personnel could be placed in charge.

The medical library is of sufficient importance in the educational scheme to justify the annual budgeting of funds for this purpose. Ordinarily it would require from $300 to $500 to establish a satisfactory nucleus of reference material for the house staff. By the gradual addition of books and periodicals from year to year a library would be evolved that could be considered an asset to the institution and the community. The annual expenditure would vary in accordance with the amount of reference material supplied, but usually it would require a minimum of $150 to $300 to provide the necessary books and journals.

When funds are not furnished through gifts, endowments or the operating budget, it may be possible to maintain the library by annual contributions from the attending physicians. These funds might then be collected in the form of staff dues.

LOCATION

It would be worth while for those interested in developing a medical library to visit similar departments and study the elements that contribute to their success. Any well organized library, general or medical, would furnish valuable suggestions concerning space and equipment, classification of subjects, indexing, and methods of filing, binding and storage.

The location of the medical library will in a large measure determine its usefulness. If it is readily accessible, comfortable and attractive, it will soon become the center of interest of the house staff. The library is most frequently found in the administrative section of the hospital near the record department or staff room, but other locations will also prove satisfactory if adequate organization and supervision are maintained. The room should be sufficiently large to house books, periodicals, reprints and other material without encroaching on the space needed for comfortable reading and uninterrupted study.

REFERENCE MATERIAL

In establishing a medical library, it is well to purchase only a few reference books on each subject. Only recent volumes should be chosen, with the exception of such standard works as are recognized classics in their respective fields and do not rapidly become obsolete. The literature on therapy and diagnosis, for example, is changing with such rapidity that the use of the most recent publications is recommended. In the field of fundamental sciences, such as anatomy and histology, literature is more stabilized and longer lived. More recent editions of the standard textbooks should be added from time to time, thus keeping the library up to date with regard to new methods of diagnosis and treatment. After a good foundation has been formed, the remainder of the apportioned funds may be expended in purchasing varied reference works that are known to be of particular value. The library should not be allowed to become a depository for antiques, and out of date books should be removed or discarded.

1. Dr. George E. Vincent, speaking on the occasion of the celebration of the fiftieth anniversary of the Boston Medical Library, Jan. 19, 1926.

The usefulness and efficiency of the hospital medical library depend not only on a good selection of medical books but also on a well chosen group of periodicals Limited library funds are often more usefully expended for periodicals than for text and reference books When ample funds are provided there is no great difficulty experienced in the selection of material

The hospital library may supplement its service by the use of the library facilities of nearby medical schools, the academy of medicine or the local county medical society It may also utilize the package library of the American Medical Association This consists of collections of reprints and other material on various subjects, prepared for lending to members of the Association and to individual subscribers to publications of the American Medical Association Information on the loan systems of medical school libraries or society libraries can readily be obtained on inquiry.

SUGGESTED PERIODICALS

The following list is furnished as a guide to the selection of medical periodicals in accordance with the needs of individual hospitals In view of the interrelation of the various fields of medicine it is desirable that a wide selection be made to cover both general and special subjects To accomplish this a minimum of ten periodicals would ordinarily be required No attempt has been made to include all of the useful journals in the various fields; only a few have been selected which it is believed the average general hospital would find particularly desirable For a complete list of periodicals, both domestic and foreign, reference should be made to the *Quarterly Cumulative Index Medicus*

ANESTHESIOLOGY

Anesthesiology Business Manager, Dr William G Schmidt 235 N 15th St Philadelphia Bi M $6
Current Researches in Anesthesia and Analgesia 318 Hotel Westlake, Rocky River 16 Ohio Bi M $10

DERMATOLOGY AND SYPHILOLOGY

American Journal of Syphilis Gonorrhea and Venereal Diseases C V Mosby Company, 3207 Washington Blvd, St Louis 3 Bi M $7 50
Archives of Dermatology and Syphilology American Medical Association 535 N Dearborn St, Chicago 10 M $5

HOSPITAL ADMINISTRATION

Hospitals, The Journal of the American Hospital Association 18 E Division St Chicago 10 M $2 Nonmembers $3
Hospital Management 100 E Ohio St Chicago 11 M $2
Hospital Progress 1402 S Grand Blvd, St Louis 4 M $3
Modern Hospital 919 N Michigan Ave, Chicag 11 M $3

INDEX AND DIRECTORY

American Medical Directory American Medical Association, 535 N Dearborn St, Chicago 10 Bi A $18 (A register of legally qualified physicians of the United States, Alaska Canal Zone Hawaii Philippines Puerto Rico, Guam Samoa and Virgin Islands, Canada Newfoundland Yukon and Northwest Territories Contains a list of hospitals in the same countries)
Quarterly Cumulative Index Medicus American Medical Association, 535 N Dearborn St, Chicago 10 Q $12 (An index and guide to the medical literature of the world)

INDUSTRIAL HEALTH

Industrial Medicine 605 N Michigan Ave Chicago M $5
Journal of Industrial Hygiene and Toxicology with Abstract of Literature Williams & Wilkins Company, Mount Royal and Guilford Aves, Baltimore 2 M $6

MEDICINE

American Heart Journal C V Mosby Company 3207 Washington Blvd, St Louis 3 M $10
American Journal of the Medical Sciences Lea & Febiger, 600 S Washington Sq, Philadelphia 6 M $6
Annals of Allergy American College of Allergists 401 LaSalle Medical Bldg Minneapolis 2 Bi M $6
Annals of Internal Medicine American College of Physicians Prince and Lemon Sts, Lancaster, Pa M $7
Archives of Internal Medicine American Medical Association 535 N Dearborn St Chicago 10 M $5
Canadian Medical Association Journal 3640 University St Montreal M $7 35
Clinics J B Lippincott Company, 227 231 S 6th St Philadelphia 5 Bi M Cloth, $16, paper $12
Endocrinology Charles C Thomas Publisher, 301 327 E Lawrence Ave, Springfield Ill M $10 50
Gastroenterology Williams & Wilkins Company Mount Royal and Guilford Aves, Baltimore 2 M $6
Journal of Allergy C V Mosby Company 3207 Washington Blvd, St Louis 3 Bi M $7 50
Journal of Clinical Endocrinology Charles C Thomas Publisher, 220 E Monroe St, Springfield Ill M $6 50
Journal of the American Medical Association 535 N Dearborn St, Chicago 10 W $8
Journal of Clinical Investigation Dr Charles A Janeway Treasurer, Children's Hospital, 300 Longwood Ave, Boston Bi M $10
Journal of Nutrition Wistar Institute of Anatomy and Biology, 36th St and Woodland Ave Philadelphia 4 M $10
Medical Clinics of North America W B Saunders Company, W Washington Sq, Philadelphia 5 Bi M Cloth $16, paper, $12
Medicine Analytical Reviews of General Medicine, Neurology and Pediatrics Williams & Wilkins Company, Mount Royal and Guilford Aves, Baltimore 2 Q $5
New England Journal of Medicine 8 The Fenway, Boston 15 W $6

MILITARY MEDICINE

Bulletin of the United States Army Medical Department Book Shop, Medical Field Service School Carlisle Barracks Pa M $2
Journal of Aviation Medicine Bruce Publishing Company, 2642 University Ave, St Paul Bi M $5
United States Naval Medical Bulletin Superintendent of Documents, Government Printing Office Washington D C Bi M $2
War Medicine American Medical Association, 535 N Dearborn St, Chicago 10 M $6

NEUROLOGY AND PSYCHIATRY

American Journal of Psychiatry American Psychiatric Association, 9 Rockefeller Plaza New York 20 Bi M $6
Archives of Neurology and Psychiatry American Medical Association, 535 N Dearborn St Chicago 10 M $8
Journal of Nervous and Mental Disease 64 W 56th St, New York 19 M $10

OBSTETRICS AND GYNECOLOGY

American Journal of Obstetrics and Gynecology C V Mosby Company, 3207 Washington Blvd St Louis 3 M $10
Surgery, Gynecology and Obstetrics (Listed under Surgery)

OPHTHALMOLOGY

American Journal of Ophthalmology Ophthalmic Publishing Company, 837 Carew Tower, Cincinnati M $10
Archives of Ophthalmology American Medical Association, 535 N Dearborn St, Chicago 10 M $8

ORTHOPEDIC SURGERY

Journal of Bone and Joint Surgery 8 The Fenway, Boston 15 Q $5

OTORHINOLARYNGOLOGY

Annals of Otology Rhinology and Laryngology Annals Publishing Company 7200 Wydown Blvd St Louis 5 Q $6
Archives of Otolaryngology American Medical Association, 535 N Dearborn St, Chicago 10 M $6

PATHOLOGY AND CLINICAL LABORATORY WORK

American Journal of Clinical Pathology Williams & Wilkins Company, Mount Royal and Guilford Aves Baltimore 2 M $6
American Journal of Pathology Dr C V Weller, E University Ave, Ann Arbor, Mich Bi M $8
Archives of Pathology American Medical Association, 535 N Dearborn St, Chicago 10 M $6
Journal of Laboratory and Clinical Medicine C V Mosby Company, 3207 Washington Blvd St Louis 3 M $8 50

PEDIATRICS

American Journal of Diseases of Children American Medical Association 535 N Dearborn St Chicago 10 M $8
Journal of Pediatrics C V Mosby Company, 3207 Washington Blvd, St Louis 3 M $8 50

PHYSICAL MEDICINE

Archives of Physical Medicine American Congress of Physical Medicine 30 N Michigan Ave, Chicago 2 M $5

PHYSIOLOGY AND BIOCHEMISTRY

American Journal of Physiology American Physiological Society, Managing Editor, Dr D R Hooker 19 W Chase St, Baltimore 1 M $30
Journal of Biological Chemistry Williams & Wilkins Company, Mount Royal and Guilford Aves, Baltimore 2 M $22 50
Physiological Reviews American Physiological Society Dr D R Hooker, Managing Editor, 19 W Chase St, Baltimore 1 Q $6

PUBLIC HEALTH

American Journal of Hygiene 615 N Wolfe St Baltimore Bi M $12
American Journal of Public Health and the Nation's Health 1790 Broadway, New York 19 M $5
Hygeia 535 N Dearborn St, Chicago 10 M $2 50

RADIOLOGY

American Journal of Roentgenology and Radium Therapy Charles C Thomas, 301 327 E Lawrence Ave Springfield Ill M $10
Radiology Radiological Society of North America, 607 Medical Arts Bldg Syracuse 2, N Y M $6

SURGERY

American Journal of Surgery 49 W 45th St New York 19 M $10
Annals of Surgery J B Lippincott Company, 227 231 S 6th St Philadelphia 5 M $10
Archives of Surgery American Medical Association, 535 N Dearborn St Chicago 10 M $8
Journal of Neurosurgery Charles C Thomas Publisher, 301 327 E Lawrence Ave, Springfield Ill Bi M $7 50
Journal of Thoracic Surgery C V Mosby Company, 3207 Washington Blvd St Louis 3 Bi M $7 50
Surgery C V Mosby Company, 3207 Washington Blvd, St Louis 3 M $10
Surgery Gynecology and Obstetrics with International Abstract of Surgery Surgical Publishing Company 54 E Erie St Chicago 11 M $12
Surgical Clinics of North America W B Saunders Company W Washington Sq Philadelphia 5 Bi M Cloth, $16, paper, $12

TUBERCULOSIS

American Review of Tuberculosis. National Tuberculosis Association, 1790 Broadway, New York 19. M. $8.

UROLOGY

Journal of Urology. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimroe 2. M. $10.

SUGGESTED BOOKS

The books mentioned in the following list are suggested as a guide for hospital medical libraries. The list is not in any sense complete but should serve to indicate the type of books ordinarily required in the organization of educational services for interns and resident physicians. The *Quarterly Cumulative Index Medicus,* medical publishers' lists, the Book Notices section of THE JOURNAL and other sources of information can also be utilized in the selection of suitable hospital reference material. Modern medical practice is constantly changing and it is therefore recommended that hospital medical libraries adopt a policy of constantly replacing older medical textbooks with those which are new and up to date. In accordance with this principle the books included in this list, with few exceptions, have appeared for the first time or in revised editions since 1940. The names and addresses of the publishers appear at the end of the list of books.

ANATOMY

Bailey, F. R.: Text-Book of Histology. Ed. 11, ed. by Philip E. Smith. $6. Wood, 1944.
Beesly, L., and Johnston, T. B.: Manual of Surgical Anatomy. Ed. 5, rev. by J. Bruce and R. Walmsley. $6.50. Oxford, 1939.
Callander, C. Latimer: Surgical Anatomy. Ed. 2. $10. Saunders, 1939.
Cowdry, E. V.: Textbook of Histology. Ed. 3. $7. Lea, 1944.
Cunningham, Daniel J.: Text-Book of Anatomy. Ed. 8, ed. by J. C. Brash and E. B. Jamieson. $12. Oxford, 1943.
Grant, J. C. B.: Atlas of Anatomy. $10. Williams and Wilkins, 1944.
Gray, Henry: Anatomy of the Human Body. Ed. 24, rev. and ed. by Warren H. Lewis and others. $12. Lea, 1942.
Jordan, H. E., and Kindred, J. E.: Textbook of Embryology. Ed. 4. $6.75. *Appleton, 1942.*
Krieg, Wendell J. S.: Functional Neuroanatomy. $6.50. Blakiston, 1942.
Maksimov, A. A., and Bloom, W.: Textbook of Histology. Ed. 4. $7. Saunders, 1942.
Ranson, Stephen W.: Anatomy of the Nervous System. Ed. 7. $6.50. Saunders, 1943.
Rasmussen, Andrew T.: Principal Nervous Pathways. Ed. 2. $2.50. Macmillan, 1941.
Stohr, P., and Lewis, F. T.: Text-Book of Histology. Arr. on an embryological basis by J. L. Bremer; rewritten by H. L. Weatherford. Ed. 6. $7. Blakiston, 1944.
Strong, Oliver S., and Elwyn, Adolph: Human Neuroanatomy. $6. Williams and Wilkins, 1943.

ANESTHESIOLOGY

Adriani, John: Pharmacology of Anesthetic Drugs. Ed. 2. $3.50. Thomas, 1941.
Andrews, Albert H.: Manual of Oxygen Therapy Techniques. $1.75. Year Bk. Pubs., 1943.
Gillespie, N. A.: Endotracheal Anaesthesia. $4. Univ. of Wis. Press, 1941.
Lundy, J. S.: Clinical Anesthesia. $9. Saunders, 1942.
Subcommittee on Anesthesia of Division of Medical Science, National Research Council: Fundamentals of Anesthesia. Ed. 2. $2.50. A. M. A., 1944.

CARDIOLOGY

American Heart Association: Nomenclature and Criteria for Diagnosis of Diseases of the Heart. Ed. 4. $2. Am. Heart Assoc., 1939.
Herrick, James B.: Short History of Cardiology. $3.50. Thomas, 1942.
Herrmann, George R.: Synopsis of Diseases of the Heart and Arteries. Ed. 3. $5. Mosby, 1944.
Levine, Samuel A.: *Clinical* Heart Disease. Ed. 3. $6. Saunders, 1945.
Lewis, Sir Thomas: Diseases of the Heart. Ed. 3. 15s. Macmillan, 1942.
Pardee, Harold E. B.: *Clinical Aspects of the Electrocardiogram.* Ed. 4. $5.75. Hoeber, 1941.
White, Paul D.: Heart Disease. Ed. 3. $9. Macmillan, 1944.

DERMATOLOGY AND SYPHILOLOGY

Becker, S. W., and Obermayer, M. E.: Modern Dermatology and Syphilology. $12. Lippincott, 1940.
Moore, Joseph E., and others: Modern Treatment of Syphilis. Ed. 2, enlarged third printing, $7.50. Thomas, 1944.
Ormsby, Oliver S., and Montgomery, Hamilton: Diseases of the Skin. Ed. 6. $14. Lea, 1943.
Pardo-Castelló, V.: Diseases of the Nails. Ed. 2. $3.50. Thomas, 1941.
Stokes, John H., and others: Modern Clinical Syphilology. Ed. 3. $10. Saunders, 1944.
Sulzberger, M. B.: Dermatologic Allergy. $8.50. Thomas, 1940.

DIAGNOSIS

Barton, Wilfred M., and Yater, W. M.: Symptom Diagnosis, Regional and General. Ed. 4. $10. Appleton, 1942.
Cabot, Richard C., and Adams, F. D.: *Physical Diagnosis.* Ed. 13, ed. by F. D. Adams. $5. Wood, 1942.
Cope, Zachary: Early Diagnosis of the Acute Abdomen. Ed. 8. $3.75. Oxford, 1940.
Elmer, Warren P., and Rose, W. D.: *Physical Diagnosis.* Ed. 8, rev. by Harry Walker. $8.75. Mosby, 1940.
Major, R. H.: Physical Diagnosis. Ed. 2. $5. Saunders, 1940.
Norris, George W., and Landis, H. R. M.: Diseases of the Chest and the Principles of Physical Diagnosis. Ed. 6. $10. Saunders, 1938.

DIETETICS AND NUTRITION

American Medical Association. Council on Foods and Nutrition: Handbook of Nutrition. $2.50. A. M. A., 1943.
Bogert, L. Jean: Nutrition and Physical Fitness. Ed. 4. $3. Saunders, 1943.
Bridges, Milton A.: Dietetics for the Clinician. Ed. 4. $10. Lea, 1941.
Eddy, Walter H., and Dalldorf, Gilbert: The Avitaminoses: The Chemical, Clinical and Pathological Aspects of the Vitamin Deficiency Diseases. Ed. 3. $4.50. Williams and Wilkins, 1944.
Hawley, Estelle E., and Carden, Grace: Art and Science of Nutrition. Ed. 2. $3.75. Mosby, 1944.
McCollum, E. V., and Becker, J. E.: Food, Nutrition and Health. Ed. 5. $1.50. E. V. McCollum, East End Station, Baltimore, 1940.
McLester, James S.: Nutrition and Diet in Health and Disease. Ed. 4. $8. Saunders, 1943.
Pelner, Louis: Diet Therapy of Disease. $3.75. Personal Diet Service, 145 W. 45th St., New York, 1944.
Rose, Mary S.: Foundations of Nutrition. Ed. 4, rev. by Grace MacLeod and Clara M. Taylor. $3.75. Macmillan, 1944.
Sherman, Henry C.: Chemistry of Food and Nutrition. Ed. 6. $3.25. *Macmillan, 1941.*
Sherman, Henry C., and Lanford, C. S.: An Introduction to Foods and Nutrition. $2. Macmillan, 1943.
Stern, Frances: Applied Dietetics. Ed. 2. $4. Williams and Wilkins, *1943.*

ENDOCRINOLOGY

Allen, Edgar; Danforth, C. H., and Doisy, Edward A. (eds.): Sex and Internal Secretions. Ed. 2. $12. Wood, 1939.
Glandular Physiology and Therapy. A symposium prepared under the auspices of the Council on Pharmacy and Chemistry of the A. M. A. Ed. 2. $2.50. A. M. A., 1942.
Grollman, Arthur: Essentials of Endocrinology. $6. Lippincott, 1941.
Sevringhaus, E. L.: Endocrine Therapy in General Practice. Ed. 4. $2.75. Year Bk. Pubs., 1942.
Van Dyke, H. B.: Physiology and [illegible] of the Pituitary Body. In 2 volumes. $4.50 per volume. [illegible]ess, 1939.
Werner, August A.: Endocrinolog[illegible] and Treatment. Ed. 2. $10. Lea, 1942.

FRACTURES AND DISLOCATIONS

(See Orthopedic Surgery)

HISTORY OF MEDICINE

Clendening, Logan: Behind the Doctor. Ed. 2. $4. Knopf, 1943.
Cushing, Harvey W.: Life of Sir William Osler. In 2 volumes. $10. Oxford, 1940.
Fishbein, Morris: Frontiers of Medicine. $1. Williams and Wilkins, *1933.*
Garrison, Fielding H.: Introduction to the History of Medicine. Ed. 4. $12. Saunders, 1929.

HOSPITAL ORGANIZATION AND MANAGEMENT

American Medical Association: Interns Manual. 60 cents. A. M. A., 1943.
American Medical Association: Standard Nomenclature of Disease and Standard *Nomenclature of Operations.* Ed. 3. $4. A. M. A., 1942.
Bachmeyer, A. C., and Gerhard, G. G. F. (eds.): The Hospital in Modern Society. $5. Commonwealth Fund, 1943.
Huffman, Edna K.: *Manual for Medical Records* Librarians. $3. Physicians Record Company, 1941.
MacEachern, Malcolm T.: Hospital Organization and Management. $7.50. Physicians Record Company, 1940.
MacEachern, *Malcolm* T.: Medical Records *in the Hospital.* $3. Physicians Record Company, 1937.
Mills, Alden B.: Hospital Public Relations. $3.75. Physicians Record Company, 1939.
Morrill, Warren P.: Hospital Manual of Operations. $3. Lakeside Publishing Company, 1934.
Ponton, Thomas R.: Medical Staff in the Hospital. $2.50. Physician Record Company, 1939.

INFECTIOUS DISEASES, HYGIENE AND PREVENTIVE MEDICIN

Boyd, Mark F.: Preventive Medicine. Ed. 6. $5. Saunders, 1940.
Dunham, George C.: Military Preventive Medicine. Ed. 3. Militar Service, 1940.
Gage, Nina D., and others: Communicable Diseases. Ed. 4. $3.5 Davis, 1944.
Harries, E. H. R., and Mitman, M.: Clinical Practice in Infectiou Diseases. Ed. 2. $6. Williams and Wilkins, 1944.
National Research Council, Division of Medical Science: Manual o Tropical Medicine. $6. Saunders, 1945.
Smillie, Wilson G.: Public Health Administration in the Unite States. Ed. 2. $3.75. Macmillan, 1940.
Stimson, Philip M.: A Manual of the Common Contagious Disease Ed. 3. $4. Lea, 1940.
Stitt, E. R.: Diagnosis, Prevention and Treatment of Tropical Di eases. Ed. 7. *In 2* volumes. $21. Blakiston, 1944.

MEDICAL DICTIONARIES

Dorland, William A. N., and Miller, E. C. LeR.: American Illustrate Medical Dictionary. *Ed. 20.* $7. *With thumb index,* $7.50. Saun ders, 1944.
Gould, George M.: Medical Dictionary. Ed. 5. $7. With thumb inde $7.50. Blakiston, 1941.
Lang, Hugo: *German-English* Dictionary of Terms Used in Medicine and the Allied Sciences. Ed. 4. $10. Blakiston, 1932.
Stedman, Thomas L.: Practical Medical Dictionary. Ed. 15. $7. Wit thumb index, $7.50. Wood, 1942.

MEDICAL JURISPRUDENCE, LEGAL MEDICINE AND TOXICOLOGY

American Medical Association, Bureau of Legal Medicine and Legislation: Medicolegal Cases: Abstracts of Court Decisions, 1926 to 1930 Inclusive. $7. A. M. A., 1932. Medicolegal Cases: Abstracts of Court Decisions, 1931 to 1935 Inclusive. $5.50. A. M. A., 1936. Medicolegal Cases: Abstracts of Court Decisions, 1936 to 1940 Inclusive. $5.50. A. M. A., 1942.

Brahdy, Leopold, and Kahn, Samuel (eds.): Trauma and Disease. Ed. 2. $7.50. Lea, 1941.

Glaister, John: Medical Jurisprudence and Toxicology. Ed. 7. $8. Wood, 1942.

Gonzales, Thomas A.; Vance, Morgan, and Helpern, Milton: Legal Medicine and Toxicology. $10. Appleton, 1940.

Hayt, Emanuel, and Hayt, L. R.: Legal Guide for American Hospitals. $5. Hospital Textbook Company, 1940.

Kessler, Henry H.: Accidental Injuries: The Medico-Legal Aspects of Workmen's Compensation and Public Liability. Ed. 2. $10. Lea, 1941.

McBride, Earl D.: Disability Evaluation. Ed. 3. $9. Lippincott, 1942.

Smith, Sydney A.: Forensic Medicine: A Text-Book for Students and Practitioners. Ed. 8. 28s. Churchill, 1943.

MEDICINE

Beckman, Harry: Treatment in General Practice. Ed. 4. $10. Saunders, 1942.

Cecil, Russell L. (ed.): Textbook of Medicine. By American authors. Ed. 6. $9.50. Saunders, 1943.

Feinberg, Samuel M.: Allergy in Practice. $8. Year Bk. Pubs., 1944.

Joslin, Elliott P.: Diabetic Manual. Ed. 7. $2. Lea, 1941.

Joslin, Elliott P., and others: Treatment of Diabetes Mellitus. Ed. 7. $7.50. Lea, 1940.

Kolmer, John A.: Penicillin Therapy. $5. Appleton, 1945.

Manson, Sir Patrick: Tropical Diseases. Ed. 11, ed. by Sir Philip H. Manson-Bahr. $11. Williams and Wilkins, 1940.

Manson-Bahr, Sir Philip H.: The Dysenteric Disorders. Ed. 2. $10. Wood, 1943.

Musser, John H. (ed.): Internal Medicine, Its Theory and Practice. Ed. 4. $10. Lea, 1945.

Nelson New Loose-Leaf Medicine. Editor-in-Chief, W. W. Herrick. In 9 volumes, including index. $100. Nelson, 1939-1944.

Osler, Sir William: Principles and Practice of Medicine. Ed. 15, rev. by H. A. Christian. $9.50. Appleton, 1944.

Spink, W. W.: Sulfanilamide and Related Compounds in General Practice. Ed. 2. $3. Year Bk. Pubs., 1942.

Tice, Frederick (ed.): Practice of Medicine. In 10 volumes. $115. Prior, 1944.

Wilder, R. M.: Clinical Diabetes Mellitus and Hyperinsulinism. $6. Saunders, 1940.

MISCELLANEOUS

American Medical Association: Principles of Medical Ethics. Single copy, 5 cents; 12 copies, 50 cents, prepaid; 50 copies or more, each 4 cents, prepaid. A. M. A.

Goepp, Rudolph M.: Medical State Board Questions and Answers. Ed. 7. $5.50. Saunders, 1938.

Rypins, Harold: Medical State Board Examinations. Ed. 4. $4.50. Lippincott, 1939.

Recent Advances Series in various fields of medicine (Anesthesia and Analgesia, Endocrinology, Medicine, and others). Blakiston.

Yearbooks in various fields of medicine (Dermatology and Syphilology, General Medicine, Pediatrics, Radiology, and others). Year Bk. Pubs.

NEUROLOGY AND PSYCHIATRY

Gellhorn, Ernst: Autonomic Regulations. $5.50. Interscience, 1943.

Grinker, Roy R.: Neurology. Ed. 3. $6.50. Thomas, 1943.

Masserman, J. H.: Behavior and Neurosis. $3. Univ. of Chicago Press, 1943.

Morgan, Clifford T.: Physiological Psychology. $4. McGraw-Hill, 1943.

Nielsen, J. M.: Textbook of Clinical Neurology. $6.50. Hoeber, 1941.

Noyes, A. P., and Haydon, E. M.: Textbook of Psychiatry. Ed. 3. $2.50. Macmillan, 1940.

Riley, H. A.: Atlas of Basal Ganglia, Brain Stem and Spinal Cord. $13.50. Williams and Wilkins, 1943.

Strecker, Edward A., and Ebaugh, F. G.: Practical Clinical Psychiatry. Ed. 5. $5. Blakiston, 1940.

Wechsler, Israel S.: Textbook of Clinical Neurology. Ed. 5. $7.50. Saunders, 1943.

OBSTETRICS AND GYNECOLOGY

Beck, Afred C.: Obstetrical Practice. Ed. 3. $7. Wood, 1942.

Crossen, Harry S., and Crossen, R. J.: Diseases of Women. Ed. 9. $12.50. Mosby, 1941.

Curtis, Arthur H.: Textbook of Gynecology. Ed. 4. $8. Saunders, 1942.

Davis, Carl H. (ed.): Gynecology and Obstetrics. In 3 volumes. $35. Prior, 1944.

De Lee, Joseph B., and Greenhill, J. P.: Principles and Practice of Obstetrics. Ed. 8. $10. Saunders, 1943.

Dieckmann, W. J.: The Toxemias of Pregnancy. $7.50. Mosby, 1941.

Greenhill, J. P.: Office Gynecology. Ed. 3. $3. Year Bk. Pubs., 1943.

Novak, Emil J.: Textbook of Gynecology. Ed. 2. $8. Williams and Wilkins, 1944.

Titus, Paul: Management of Obstetric Difficulties. Ed. 2. $10. Mosby, 1940.

Williams, J. Whitridge: Obstetrics. Ed. 8, rev. by Henricus J. Stander. $10. Appleton, 1941.

OPHTHALMOLOGY

Duke-Elder, Sir W. Stewart: Practice of Refraction. Ed. 4. $4.50. Blakiston, 1943.

Gifford, Sanford R.: Handbook of Ocular Therapeutics. Ed. 3. $4. Lea, 1942.

May, Charles H.: Manual of the Diseases of the Eye. Ed. 18. $4. Wood, 1943.

Parsons, Sir John H.: Diseases of the Eye. Ed. 10. $7. Macmillan, 1942.

Peter, Luther C.: The Extra-ocular Muscles. Ed. 3. $4.50. Lea, 1941.

Rea, R. Lindsay: Neuro-ophthalmology. Ed. 2. $13.50. Mosby, 1941.

Spaeth, Edmund B.: Principles and Practice of Ophthalmic Surgery. Ed. 3. $11. Lea, 1944.

Thorington, James: Refraction of the Human Eye and Methods of Estimating the Refraction. Ed. 3, rev. and ed. by J. Monroe Thorington $3.50. Blakiston, 1939.

Traquair, H. M.: An Introduction to Clinical Perimetry. Ed. 4. 30s. Kimpton, 1942.

Uribe y Troncoso, Manuel: Internal Diseases of the Eye and Atlas of Ophthalmoscopy. Ed. 2. $15. Davis, 1942.

Wolff, Eugene: Anatomy of the Eye and Orbit. Ed. 2. $7.50. Blakiston, 1940.

ORTHOPEDIC SURGERY

American Academy of Orthopaedic Surgeons: Peace and War Orthopedic Surgery. $4. Edwards Bros., 1943.

American Medical Association. Special Exhibit Committee on Fractures: Primer on Fractures. Ed. 5. $1. A. M. A., 1943.

Caldwell, Guy A.: Treatment of Fractures. $5. Hoeber, 1943.

Campbell, Willis C.: Operative Orthopedics. $12.50. Mosby, 1939.

Dickson, F. D., and Diveley, R. L.: Functional Disorders of the Foot. Ed. 2. $5. Lippincott, 1944.

Geckeler, Edwin O.: Fractures and Dislocations for Practitioners. Ed. 3. $4.50. Wood, 1943.

Key, John Albert, and Conwell, H. Earle: Management of Fractures, Dislocations and Sprains. Ed. 3. $12.50. Mosby, 1942.

Magnuson, Paul B.: Fractures. Ed. 4. $5.50. Lippincott, 1942.

Mercer, Walter: Orthopaedic Surgery. Ed. 3. $12. Williams and Wilkins, 1944.

Shands, A. R., and Raney, R. B.: Handbook of Orthopaedic Surgery. Ed. 2. $4.25. Mosby, 1940.

Speed, Kellogg: Text-Book of Fractures and Dislocations. Ed. 4. $12.50. Lea, 1942.

Steindler, Arthur: Orthopedic Operations; Indications, Technique and End Results. $9. Thomas, 1940.

Trueta Raspall, José: Principles and Practice of War Surgery. 42s. Heinemann, 1944.

Watson-Jones, R.: Fractures and Joint Injuries. Ed. 3. In 2 volumes. $20. Wood, 1943.

OTORHINOLARYNGOLOGY

Ballenger, William L.: Diseases of the Nose, Throat and Ear. Ed. 8, rev. by Howard C. Ballenger. $12. Lea, 1943.

Jackson, Chevalier, and Jackson, C. L.: Diseases of the Air and Food Passages of Foreign-Body Origin. $12.50. Saunders, 1936.

Lederer, Francis L.: Diseases of the Ear, Nose and Throat. Ed. 4. $10. Davis, 1943.

Van Alyea, Oliver E.: Nasal Sinuses. $6.50. Wood, 1941.

PATHOLOGY, BACTERIOLOGY AND CLINICAL LABORATORY WORK

Bell, E. T. (ed.): Textbook of Pathology. Ed. 5. $9.50. Lea, 1944.

Boyd, William: Pathology of Internal Diseases. Ed. 4. $10. Lea, 1944.

Boyd, William: Surgical Pathology. Ed. 5. $10. Saunders, 1942.

Craig, C. F.: Laboratory Diagnosis of Protozoan Diseases. $4.50. Lea, 1942.

Craig, C. F., and Faust, E. C.: Clinical Parasitology. Ed. 3. $9. Lea, 1943.

Ewing, James: Neoplastic Diseases. Ed. 4. $14. Saunders, 1940.

Gradwohl, Rutherford B. H.: Clinical Laboratory Methods and Diagnosis. Ed. 3. In 2 volumes. $20. Mosby, 1943.

Haden, Russell L.: Principles of Hematolgy. Ed. 2. $4.50. Lea, 1940.

Jordan, Edwin O., and Burrows, W.: Textbook of Bacteriology. Ed. 13. $6. Saunders, 1941.

Karsner, Howard T.: Human Pathology. Ed. 6. $10. Lippincott, 1942.

Kolmer, John A.: Clinical Diagnosis by Laboratory Examinations. $8. Appleton, 1943.

Kolmer, John A., and Boerner, F.: Approved Laboratory Technic. Ed. 4. $10. Appleton, 1945.

Kracke, Roy R.: Diseases of the Blood and Atlas of Hematology. Ed. 2. $15. Lippincott, 1941.

MacCallum, William G.: Textbook of Pathology. Ed. 7. $10. Saunders, 1940.

Moore, Robert A.: Textbook of Pathology. $10. Saunders, 1944.

Park, William H., and Williams, A. W.: Pathogenic Microörganisms. Ed. 11. $8. Lea, 1939.

Stitt, E. R.: Practical Bacteriology, Haematology and Animal Parasitology. Ed. 9. $7. Blakiston, 1938.

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Alabama State Medical Assn. Journal, Montgomery

14:181-208 (Feb.) 1945

Bronchiectasis. J. O. Lisenby.—p. 181.
Planning for Medical Care in Postwar Period with Particular Reference to Alabama. J. Newdorp.—p. 183.
Value of Preemployment Examination in Industrial Health Program. P. W. Auston.—p. 189.
Management of Complications of Intraocular Surgery. H. W. Frank.—p. 193.

14:209-232 (March) 1945

Total versus Subtotal Hysterectomy. J. O. Morgan.—p. 209.
Planning for Medical Care in Postwar Period, with Particular Reference to Alabama: Part II. J. Newdorp.—p. 213.
What Surgeon Should Know of Radiology in Treating Malignancy. I. P. Levi.—p. 219.

Amer. Journal of Digestive Diseases, Fort Wayne, Ind.

12:61-96 (March) 1945

Orientation of Gastroscope by Roentgenograms. A. R. Hufford and G. G. Stonehouse.—p. 61.
Aluminum Phosphate Gel in Treatment of Peptic Ulcer. J. Lichstein, S. Simkins and M. Bernstein.—p. 65.
Bacillary Dysentery in Curaçao, Netherlands West Idies. A. W. Pot.—p. 70.
Gastrointestinal Disorders Simulating Circulatory Disease and Vice Versa. F. M. Groedel.—p. 73.
Nutritional Significance of Amino Acids and Proteins. M. Sahyun.—p. 80.
Arterial Thrombosis Associated with Chronic Ulcerative Colitis. Mary E. Martin.—p. 85.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:109-212 (Feb.) 1945

Roentgenologic Appearance and Pathology of Intrapulmonary Lymphatic Spread of Metastatic Cancer. H. P. Mueller and R. C. Sniffen.—p. 109.
Pulmonary Changes in Cardiospasm. L. E. Hawes and A. B. Soule Jr.—p. 124.
Congenital Aplasia of Lung. R. L. Garber.—p. 129.
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Meckel's Diverticulum. M. E. Mottram and L. H. Garland.—p. 142.
*Periosteal Lesions in Scurvy. W. A. Evans Jr.—p. 147.
Roentgenographic Demonstration by Tantalum Powder of Sinuses Resulting from Extraction of Intervertebral Disk Protrusions. C. J. Graf and W. B. Hamby.—p. 157.
Anomalous Development of First Rib Simulating Isolated Fracture. E. R. Bowie and H. G. Jacobson.—p. 161.
Triticeous Cartilages: Roentgen Anatomic Study. J. W. Grossman.—p. 166.
Changes After Treatment of Unprotected Brain with Large Doses of Roentgen Radiation. O. Marburg, R. Rezek and R. M. Fleming.—p. 171.

Periosteal Lesions in Scurvy.—Evans reviewed roentgenograms of cases in which the diagnosis of scurvy had been made at the Children's Hospital of Michigan during the years 1936 to 1941. During this six year period in a hospital service comprising 106,800 new outpatient visits and 41,773 hospital admissions 93 cases were encountered, indicating that even in these days of vitamin consciousness infantile scurvy is not rare. It occurs almost exclusively in the narrow age range of 7 to 15 months. The most advanced lesions were usually seen in the knees, followed by the shoulder and ankle joints, and then by the wrist, hips and elbow joints. The earliest changes represented by the ground glass type of demineralization of the bone structure and by the signet ring appearance of the epiphyses are seen with great frequency but are not of sufficient specificity to be regarded as pathognomonic of scurvy. The signet ring appearance was most pronounced in the epiphyses at the knee joints and was present in the same degree in all of the cases. The ground glass appearance was seen less constantly (74 per cent) and was absent particularly in cases complicated by rickets. The submetaphysial notch, emphasized by Park and his colleagues as the earliest pathognomonic sign of scurvy in the x-ray examination, was observed in 89 per cent of the 93 cases. Periosteal shadows in scurvy were observed to be of two types. The first appears as a narrow triangular shadow having its base at the metaphysis and extending from there for some distance along the shaft. The second type of periosteal shadow is much larger, is usually club shaped and extends along the greater length of the shaft. The periosteal lesions of scurvy depend for their occurrence, location and severity on the severity of the lesions which develop in the metaphysial areas of the long bones.

Annals of Allergy, Minneapolis

3:1-90 (Jan.-Feb.) 1945

Growth and Development of Allergy: Ten Year Study of 100 Allergic Children from Birth to 10 Years of Age. N. W. Clein.—p. 1.
Problems in Diagnosis of Bronchial Asthma. G. L. Waldbott.—p. 12.
Unusual Complications of Bronchial Asthma: Air in Extrapulmonary Spaces. V. J. Derbes, H. T. Engelhardt and W. A. Sodeman.—p. 21.
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Soap, Soap Sensitivity and Soap Substitutes. E. A. Brown.—p. 50.
Report of Case of Spontaneous Animal Allergy. G. R. Moreno and Leon Bentolila.—p. 61.
Serum Potassium Response to Epinephrine in Normal and Asthmatic Subjects. S. C. Dees.—p. 64.
Routine Technic of Administration of Antigenic Substances to Hypersensitive Patients: Suggestion for Modification. K. J. Deissler.—p. 71.

Annals of Surgery, Philadelphia

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*Biopsy as an Accurate Guide to Decision of Early Skin Grafting. J. E. Pritchard.—p. 164.
Skin Graft of Dorsum of Hand: Use of Large Size Dermatome to Obtain One Piece Pattern. J. M. Converse.—p. 172.
Proximal Ligation and Thrombectomy for Phlebothrombosis of Femoral and Iliac Veins. F. W. Bancroft.—p. 175.
Economic Value of Peritoneoscopy. M. M. Narancio, J. C. Pierson, G. McNeer and G. T. Pack.—p. 185.
Spontaneous Intra-Abdominal Hemorrhage. M. Marks and S. O. Freedlander.—p. 191.
Comparative Studies of Cancerous versus Noncancerous Breasts. F. W. Foote and F. W. Stewart.—p. 197.
Studies in Surgical Convalescence: II. Preliminary Study of Nitrogen Loss in Exudates in Surgical Conditions. Co Tui, A. M. Wright, J. H. Mulholland, E. S. Breed, I. Baicham and D. Gould.—p. 223.
Effects of Temperature on Digestion of Collagen Sutures and Surgical Gut (Catgut) by Enzymes and by Subcutaneous Tissues of Frog. I. W. Sizer.—p. 231.
Submucosal Morcellation of Hemorrhoids. H. B. Benjamin, H. W. Ahrenberger and C. J. Fairless.—p. 239.
Albright's Syndrome: Report of Case Associated with Multiple Pathologic Fractures, Disseminated Fibrous Dysplasia of Bones, Precocious Puberty and Multiple Pigmented Nevi. A. Behrend.—p. 245.

Biopsy as Guide to Early Skin Grafting.—Pritchard says that in burns it is desirable to have some means of determining whether the wound can be expected to heal spontaneously or whether it should be skin grafted. At the Montreal General Hospital the treatment of burns includes the occlusive compression dressing with an emulsion of sulfathiazole in an oil in water base. This dressing, except in superficial burns which heal within one week, is commonly removed on about the thirteenth or fourteenth day, with the intention of grafting if necessary. It is not easy, even at this stage, to be certain from the gross appearance of the wound whether it is healing satisfactorily or will require grafting. It was decided to submit all questionable cases at the time of removal of the first dressing to biopsy. Rapid frozen sections were relied on. If destruction involves most or all of the hair follicles but spares the sweat glands which lie at a deeper level, spontaneous reepidermization may still be expected, but the process will be slow.

If the destruction extends deep enough to involve the sweat glands there will be no sources of reepidermization other than that at the margins of the wound, and this, in all but small burned areas, is inadequate.

Archives of Neurology and Psychiatry, Chicago

53:91-164 (Feb.) 1945

Blood Supply of Nerves of Upper Limb in Man. S. Sunderland.—p. 91.

Interpretation of Findings in Cerebrospinal Fluid: I. Dementia Paralytica Formula and Necessity of Its Quantitative Differentiation. C. Lange and A. H. Harris.—*p. 116.*

**Prefrontal Lobotomy in Treatment of Chronic Psychoses, with Special Reference to Section of Orbital Areas Only.* L. Hofstatter, E. A. Smolik and A. K. Busch.—p. 125.

Meningioma Obstructing Foramen Magnum. A. E. Bennett and A. Fortes.—p. 131.

Divergence Paralysis and Head Trauma. N. Savitsky and M. J. Madonick.—p. 135.

**Electroencephalographic Evaluation of Primary Behavior Disorders in Children: Correlations with Age, Sex, Family History and Antecedent Illness or Injury.* J. S. Gottlieb, J. R. Knott and M. C. Ashby.—p. 138.

Subdural Suppuration Originating in Purulent Leptomeningitis. E. Spitz, Ann Pollak and A. Angrist.—p. 144.

Hyperthermia Following Injury of Preoptic Region: Report of Case. L. E. Beaton and J. D. Herrmann.—p. 150.

Prefrontal Lobotomy in Chronic Psychoses.—Hofstatter and his associates performed prefrontal lobotomy on 45 patients. Thirty of these were studied for twelve months or more after the operation. Of these 8 had been subjected to the unmodified operation and 22 to the section of the orbital area only. None of the patients became worse after the operation. None died. Transitory incontinence occurred in 4 of the 22 patients in whom only the lower quadrants were sectioned and in 4 of the 8 patients in whom all quadrants were transected. Delusional ideas might disappear rapidly or might continue with less emotional impetus than before. During the period of convalescence the patient's psychotic behavior persisted to some extent; then inertia became more prominent. The postoperative rate of recovery of 40 per cent of the total number of patients compares favorably with the computed average of 31.3 per cent of seventeen other American centers. The results of surgical intervention on only the orbital quadrants in these patients appear at least equal to the results obtained with transection of all four quadrants. The orbital areas of the frontal lobes seem to have a role in regulation of the emotions.

Electroencephalographic Evaluation of Behavior Disorders.—Gottlieb and his associates show that there is a high incidence of abnormality in the electroencephalograms of children with primary behavior disorders. In a series of 67 children, none of whom presented signs of organic disease or in whose condition an organic etiologic factor was suspected, 49 per cent had electrical brain potentials which were clearly abnormal. Significantly, greater proportions of abnormal electroencephalograms were found when there was either a history of psychosis, maladjusted personality, chronic alcoholism or epilepsy in the family or a personal history of cerebral trauma or severe illness than when neither of these factors was present.

Archives of Ophthalmology, Chicago

33:97-172 (Feb.) 1945

**Retinal Changes Associated with Diabetes and with Hypertension: Comparison and Contrast.* A. J. Ballantyne.—p. 97.

Unusual Type of Keratitis Associated with Exposure to N-Butyl Alcohol (Butanol). D. G. Cogan and W. M. Grant.—p. 106.

Diffuse Neurofibromatosis (von Recklinghausen's Disease) Involving Bulbar Conjunctiva. F. Páez Allende.—*p. 110.*

Astigmatism at Oblique Axes and Binocular Stereoscopic Spatial Localization. K. N. Ogle and L. F. Madigan.—*p. 116.*

Cyclopia and Arhinia: New Concept. J. Krafka.—p. 128.

Ocular Defects in 60,000 Selectees. A. H. Downing.—p. 137.

Syndrome of Nonsyphilitic Interstitial Keratitis and Vestibuloauditory Symptoms. D. G. Cogan.—p. 144.

Simple Technic for Corneal Transplantation. M. I. Green.—p. 150.

Industrial Injuries of Eye Caused by Flying Objects. P. W. Tisher.—p. 152.

Retinal Changes in Diabetes and Hypertension.—Ballantyne maintains that the retinopathies of diabetes and of the hypertensive diseases are separate entities. In both conditions the earliest lesions are changes in the retinal vessels. In diabetes these lesions affect primarily the venous, and in hypertension the arterial, side of the retinal circulation. In diabetes these changes point to venous stasis and, in addition to hemorrhages and exudates, consist in congestion of the veins, microaneurysms of the capillaries and gross changes in the principal veins. Microaneurysms seem to be the earliest pathologic change in the fundus of the diabetic patient. Histologically the earliest recognizable change takes the form of minute fatty granules in the vascular endothelium, together with swelling of the endothelial cells. In hypertension fatty granules are observed more frequently in the media and the adventitia. The most striking changes in the retinal veins of diabetic patients appear as expansions, beading and formation of loops, coils and networks, and the predominant microscopic changes at this stage are phlebosclerosis and intraretinal and preretinal networks of large, thin walled vessels. The hemorrhages in diabetic retinopathy occur primarily in the central area of the fundus, are characteristically rounded and occur chiefly in the deep layers, for the most part the internuclear layer. In hypertension arterial changes predominate; the hemorrhages are primarily circumpapillary and striate, owing to their situation in the nerve fiber layer. Exudates are observed in the deep layers but also include patches of gangliform degeneration in the nerve fiber layer.

Archives of Pathology, Chicago

39:67-132 (Feb.) 1945

**Congenital Glycogenic Tumors of Heart.* T. M. Batchelor and M. E. Maun.—p. 67.

**Primary Tumor of Heart.* R. Straus and R. Merliss.—p. 74.

Esophageal Carcinoma in British West Indian and Panamanian Negroes: Study of Incidence, Etiologic Factors and Pathologic Anatomy in Fifty Cases. W. J. Tomlinson and L. A. Wilson.—p. 79.

Experimental Hypertension: Its Production in Dogs by Intravenous Injection of Streptococci. G. F. Dick.—p. 81.

Ossified Cartilage with Myeloid Fat Marrow in Aortic Ring of Rabbit. W. C. Hueper.—p. 89.

Effects of Abortifacient Paste ("Utra-Jel"): Report of Death from Its Use and of Experimental Study of Its Effects on Rabbits and Rats. R. Straus and N. De Nosaquo.—p. 91.

Adenomyoepithelioma (Cylindroma) of Palatal Mucous Glands. W. H. Bauer and R. A. Fox.—p. 96.

Experimental Nephropathies: I. Method of Producing Controlled Selective Injury of Renal Units by Means of Chemical Agents. J. P. Simonds and Opal E. Hepler.—*p. 103.*

Congenital Glycogenic Tumors of Heart.—According to Batchelor and Maun, congenital tumors of the heart are comparatively rare. In the case reported glycogen was demonstrated within the tumor cells of the multiple tumors of the heart of an infant who died on the third day of life. A review of the literature on so-called congenital rhabdomyoma of the heart revealed 62 authentic cases of tumors of the heart that presented a characteristic vacuolated appearance on microscopic examination. The cardiac tumors were seen chiefly in infants and the newborn, with 52 per cent of the patients dying in the first year of life and 86 per cent before they reached puberty. The clinical symptoms were nonspecific, and in no case was the diagnosis made before death. Frequently the symptoms were due to associated lesions. Tuberous sclerosis was found in 50 per cent of the cases. The authors suggest that the term "congenital nodular glycogenic tumors of the heart" should replace "congenital rhabdomyoma" until more is known about the nature of the lesions.

Primary Tumor of Heart.—Strauss and Merliss present 3 additional cases of primary tumor of the heart, 2 of which were instances of myxoma and 1 of myxosarcoma. In 2 the tumor was silent, in the third it produced clinical signs and symptoms of tricuspid stenosis. As a rule, primary tumor of the heart is clinically silent. Only 2 cases are on record which were diagnosed prior to death. In both the tumor was a cancer involving the conduction system and in both there was a hemorrhagic pericardial effusion. In no case of benign tumor has the diagnosis been made before death. Primary tumor of the heart should be considered in the differential diagnosis when there is sudden onset of signs of cardiac decompensation in a young person without a preexisting history of heart disease with no discoverable anatomic basis for the heart disease, a hemorrhagic pericardial effusion, an involvement of valvular function or of the conduction system and signs of valvular stenosis which change on motion of the body as well as signs of mediastinal tumor with alteration of the appearance of the shape of the heart in the roentgenogram.

Arkansas Medical Society Journal, Fort Smith

41:163-182 (Jan.) 1945

Tetanus. W. J. Sheddan —p. 163.
Modern Concepts of Cardiovascular Disease C T Chamberlain.—p 165.

41:183-210 (Feb.) 1945

Brief Summary of Modern Concept of Acquired Syphilis. E. J. Easley. —p. 183.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

86:1-122 (March) 1945

Fractures in Battle Casualties J. T. Coyle and W D Thompson Jr. —p. 57.
Toxic Psychoses Following Atabrine H S Caskill and T. FitzHugh Jr —p. 63.
Diarrhea Problem in New Guinea Base. A H Jacoby, J. R Loudon, P. S. Wyne and T R. Fallmezger —p 70
Enlisted Man as Psychiatric Aide N Hurwitz and R. M. Kramer. —p 79.
Yaws in a White Soldier H Rifkin —p 81
Treatment of Yaws with Penicillin. R. Whitehill and R. Austrian. —p. 84.
Treatment of Acute Gonorrhea with Penicillin Results in 100 Cases. J. H. Long —p 95.
*Inspection of Oysters G. W. Snook —p 101
Suggestions on Immobilization of Hand. D R Pratt —p 105
X-Ray Department in Southwest Pacific Area D Tucker and A J. Tillinghast —p 109.
Colostomies C. H Keene —p. 115
Canoscope: Improvised Projector. H J Hopkins —p 118

Inspection of Oysters.—Snook states that oysters contain both protein and carbohydrates When these decompose, fermentation as well as putrefaction occurs Following the death of the oyster, which occurs soon after shucking, the glycogen is hydrolyzed to produce sugars, which in turn are fermented by bacteria to produce acid Acid production is gradual, and a direct relation exists between hydrogen ion concentration and the stage of decomposition. The edibility of oysters can be determined readily by the use of p_H tests Freshly shucked oysters normally show a p_H of between 6 3 and 7.1. When the p_H drops to between 5.7 and 5.9 the oysters are considered "stale," and when a p_H below 5.7 is reached they are considered "sour." The edible zone is thus above a p_H of 5 9. If oysters are kept under proper refrigeration, the lower limit of the edible zone, that is, a p_H of 5.9, is reached about eleven days after shucking. For reliable p_H readings it is advisable to use the Taylor slide comparator, a La Motte block comparator or a potentiometer. Nitrazine paper should not be used. Milky liquor is a normal property of oysters, but when in doubt a p_H reading is necessary. The only satisfactory method of preventing spoilage of freshly shucked oysters is the liberal use of ice. Green oysters should not be rejected. This condition is caused by the accumulation in the gills and mantle of the oyster of a bluish or greenish pigment derived from certain types of diatoms which normally live in sea water and are ingested by the oyster. Pink oysters are stale.

Canadian Journal of Public Health, Toronto

36:47-86 (Feb.) 1945

Surveys and Health Insurance I. Schultz —p 47
Public Health Aspects of Venereal Disease Control R. P. Vivian. —p. 53
Organization of Laboratory Services: Observations from Recent Visit to Britain G D W. Cameron —p 58
Medical Intelligence in United States Army G W. Anderson —p 65.
*Errors in Applying Nutrient Allowances to Dietary Surveys or Food Policies L B Pett —p 69.

Nutrient Allowances in Food Policies.—Pett shows that innumerable combinations of individual foodstuffs are capable of providing optimal nutrition. This is fortunate because it permits adaptation to the wide variations observed around the world in dietary habits, in agricultural possibilities and in food composition Standards have been devised from time to time. The most detailed of such tables is that of the United States National Research Council drawn up in 1941-1942 Serious errors may result when attempts are made to interpret such standards in terms of foods and in terms of national and international food requirements and agricultural policies. Physiologic experiments show a variation in individual susceptibility or requirements. Out of 97 persons a balance between intake and output of calcium was achieved for 22 persons with less than 0 35 Gm. daily, while 54 persons were in balance with between 0 35 and 0 55 Gm of calcium daily, and 3 needed over 0.70 Gm. daily. The mean or average for this group is between 0.40 and 0 45 Gm. of calcium daily. In order to allow for unknown factors, the recommended allowance in the standard is 0 8 Gm. Only a small fraction of a population group needs this much; nearly half of the group could be in calcium balance with a calcium intake of only 50 per cent of the standard. Standards are also used as points of reference for dietary surveys. Current efforts to plan national or international food policies may lead to serious errors unless account is taken of the lack of knowledge on how to apply "standards" or "requirements" for various nutrients to population groups.

Hawaii Medical Journal, Honolulu

4:129-149 (Jan.-Feb.) 1945

Outbreak of Fish Poisoning in Honolulu, Hawaii. R. K C Lee and H. Q Pang —p 129.
A Doctor Looks at Automobile Accidents W. J. Holmes —p 133.
Use of Weltmann Reaction in Myocardial Infarction A. S. Hartwell. —p 136

Journal of Nutrition, Philadelphia

29:85-154 (Feb.) 1945

*Effects of Light Intensity, Day Length, Temperature and Other Environmental Factors on Ascorbic Acid Content of Tomatoes K C Hamner, L Bernstein and L. A Maynard —p. 85
Short Period Blood Sugar Time Curves Following Ingestion of Sucrose I M. Rabinowitch —p 99.
Neuropathologic Studies of Pantothenic Acid, Biotin and Folic Acid Complex Deficiencies in Chick J. H. Shaw and P H. Phillips —p 107.
Neuropathologic Studies of Acute and Chronic Thiamine Deficiencies and of Inanition J. H Shaw and P. H Phillips —p 113
Effects on Albino Mouse of Feeding Diets Very Deficient in Each of Several Vitamin B Factors (Thiamine, Riboflavin, Pyridoxine and Pantothenic Acid). J. H. Jones, Claire Foster, Frieda Dorfman and Gladys L Hunter, with the technical assistance of Mabel E. Quinby and Dorothy L. Alexander.—p 127.
Nicotinic Acid, Pantothenic Acid, Choline and Biotin Content of Fresh, Irradiated Evaporated and Dry Milk A. Z Hodson —p. 137
Effect of Succinylsulfathiazole and Phthalylsulfathiazole on Bacterial Flora of Rat Feces. A. Kathrine Miller.—p 143

Environment and Ascorbic Acid Content of Tomatoes.—Hamner and his associates studied the influence of environmental variables on the ascorbic acid content of tomatoes in the field and under controlled conditions in the laboratory. Neither the nature of the soil nor fertilization has been found to exert a great effect. There is also little evidence that the location effects can be ascribed to differences in temperature, humidity or variations in day length. The one variable so far studied which seems to exercise great effects is light intensity. Greatest influence on ascorbic acid content was produced by variations in light intensity previous to harvest. Increases in the ripe fruit of 66 per cent in ascorbic acid resulted when plants were transferred from shade to sunshine at the time the fruit was mature green The light intensity to which the plants are exposed just previous to harvest may be the dominant factor in determining the ascorbic acid content of ripe fruit.

Journal of Pediatrics, St. Louis

26:107-208 (Feb.) 1945

*Analysis of Duodenal Drainage in Steatorrheas H F. Philipsborn, Grace Lawrence, S Gibson and H. Greengard —p 107.
Observations on Child Populations, Birth and Infant Death Rates, Medical Personnel in Certain Countries J. B. Gillespie.—p 120.
Chronic Stridor in Early Life Due to Persistent Right Aortic Arch. H. K. Faber, J. W. Hope and F. L Robinson —p 128.
Tuberculous Pleurisy with Effusion in Infancy J. B. Hardy and E. L. Kendig —p 138
Purulent Parotitis in Newborn. H. N. Sanford and I Shmigelsky. —p 149.
Diagnostic Methods in Whooping Cough. N Silverthorne, V. Zacks and E. Jenkins —p. 155.
Electrocardiographic Studies in Asthmatic Children. H. T. Engelhardt and V. J. Derbes —p 160
What is Guillain-Barré Syndrome? F. H. Lewey —p. 165.
*Calcification of Intervertebral Disks in Childhood. H. S Weens —p. 178.
Postwar Developments in Child Health Study in Great Britain. A. Moncrieff.—p. 189.

Duodenal Drainage in Steatorrheas.—According to Philipsborn and his associates fibrocystic disease of the pancreas and celiac disease may resemble each other closely. Fibrocystic disease is characterized by an achylia or hypochylia

pancreatica. Celiac disease is considered a failure of absorption of already digested foodstuffs. Since the stools in celiac and fibrocystic disease may be identical and because the vitamin A curve is diagnostically nonspecific, quantitative analysis of the duodenal drainage for enzymatic activity coupled with a notation of the response of the pancreas to secretin or intraduodenal hydrochloric acid is the most reliable laboratory aid in the differential diagnosis of fibrocystic and celiac disease. "Feeding problems" may be on the basis of a temporary pancreatic insufficiency. Permanent pancreatic insufficiency with infantilism must be differentiated from celiac disease, fibrocystic disease and certain types of feeding problems. The value for tryptic activity is the most reliable index of pancreatic function. Values of less than 4 Gm. of liberated nitrogen per hundred cubic centimeters of duodenal fluid are abnormal in children. Less than 0.5 Gm. of liberated dextrose per hundred cubic centimeters of duodenal drainage during the first twelve months of life is abnormal. Subsequently less than 2 Gm. of liberated dextrose is abnormal in children. When less than 60 cc. of twentieth normal sodium hydroxide is required to neutralize the free fatty acids produced by the lipolytic activity of 100 cc. of duodenal fluid the pancreatic lipase may be considered diminished in children. The enzymatic activity in the duodenal drainage is greatly diminished in fibrocystic disease; it remains essentially normal in celiac disease. The response to intravenous secretin or intraduodenal tenth normal hydrochloric acid is reduced in fibrocystic disease but may remain normal in celiac disease and in transient and permanent hypochylia pancreatica.

Calcification of Intervertebral Disks in Childhood.—Weens says that instances of calcification of the intervertebral disks have been observed in childhood. He reports 1 case that he observed and reviews 5 cases from the literature. Contrary to observations in adult life, prominent clinical signs and symptoms were noted. All of the cases were characterized by an acute episode of pain in the region of the involved segment of the spine, limitation of motion and spinal deformity. In the absence of pathologic studies it is not possible to arrive at definite conclusions as to the etiology of this phenomenon in childhood. Signs and symptoms of infection were noted in most of the cases, and these suggest that an inflammatory process was associated with the calcification. The fact that the intervertebral disks in childhood possess a blood supply may be important in this connection. The intervertebral disks are thus open to any disease carried by the blood stream. An aseptic necrotic process as a possible cause of the calcification is mentioned. The author stresses differences between calcification of intervertebral disks in childhood and in adult life. Involvement of the cervical spine was noted in 4 of 6 cases occurring in childhood. Calcification of the nucleus pulposus in adult life is localized predominantly in the dorsal spine and lumbar spine. Rapid change in the size of the calcification or complete absorption was noted in 5 of the 6 described cases. Calcification of the nucleus pulposus in adult life is, as a rule, a stationary process. All of the children recovered. The recognition of calcification of intervertebral disks in children appears important in view of the differential diagnosis of meningitis, myositis and diseases involving the vertebrae or spinal cord.

Journal of Thoracic Surgery, St. Louis

14:1-82 (Feb.) 1945

Pulmonary Resection in Treatment of Tuberculosis: Introductory Remarks. F. S. Dolley.—p. 1.
Total and Partial Pneumonectomy in Treatment of Pulmonary Tuberculosis. R. M. Janes.—p. 3.
Lobectomy for Pulmonary Tuberculosis. H. C. Maier and R. Klopstock.—p. 20.
*Primary Upper Lobectomy versus Modern Selective Thoracoplasty in Treatment of Tuberculosis: Physiopathologic Considerations. J. M. Chamberlain.—p. 32.
Pulmonary Resection in Treatment of Tuberculosis: Preliminary Report. R. H. Overholt and N. J. Wilson.—p. 55.

Lobectomy versus Thoracoplasty.—The evaluation of primary upper lobectomy and of selective thoracoplasty convinced Chamberlain that thoracoplasty is successful because it utilizes four of the five basic principles of therapy in tuberculosis: (1) drainage (bronchial), (2) immobility, (3) relaxation and (4) compression. The fifth principle, resection, is reserved for its failures. Primary upper lobectomy excises only the active major focus and causes overdistention, which is probably a precursor to emphysema, may cause reactivation of latent foci in the overdistended lobes and leaves these foci in a poor state of healing or self protection. Primary upper lobectomy may prove to be a less physiologic procedure than the modern selective six rib thoracoplasty, since the latter shows a significant reduction in function in only 25 per cent of the cases. Upper lobectomy should be secondary to the thoracoplasty failure.

New England Journal of Medicine, Boston

232:181-210 (Feb. 15) 1945

What About Health Insurance? R. I. Lee.—p. 181.
McMurray Osteotomy for Nonunited Hip Fractures. O. J. Hermann.—p. 186.
Vaginal Bleeding from Potassium Permanganate as Abortifacient. J. F. McDonough.—p. 189.
Physical Medicine in Rehabilitation. A. L. Watkins.—p. 191.

232:211-240 (Feb. 22) 1945

*Herniated Intervertebral Disk: Analysis of 400 Verified Cases. J. L. Poppen.—p. 211.
Cardiac Failure Associated with Acute Anemia. T. D. Kinney and G. K. Mallory.—p. 215.
Bloodless Circumcision. J. M. Birnie.—p. 218.
Diabetes Mellitus. E. P. Joslin.—p. 219.

Herniated Intervertebral Disk.—Poppen studied 400 surgically proved cases in which eighteen months to ten years have elapsed since surgical intervention. This series represents 8 per cent of the patients who entered the clinic with the complaint of low back pain. This emphasizes that even though the herniated disk is an important cause of low back pain and sciatica it is by no means the predominant one. The most constant objective finding was a positive straight leg reaction, which was present in 90 per cent of the patients when the protrusion was at the third, fourth or fifth lumbar segment. Seventy-five per cent of the patients demonstrated spasm of the low back muscles. Localized paraspinous tenderness was present in 80 per cent. Forty-eight per cent had sensory changes in the fifth lumbar or first sacral dermatomes or both. Narrowing of the disk space was not an assurance that a posterior dislocation of a disk was present. A normal roentgenogram of the low spine in the presence of a typical history and findings is an additional indication of the probable presence of a ruptured cartilage. A patient who has had repeated disabling attacks of sciatica necessitating narcotics and who in the previous few months has been unable to work because of a ruptured cartilage should have an operation. When a patient has had mild recurrences of symptoms causing considerable discomfort but not severe enough to discontinue work, he should be treated conservatively with physical measures in the form of heat, massage and postural exercises, rest in bed on a firm mattress and administration of large doses of vitamin B intravenously for a few days. Patients with predominating leg pain and with minor back difficulty whose roentgenograms show no bone changes should have only the disk removed, whereas for a patient who has predominating back pain, with abnormal facets and evidence of an unstable back, and who has to do hard manual labor, removal of the degenerated cartilage with fusion is indicated. There were no deaths or paralysis in any of the patients operated on. Infection occurred in 3 patients, but opening the incision and allowing adequate drainage with liberal use of the sulfonamide drugs brought about wound healing. The shortest postoperative stay in the hospital was four days and the longest five weeks; the average stay was twelve days. The relief of sciatica was satisfactory in most of the cases. Residual back discomfort on heavy lifting or sitting in a cramped position for many hours occurred in almost half the patients. This percentage was not materially altered in those who also had fusions. Fifteen per cent of patients did not obtain relief. Six cases in a series not treated surgically developed sudden complete paraplegia as a result of ruptured cartilage. Even though the protruded cartilages were removed in a relatively short time following the paralysis, many weeks and months elapsed before complete function returned.

Surgery, Gynecology and Obstetrics, Chicago

80:225-336 (March) 1945

Pancreatic Collections (Pseudocysts) Following Pancreatitis and Pancreatic Necrosis: Review and Analysis of 10 Cases. R. D. Pinkham. —p. 225.

Strength Frequency Curves in Electrodiagnosis of Experimentally Produced Peripheral Nerve Lesions in Cat. L. J. Pollock, J. G. Golseth and A. J. Arieff.—p. 235.

Fascia-Patch Transplant in Repair of Hernia. A. O. Singleton and O. W. Stehouwer.—p. 243.

*Total Pancreatectomy, Total Gastrectomy, Total Duodenectomy, Splenectomy, Left Adrenalectomy and Omentectomy in Diabetic Patient, Recovery. A. Brunschwig, H. T. Ricketts and R. R. Bigelow.—p. 252.

Pantopaque Myelography as an Aid in Preoperative Diagnosis of Protruded Intervertebral Disks: Preliminary Report. F. A. Echlin, J. McK. Ivie and A. Fine.—p. 257.

*Malaria from Blood Bank Transfusions. R. D. McClure and C. R. Lam. —p. 261.

Statistical Analysis of Study of Prevention of Infection in Soft Part Wounds, Compound Fractures and Burns, with Special Reference to Sulfonamides. F. L. Meleney, with foreword by A. O. Whipple. —p. 263.

*Absorption of Sulfonamides from Burn Surface. E. I. Evans, M. J. Hoover and G. W. James.—p. 297.

Closure of Defects of Skull with Tantalum. W. J. Gardner.—p. 303.

Intravenous Injection of Protein Digest Solution in Surgical Patients. C. S. White and J. J. Weinstein.—p. 313.

Practical Considerations in Definitive Amputation Surgery. H. W. Woughter and E. E. Myers.—p. 319.

Conservative Management of Adolescent Slipping of Capital Femoral Epiphysis. R. D. Moore.—p. 324.

Total Pancreatectomy, Gastrectomy, Duodenectomy, Splenectomy, Left Adrenalectomy and Omentectomy in Diabetic Patient.—Brunschwig and his associates report that a man aged 53 was admitted to a hospital with a complaint of watery, foamy stools for the previous two years and a loss of 50 pounds (23 Kg.). The presence of steatorrhea was confirmed and the patient was found to be severely diabetic. X-ray examinations of the stomach, duodenum, chest and colon were negative. Laparotomy was not indicated, as improvement occurred on medical management without pain. The patient was readmitted six months later because of moderately severe icterus, pruritus and pain in the right upper quadrant. Exploratory laparotomy revealed carcinoma of the body of the pancreas with invasion of the adjacent viscera. The patient was subjected to a total pancreatectomy, total gastrectomy, splenectomy, total duodenectomy and left adrenalectomy. The diabetes was not aggravated following the operation; there were periods when the diabetes appeared to be less severe than before operation. With a caloric intake equivalent to about 2,500 (400 Gm. of carbohydrate) the insulin requirements were 30 units of protamine and 10 units of regular insulin daily. Experience with this patient demonstrates the feasibility of very radical resections for abdominal cancer. Two and a half months after the operation the patient was in fair condition and ambulatory, but a month later he died and necropsy revealed abdominal carcinomatosis.

Malaria from Blood Transfusions.—Two patients were infected with blood that had been refrigerated for five days. A woman aged 57 developed malaria after a transfusion with bank blood, the donor having been a man aged 50 who had been born in Sicily and who at the age of 10 had had chills and fever for four months; he had been living in Michigan since the age of 16; an ordinary blood smear made on the donor after the transfusion was negative for malarial parasites. A white woman aged 23 developed malaria following transfusion of bank blood; her donor also had been a man born in Sicily, who had lived in this country since the age of 19. Since addition of quinine to the blood has been without effect, prophylactic administration of the drug to the recipient has been suggested, whenever questionable blood is being given. McClure and Lam state that the proper screening of donors is the logical means of preventing malarial transmission and that questions relating to geography would probably be more effective than those regarding past illness.

Absorption of Sulfonamides from Burn Surface.—Evans and his associates show that absorption of sulfonamides from a burn surface is limited when oil base ointments are employed. In contrast, when a water dispersible base is used toxic blood levels of the drug may occur. Studies on burned patients indicate that oil base sulfonamide ointments can be used with safety; their use has been attended with gratifying results of low incidence of infection. An oil base composed largely of mixtures of lanolin and petrolatum has proved very satisfactory.

Surgery, St. Louis

17:153-318 (Feb.) 1945

Problem of Thromboembolism. G. de Takats and E. F. Fowler.—p. 153.

*Etiology and Prevention of Thrombosis of Deep Leg Veins. W. C. Hunter, J. J. Krygier and J. C. Kennedy.—p. 178.

Postoperative Pulmonary Embolism. J. S. McCartney.—p. 191.

*Use of Dicumarol in Prevention of Postoperative Thrombosis and Embolism, with Special Reference to Dosage and Safe Administration. N. W. Barker, H. E. Cromer, M. Hurn and J. M. Waugh.—p. 207.

Surgery of Deep Venous Thrombosis of Lower Extremity. J. R. Veal and H. H. Hussey.—p. 218.

*Surgical Therapy of Thrombosis of Deep Veins of Lower Extremities. J. Fine and A. Starr.—p. 232.

Intravenous Clotting. A. Ochsner.—p. 240.

Disaster Following Femoral Vein Ligation for Thrombophlebitis; Relief by Fasciotomy; Clinical Case of Renal Impairment Following Crush Injury. C. Dennis.—p. 264.

Sensation of Gas Stoppage During Onset of Acute Appendicitis. E. L. Keyes.—p. 270.

Urologic Problems Associated with Surgical Treatment of Carcinoma of Rectum. J. A. Lazarus.—p. 284.

Conservative and Operative Treatment of Lesions of Intervertebral Disk in Low Back. J. A. Key.—p. 291.

Cranioplasty with Tantalum Plate. H. Echols and J. A. Colclough. —p. 304.

Thrombosis of Deep Leg Veins.—Hunter and his associates present a comparative study of the incidence of venous thrombosis in the legs in 400 unselected necropsies on adults performed before and after preventive measures were instituted. In the first group the authors routinely removed the calf muscles in order to test their conviction that the most important etiologic factor in phlebothrombosis of the lower extremities is confinement to bed for more than a brief period. The second study was extended to include dissection of the femoral veins and those of the abductor muscles, shown by Frykholm to be almost as frequently occluded as the major veins. The authors found that phlebothrombosis of the lower extremities begins in the deep vessels of the calf and tends to propagate toward the heart, and that thrombosis of the femoral veins alone is an uncommon occurrence. Thrombosis of the deep veins of the leg is a frequent event in all classes of middle aged and older patients who must go to bed for longer than a few days. The onset is insidious and without prominent symptoms. Phlebitis, as a cause or as a complication of deep extremity vein thrombosis, is uncommon and for this reason is unimportant. The logical approach to the problem of phlebothrombosis and pulmonary embolism is prophylactic. The authors stress the importance of leg exercises after operations and in other bedfast patients. Reeducation of physicians and nurses with respect to the causes of thrombosis of the legs is urgently needed. The incidence of phlebothrombosis in medical patients proved to be significantly less than it was in the first 200 cases. It seems probable that the institution of active exercises for this group is responsible for the decrease.

Dicumarol in Prevention of Postoperative Thrombosis and Embolism.—One thousand surgical patients were given dicumarol in the immediate postoperative period for the purpose of preventing postoperative venous thrombosis, pulmonary embolism and thrombophlebitis. Barker and his associates have found it effective in preventing these complications in cases in which there had been nonfatal pulmonary embolism, thrombophlebitis or a history of previous thrombosis or embolism and when the drug was given prophylactically if no thrombosis or embolism had occurred. There is a small risk of bleeding. This can be minimized by proper administration of the drug and rapid control of excessive prothrombin deficiency. Dicumarol should not be given unless prothrombin time tests are done daily. The prothrombin level should be kept between 10 and 30 per cent of normal. Excessive prothrombin deficiency produced by dicumarol can almost always be controlled by the intravenous administration of large doses (60 to 64 mg.) of menadione bisulfite (synthetic vitamin K). If bleeding occurs as the result of excessive prothrombin deficiency it can be controlled by transfusions of freshly drawn citrated blood and intravenous administration of large doses of menadione bisulfite.

Surgical Therapy of Thrombosis of Lower Extremities.—Fine and Starr show that heparin and dicumarol are useful but not thoroughly dependable agents for the prophylaxis of pulmonary embolism. Their use is furthermore complicated by hemorrhage in wounds and elsewhere, which has occasionally proved fatal. The surgical prophylaxis of pulmonary embolism is the procedure of choice among those who prefer a more direct and immediately applicable method for blocking the discharge of an embolus. The risks of ligation of the common femoral, the iliacs and possibly also the vena cava are minimal and are accompanied by little postoperative disturbance except for transitory increase in edema in occasional instances. The selection of the level of ligation is made on the basis of the extent of involvement: (*a*) The common femoral vein is ligated when thrombophlebitis is limited to the veins below the knee or when pulmonary embolism has occurred in the absence of all signs of involvement; (*b*) the common iliac is ligated when thrombophlebitis involves the common femoral, external or common iliac veins; (*c*) the vena cava is ligated when the indications are that both common iliacs require ligation. Since the frequency of bilateral involvement is high, bilateral vein ligation is generally indicated. The occurrence of spastic narrowing or obliteration of venous channels limits the diagnostic usefulness of venography. The distinction between quiet venous thrombosis and full blown thrombophlebitis, that is, phlegmasia alba dolens or milk leg, is not a dependable means of deciding when a clot is detachable and when it is not. Therefore, exploration in most cases of so-called milk leg is advisable Early mobilization after operation does not provide full security against the development of thrombophlebitis.

United States Naval Med. Bulletin, Washington, D. C.

44:225-452 (Feb) 1945. Partial Index

*Immersion Blast Injury: Clinical Experiences E L Gage—p 225
Pathology of Immersion Blast Injury. A. Yaguda—p 232
Report of Injuries Among Survivors of Airplane Crash. J S Thiemever Jr.—p. 241.
Delayed Acute Aero Otitis Media and Methods of Prevention W J Brown—p 247.
Medullary Canal Wire Transfixion in Metacarpal and Forearm Fractures R. D Long and H. C. Fett—p 253
Haynes External Fixation Splint in Treatment of Lower Extremity Fractures. W. M. Cashman—p. 257.
Injection Treatment of Flat Feet H L Hipps and H Neely—p 262
Diarrheal Diseases in Navy Navy's Experience, 1882 1942 D F Smiley and H. A. Raskin—p 267.
Use of Paredrine Hydrobromide· Parahydroxy a Methyl Phenyl Ethyl amine Hydrobromide in Control of Cardiac Arrhythmias, with Review of Literature G C Griffith—p 284
*Venopressor Mechanism in Production of Shock Its Treatment with Nikethamide. L. Gunther—p 300
Medicine in South Pacific. A. M. Master.—p 308
Special Problems in Acute Rheumatic Fever A C Wyman.—p 316
Suppression of Urine Complicating Sulfadiazine Therapy. L V Smiley—p. 328
Fluoroscopic Hazards, Including Use of Unprotected Radiographic Screens. C. F Behrens—p 333
Electroencephalography in Study of Chronic Behavior Problems Review. O. A. Will Jr—p 341
Sclerosing Agent in Treatment of Subluxation of Mandible and of Hemangiomas of Mouth I Salman—p 361
So Called Reiter's Disease· Triad of Acute Arthritis, Conjunctivitis and Urethritis H. H. Rosenblum—p 375
Meningitis in an Island Naval Air Station Dispensary S M Dillenberg—p. 379

Immersion Blast Injury.—Gage reports observations on 98 men who had survived a sinking at sea and subsequent depth charge explosion. Serious intra-abdominal injury occurred in 23 patients. Since these patients were received thirty-six hours after injury, conservative treatment was decided on. Morphine was given freely to overcome shock, to relieve pain and to reduce intestinal activity. No patient was given food or an enema until it could be determined that no intra-abdominal injury was present. Plasma, dextrose or saline solution was given as indicated. In 10 instances it was necessary to pass a Miller-Abbott or Wangensteen suction tube. At the end of ten days 35 of the 98 patients remained in the hospital, 58 had been discharged and 5 had died. Four of the deaths occurred in seven, twenty-seven, thirty and forty-two hours respectively, the cause being generalized peritonitis. At no time were these patients in condition for operation. The fifth death occurred at the end of five days from pooled plasma anaphylaxis. Nearly all the injured men reported that they felt as if they had been kicked in the painful area (stomach, back, testes) when the depth charge went off. All but 2 of the patients with serious abdominal injury estimated that they were within 100 feet of the depth charge when it went off. A study of the severe abdominal injuries shows that when the depth charge exploded all these men were on their abdomens or were in water above the abdomen and facing the blast. The advisability of allowing no food or activity until careful examination has been made cannot be overemphasized. Surgical intervention might have been deemed necessary in some instances had the patients been hospitalized within ten to twelve hours after the explosion. Secondary perforation of a viscus occurred in 2 patients, in 1 as late as forty days after the injury. One man who was promptly operated on recovered. Gage is inclined to believe that, with the excellent supportive treatment received, recovery might have occurred without operation. This does not mean that patients with immersion blast injuries with perforation, rescued early, should not be operated on; however, when the optimum period for operation has passed, nonoperative treatment can help save many lives.

Venopressor Mechanism in Shock: Treatment with Nikethamide.—According to Gunther peripheral circulatory failure is always associated with and preceded by a decline in intramuscular pressure. Shock, observed under these circumstances, is never manifest without a low intramuscular pressure. The value for intramuscular pressure may be found as low as 20 mm. of water. This level indicates a complete absence of muscle tonus and a complete failure of the venous pump An increase in intramuscular pressure, either spontaneously or induced by treatment, to above 40 mm. of water always coincides with compensation of a failing peripheral circulation Of the many substances studied, only two accomplished a restoration of a low intramuscular pressure. These were human plasma and a 25 per cent solution of pyridine-beta-carboxylic-acid-diethylamide, which is known as nikethamide. Human plasma acts slowly, requiring from seventy to one hundred minutes to manifest its pressor action on the venopressor mechanism Nikethamide acts rapidly, manifesting its pressor action on the venopressor mechanism within five to ten minutes, but the effect does not last as long as with plasma. The intravenous administration of nikethamide in adequate dosage will support the venopressor mechanism during the time needed for plasma to become effective. Nikethamide is to be used as an adjunct before or concurrently with plasma. Nikethamide is relatively without toxicity It must be given in large amounts intravenously to be effective. It is not effective for restoration of muscle tonus when administered by mouth or intramuscularly.

Virginia Medical Monthly, Richmond

72:99-148 (March) 1945

Narcosynthesis and Hypnotism. A. M. Duval—p 101.
Radiation and Neurosurgery in Advanced Cancer. G. Cooper and V W Archer—p 108
Relationship of Soil Fertility and Psychic Reactions. J. A Shield. —p 114.
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Western J. Surg., Obst. & Gynecology, Portland, Ore.

53:65-92 (March) 1945

Thiouracil (Deracil): Study of its Use in 43 Cases of Thyrotoxicosis. J. R. Montague and C. P. Wilson—p 65
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*Use of Vitallium Tube in Stricture of Common Bile Duct J. H. Saint.—p. 73.
Aids in Management of Varicose Veins E F. Gooel—p 80
Clinical Significance of Chronic Gastritis M E Dailey—p 85.
Appendectomy on Poliomyelitis Patient in Drinker Respirator. D. Metheny and H H Olson—p 88

Vitallium Tube in Stricture of Common Bile Duct.—Saint reports a case in which an initial stricture of the common bile duct was treated by permanent intubation with a vitallium tube. The patient made a satisfactory recovery and is in good health up to the time of writing, nineteen months after her operation. Results so far reported are encouraging enough to warrant the further use of the tube in selected cases

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine, Liverpool

38:159-222 (Dec. 20) 1944. Partial Index

Second Report on Treatment of Trypanosomiasis by Pentamidine. G. F. T. Saunders, J. R. Holden and M. H. Hughes.—p. 159.

Investigations in Chemotherapy of Malaria in West Africa: II. Malaria Suppression—Quinine and Atabrine. G. M. Findlay and A. C. Stevenson.—p. 168.

Use of Penicillin for Obtaining Bacteria-Free Cultures of Trichomonas Vaginalis Donné, 1837. S. Adler and R. J. V. Pulvertaft.—p. 188.

New Keys to West African Anophelini. P. F. Mattingly.—p. 189.

Investigations in Chemotherapy of Malaria in West Africa: III. Further Investigations on Treatment With Quinine and Atabrine. G. M. Findlay, J. L. Markson and J. R. Holden.—p. 201.

Notes on Fatal Case of Yellow Fever. R. Kirk and A. Bayoumi.—p. 205.

Prophylactic Effect of Soaps Impregnated Respectively with Tetraethylthiuram Monosulfide and with Benzyl Benzoate When Used Once Daily to Wash Rats Exposed to Infection with Scabies Due to Notoedres. R. M. Gordon and K. Unsworth.—p. 207.

British Journal of Urology, London

16:125-168 (Dec.) 1944

Tuberculosis of Prostate. A. and E. de la Peña.—p. 125.

Clinical Use of 100,000 Units of Penicillin in Sulfa-Resistant Gonorrhea: Report of 112 Cases. C. J. Schmidlapp, N. L. Bosworth and L. W. Riba.—p. 133.

Indian Medical Gazette, Calcutta

79:455-510 (Oct.) 1944

Cerebral Malaria: Pathogenesis, Symptoms and Treatment. R. Viswanathan.—p. 455.

Developing Gametocytes and Schizonts of Plasmodium Falciparum: Case Showing All Stages in Peripheral Circulation. B. M. Das Gupta and S. K. Ganguli.—p. 458.

*Early Diagnosis of Kala-Azar. J. Lowe.—p. 459.

*Value of Complement Fixation Test in Diagnosis of Kala-Azar. P. C. Sen Gupta.—p. 465.

Quality of Indian Made Synthetic Drugs. II. Examination of Iodochlorhydroxyquinoline (Enterovioform) of Indian Manufacture. J. C. Pal, B. Mukerji, J. C. Gupta and M. L. Chatterjee.—p. 469.

Anacidity in Gastric Cancer. R. G. Chitre and V. G. Samant.—p. 472.

Case of Military Tuberculosis of Serous Membranes with Nontuberculous Brain Abscess. B. I. S. Bhalla and P. N. Bardhan.—p. 476.

Transmission of Kala-Azar in India: Case Against Sandfly. R. H. Malone and A. G. Brooks.—p. 484.

Early Diagnosis of Kala-Azar.—According to Lowe, present conditions in eastern India favor an epidemic of kala-azar. In the past, diagnosis was usually delayed until the third or fourth month of fever. Earlier diagnosis was often impossible because spleen puncture is advisable only when the spleen is considerably enlarged, and moreover the aldehyde and antimony tests become positive only after this period. Patients who developed kala-azar frequently suffered from recurring bouts of fever which were either untreated or treated as due to malaria or some other condition. The author presents reports of patients with kala-azar who have been seen early in the disease. The most constant finding in the early cases has been the irregular temperature of remittent nature with a relatively rapid pulse rate and the absence of severe toxemia. In the early diagnosis of kala-azar the general clinical picture and the nature of the fever are the most important considerations; sternal puncture with staining for Leishmania donovani provides the most reliable method of confirmation. The complement fixation test done with the Witebsky, Klingenstein and Kuhn antigen or some modification of it is the next most useful confirmatory measure. With clinical observations and the use of these tests, diagnosis should usually be possible within three weeks of onset.

Complement Fixation Test in Kala-Azar.—Sen Gupta reports from the Calcutta School of Tropical Medicine 920 cases in which the complement fixation test was done according to the technic described by Greval, Sen Gupta and Napier with an antigen prepared according to the Witebsky, Klingenstein and Kuhn method from Kedrowsky's bacillus. A positive reaction was obtained in 93 per cent, a doubtful reaction in 6 per cent and a negative reaction in 1 per cent of all cases of kala-azar. In 99 per cent of all cases likely to be considered in the differential diagnosis of kala-azar a negative reaction is obtained. In 1 per cent a doubtful reaction may be obtained. A positive reaction is obtained in a few cases of chronic pulmonary tuberculosis, but such cases are readily excluded by their clinical features. The antigen prepared from Kedrowsky's bacillus is somewhat inferior. It is probable that with the antigen prepared locally from the human tubercle bacillus better results will be obtained. This test provides a method of laboratory diagnosis at a stage when all other procedures except a sternal puncture are negative. In several cases the positive reaction was obtained within three weeks of onset. Specific treatment of kala-azar causes the reaction to become negative or produces a lowering of the degree of complement fixation.

Journal of Hygiene, London

44:1-66 (Jan.) 1945

Studies on Disinfecting Action of Hypochlorous Acid Gas and Sprayed Solution of Hypochlorite Against Bacterial Aerosols. W. J. Elford and Joan Van DenEnde.—p. 1.

Etiologic Factors in Bronchopneumonia Among Infants in London. G. P. Wright and H. P. Wright.—p. 15.

Study of Vi Agglutination Test for Detection of Typhoid Carriers. E. F. W. Mackenzie, and E. W. Taylor.—p. 31.

Bacteriologic Investigation into Causation of Diarrhea and Enteritis in Dublin in 1942-1943. S. Sevitt.—p. 37.

New Form of Reagent Against Perspiration Effects on Shoe Materials. A. Colin-Russ.—p. 53.

Influence of Salmonella Typhi-Murium Infection in Rats on Vitamin Metabolism. I. J. Kligler and K. Guggenheim.—p. 56.

Susceptibility of Vitamin A Deficient and Starved Rats and Mice to Peroral Infection with Salmonella Typhi-Murium. I. J. Kligler, K. Guggenheim and E. Henig.—p. 61.

Lancet, London

1:135-166 (Feb. 3) 1945

Compound Fractures in War: 1944. J. A. MacFarlane.—p. 135.

Decompression for Chronic Prostatic Retention. H. T. Cox.—p. 138.

*Pneumococcus Lobar Pneumonia: Results with Different Blood Levels of Sulfapyridine. A. Dick.—p. 141.

*Hemothorax. T. H. Sellors.—p. 143.

Determination of Plasma Mepacrine: Note on Anticoagulant.—p. 144.

Aspirin Poisoning: Report of Case. P. Hopkins.—p. 145.

Treatment of Burns with Partial Skin Destruction: Illustrative Case. D. H. Patey and R. W. Scarff.—p. 146.

Traumatic Anuria in Miner. A. Caplan and G. E. Dunkerley.—p. 147.

Cold Agglutination in Tropical Eosinophilia. R. Viswanathan and B. Natarajan.—p. 148.

Blood Levels of Sulfapyridine in Pneumonia.—Dick previously called attention to the fact that in Glasgow type II pneumococcus infections carried a fatality rate of about 14 per cent when only a sulfonamide drug was administered and that the addition of an autogenous vaccine failed to improve the results. A more intensive course of chemotherapy was suggested. Results of therapy in 161 patients with pneumonia as judged by the duration of primary pyrexia, the incidence of complications and the final outcome of the disease could not be correlated with the blood concentration of the drug. A more intensive course of chemotherapy in pneumonia does not appear to be justified, and there appears to be no reason for exceeding the recognized dosage of 2 Gm. initially followed by 1 Gm. every four hours.

Hemothorax.—In most hemothoraces the blood remains liquid. It is now generally recognized that clotting occurs, but the hematoma is rapidly defibrinated so that the actual gel form of clot is transposed into shreds of fibrin floating in a pool of liquid blood. To get some evidence on the behavior of intrapleural blood, investigations have been made on a number of hemothoraces. No instances of infected hemothorax has been included, since inflammation would alter the pleural reaction. Only those cases have been included in which the first two aspirations yielded at least 2 pints. The blood may reach a volume of several pints and in the free pleural sac this clots normally but is rapidly defibrinated. A liquid mass is formed in which fibrin shreds may be deposited. Fairly quickly a serous effusion develops, and it is this effusion that accounts for the main deposit of fibrin that complicates the later picture. The sooner the original hemothorax can be evacuated the better will be the chances of functional recovery. Clotted hemothorax is relatively rare, but coagulation of an effusion of high fibrinogen content gives rise to the clotted fibrothorax. In the presence of a clot—blood or fibrin—active surgery may be required. A small thoracotomy allows the cavity to be cleaned and in selected cases permits removal of the restricting layer of fibrous tissue over the lung. Breathing exercises are of great value in reestablishing full expansion of the collapsed lung.

Prensa Médica Argentina, Buenos Aires

32:1-64 (Jan. 5) 1945. Partial Index

Modern Concepts of Cerebral Vascular Syndromes. A. De Castro. —p. 1.
*Gastrectomy and Skeletal Decalcification. C. Bonorino Udaondo and M. R. Castex.—p. 3.
Hemostatic Action of Blood Plasma. A. Peralta Ramos and A. Pavlovsky.—p. 19.
*Ligneous Thyroiditis (Riedel's Disease): 2 Cases. F. Strada, V. Bertola and A. Ferraris.—p. 22.
Interosseous Arteries of Hand. H. Fracassi.—p. 27.
Thiouracil in Hyperthyroidism. S. E. Luchetti.—p. 34.
Paramesial Supraumbilical Eventrations: Repair with Fascia Lata. L. L. Fernández.—p. 37.
Sedimentation of Erythrocytes in Diphtheria. R. Maggi and D. Wencelblat.—p. 41.

Gastrectomy and Skeletal Decalcification.—Bonorino Udaondo and Castex report clinical, radiologic and chemical investigations on 41 patients who had undergone gastrectomy for gastric or duodenal ulcer or for gastric carcinoma or sarcoma. The time that had elapsed between the gastrectomy and the radiologic study and the investigation of the mineral metabolism varied between four months and twenty-one years, but in the majority three or more years had elapsed. The authors found that the incidence of osseous decalcification in the lumbosacral and pelvic bones (the only bones studied by them) was extremely frequent, and they believe that the digestive and nutritive status produced by the gastrectomy is the primary factor. The investigations revealed that there are other contributing factors in the causation of this osteomalacia, such as too little exposure to sunlight with deficient synthesis of vitamin D and insufficient ingestion of calcium in assimilable form due to inadequate alimentation and digestive disturbances. Cancer, advanced age and endocrine disorders are factors that create or intensify decalcification. Account should be taken of this combination of causes of osteomalacia in patients subjected to gastrectomy and recourse should be taken to measures that nullify the deleterious action of these factors, because preventive measures are usually more effective than is treatment of the established process.

Ligneous Thyroiditis.—Strada and his collaborators mention thyroid cirrhosis, petrous thyroiditis and several other terms for the condition which was first described by Riedel in 1896. They describe 2 cases of ligneous thyroiditis, 1 in a boy aged 15 and 1 in a woman aged 44. The diagnosis is based on three main symptoms: hardness, invasion of neighboring tissues and compression. Two other disorders cause considerable induration of the thyroid, namely cancer and Hashimoto's disease (struma lymphomatosa). Cancer can be differentiated by the grossly nodular surface and early metastases in the lymph nodes of the neck. In Hashimoto's disease, which some regard as the primary stage of ligneous thyroiditis, there exists a uniform enlargement of the entire gland, but the surface is smooth and slightly lobulated; there is no adherence to the neighboring organs; and it occurs almost exclusively in women of menopausal age. The treatment of ligneous thyroiditis consists in subtotal thyroidectomy in order to overcome the compression. It produces favorable results even if only a small part of the tumor is extirpated. In both of the reported cases the operation was well tolerated and great relief obtained.

Deutsche medizinische Wochenschrift, Leipzig

69:713-738 (Oct. 15) 1943

*Intensive Treatment of Malaria (Five Day Cure). A. Hauer.—p. 713.
Results of Treatment for Causalgia with Obliteration of Ganglions of Sympathetic Nerve. J. Hirschmann.—p. 717.
*Intrasternal and Intraosseous Injections and Infusions. N. Henning. —p. 720.
Natural Methods of Treatment for Decompensated Circulation in Rheumatic Cardiac Disorders. F. Pezold.—p. 722.
Treatment for Croupous Pneumonia with Sulfonamide Compounds. A. Dieckmann.—p. 725.
Cholecystography with Bilisectan and Rapid Cholecystography. H. Griessmann.—p. 726.
*Immunization Against Scarlet Fever in Camps of Hitler Youth. J. Wolff. —p. 727.

Five Day Cure of Malaria.—Hauer reports results of intensive treatment of 566 cases of tertian, quartan and tropical malaria during the period from December 1942 to June 1943. A five day course was practiced. One tablet of 0.01 Gm. of plasmochin three times daily and two tablets of 0.1 Gm. of atabrine three times daily were given for the first three days. One tablet of 0.1 Gm. of atabrine three times daily was given on the fourth and on the fifth day. Hydrochloric acid was administered at the same time. Tolerance was convincingly good. The effects of the drugs as parasiticides and as antipyretics were at least the same as if not better than those of a ten or twelve day course which had been employed previously. The early effect of the plasmochin on the gametes may support the control of the mosquito borne infections in the endemic regions of tropical malaria. It is too early for a definite statement with regard to relapses, but it seems likely that the results of the five day course were not less favorable than those of the other methods. A large scale trial is recommended.

Intrasternal Infusions.—Intrasternal transfusions represent a satisfactory substitute in cases in which the intravenous route is not available. The intramedullary route is suggested for cases in which the veins of the extremities are obliterated or are too small. Intrasternal infusions are of the greatest value in wartime for emergency blood transfusions in cases of severe injuries complicated by collapse or shock. Because the needle remains fixed in the cortical substance, the sternal infusion method is indicated in motor unrest of various origin, such as that of diabetic coma, acute circulatory collapse, malignant diphtheria and drug poisoning. The intramedullary route is particularly suited for infants and young children. Henning opposes Tocantins' opinion that the femur or the tibia should be used instead of the sternum in children under 3 years of age. By inserting the needle at an angle, intrasternal injections and infusions may be used in infants. The intramedullary injection into any bone is to be considered in case of failure of the intrasternal injection. This failure may be caused by clotting of the bone marrow and may be prevented by flushing the cannula with a 3.8 per cent sodium citrate solution prior to puncture.

Immunization Against Scarlet Fever.—Children from various parts of Germany were brought to Lower Silesia, where the incidence of scarlet fever was high. Concentration of the children in camps where they had to live permanently, sharing meals and bedrooms, increased the risk of direct infection. Prophylactic active immunization was carried out with "Scarlet Fever Adsorption Vaccine K, Behring," a suspension of killed hemolytic streptococci in an attenuated toxin solution which had been adsorbed with aluminum hydroxide. The vaccine contained an antitoxic component in addition to the antibacterial component. Preliminary immunization experiments were carried out on 40 children whose Dick reaction was positive, 0.5 cc. of the new vaccine being given twice every two weeks. Dick tests were then repeated with negative result in all the children. There were no untoward reactions, such as fever or eruption, except for mild local reactions such as redness or swelling. The same good results were obtained from immunization of 58 children to whom 0.5 cc. of the vaccine was given three times at intervals of four weeks, and from the immunization of 400 children to whom 0.5 cc. of the vaccine was applied twice at an interval of two weeks. Mass immunization with two applications of the vaccine to the upper arm at a four weeks interval was carried out on 3,400 young people from 6 to 16 years of age. Diphtheria vaccine was given at the same time in the other arm. Not a single case of scarlet fever occurred in the camps. In some of the camps, with children between the ages of 10 and 14 years the immunization was performed with "Scarlatox-Asid-Vaccine" instead of the scarlet fever-adsorption vaccine K, Behring. The difference between the two vaccines consisted in the purification method used for the toxin. Three applications at intervals of two weeks were made. Twenty-two children had temperatures up to 103 F. Headache and pharyngitis were present and an eruption occurred in 8 instances. The local conditions in the camp were believed to be responsible for these untoward reactions.

Book Notices

Endocrinology of Woman. By E. C. Hamblen, B.S., M.D., F.A.C.S., Clinical Professor of Endocrinology and Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine, Durham, North Carolina. Cloth. Price, $8. Pp. 571, with 157 illustrations. Springfield, Illinois: Charles C Thomas, 1945.

The author's decision, as stated in his preface, to prepare an essentially new book rather than to refurbish his former volume on Endocrine Gynecology, published in 1939, was a wise one. The present work is undoubtedly a great improvement over the earlier one, which contained much good material, but the arrangement was poor and it was difficult for the reader to find what he might be looking for. In the present streamlined volume, to use the author's own adjective, the subject matter is presented in a systematic and orderly fashion, under five chief subdivisions.

The first of these presents a short but adequate discussion of the history, embryology, anomalies, anatomy, physiology, chemistry and interrelations of the various endocrine glands. The second is devoted to applied endocrine physiology, including a discussion of the endocrines in the fetus and newborn, childhood and adolescence, together with a very satisfactory review of the endocrinology of menstruation and the climacteric. While this section incorporates a good deal of material from the author's previous volume, it has been brought up to date and attractively rearranged.

The third section, dealing with endocrine diagnostic methods, is one of the most valuable in the book. Not only does it describe the innumerable laboratory tests so often necessary in the diagnosis of endocrine problems but it also discusses such clinicolaboratory procedures as endometrial biopsy and vaginal smear study. Hamblen expresses skepticism as to the clinical value of vaginal smear studies, and in this skepticism we heartily concur.

The fourth part of the book deals with functional disorders of the endocrine glands, including many not closely related to the gynecologic field. There can be no criticism of this broad scope, since the gynecologic endocrinologist soon learns that he cannot interpret his problems intelligently if he tries to fence himself within pelvic limits.

The last section of the book deals with endocrinology applied to gynecologic disease and naturally includes the author's views as to the therapy of functional disorders. Curiously enough there is no mention of the treatment of amenorrhea, one of the most troublesome of gynecologic problems. The only plan of treatment of functional bleeding discussed is the author's method of "cyclic regulation" and "pituitary regulation." The plan of beating a dysfunctioning and probably refractory pituitary into cyclic submission by ovarian therapy sounds pretty, but, aside from the duration, expense, inconvenience and general ponderousness of the regimen it has not given as good results in the hands of others as appear to have been obtained by Hamblen. Throughout the book, and even in its preface, the author expresses undying opposition to androgenic therapy under any circumstances, and this extreme view seems unreasoning. He states that such treatment is always "unphysiologic," but so is the accepted diethylstilbestrol treatment of prostatic carcinoma, to mention only one of many possible examples. Every sensible gynecologist recognizes the limitations of androgen therapy as well as its hazards if employed indiscriminately, but many find a limited indication for its employment in this present makeshift era of organotherapy.

The chapter on dysmenorrhea is poor. Hamblen is evidently still a believer in the so-called nasal treatment of dysmenorrhea by cautery of Fliess's spots with trichloroacetic acid crystals, a curious anachronism in an otherwise modern textbook. It is impossible for any one in the present confused era of organotherapy to write a book which would meet the approval of all other endocrinologists, and many will question some of the therapeutic advice given by Hamblen, such as that of giving estrogens cyclically or according to a rather fixed schedule in the treatment of menopausal symptoms. The therapeutic section of this book will be definitely less valuable to its readers than those portions dealing with physiology and diagnosis.

The illustrations are numerous and well chosen, especially the photomicrographs illustrating all manner of endometrial patterns. The publishers have done a good job with typography and format. The book as a whole is one which can be warmly recommended as a very worthy addition to the ever increasing number of works devoted to this expanding field.

Pastoral Work and Personal Counseling. By Russell L. Dicks. Cloth. Price, $2. Pp. 230. New York: Macmillan Company, 1944.

This work by the chaplain of Wesley Memorial Hospital is written for the "average clergyman." The author has had considerable experience in dealing with illness and is co-author with Dr. Richard Cabot of "The Art of Ministering to the Sick." For this reason the book is of interest to the physician. The author stresses the lack of preparation of many clergymen for counseling with persons in conflict and feels that the physician and social worker have almost shouldered the clergyman out of his own field. The book deals with methods in approaching individual problems and correctly emphasizes the importance and nature of the relationship of the pastor to members of his church as counselor. By example and by records of interviews the author attempts to place before the reader his own basic attitudes and his actual experience. This is a candid, refreshing work, well suited to its purpose. Its scope is distinctly limited, since there is no pretense of presenting principles underlying the disturbing behavior or disturbed feelings of those whom the pastor attempts to aid. The present day theological student would wish more thoroughgoing ground work in psychology and psychiatry. The author is quite direct in delimiting problems to which the pastor should address himself and stresses the appropriate working relationship between pastor, social worker and physician. This is an honestly written book that evidences the warmth and human understanding of the author.

The Principles and Practice of Tropical Medicine. [Part I.] By L. Everard Napier, C.I.E., F.R.C.P., Director and Professor of Tropical Medicine, Calcutta School of Tropical Medicine. Cloth. Price, 25 rupees. Pp. 522, with illustrations. Calcutta: Thacker, Spink & Co. (1933), Ltd.; London: W. Thacker & Co., 1943.

Part I of a two volume work, the second of which is yet to appear, considers measures for mitigating the effects of tropical climate, diseases due to the direct effects of tropical climate, malaria, leishmaniasis, trypanosomiasis, the relapsing fevers, rat bite fever, the typhus fevers, Oroya fever, yellow fever, Rift Valley fever, the dengue sandfly fever group, plague, tularemia, the undulant fevers, melioidosis, the intestinal fluxes and leprosy. The work is admittedly an introductory textbook on tropical medicine and because of several excellent clinical descriptions and complete discussions of treatment it will be of particular value to medical students and clinicians. No attempt has been made to prepare a volume of reference for the advanced worker. Although the presentation of diseases gives major importance to the clinical side, the essentiality of proper laboratory procedures is adequately stressed. In this connection attention is called to the increased frequency with which the etiologic agents of tropical diseases may be demonstrated. The section on kala-azar reflects the author's knowledge of the disease and substantiates his rank as an authority on the subject. On the other hand, the conception that all primary infections with Endameba histolytica should be called "amebic dysentery" and all other symptoms should be considered as secondary to dysentery is at variance with most authorities on the subject. On the whole, the book is considered to be an excellent one for its purpose and should find wide use.

Etudes de psychologie médicale. Par André Ombredane, professeur de psychologie expérimentale à l'Université du Brésil, Rio de Janeiro. I. Perception et langage. II: Geste et action. Les publications savantes de l'École libre des hautes études du Brésil, 2,3. Paper. Pp. 189, with 12 illustrations; 129, with 7 illustrations. Rio de Janeiro: Atlantica Editora, 1944.

It would be difficult, if not impossible, to find in the modern literature of any country a more fundamental and exhaustive study of the problems presented here than this masterly work by André Ombredane. Only a man who commands the enormous literature of two continents dealing with aphasia, agnosia and apraxia and has the brilliance and experience of Ombredane

could give us such a critical analysis and synthetic presentation of this most difficult subject.

The author bases his chapter on aphasia on Baillarger's principle "the substitute of the involuntary verbal incitation for the voluntary one" and Hughlings Jackson's conception of diseases of the nervous system as reversed evolution, e. g. dissolution. Dissolution as a process of regression proceeds from the least organized, the most complex, the least automatic toward the most organized, the simplest and most automatic. In a uniform dissolution the highest centers are the most affected. A high (cortical) center tends to represent the whole of the organism in contrast to a low (for instance spinal) center, which represents an elementary organ capable of functioning independently of the rest of the organism. All the nerve centers are necessarily of sensory-motor constitution. There are stages of conscience corresponding to the different levels of central organization, their mental character being the more accentuated the more higher centers are engaged. Body parts predominantly employed in voluntary actions have a particularly important representation in the highest brain centers.

Under these conditions the internal evolution of the upper centers corresponds to a great multiplication of neural arrangements representing the muscles of the hands, the eyes, the speech, the retina, so much so that the dissociated or mental activity of the upper centers is in reality bound to the awakening of sensory impressions and to the concept of manual, ocular, articulate movements which mutually release themselves, get organized and develop in conformity with the symbolic values which they have acquired.

In the process of dissolution voluntary execution is found defective when automatic acts may still function normally. The question, as far as aphasia is concerned, is not which elements but which uses of speech are affected by a lesion. The author then discusses the different uses of speech. A large part of volume I, 85 pages, deals with optic agnosia and contains among others a discussion of the publication of Goldstein and Gelb. Then follows an analysis of a case of pure alexia. Two chapters on congenital dyslexia and acoustic agnosia terminate this volume.

The second volume, of 107 pages, is dedicated to the analysis of apraxia, understood as a loss of voluntary or propositional gestures. The theories of Liepman, Pick, Charles Foix and von Monakow are thoroughly discussed and at the end the relation of apraxia to aphasia is analyzed. The author finally arrives at the very concept from which he started in discussing the jacksonian concept of aphasia, e. g. that apraxia does not conform to the body anatomy but to the different conditions under which actions are performed. One should distinguish an apraxia integrated in a disturbance of the equilibrium, an apraxia as a part of a disturbed left-right and body orientation, an apraxia as part of a sensory agnosia, particularly an optic one, an apraxia as part of an aphasia and an apraxia of the type seen in dementia. Two cases of apraxia are analyzed in detail.

Handbook of Industrial Psychology. By May Smith. Cloth. Price, $5. Pp. 304. New York: Philosophical Library, Inc., 1944.

This is a useful, comprehensive book whose author has had much experience. It discusses fatigue, the environment with relation to light, temperature, noise and hours and the relationship of the individual worker to the group around him. There are also chapters on vocational guidance and selection and training and on time and motion studies. Another chapter deals with the nervous temperament and expressions of nervousness in work. Also included in the general content are discussions of accidents, grievances, misfits, sick absenteeism and labor wastage and comments on methods of investigation. In these times, so much is said and so much written concerning industrial medicine, comprehensive medical plans for workers and their dependents, hospitalization schemes and similar topics that it is most beneficial to be able to refer to a publication which deals with the basic factors influencing the reactions and conduct of industrial workers. These factors are universal and arise either out of environment or out of the reactions of one human being on another. They are commonly disregarded, often by those who talk loudest about medical care for workers, and it is to be feared that there are many who are active in the field of industrial medicine and industrial relations to whom this book would come as a revelation. This handbook is based on British experience but basically it is applicable anywhere. It is well printed, the type is large enough to make reading easy, and it is to be hoped that it will have a wide circulation among those who are engaged in an administrative capacity in personnel and medical departments in industry.

Elements of Bacterial Cytology. By Georges Knaysi, Professor of Bacteriology, Cornell University, New York. Cloth. Price, $3.50. Pp. 209, with 101 illustrations. Ithaca, New York: Comstock Publishing Company, Inc., 1944.

This is a detailed and critical treatment of bacterial structure. The author, who has an exceptional background in physical chemistry in addition to cytology, has avoided and revealed many pitfalls in a difficult subject. He has drawn on recent knowledge gained with the electron microscope. The medical bacteriologist will be disappointed, however, to find almost no use made of the great contributions of immunochemistry and the chemistry of pathogenic bacteria to the composition of the bacterial cell wall and capsule. It is regrettable too that the treponemes are described as possessing axial filaments and no flagella; recent work with the electron microscope has shown both these accepted beliefs to be in error. The specialist and graduate student in general bacteriology will find in this book critical insights into bacterial morphology and the structural basis of bacterial function and, in addition, many problems in need of critical review.

Combined Textbook of Obstetrics and Gynæcology for Students and Medical Practitioners. Revised by J. M. Munro Kerr, LL.D., M.D., F.R.F.P. & S., and others. With additional contributions by Charles McNeil, M.A., M.D., F.R.C.P., Professor in Child Life and Health, University of Edinburgh, and G. Jackson Wilson, M.B., D.P.H., Radiologist, Glasgow Royal Maternity Hospital and the Victoria Infirmary, Glasgow. Fourth edition. Cloth. Price, $12. Pp. 1,208, with 511 illustrations. Baltimore: William Wood & Company, 1944.

This edition is the fourth one which has appeared during the last twenty-one years. Like its predecessors, several of the leading British obstetricians and gynecologists are contributors. There is rarely any mention of authorship of a chapter; hence presumably each chapter was discussed by all or several of the contributors. For the first time a section on contraception is included.

In the opinion of the reviewer the following are faults in the book: In the discussion of young human ova, the Miller ovum is still regarded as the youngest despite the fact that Hertig and Rock recorded a much younger and thoroughly studied ovum; the Hertig-Rock studies were reported in 1942. Among the biologic tests of pregnancy space is devoted to such antiquated and discarded tests as Abderhalden's serum reaction, the sugar tolerance tests, the phlorhizin test, the epinephrine test, complement fixation tests and blood sedimentation tests. The authors advise against long motor or train journeys in spite of the fact that during the last few years large numbers of pregnant wives of men in the armed forces have traveled thousands of miles under the most trying conditions with practically no harm to themselves or their babies. In cases of septic abortion, emptying of the uterus is advised and, while the results are good, most American obstetricians believe that it is safer to avoid surgical intervention in infected cases of abortion. Likewise exception may be taken to the use of glycerin, pituitary extract and ergot in these cases. In the chapter on analgesia and anesthesia there is no mention of caudal anesthesia. This will astonish many of the stanch advocates of continuous caudal anesthesia and the editors of some of our popular lay magazines. The authors properly condemn the Walcher position, yet they waste an illustration on it. In the illustration demonstrating an episiotomy a lateral incision is shown, but this is the least satisfactory of all the types of episiotomy. There is a section on intrauterine douches for various purposes, but few obstetricians or gynecologists in the United States use intrauterine douches. For replacing a retroflexed uterus the authors describe and illustrate replacement with a uterine sound. This procedure carries too much risk to be recommended to general practitioners.

In spite of the foregoing criticisms, the book is full of useful information about obstetrics and gynecology. It is well written and abundantly illustrated. It will undoubtedly and deservedly continue to be one of the most popular books in England.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES, UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

STERILIZATION OF OBJECTS CONTAMINATED WITH TUBERCLE BACILLI

To the Editor:—One of the things that deserves more attention about tuberculosis sanatoriums is the matter of sterilization of the products of patients' handiwork. Information on this subject is certainly not as widespread as it should be, even in tuberculosis institutions. Tuberculosis usually spreads by inhalation of bacilli expectorated by a patient, but the possibilities of contraction by indirect contact cannot be neglected, particularly in the case of toys or other articles made by patients for the use of small children. Dry cleaning is advised to deal with woolens contaminated with tuberculous sputum, but I can find no authority stating that naphtha, gasoline or carbon tetrachloride will definitely kill tubercle bacilli. If not these agents, what part of the dry cleaning process sterilizes the cloth? As steam sterilizing or boiling ruins woolens, we must trust to dry heat in some cases. What temperature will woolen garments stand of dry heat without deterioration, and how long should woolens be subjected to a suitable dry temperature for sterilization? What are the specifications for sterilizing mattresses in a tuberculosis sanatorium? In the case of cotton or kapok filled toys covered with cotton or wool and unable to undergo wetting, what degree of dry heat should be used and for how long? Would formaldehyde vapor be injurious to wool, cotton or furs or the dye therein? How long should articles be subjected to formaldehyde vapor for sterilization? What solution is used by bottlers to sterilize bottles for carbonated beverages? Is this efficacious in destroying tubercle bacilli? Is it injurious to cloth?

B. J. Terrell, M.D., Nopeming, Minn.

ANSWER.—The department of bacteriology of a medical school subjected standard strains of Staphylococcus aureus and Eberthella typhi to Stoddard solvent for the same time that clothing is in this solvent during the cleaning process. All the organisms were killed. A pure culture of tubercle bacilli was then treated in like manner and the sediment was inoculated into guinea pigs. To date no sign of infection has developed in these animals. Other strains of tubercle bacilli are to be subjected to the same treatment, after which the final report will be published. As far as can be determined at this time, the dry cleaning process described serves to destroy tubercle bacilli.

Dry heat may be applied to ordinary woolens at a temperature of 250 F., and to carbonized woolens at 230 F. for a few minutes to one-half hour without damaging the material. Thirty minutes of dry heat to this degree is adequate to destroy tubercle bacilli. (Any heat over these temperatures tenders the cloth and drys up the dye oils and grease.)

The sterilization of mattresses by dry heat is effective. Laundering is satisfactory for cotton materials as, if color fast, they can be subjected to hot water. In the case of cotton or kapok filled toys covered with cotton or wool and unable to undergo wetting, dry heat should suffice; in fact, cotton tolerates a temperature of 400 degrees, which also is harmless to kapok.

The use of formaldehyde vapor for sterilization is falling more and more into disfavor. Rosenau states that none of the gases can be depended on to disinfect clothing, bedding or fabrics. While formaldehyde is suitable for general use, it does not accomplish more than a surface disinfection, as it ordinarily possesses small powers of penetration. Large quantities of formaldehyde vapor are lost by uniting with the organic matter of fabrics, especially woolens, which further hinders its penetration.

For a number of years the American Bottlers of Carbonated Beverages made investigations concerning the causes of spoilage. They found that by far the most important causes of biologic spoilage of beverages are yeasts. Bacteria are not so important because they are sensitive to citric acid, do not grow in sugar concentrations favorable to yeasts and are checked or entirely prevented from growing by moderate quantities of carbonic acid. The molds rarely cause spoilage. Much investigation led the American Bottlers of Carbonated Beverages to the recommendation that unclean bottles be exposed to a 3 per cent alkali solution, of which not less than 60 per cent is caustic (sodium hydroxide) for a period of not less than five minutes at a temperature of not less than 130 F. or an equivalent cleansing and sterilizing process. While this is probably adequate to destroy tubercle bacilli, an extra five or ten minutes is suggested to insure safety. In one large bottling plant a commercial powder, consisting of sodium hydroxide and trisodium phosphate, is used in a 3.5 per cent solution. The bottles are kept in this for fifteen minutes, with a temperature ranging from 130 to 150 F. This procedure should be entirely adequate to destroy tubercle bacilli. In the state where this concern operates there is a requirement that washed bottles contain less than 100 bacteria per bottle. However, numerous tests of washed bottles by the aforementioned method have shown an average of only 6 or 7 bacteria per bottle, none of which were pathogens except Staphylococcus aureus. These probably reached the washed bottles through the air. There is no report available of tubercle bacilli having been recovered from washed bottles.

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EXCRETION OF SULFONAMIDES AND GLOMERULONEPHRITIS

To the Editor:—What is the effect of glomerulonephritis on the excretion of the sulfonamides? What information is available on "sulfonamide block" as pertaining to the kidney?

Lloyd J. Netto, M.D., West Palm Beach, Fla.

ANSWER.—The question is rather ambiguous. If a glomerulonephritis already exists, it can be anticipated that excretion of the sulfonamides will definitely be inhibited and blood levels of these compounds will be maintained at a greater height than if there was no renal involvement. On the other hand, if the only consideration is that glomerulonephritis might result from the use of the sulfonamides it should be pointed out that sulfanilamide has been used successfully in the treatment of acute hemorrhagic (glomerular) nephritis. Sulfapyridine and sulfathiazole, and probably sulfadiazine, should not be employed in the treatment of an infection with an accompanying nephritis. Sulfapyridine and sulfathiazole may injure the kidneys either through intrarenal precipitation of crystals or by a direct action on the kidney cells. Sulfadiazine produces kidney damage only to a limited extent. Under any circumstance, until more definite information has been obtained, if sulfadiazine is used when glomerulonephritis is already present it should be accompanied by sufficient sodium bicarbonate to keep the urine alkaline.

An excellent account of the renal complications following sulfathiazole therapy by Winsor and Burch appeared in THE JOURNAL, April 18, 1942, page 1346. A more recent article is that of Vilter and Blankenhorn in THE JOURNAL, Nov. 11, 1944, page 691.

Even in the presence of a glomerulonephritis, were the indications sufficiently pronounced to warrant the use of sulfadiazine this sulfonamide salt should be given with the reasonable certainty that crystalluria will not develop if adequate sodium bicarbonate and fluids sufficient to bring about a daily output of 1,500 cc. are given.

SULFONAMIDES NOT USEFUL IN POLIOMYELITIS

To the Editor:—Is there any evidence that the sulfonamide compounds have a detrimental effect in acute anterior poliomyelitis? Is the rapidity of the extension of paralysis or the extent thereof affected by these drugs?

M.D., Puerto Rico.

ANSWER.—Extensive work has been done on the effect of sulfonamide therapy on experimental poliomyelitis in mice (Kramer, S. D.; Geer, H. A., and Szobel, D. A.: The Chemoprophylactic and Therapeutic Action of a Wide Variety of Chemical Compounds on Two Neurotropic Virus Infections in Mice, *J. Immunol.* **49**:273 [Nov.] 1944). These workers, using some forty-eight derivatives and compounds of the sulfonamide group, were unable to demonstrate any ameliorating effects on the course of the disease. These workers do not mention any definite deleterious effects in the animals subjected to this type of therapy.

STERILIZATION OF LOCAL ANESTHETICS FOR USE IN EYE

To the Editor:—Please give me information on sterilization of eyedrops for local anesthesia to be used in cataract operations. Is there any solution in which cocaine, atropine, physostigmine or pilocarpine can be dissolved which is self sterilizing? S. F. Goldfain, M.D., Baton Rouge, La.

ANSWER.—Eyedrops are best sterilized by heat. The dropper and the container must also be sterilized. The dropper and a small flask containing the solution may be placed in a small glass jar, such as is used for preserving fruits; this should be autoclaved ten minutes under 20 pounds of steam. In the solution it is well to incorporate a bacteriostatic agent aimed to keep the solution sterile. The universal bacteriostat (an antiseptic as distinguished from a germicide) for solutions of alkaloids is chlorobutanol in a strength of 1 to 0.5 per cent. The chlorobutanol should not be relied on to sterilize a solution as is shown by the following experiment: One drop of a culture of Staphylococcus aureus was dropped into a bottle of water saturated with chlorobutanol. After one, two and three hours samples were tested and there was copious growth, showing that the chlorobutanol did not kill the staphylococci. Another method of sterilizing the solution is to boil the water and while it is boiling add the alkaloid, which can be obtained in tablet form for easy measurement, after which it need not boil more than half a minute.

Precautions: Some of the alkaloids, especially cocaine, are decomposed by heat. If the solution is carefully kept acid p_H 4.5 (which is the p_H when cocaine is dissolved in distilled water without any addition), very little decomposition will take place, but if the solution is even slightly alkaline the cocaine will be rapidly decomposed. It is not safe to use chlorobutanol to sterilize the solution, and if other more powerful antiseptics are used, to be effective they must be in such strength that they will be decidedly injurious to the epithelium of the eye. These include zephiran, which should not be stronger than 1:3,000, and metaphen, which is marketed in the strength 1:2,500 to be diluted with equal parts of water to make 1:5,000. Metaphen comes buffered to a p_H of 7 plus and is therefore much too alkaline for use with cocaine. The cocaine solution should not be reheated over and over because it will become decomposed. Therefore only small quantities should be prepared at one time.

ROCK WOOL NOT CAUSE OF PNEUMONOCONIOSIS

To the Editor:—In the more recent installation of refrigeration in numerous war plants, I have observed in several patients a condition apparently caused by inhalation of rock wool and other fine particles passing into the lung proper. Please give the diagnosis, prognosis and treatment of such a condition. W. A. Newton, M.D., Beaumont, Texas.

ANSWER.—Information on the chronic pathologic effects of inhaled rock wool is practically nonexistent. Fibers of glass wool are not inhalable, and it is assumed that rock wool is likewise excluded from the lungs because of the size and physical properties of the fiber. X-ray films of persons exposed to this material tend to confirm the inference, for none of those observed in any way resemble the reaction to the known fibrous dust asbestos. If there is any change noted at all it is limited to an exaggeration of the normal linear markings due to particles and broken fragments of the fiber; such changes are rarely associated with symptoms or disability. Diagnosis would depend on a history of exposure over periods measured in years, the demonstration of a uniformly altered x-ray pattern in a considerable group of workmen and a physical examination for evidence of disability. The prognosis should be good, and no disability or increased susceptibility to pulmonary infection is likely. Treatment is entirely prophylactic.

BAR'S SYNDROME, OR COLIBACILLOSE GRAVIDIQUE

To the Editor:—I have a patient on whom a diagnosis of Bar's syndrome, or colibacillose gravidique has been made. De Lee's textbook seems to be the only one that mentions it. The *Quarterly Cumulative Index Medicus*, starting in 1920, lists references only to foreign journals. The patient is a primipara in her ninth lunar month who has had spiking fever, pyelitis and jaundice since July 1944. She had appendicitis in July. What information is available on this disease, especially as to prognosis and treatment? W. J. Schecter, M.D., Indianapolis.

ANSWER.—In De Lee-Greenhill's "Principles and Practice of Obstetrics" (ed. 8, Philadelphia, W. B. Saunders Company, 1943, p. 509) appears the statement:

"Bar has called attention to a syndrome of pain in the region of the gallbladder, the ureters and the appendix, with occasional fever, the pathologic basis being a cholecystitis, ureteritis and appendicitis. He calls it 'colibacillose gravidique.' This is a not rare condition in pregnancy. Bacteriuria accompanies it *(Vignes)*."

The Vignes reference is to a book, but while the Bar syndrome is mentioned in the book the original Bar reference is not given. Likewise, in a book entitled "Pratique obstétricale" (Paris, Masson et Cie., 1935, p. 11) L. Devraigne speaks of the Bar syndrome and, instead of giving the original Bar reference, quotes Tarnier and Vignal and Budin as his sources. Devraigne says that because of the constipation which is common in pregnancy the colon bacilli can gain access to the blood and produce a bacillemia. The latter has three sites of predilection, the gallbladder, the appendix and the renal pelvis. In the puerperium the Bar syndrome may simulate puerperal infection. P. Desgeorges (*Rev. gynéc. et obst.* **34**:335, 1936) speaks of a colibacillemia due to infection of the lymphatic system by the colon bacilli from the intestine.

As is evident from the foregoing quotations, the French obstetricians have been strongly impressed with the idea that colon bacilli can invade the blood or lymph stream and produce trouble. A search of the *Quarterly Cumulative Index* as far back as 1916 failed to reveal Bar's original paper, if there was one. Likewise no cross reference to it could be found.

Devraigne recommended disinfection of the intestinal and urinary tracts with cultures of lactic acid because, he said, these cultures create a pathogenic medium for colon bacilli. He also suggested the use of collargol, autovaccines, serum, bacteriophage, methenamine and a vegetable diet. Today it is recognized that most of this therapy is not only useless but also unnecessary. The sulfonamides, especially sulfathiazole, offer the most promising line of treatment.

LIGATION OF EXTERNAL CAROTID FOR INTRACTABLE EPISTAXIS

To the Editor:—In 1940 I did a ligation of the right external carotid artery to control an intractable unilateral right epistaxis. This procedure was decided on only after all other measures had failed; anterior and posterior tamponade, local and general styptics, cauterization, blood transfusions and, in an endeavor to visualize the bleeding vessel, a submucous resection had all been tried. The patient, a man aged 67, hypertensive with pronounced sclerosis, continued to bleed until almost exsanguinated. Ligation of the right external carotid artery was done under local anesthesia, and the epistaxis was immediately and permanently controlled. During the past month the patient has had several slight hemorrhages from the left nostril. Naturally he is apprehensive after his unpleasant experience and is even now anticipating a ligation of the other external carotid. Would there be any contraindication to such a procedure should the necessity present itself? M.D., Ohio.

ANSWER.—There should be no contraindication to ligation of the left external carotid artery if this procedure becomes necessary. In performing the ligation it might be well to consider placing the ligature above the facial artery branch to insure adequate circulation to the structures below the facial artery supply.

ENCEPHALITIS

To the Editor:—A woman aged about 60 has virus encephalitis. Examination of the spinal fluid showed on Aug. 7, 1944 globulin 2 plus, 17 white blood cells, 92 per cent lymphocytes, total protein 117, colloidal gold test negative, on August 21 globulin 1 plus, 23 white blood cells, 75 per cent lymphocytes, total protein 186, colloidal gold 0001232100, on September 15 globulin slightly positive, 18 white blood cells and sugar 50 mg. per hundred cubic centimeters. What is the latest treatment for this? Fred R. Isaacs, M.D., Lawrence, Kan.

ANSWER.—The diagnosis of virus encephalitis seems doubtful in this case in view of the relatively low cell count and protein and the apparently sporadic incidence. The spinal fluid picture is compatible also with brain abscess or infarction.

There is not any generally accepted treatment for such cases. If the patient suffers from a sporadic encephalitis or encephalopathy of the white matter of the brain there is a fair outlook for spontaneous improvement. If the disease has attacked the spinal cord and the bladder is involved, tidal irrigation should be instituted. Foci of infection should be sought and eradicated.

SIGNIFICANCE OF NYSTAGMUS WITH CALORIC TEST

To the Editor:—A patient gave no response to the caloric vestibular test and a diminished response by the Bárány rotating test. Could such reactions ever be considered hysterical in nature? This patient had certain manifestations of hysteria, but he also had meningovascular syphilis. Could lack of response to the caloric vestibular test be produced by hysteria? Major, M. C., A. U. S.

ANSWER.—As the nystagmus occurring with a positive caloric test is the result of impulses through nerve pathways in the brain stem independent of the cerbral cortex, a true hysteria would not be expected to have any influence on the caloric vestibular reaction. Hysterical deafness does occur as the result of suppression of consciousness of the impulses which reach the cerebral cortex.

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FEMALE INFERTILITY

OUR DIAGNOSTIC RESPONSIBILITIES

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CHICAGO

It is amazing that women tend to accept full responsibility for their failure to conceive, and it is equally inconsistent that communications on this problem are usually entitled "female sterility." The term female sterility implies that husbands are usually fertile, whereas in my own experience more than half of the husbands must either share or accept full responsibility for a childless union. A man cannot be absolved from responsibility for his wife's failure to become pregnant simply because his semen contains some actively motile spermatozoa; we must be more critical than that in our evaluation of seminal fluid.

To call these women sterility problems is inappropriate for other reasons. There are few individuals, either men or women, who can be considered absolutely fertile and, conversely, very few who are absolutely sterile. Human beings, at best, are only relatively fertile. Furthermore, there must be varying degrees of relative fertility even though there is no scale by which such relative fertility can be measured; e. g., many couples of whom both the husband and the wife must be of high fertility have no difficulty in achieving pregnancies as promptly and as frequently as they wish; other couples of whom one spouse is apparently normally fertile and the other only moderately fertile have children—but it may be months before the wife becomes pregnant. On the other hand, the marriage of individuals who are both of low fertility is likely to result in no progeny. Occasionally such unions are terminated; subsequently each spouse remarries and both achieve pregnancies by the second marriage, possibly because each new spouse is an individual of high fertility.

Furthermore, the majority of childless marriages do not result from an absolute sterility either in the husband or in the wife: they are instances of relative infertility brought about by a multiplicity of factors in both spouses; some of these factors may seem trivial but, added together, they are sufficient to prevent conception. Success in the relief of barrenness therefore depends on thorough examination of both the husband and the wife followed by systematic elimination of every possible contributing cause from each of them.

From the Department of Obstetrics and Gynecology, Northwestern University Medical School, and the Gynecologic Service of Passavant Memorial Hospital.

Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Urology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

The physician whom the wife consults is obligated to make a diagnosis, i. e. to discover all factors which may contribute to her infertility. He must not jump at conclusions and he dare not take anything for granted. His examination must be thorough, and as a minimum it should include (1) a complete general physical survey, (2) a search for gross abnormalities in the female generative tract, (3) an evaluation of the male factor, (4) study of the uterine cervix, (5) testing of the oviducts for patency and (6) an investigation of the endocrine system.

At her first visit the wife is subjected to a general physical examination. At this time one should also attempt to evaluate the function of the glands of internal secretion from her height, weight and body configuration, together with the distribution of fat and hair.

The lower genital tract is searched for infection—leukorrheal discharges, especially those resulting from cervicitis, are important. Not only is the cervix inspected but its canal is tested with cervical dilators to determine whether it is adequately patent.

The size of the uterus has some significance. Hypoplasia of the uterus may be suspected either from the presence of an elongated small cervix with tiny external os or from the difficulty experienced in palpating the corpus; the length of the uterine cavity is easily ascertained with a sound. Long ago I learned that some young women with moderate hypoplasia of the uterus became pregnant with amazing alacrity.

Retrodisplacement of the uterus, with anterior tipping of the cervix away from the seminal pool, has probably been overemphasized as a cause of infertility. Following Sampson's description of endometriosis, retroflexion assumed a more important role in this problem. Pelvic endometriosis may follow retrograde menstruation through the oviducts, and such backflow of menstrual blood is most likely to occur when the cervix is stenotic, the uterus is retroflexed or fibroid tumors distort the uterine cavity. Pelvic endometriosis is found frequently in a private clientele, especially among young women who fail to become pregnant. Thus far there is no convincing explanation for the low fertility of women with pelvic endometriosis; their oviducts are patent; they ovulate, and they may become pregnant—but not frequently. This condition should be suspected when the uterus is retroflexed and fixed, the ovaries are enlarged and adherent, and when there are tiny, firm, sensitive nodulations either in the cul-de-sac, in the rectovaginal septum or on the uterosacral ligaments. If the patient complains of dysmenorrhea that has been acquired during adult life and consists, in part, of pain referred to the rectum, one can be almost certain that one is dealing with pelvic endometriosis. In my experience endometriosis is a most frequent cause of infertility.

Gynecologists disagree about the relationship of uterine fibroids to a woman's failure to conceive; I doubt that they are often responsible for infertility.

Masses in the region of the oviducts and ovaries may be either residues of pelvic inflammatory disease or cystic ovaries, signifying either previous inflammation, endometriosis, endocrine imbalance or new growths. All are of importance in the problem of relative fertility.

The next step, not the last, is an examination of the husband's semen. Preferably, the specimen should be obtained after several days of continence. The semen is collected and transported in a clean glass container, not in a rubber condom, which tends to inhibit the motility of spermatozoa. The semen should be kept at room temperature, since spermatozoa die more quickly at body temperature. 1. One should determine the amount of semen (it should be about 4 cc.); most of our specimens are obtained by coitus interruptus, frequently some of the specimen is lost and I doubt that the volume of a specimen is of great import. 2. The number of spermatozoa per cubic centimeter is vital (the normal is about 100 million per cubic centimeter); every specimen of semen must have a sperm count. 3. Eighty-five per cent of the spermatozoa should be actively motile and migrating at room temperature for hours after ejaculation. 4. One should also search for adventitious elements, such as leukocytes and red blood cells. 5. The morphology of the spermatozoa is studied in stained smears (at least 80 per cent should be normally formed).

Most husbands consider themselves fertile if they are sexually potent; they actually believe that "patent oviducts plus a potent male" should invariably result in a pregnancy. Too often physicians are guilty of further pampering this masculine ego by accepting, as normal, any specimen of semen which contains some actively motile spermatozoa. The following observation by Mazer and Israel [1] is extremely pertinent: "The degree of fertility of the male decreases, and approaches zero, with diminution in the volume of semen, decline in the number and viability of spermatozoa, and with an increase in the percentage of abnormal forms." Consequently the accepted criteria for a normal specimen of semen are reiterated: amount, 3 to 4 cc.; number of spermatozoa, approximately 100,000,000 per cubic centimeter; motility, 85 per cent actively motile and migrating at room temperature; morphology, 80 per cent normally formed; and, finally, there should be no more than an occasional leukocyte or red blood cell per high power field. Husbands must be referred to a urologist if their semen does not conform in all respects to the aforementioned criteria. Although only one spermatozoon is required to fertilize an egg, the husband with a reduced sperm count is essentially sterile.[2]

Failure to recognize deficiencies in semen has been responsible for many failures in the management of barren marriages. Possibly it would be best if all husbands were examined by a urologist, but it must be by one who is especially interested in the problem of male infertility.

Patency of the oviducts is determined by transuterine insufflation with carbon dioxide gas. I prefer an apparatus which receives carbon dioxide at a constant pressure, measures the volume of gas which passes into the abdomen and includes a mercury manometer. The ideal time to make this test is three to seven days after the conclusion of a menstrual period. Under normal conditions, gas flows through the oviducts freely at a pressure that fluctuates between 40 and 80 mm. mercury. If gas fails to pass through at 180 to 200 mm of mercury the pressure should not be carried high for fear of traumatizing the oviducts. The position of the cannula in the uterus is changed several times, and gas pressure each time allowed to rise to 180 mm., before it is assumed that gas is not going to pass through the oviducts at that test. Insufflation tests should be repeated three or four times, preferably at monthly intervals, before one is justified in concluding that the oviducts are actually blocked. Intrauterine injection of a radiopaque substance is seldom indicated; this procedure is reserved for patients who wish to consider surgical relief from occluded oviducts. The chief value of hysterosalpingography is to demonstrate the exact site of tubal obstructions. Lipiodol and similar oily opaque mediums are not innocuous; sometimes they cause tubal inflammation and, if retained in the oviducts, they may initiate a foreign body reaction.

The next examination is a Huhner test. This should be performed at the time of ovulation, i. e. twelve to fourteen days before the expected onset of a menstrual period. The wife reports for examination several hours after coitus. One should still find spermatozoa in the vaginal vault, but they will probably be immotile because spermatozoa are killed rather quickly by normal acid vaginal secretions. In normal persons the clear glairy endocervical mucus, aspirated with a Luer syringe two to four hours after intercourse, should contain 3 to 15 actively motile spermatozoa per high power field.

Consequently, the Huhner test demonstrates (1) whether intercourse has been consummated normally, (2) the ability of spermatozoa to ascend into the cervical canal and (3) the effect of endocervical secretions on the spermatozoa. Dead spermatozoa in the cervical canal are indicative of endocervical hostility; this usually results from an endocervicitis where there is a mucopurulent discharge. Eradicating an endocervicitis is one of the most direct methods of improving fertility.

After one has examined the wife's genital organs for gross abnormalities, determined the status of the husband's spermatogenesis, investigated the patency of the cervix, uterus and oviducts, checked on the delivery of semen to the cervix and the reception accorded spermatozoa by endocervical mucus, the final diagnostic step is an endocrine survey. This is the least satisfactory phase of the problem, from the standpoint both of diagnosis and of treatment.

Healthy women of childbearing age, who menstruate normally and with some degree of regularity, probably also ovulate fairly regularly. On the other hand, individuals without gross genital pathologic changes, who either menstruate infrequently, flow irregularly and scantily or bleed continuously, probably do not ovulate —such menstrual disorders usually result from disturbed function by the glands of internal secretion.

There is no direct method of proving that a woman ovulates. We are compelled to rely on presumptive evidence, namely the microscopic appearance of the endometrium at the onset of a menstrual period. Endometrial biopsies for this purpose are obtained with a suction curet, preferably within a few hours after the first show of menstrual blood. It is assumed that a woman has ovulated if her endometrium shows the normal effect of corpus luteum hormone stimulation. Such progesterone effects are hypertrophy of stroma cells, corkscrew hypertrophy of uterine glands, secretory swelling of their lining epithelial cells and good develop-

1. Mazer, D., and Israel, S. L.: Menstrual Disorders and Sterility, New York, Paul B. Hoeber, Inc., 1941.
2. Huffman, J. W.: New Factors of Clinical Significance in the Study of Human Spermatozoa, Surg., Gynec. & Obst. 73: 228, 1941.

lent of spiral arteries so that they extend into the compacta, or surface layer, of the endometrium. Although it is more difficult to interpret endometrial biopsies taken after the onset of menstrual bleeding, this is the safe time to take them. If one takes biopsies a few days before the expected onset of a menstrual period, sooner or later he will take a biopsy of a pregnant uterus.

For women who fail to ovulate, as well as for many others, additional diagnostic studies may be desirable, viz., x-ray films of the sella turcica, basal metabolic rates, blood cholesterol determinations and sugar tolerance tests.

In addition to the foregoing physical conditions, it is probable that there are psychologic factors which contribute to infertility; e. g., adoption of an infant is sometimes followed rather promptly by a pregnancy, and this despite years of previous infertility.

The diagnostic survey must be a painstaking search for every factor which might contribute to the barren marriage. The physician's next obligation is a systematic elimination of each and every contributing cause found in both the husband and his wife. We must not restrict treatment to a single major factor while neglecting the minor, more trivial causes. Due consideration to these apparently nonessential conditions may account for the success of some clinicians where others fail. However, the details of treatment do not fall within the province of this presentation.

CONCLUSIONS

1. Either the husband or the wife may be responsible for her failure to conceive; usually both are at fault and both must be examined thoroughly.

2. The diagnostic survey of such cases should be concerned with (*a*) the wife's general physical condition, (*b*) the status of her genital organs, (*c*) spermatogenesis, (*d*) delivery of semen to the cervix, (*e*) ascent of spermatozoa into the uterus, (*f*) patency of the oviducts, (*g*) ovulation and (*h*) the ability of the endometrium to receive and nourish a fertilized egg.

3. All physicians must search more carefully for deficiencies in seminal fluid; husbands should be referred to an interested urologist if the semen is not absolutely normal.

4. Most childless marriages result from a multiplicity of factors; all must be systematically eliminated.

5. One is likely to fail in the management of infertility cases unless one receives wholehearted cooperation from the husband as well as the wife; both must submit to the entire diagnostic study and both must follow through with all indicated treatment.

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ABSTRACT OF DISCUSSION

DR. ROBERT M. GRIER, Evanston, Ill.: Large and numerous uterine tumors may only indirectly cause sterility, not because conception is impossible, but because pregnancy does not carry to term, which results in a barren marriage. Endometriosis notoriously results in sterility or single child marriage. The explanation for this is as yet lacking, especially as the tubes are usually patent. Endocrine disturbances, as are evident from a careful physical examination and laboratory tests, leave us too often without procedures for therapy. Only hypothyroidism seems to offer much in the way of help. Administration of thyroid to these patients under close observation has been so repeatedly successful that its use cannot be overlooked. Why this is true is still not clearly explained. It is amazing to me how many women have been informed by physicians that pregnancy is impossible or unlikely because of retrodisplacement of the uterus. This condition in itself almost never is the sole cause of failure to conceive. When one thinks of the number of spermatozoa deposited at each male emission and their extreme motility when the male is healthy, it is hard to believe that they can fail to reach the cervical canal in sufficient numbers, even though the cervical opening is not bathed in the seminal pool. Probably 50 per cent of the women I see show absolutely no condition which could cause barrenness. Frequently the husband refuses to cooperate. It has been my plan to require examination of the husband's spermatozoa before submitting the woman to tubal patency or other tests. If the husband will not cooperate to this extent I refuse to go further, and frequently the matter is dropped after the first visit. This may be due to the man's ego or to a wife's fear of the harmful psychologic effect it will have on her husband. The fear of discovery of an old venereal infection plays its part. It also may be inconvenient because of the husband's working hours. I have found that the Huhner test is the easiest to accomplish. Even though this test is not completely accurate, certainly if abundant normal and active sperm are seen we cannot attach too much responsibility to the husband. But if this condition is not found I then ask the husband to consult an interested urologist. It appears to me that with the improvement in education of the public in these matters more and more cooperation is being attained. When the husband is pronounced normal by a urologist or the Huhner test shows him to be healthy, then the Rubin test is done. It is very gratifying to see the good results following this test. Patency may be established following some weak obstruction. This is suggested by a manometer reading which rises at first to 160 mm. of pressure and then descends to normal around 70 or 80. I am quite skeptical of the value of endocrine therapy other than thyroid medication. Its workings are still in the realm of conjecture and are not without danger.

DR. RALPH A. REIS, Chicago: It is strange that sterility has become a problem of the gynecologist. After all, 30 to 40 per cent of all barren marriages result from deficiencies of the male partner be they systemic, endocrine, developmental or inflammatory in character. Furthermore, an additional 20 to 40 per cent of barren marriages are indirectly male in origin in that the male is the donor and the female is the recipient of the infection which results in genital tract occlusion. The barren marriage always presents a double problem; that is, the necessity of investigating the fertility of both husband and wife. The intelligent layman has come to understand that an investigation of his fertility is not an investigation of his virility. Resentment or lack of cooperation is therefore gradually fading away even though such education is both slow and difficult. I should like to agree heartily with Dr. Gardner's procedure in evaluating the male partner. My difficulties in interesting urologists in male fertility studies has led me to carry out these studies myself. The site of the occlusion of the female generative tract may be the uterine tubes or the cervix. Salpingitis has always been considered the more common cause of such obstruction and is most frequently found by investigators of patients of clinic level. It has been my experience that the incidence of salpingitis in private patients is much lower than the generally accepted level. I found that 60 (48 per cent) of 125 consecutive private patients complaining of sterility had definite cervical disease. This was in contrast to the 21 (17 per cent) with evidence of salpingitis or pelvic inflammatory disease. Dr. Gardner has said that "eradicating an endocervicitis is one of the simplest methods of improving fertility." This was proved in our series and reported last year by Dr. Bernick and me; 35 of our patients were treated by cervical cautery alone. No other treatment was used for this group of patients and pregnancy followed in 27 of the 35 within twelve months. Like Dr. Gardner, I cannot produce ovulation, normal menstrual function or normal pituitary-ovarian relationships. But I am much more optimistic concerning the endocrine phase of the barren marriage than Dr. Gardner professes to be. By far the largest percentage of endocrine problems which I see are due to hypothyroidism, the one type of endocrine dysfunction which can be successfully treated. Hypothyroidism is so common in my experience that basal metabolic determinations are carried

out routinely on husband and wife as a primary diagnostic procedure. Much will be lost by considering the basal metabolic rate as a secondary or additional diagnostic study in the same category as sella turcica x-ray studies, cholesterol determinations and sugar tolerance tests. Basal metabolism rates should be determined primarily. Hypothyroid patients do respond to simple replacement therapy and one dollar's worth of thyroid substance will frequently accomplish infinitely more than one hundred dollars' worth of x-rays, biologic assays and endometrial biopsies. I feel that the majority of childless marriages are due to a single cause and that only a minority have multiple causes.

Dr. V. D. Lespinasse, Chicago: My work has been largely with the obstructive lesions in the male in relation to sterility. The commonest type of obstruction is in the lower portion of the epididymis. My contribution to this mechanical problem is in taking one definite epididymis tube and joining it to the vas. My results are about 65 to 70 per cent successful. The pelvic vas, when obstructed, needs a cross operation. That operation is a vas anastomosis and carries practically 100 per cent success, so that mechanical problems in male sterility, even after one has diagnosed them as being mechanical, still require a further diagnosis as to where that obstruction is and what the appropriate surgery is to relieve that obstruction.

Dr. Henry K. Sangree, Philadelphia: The male is at fault in about 50 per cent of nonfertile marriages. Teamwork is necessary in a study of infertility and should include an associated survey by the gynecologist, obstetrician, internist, endocrinologist and urologist. The latter by training and experience is particularly fitted to examine and treat the male partner in a barren marriage. About twenty years ago the average couple seeking relief for infertility had about a 20 per cent chance, even when they consulted physicians interested in this field, whereas today many groups of expert workers effect cures ranging from 40 to 50 per cent. Between two and nine factors are often present in the study of both partners. Dr. Meaker says that 4.7 is the average. In a consecutive study of 132 men, azoospermia was present in 12 of the first 100 cases and aspermia was present in 26. Chronic prostatitis was present in 30 cases. Endocervicitis is considered an obstructive to action by the sperm as it enters the uterus. I did 5 epididymovasostomies with 1 success. Gonococci were present in 28 per cent and, of course, many men with such infections have children. A positive serologic reaction was present in 8 per cent, even though the wife had a negative serologic reaction. A severe type of varicocele was present in 8 per cent of the cases. Penile hypospadias was present in 2 per cent. In these cases of penile hypospadias it is almost necessary for the man to wear a cover and cut a tiny hole in it, in the end, so that the spermatic fluid can come through. Hypothyroidism was present in 28. Mumps had been present in 13 cases and bilateral orchitis in 9 cases. I don't think that mumps has much to do with infertility in my study, but if a man has had bilateral inflammatory orchitis in conjunction with mumps after he has reached adulthood then I think it may be a cause. I think it is advisable to do a testicular biopsy before operation to see if there are sperm in the testes. A hundred million was the number that Dr. Gardner gave. Sixty million was the count in New York by Dr. Hotchkiss on 100 men who were perfectly normal and who had children.

Dr. A. R. Abarbanel, Washington, D. C.: The evidence at hand shows that there is a period of about twenty-four hours, ranging from twelve up to (rarely) seventy-two hours, in which sperm can penetrate cervical mucus. This fortunate event usually occurs around the tenth to fourteenth day of the menstrual cycle but has been found occasionally as early as the fifth or as late as the twentieth day of the cycle. During the remainder of the cycle the cervical mucus is not penetrable by sperm, except during menstruation. Therefore, in performing the Huhner test, one is merely going on chance. In the past few months I have seen 3 patients who were told that their tubes were absolutely closed because no gas went through at 220 mm. of mercury pressure. As a matter of fact there was present only tubal spasm. After these patients had taken oral methyltestosterone for a total dosage of 50 to 150 mg., repeat tubal insufflation revealed the carbon dioxide going through at 40 to 80 mm. of mercury pressure, while the pattern of tubal motility was normal. Two of these patients are now pregnant. The third point I would like to present is that of the management of threatened and habitual abortion. I have been able to confirm Karnaky's original contention that large doses of diethylstilbestrol will effectively maintain gestation in these patients. The therapeutic plan in the case of threatened abortion is as follows: 25 mg. of oral diethylstilbestrol at once, followed by 5 mg. every fifteen minutes until bleeding and/or cramps stop. Usually 50 to 100 mg. does the trick. Then 5 mg. three times daily is given until "life" is felt. After that 5 mg. daily until the thirty-second week of gestation. At the first sign of bleeding or cramps, 25 mg. is to be given followed by the routine outlined. In the case of habitual abortion, as soon as the diagnosis of pregnancy is confirmed the patient is placed on 5 mg. of oral diethylstilbestrol three times daily and continued until the thirty-second week. Pregnant patients tolerate these doses of diethylstilbestrol easily with no side effects. The rationale for the use of large doses of estrogen is this: Most abortions result from vascular discontinuity between the trophoblast and the maternal endometrial circulation. By maintaining vascular integrity and continuity, the estrogen maintains the pregnancy.

Dr. C. J. Stamm, Philadelphia: The excessive acid reaction of the vagina was simply mentioned and passed over. Tests recently have shown that the spermatozoa need sugar to live; therefore some one ingeniously got together a formula (glucose and isotonic solution of three chlorides), thus reducing the hyperacidity of the vaginal secretion. Whether it was the Ringer's solution or the sugar I can't say, but the addition of sugar to the douche is of real value. I strongly advise the use of this solution as a douche at night, particularly before coitus. We have heard about the inability of some women to conceive, yet with all of our present knowledge about rhythm no one today has mentioned the fact that it might not be a bad idea to instruct our patients that the proper time for them to try to conceive is at or about the time ovulation is due. In the question of the failure of the tubes to give a proper response to insufflation the previous speaker advocated the use of testosterone. I use an ordinary antispasmodic, any one will do, given to the patient for two or three days before the time when we are ready to do our insufflation. I have found repeatedly that the simple antispasmodic was sufficient to relax the musculature of the tubes and that the tubes previously reported closed were really patulous. Operations on the cervix are simple. Conization and cauterization will clear up cervicitis and endocervicitis. A word of warning—don't go too deep and do it at the proper time, which is immediately, or soon after the menstrual flow ceases, in order to prevent secondary hemorrhage, which usually occurs if it is done after the seventh day following menstruation.

Dr. J. P. Greenhill, Chicago: I should like to add something to this discussion only because of the remarks made by the last speaker concerning a douche preparation which is said to help women become pregnant. A number of physicians met to organize a new society interested in the study of infertility. This group consisted of specialists in obstetrics, gynecology, urology, physiologic chemistry and psychiatry. Among the subjects discussed was vaginal acidity and douches. It was unanimously agreed that the amount of acidity of the vagina has no bearing on fertility or infertility. Therefore douches aimed at overcoming hyperacidity or hypoacidity of the vagina or directed at prolonging the motility or life of spermatozoa in the vagina are of no value. In recent years, endometrial biopsies performed to determine the presence or absence of ovulation have revealed a relatively high incidence of unsuspected tuberculosis of the endometrium in sterile women. Since in almost every case of endometrial tuberculosis the oviducts are involved, tuberculous salpingitis is one of the causes of infertility which must be considered.

Dr. George H. Gardner, Chicago: I wish to thank all of those who have discussed my paper. They have added many interesting points which time limitations prevented me from discussing as a part of my presentation.

THIOURACIL TREATMENT OF ANGINA PECTORIS

RATIONALE AND RESULTS

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Total thyroidectomy has proved an effective therapeutic procedure in the treatment of angina pectoris (Lev and Hamburger,[1] Blumgart, Levine and Berlin,[2] Levine and Eppinger,[3] Claiborne and Hurxthal,[4] Clark, Means and Sprague,[5] Scherf,[6] Singer[7] and others).

Eppinger and Levine[8] expressed the belief that the complete removal of the thyroid gland alters the response of the cardiovascular system to epinephrine and that it is the alteration of this mechanism which may, in a measure, be responsible for the relief of anginal pain Likewise Shambaugh and Cutler[9] reached the conclusion that the beneficial effect of removal of the thyroid gland in angina pectoris may be due, in a part at least, to a diminished effectiveness of the physiologic output of epinephrine Barbour and Prince[10] ascribed to epinephrine a causative role in angina pectoris as early as 1915, when they showed that it constricts the coronary arteries of monkeys and probably also of man, in contrast to those of other mammals.

Today the dominant role of adrenergic discharges in the pathogenesis of angina pectoris on effort, emotion, exposure to cold and the like appears established by numerous experimental and clinical facts

1. The specific annoxiating effect of epinephrine on the heart muscle (Barcroft and Dixon[11] Evans and Ogawa,[12] Gremels,[13] Rein,[14] Green and his associates[15]) which decidedly exceeds the oxygen requirement for the simultaneous increase of its muscular action (Gollwitzer-Meier, Kramer and Kruger[16])

2 The physiologic discharge of epinephrine into the blood stream under the very conditions which typically elicit anginal symptoms, namely exercise, emotion and exposure to cold (Cannon[17] and others).

3. The accumulation of epinephrine in the heart muscle during exercise and exposure to cold.[18]

4. The production of anginal pain through injection of epinephrine in persons with coronary sclerosis (Levine, Ernstene and Jacobson,[19] Katz, Hamburger and Lev,[20] Cottrell and Wood[21]) and also in normal persons[22] (Wenckebach[23]).

5. Abnormally intense discharges of epinephrine and related substances[24] into the blood stream during physical exercise in angina patients[25]

6 The presence of abnormally high concentrations of epinephrine and related substances in the heart muscle of patients who have suffered from anginal symptoms[26]

7. The analogy between the effects of epinephrine on the electrocardiogram and the electrocardiographic changes occurring during anginal attacks (Vesa,[27] Lepeschkin,[28] Katz, Hamburger and Lev[20] and others).

8 The occurrence of anginal symptoms in patients with adrenal medullary tumors (Bauer,[29] Nuzum and Dalton,[30] Brunschwig, Humphreys and Roome[31] and others) and their disappearance after removal of the tumor (Lenhartz[32]).

9 The provocation of anginal symptoms by agents which are known to stimulate the secretion of epinephrine, such as insulin (Brandt and Katz,[33] La Barre and Houssa,[34] Kugelmann,[35] Raab,[36] Schonbrunner[37]) and tobacco smoking (Cannon, Aub and Binger,[38]

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10. The prolonged absence of anginal symptoms paralleling the disappearance of the abnormal discharges of epinephrine in angina patients following roentgen irradiation of the adrenal region[23] (Hutton,[44] Hadorn,[45] Schittenhelm,[46] Lippross,[47] Raab and Soule[48]).

It is well known that the thyroid hormone sensitizes the heart to the effects of epinephrine (Steppuhn, Naumova and Ugarova,[49] Wise and Hoff,[50] Aumann and Youmans,[51] Sawyer and Brown,[52] Sadae,[53] Lütolf[54]). In recent experiments a striking increase in the cardiac mortality of rats resulting from the injection of epinephrine was brought about by pretreatment with thyroxin, and a number of thyroxin

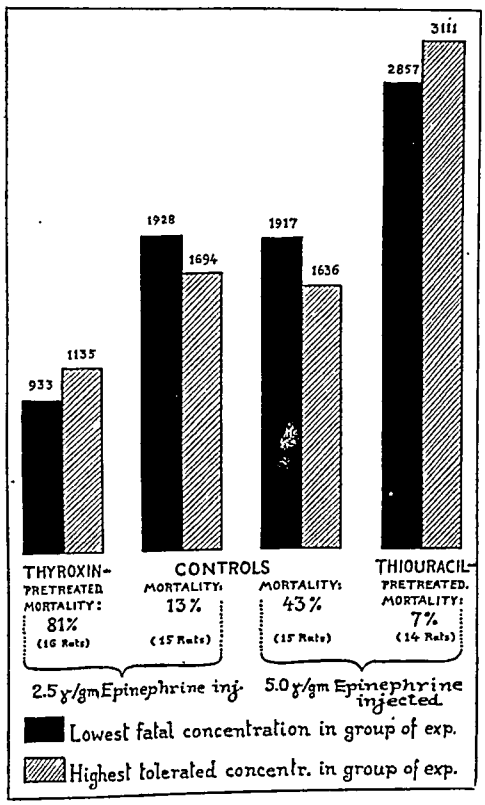


Fig. 1.—Accumulation of injected epinephrine in the heart muscle of the rat. The columns and figures represent the total colorimetric readings in the heart muscle (method explained in articles referred to in footnote 18 and in second reference in footnote 24). They include the basic concentration of epinephrine, sympathin and related substances plus the amounts of epinephrine accumulated following injection, partly in a chemically modified form. These experiments demonstrate the sensitization of the heart to epinephrine through thyroxin and the opposite, heart-protecting effect of thiouracil.

pretreated animals succumbed to myocardial accumulations of epinephrine which were considerably below the minimum level which had been found to be fatal in normal rats[55] (fig. 1). Furthermore, angina pectoris is a not uncommon complication of hyperthyroidism (Lev and Hamburger,[56] Brill[57]).

The observations of Riseman, Gilligan and Blumgart,[58] concerning an unchanged effect of intravenously injected epinephrine on blood pressure, pulse rate and systemic oxygen consumption in angina patients before and after thyroidectomy (except in cases of fully developed hypothyroidism) are not dealing with the criteria of angina pectoris (i. e. paroxysmal myocardial anoxia). Consequently they cannot be held against a fundamental role of epinephrine in the mechanism of angina pectoris. The theory that I[58a] have advanced maintains that the anginal symptoms on effort, emotion, exposure to cold and the like are caused essentially by the locally anoxiating effect of acute excess accumulations of epinephrine and sympathin in the heart muscle whose coronary arteries are sclerotic and which is sensitized to epinephrine through the thyroid hormone.

Thiouracil, as an agent which selectively suppresses the formation of thyroxin in the thyroid gland (Astwood[59]), appeared theoretically as a possible substitute for total thyroidectomy, whose shortcomings (risks of surgical intervention, irreparable loss of thyroid function) prevented its general acceptance.

It could be shown in recent experiments on rats that the sensitivity of the heart to epinephrine is much reduced after pretreatment with thiouracil and that considerably larger myocardial accumulations of epinephrine are tolerated by thiouracil treated rats compared with untreated animals[55] (fig. 1).

Also the epinephrine sensitivity of the heart of 10 physically healthy persons was found diminished after three months of thiouracil administration regarding pulse rate and anoxic changes of the electrocardiogram, while the blood pressure reactions were not significantly altered.[60]

Beginning in October 1943 thiouracil[61] was given to 10 patients with typical angina on effort. The patients were urged to keep a record of the daily number of their attacks on calendar sheets. When these records were kept in a negligent fashion the approxi-

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date number of attacks was estimated from the patient's description.

Periods of thiouracil treatment of 6 patients were followed by or alternated with periods of placebo administration without the patients' knowledge.

Leukocyte counts were taken at weekly intervals during the early stages of the treatment and later on at increasingly longer intervals.

REPORT OF CASES

CASE 1 (fig. 2).—E. P., a woman aged 63, a housewife, had no serious illnesses previous to the onset of anginal symptoms seven years before. These increased gradually in intensity and number until a maximum was reached, which had persisted during the past three years without interruption. Two to five attacks of several minutes' duration occurred every day, consisting of a painful oppression underneath the sternum and in both shoulders. They were elicited by the slightest physical exertion, such as housework and walking, and furthermore by emotions and exposure to cold. At times they also occurred during bed rest.

There was a slight enlargement of the heart to the left and accentuation of the second aortic sound but no murmurs; the blood pressure was 185/102, the pulse rate 84. The basal metabolic rate was +24 per cent.

Thiouracil was given during seven weeks, first 1.0 Gm. daily in five doses, later 0.6 Gm. daily in three doses. The anginal symptoms improved decidedly within about ten days. The basal metabolic rate fell to +9 per cent and +4 per cent. The patient was soon able to do her housework and to walk uphill without trouble, except for a few isolated spells of pain at increasing intervals. The electrocardiogram became practically normal within two weeks (fig. 3). Discontinuation of the medication was followed by a slowly developing but only partial relapse, while the basal metabolic rate returned to a level of +25 per cent within eleven weeks. A second period of thiouracil medication (six weeks) caused a rapid fall of the basal metabolic rate to —3 per cent and an almost complete disappearance of the anginal symptoms persisting for another month after the thiouracil tablets had been replaced by placebos. Subsequently, while placebos were given over a total period of eleven months, the anginal symptoms reappeared slowly. However, the attacks remained much less frequent than before treatment, even when the basal metabolic rate had returned toward its original level and the electrocardiogram showed renewed signs of myocardial anoxia (fig. 5).

CASE 2 (fig. 3).—J. G., a man aged 70, an inmate of the "city farm," who had syphilis at the age of 46, "radically" treated, suffered during the past four years from attacks of pain underneath the sternum radiating into the left shoulder and arm, of two to three minutes' duration, sometimes longer; they occurred on walking, emotions, exposure to cold, after meals and now and then at rest; he had one or more attacks almost every day. Eight months before he had one very severe

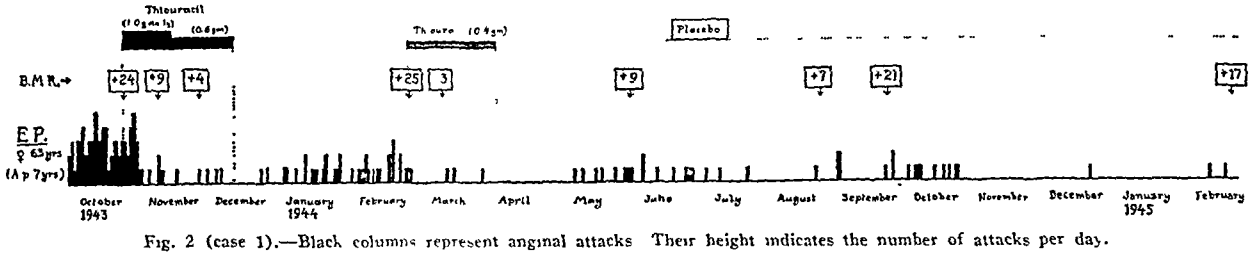


Fig. 2 (case 1).—Black columns represent anginal attacks. Their height indicates the number of attacks per day.

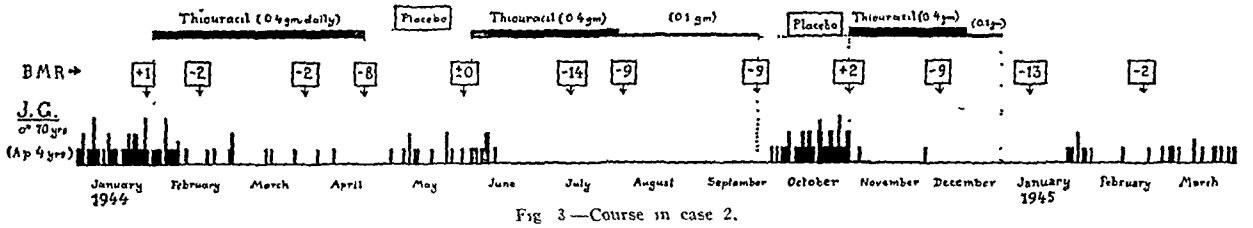


Fig. 3.—Course in case 2.

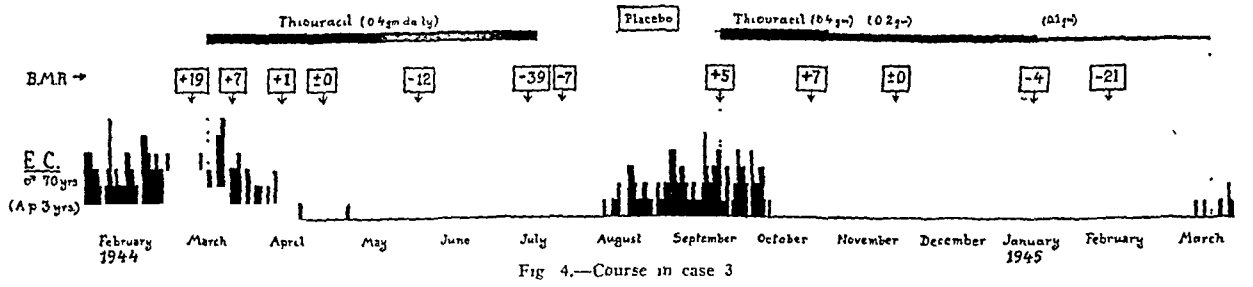


Fig. 4.—Course in case 3.

The patient was sent to the hospital in a state of collapse following a severe attack of pain. The heart was of normal size and shape; the blood pressure was 140/84. The electrocardiogram showed rate 61, low voltage, QRS notched, prominent Q_3, no upward deflection in lead 4, $T_{1,4}$ inverted, $T_{2,3}$ low. The basal metabolic rate was +1 per cent.

The patient received three periods of thiouracil treatment of three, four and two months' duration respectively, each with a dose of 0.4 Gm. daily at the beginning, later being reduced to 0.1 Gm. daily. During the first period of treatment the anginal attacks became quite infrequent within about two weeks; during the two following periods of treatment they disappeared rapidly and almost completely. The patient was now able to walk and climb stairs without discomfort. During each period of treatment the basal metabolic rate fell 7, 14 and 11 points respectively. When it was at its lowest the face appeared slightly puffy, he complained of sleepiness and the blood cholesterol was 330 mg. per hundred cubic centimeters (Aug. 2, 1944). Reduction of the dose to 0.1 Gm. abolished the myx-

edematous features without reappearance of the anginal complaints. Each period of treatment was followed by several weeks of placebo administration without the patient's knowledge. In each instance the anginal symptoms reappeared in either partial or full relapses together with a return of the basal metabolic rate to its original level. The electrocardiogram remained unchanged throughout.

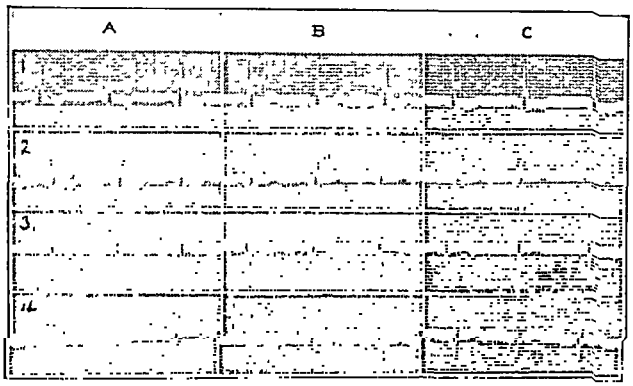


Fig. 5 (case 1).—*A*, untreated; severe anginal attacks; basal metabolic rate + 24 per cent. *B*, thiouracil (two weeks); almost symptom free; basal metabolic rate + 9 per cent. *C*, placebo (eleven months); partial relapse; basal metabolic rate + 17 per cent.

CASE 3 (fig. 4).—E. C., a man aged 70, without occupation previously in good health, during the past three years had attacks of severe pain in the epigastrium and under the lower part of the sternum, often accompanied by numbness in the arms, occurring on the slightest exertion (he could not walk farther than 50 feet without stopping) and also if exposed to cold. The pains persisted usually for about five minutes and occurred several times daily.

The heart was slightly enlarged to the left; the aortic second sound was accentuated; there was a systolic murmur over the entire heart. The blood pressure was 190/110. The basal metabolic rate was + 19 per cent.

Thiouracil was given in two periods of four months' and five months' duration respectively, during the first period 0.4 Gm. daily, during the second period 0.4 Gm. daily at the beginning, later 0.2 and 0.1 Gm. daily. During the first period the attacks disappeared within one month, except for two more isolated attacks; during the second period about three weeks elapsed before the attacks disappeared completely. The patient was now able to walk and climb hills at a fast pace without any discomfort. During the first period of treatment the basal metabolic rate fell to — 39 per cent and typical myxedematous features developed. The blood cholesterol was 311 mg. per hundred cubic centimeters at this time. During the second period the basal metabolic rate fell to a minimum of — 21 per cent; the blood cholesterol was 368 mg. per hundred cubic centimeters but puffiness and sleepiness were much less pronounced with the smaller dosage.

Between the two periods of medication a nine week period of unconscious placebo intake was interpolated during which the basal metabolic rate rose rapidly although not quite to its original level, and the attacks reappeared in almost full force within three weeks.

The electrocardiogram (fig. 6) showed at first increasing pathologic changes (depression of $ST_{1,2}$, diphasic T_1, flattening of T_4) at a time when anginal symptoms were completely absent. During the following placebo-induced relapse these changes were even more accentuated, but they gradually subsided during the second period of treatment, at the end of which the electrocardiogram was about the same as at the beginning.

CASE 4 (fig. 7).—W. J. L., a man aged 68, formerly a carpenter, had previously been in good health. During the past two years a sensation of oppressing "fulness" was felt underneath the sternum once or several times daily on walking and emotions. It usually stayed on for four to five minutes and compelled the patient to stand still.

There was a moderate degree of pulmonary emphysema. The heart was slightly enlarged to the left; there was a systolic murmur over the entire heart. The blood pressure was 130/68. The electrocardiogram showed rate 67, PR 0.23 second; T_3, inverted. The basal metabolic rate was — 4 per cent.

The patient received liver injections from time to time because of soreness of the tongue. There was no anemia.

Thiouracil 0.4 Gm. daily in four doses was given during three and a half months. The basal metabolic rate fell gradually to — 27 per cent. When it had reached — 14 per cent after about two weeks the anginal attacks became very infrequent and from the sixtieth day on they ceased completely. The patient was now able to walk without discomfort and to do strenuous work, such as lawn mowing and carrying wood. The blood cholesterol level was 284 mg. per hundred cubic centimeters. Under placebo administration the basal metabolic rate remained low (— 9 to — 24 per cent) for six months. After seven months, when the basal metabolic rate had risen to + 9 per cent, anginal symptoms reappeared in a mild form. The electrocardiogram remained unchanged throughout.

CASE 5 (fig. 8).—R. M., a woman aged 43, a housewife, during the past nine months had suffered from attacks of heavy, painful pressure underneath the sternum, expanding into the left shoulder and arm, sometimes also into the left jaw. These were elicited by walking, emotions and cold wind and occurred several times daily, lasting several minutes.

The heart was slightly enlarged to the left. The aortic second sound was accentuated. The blood pressure was 212/112. There was occasionally some shortness of breath on exertion without other signs of cardiac decompensation. The menstruation had been irregular during the last half year.

The electrocardiogram showed rate 81, PR 0.20 second, QRS_1 0.15 second, QRS_2 0.11 second, ST_1 depressed, ST_3 elevated, left axis deviation and left sided bundle branch block. The basal metabolic rate was + 27 per cent.

Thiouracil 0.4 Gm. daily in four doses was given continually during five and one-half months with an interruption of one week. The basal metabolic rate responded only to a moderate degree, the lowest level reached being + 14 per cent. It later returned to + 26 per cent under continued medication. A

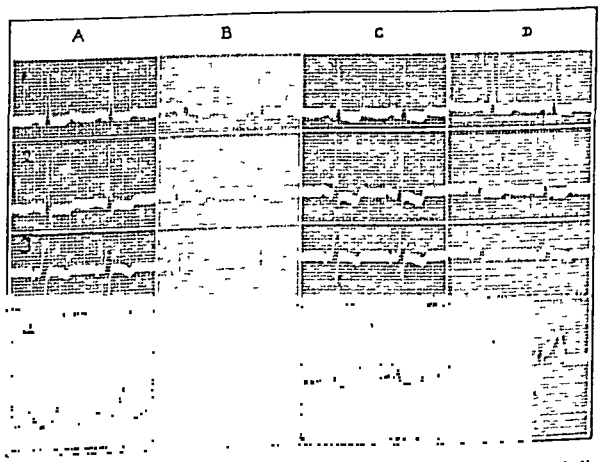


Fig. 6 (case 3).—*A*, untreated; severe anginal attacks; basal metabolic rate + 19 per cent. *B*, thiouracil (four months); symptom free; basal metabolic rate — 39 per cent. *C*, placebo (two months); complete relapse; basal metabolic rate + 5 per cent. *D*, thiouracil (four months); symptom free; basal metabolic rate — 4 per cent.

slight improvement of the anginal symptoms was reported, beginning after five weeks of medication. The patient could walk with greater ease and on many days had no symptoms at all, but the improvement remained only partial. During a subsequent six week period of placebo administration the condition grew worse again. Two series of x-ray irradiation of

the adrenal region at a seven week interval were finally followed by an almost complete disappearance of the anginal symptoms. The electrocardiogram and blood pressure remained practically unchanged until a coronary occlusion occurred three months later.

CASE 6 (fig. 9).—J. K., a man aged 62, an employee, previously in good health, one year before examination had a coronary infarction. Since then he suffered from attacks of a "burning oppression" spreading from the epigastrium to the substernal area, sometimes accompanied by numbness of the left arm. The attacks occurred once to a few times daily on walking, emotions, after meals, rarely at rest. They lasted a few seconds to minutes.

The heart was normal to percussion and auscultation. Blood pressure was 135 systolic; the diastolic pressure was indistinct. The electrocardiogram showed rate 65, PR 0.22 second, left axis deviation, QRS notched, T flat in all leads. The basal metabolic rate was —9 per cent.

Thiouracil 0.4 Gm. daily in two doses was given during four and one-half months. The symptoms began to improve after six weeks of treatment and then disappeared completely. Physical exertion was no longer accompanied by any discomfort after one month of treatment. The basal metabolic rate had fallen to +11 per cent at this time. Pains became quite infrequent (only about once or twice a week at heavier work) and were much less intense. Walking caused only rare and little discomfort. The basal metabolic rate fell to ±0 per cent and finally, at the end of the fourth month, to —3 per cent. At this time she appeared slightly puffy and the blood cholesterol was 619 mg. per hundred cubic centimeters.

CASE 8.—G. C., a man aged 69, without occupation, who previously had been in good health, during the past four years felt an oppressing substernal pain on walking, climbing, emotions, exposure to cold, sometimes after meals. These attacks, which occurred several times per week, lasted from a few minutes to one hour. Seven months before the patient suffered a cerebral accident with temporary hemiplegia.

The heart was slightly enlarged to the left. There was a loud systolic murmur. The blood pressure was 192/88. The spinal column showed a pronounced degree of hypertrophic arthritis. The basal metabolic rate was +16 per cent. The electrocardiogram is reproduced in figure 11.

Thiouracil 0.4 Gm. daily in two doses was given during four months with an interruption of three weeks. Within about

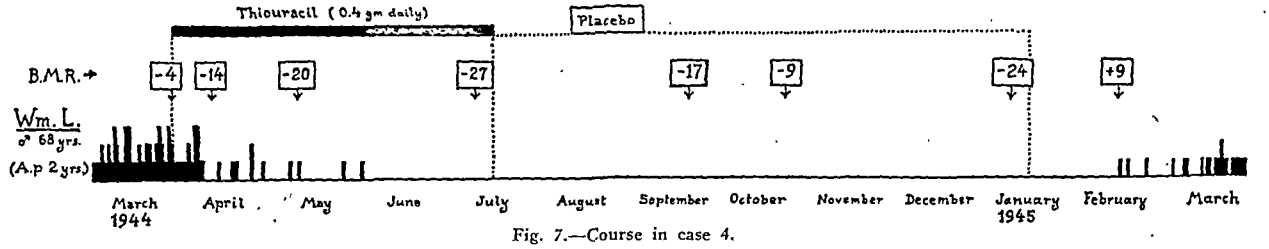


Fig. 7.—Course in case 4.

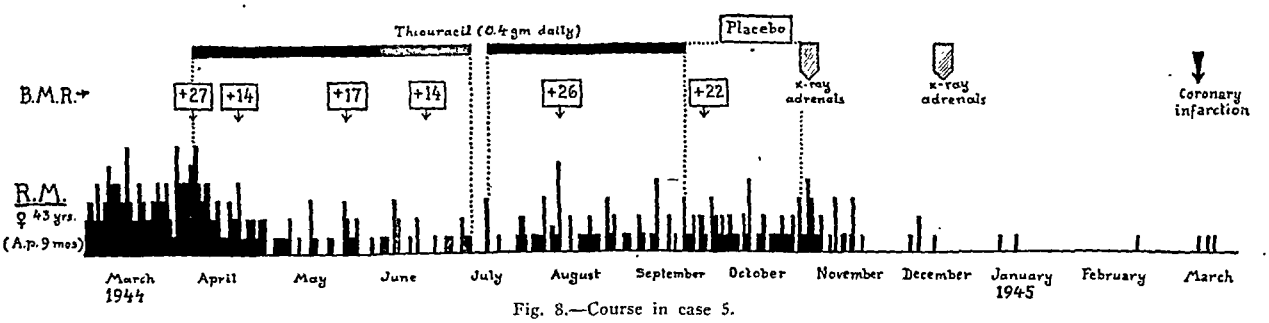


Fig. 8.—Course in case 5.

during the last two months of treatment. The basal metabolic rate began to fall only after two and one-half months. When it reached a lowest point of —19 per cent the patient appeared somewhat pasty and complained of a slight degree of sleepiness and fatigue and of an unpleasant taste "like iron." The blood cholesterol was 419 mg. per hundred cubic centimeters at this time. Replacement of thiouracil by placebos without the patient's knowledge was followed by an almost complete relapse within two weeks. The basal metabolic rate rose to +2 per cent within about three weeks. The electrocardiogram remained unchanged.

CASE 7 (fig. 10).—R. L., a woman aged 67, a housewife, who had had diabetes for the past fifteen years (daily 40 units of protamine zinc insulin), hypertension and headaches for the past six years, during the last two years had to complain of substernal pain, irradiating into the left shoulder, jaw and arm on any kind of exertion, even light housework, and furthermore on exposure to cold and on emotions. The pains occurred several times daily, lasting a few minutes to hours.

The heart was moderately enlarged to the left. The blood pressure was 225/98. The electrocardiogram showed rate 78, left axis deviation, ST_1 slightly depressed, ST_3 slightly elevated, T_1 inverted. The basal metabolic rate was +32 per cent. Thiouracil 0.4 Gm. in 2 doses was given daily during four months. An improvement of the anginal symptoms was noticed three weeks, when the basal metabolic rate had fallen to +7 per cent, the symptoms began to improve and the patient walked and climbed much more easily. This improvement made further progress during the entire period of treatment, and he frequently took long walks, even in very cold weather. There were still pains "from time to time" but they were no longer elicited by exertion. They were only quite mild and of a dull, aching character, which seemed to be attributable to the spinal arthritis rather than to the coronary condition. The patient stated repeatedly in writing that he felt "lots better."

The basal metabolic rate fluctuated during the first three months (+14, +7, +10, +9, +5, +12 per cent) but finally fell to —5 per cent. At this time he appeared slightly puffy and the blood cholesterol was 442 mg. per hundred cubic centimeters.

CASE 9.—R. H., a man aged 62, an undertaker, previously in good health, had during the past three years had anginal symptoms consisting of heavy substernal pressure on walking, climbing, emotions and exposure to cold wind, rarely at rest. The attacks occurred once or more daily and lasted a few minutes.

The heart was normal to percussion and auscultation. The blood pressure was 170/100. The electrocardiogram showed left axis deviation but otherwise was normal. The basal metabolic rate was —2 per cent.

Thiouracil 0.4 Gm. daily in four doses was given during three months. The anginal symptoms remained essentially unchanged, although the patient claimed that he felt "a little better with slightly diminished frequency and intensity of the attacks." The basal metabolic rate also remained practically unchanged (—2, +2, +3 per cent). After three months of medication he suddenly collapsed and died at a funeral which he was conducting, obviously from coronary occlusion. No autopsy was performed.

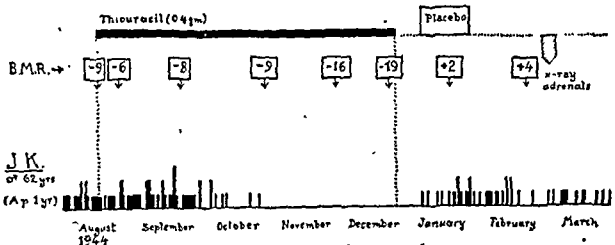


Fig. 9.—Course in case 6.

CASE 10.—M. N., a woman aged 57, a housewife, with old tuberculosis of the spine and mild diabetes, during the past four years had had attacks of pain across the chest, irradiating into both arms, lasting from a few minutes to one hour or more. These attacks occurred two to six times daily on walking, emotions or exposure to cold wind and frequently also at rest. There had been repeated episodes of cardiac decompensation with dyspnea, orthopnea, cyanosis and edema, controlled each time by digitalis. Roentgen irradiation of the adrenal region in April and December 1940 had been followed by partial improvement of the anginal symptoms of about two years' duration, until a complete relapse occurred in September 1942.

The heart was enlarged to the left. There was a systolic murmur over the entire heart. The aortic second sound was accentuated. The blood pressure was 210/120. The electrocardiogram showed rate 76, left axis deviation, $T_{1,2}$ flat, T_3 inverted, T_4 invisible. The basal metabolic rate was +3 per cent.

Thiouracil was given during four weeks, first 0.8 Gm. daily in four doses for three weeks, then 1.2 Gm. daily for one more week. During this treatment the basal metabolic rate remained practically unchanged (+3, +1, —1 per cent) and also the anginal attacks continued unabated. Two days before conclusion of the treatment there occurred a number of unusually severe attacks with electrocardiographic evidence of a posterior wall coronary occlusion. Death followed eight days later. No autopsy was performed.

COMMENT

Thiouracil medication proved therapeutically effective in 8 out of 10 patients with angina pectoris. In 4 cases, 3 of which can be classified as severe, the

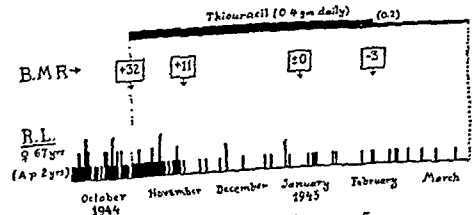


Fig. 10.—Course in case 7.

symptoms disappeared entirely during the treatment. When the drug was replaced by placebo tablets without the patient's knowledge, partial or complete relapses occurred within a matter of weeks or months in these 4 cases.

Definite improvement regarding the frequency and intensity of the anginal symptoms occurred in 3 cases. In 1 of them the treatment was followed by placebo administration, leading to a partial relapse.

One patient was only slightly improved, but two subsequent series of roentgen irradiations of the adrenal region brought the symptoms to almost complete disappearance.

Two patients with severe angina pectoris died from coronary occlusion, while the treatment was still under way, without having experienced an improvement of their symptoms.

The dosage ranged between 1.2 Gm. (1 case) and 0.4 Gm. per day in divided doses at the beginning of the treatment to 0.1 Gm. daily as a maintenance dose.

The onset of subjective improvement was reported after ten days to six weeks of medication. If thiouracil was given in a second or third period following placebo-induced relapses, improvement and disappearance of symptoms occurred more rapidly.

A significant decrease of the basal metabolic rate was observed in the 7 decidedly or completely improved patients, rather closely paralleling the diminution or disappearance of the anginal symptoms. No significant lowering of the basal metabolic rate occurred in

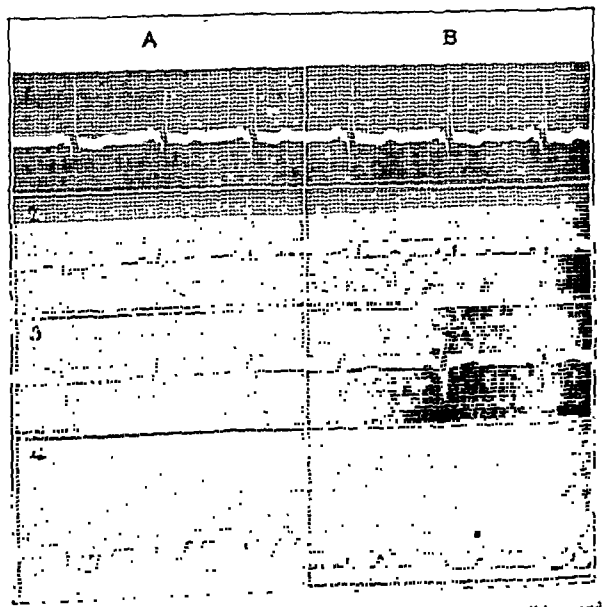


Fig. 11 (case 8).—*A*, untreated; anginal symptoms on walking and other effort; basal metabolic rate +16 per cent. *B*, thiouracil (four months); considerably improved; no more pain on walking; basal metabolic rate —5 per cent.

the 2 nonresponding patients who died, and only a moderate and temporary fall was observed in the 1 patient who was only slightly improved.

Maximum improvement was reached when the basal metabolic rate had fallen 7 to 27 points below its original level, as shown in the table. Relapses occurred simultaneously with a return of the basal metabolic rate toward its pretreatment level. In case 4 the basal metabolic rate remained for six months far below the pretreatment level and there was freedom from symptoms during this entire period. In case 2 analogous developments required only a few days.

The initial basal metabolic level at the time of introduction of the thiouracil treatment had no apparent influence on the efficacy of the medication. It ranged between +32 and —9 per cent. In none of the 10 patients were there any indications of hyperthyroidism. High basal metabolic levels are not unusual in hypertensive patients (e. g. patients 1, 5 and 7). They are probably of hypothalamic origin.[62]

62. Raab, Wilhelm: Hypermetabolic Hypertension: A Syndrome of Central Nervous Origin, to be published.

Fully developed myxedema resulted in case 3; in cases 2, 6, 7 and 8 there was some puffiness of the face, in 2 of them combined with sleepiness, when the basal metabolic rate had reached its lowest level. These phenomena disappeared spontaneously within one to two weeks after discontinuation or reduction of the thiouracil medication. The blood cholesterol was elevated during the hypothyroid episodes.

The electrocardiogram was rapidly normalized in case 1 and remained so for about six months of placebo administration until the basal metabolic rate returned to its former level. A partial normalization of the electrocardiogram occurred also in case 8 together with clinical improvement. In case 13, on the other hand, the pathologic changes of the electrocardiogram became even more pronounced during the first thiouracil period than before treatment. They reached a maximum during a severe relapse under placebo administration but reverted to the original degree when the patient became again symptom free during a second thiouracil period. In the other cases no significant changes of the electrocardiogram were noted.

The behavior of the blood pressure was uncharacteristic.

No untoward side effects of the thiouracil medication were observed in any case.

bolic rate and symptomatic response is the fundamental involvement of even the normal thyroid function in the mechanism of a probably large group of angina pectoris cases. That this involvement consists essentially of a sensitization of the heart muscle to the anoxiating action of epinephrine and probably also of sympathin originating in the heart itself is suggested by many clinical and experimental facts as outlined in the introduction.

Failure of anginal symptoms to respond to thiouracil, as in cases 9 and 10, may be due to the rather wide individual differences regarding the effect of thiouracil on the human thyroid gland as described by Astwood.[59] On the other hand, even complete absence of thyroid function, as in total thyroidectomy, does not always abolish the anginal symptoms (Claiborne and Hurxthal[4] and others). The degree of coronary stenosis, of the intensity of epinephrine discharges and other factors may be responsible for these differences of therapeutic results. In 1 case that I observed anginal symptoms persisted after total thyroidectomy despite the development of myxedema. Two others with spontaneous myxedema also showed typical angina pectoris.

Elaboration of an ideal dosage of thiouracil both for initial treatment of angina pectoris and for maintenance of an established improvement will require further pro-

Observations in Ten Cases

Case No.	Age	Sex	Blood Pressure, Mm. Hg	Duration of Angina Pectoris, Years	Severity of Angina	Basal Metabolic Rate, %	Degree of Response to Thiouracil	Onset of Improvement	Diminution of B. M. R. at Time of Maximum Improvement *	Maximum Duration of Improvement After Discontinuation of Thiouracil
1	63	♀	185/102	7	Severe	+24	++	10 days	—27	11 months
2	70	♂	140/ 84	4	Medium	+ 1	+++	2 weeks	—15	2 months
3	70	♂	190/110	3	Severe	+19	+++	1 month	—19	1 month
4	68	♂	130/ 68	2	Severe	— 4	+++	2 weeks	—23	7 months
5	43	♀	212/112	¾	Severe	+27	±	5 weeks	—13	.....
6	62	♂	135/ ?	1	Medium	— 9	+++	6 weeks	— 7	2 weeks
7	67	♀	225/ 98	2	Medium	+32	++	1 month	—21	.....
8	69	♂	192/ 88	4	Medium	+16	++	3 weeks	— 9	.....
9	62	♂	170/100	3	Severe	— 2	—	.....	....	.....
10	57	♀	210/120	4	Severe	+ 3	—	.....	....	.....

* Points.

The therapeutic results obtained with thiouracil so far are similar to those described after thyroidectomy by Blumgart and his associates,[2] Levine and Eppinger[3] and others. These workers found a basal metabolic level of about —20 per cent most favorable regarding prevention of both anginal symptoms and of troublesome myxedematous features. The prompt disappearance of myxedematous phenomena with discontinuation or reduction of thiouracil is one of the advantages of this reversible "functional thyroidectomy" over the irreversible surgical procedure, which often requires substitutive thyroid medication.

The coincidence of symptomatic response and of response of the basal metabolic rate to thiouracil was quite striking. However, this cannot be considered as proof of the conception that the presence or absence of anginal symptoms is directly determined by the rate of systemic oxygen consumption. This conception has been questioned also in regard to the effect of thyroidectomy by Eppinger and Levine[8] and by Scherf.[6] According to Leblond and Hoff[63] the effect of thyroxine on the heart is a direct one and not the consequence of general metabolic stimulation.

The only fact which can be concluded from the approximate parallelism of changes in the basal metabolic rate and symptomatic response is the fundamental involvement of even the normal thyroid function in the mechanism of a probably large group of angina pectoris cases. That this involvement consists essentially of a sensitization of the heart muscle to the anoxiating action of epinephrine and probably also of sympathin originating in the heart itself is suggested by many clinical and experimental facts as outlined in the introduction.

Failure of anginal symptoms to respond to thiouracil, as in cases 9 and 10, may be due to the rather wide individual differences regarding the effect of thiouracil on the human thyroid gland as described by Astwood.[59] On the other hand, even complete absence of thyroid function, as in total thyroidectomy, does not always abolish the anginal symptoms (Claiborne and Hurxthal[4] and others). The degree of coronary stenosis, of the intensity of epinephrine discharges and other factors may be responsible for these differences of therapeutic results. In 1 case that I observed anginal symptoms persisted after total thyroidectomy despite the development of myxedema. Two others with spontaneous myxedema also showed typical angina pectoris.

Elaboration of an ideal dosage of thiouracil both for initial treatment of angina pectoris and for maintenance of an established improvement will require further prolonged observations. From the cases reported it would seem that a dosage quite similar to that in hyperthyroidism will be adequate: 0.4 Gm. daily for a few weeks or months followed by a maintenance dose of 0.2 or 0.1 Gm. daily over longer periods of time and eventually tentative discontinuation of the drug. Doses larger than 0.6 Gm. per day should be avoided in view of the possibility of untoward side effects as described in the literature on thiouracil.

Whether or not the elevation of the blood cholesterol level which is likely to result from thiouracil medication has to be regarded as a serious disadvantage, considering a possible enhancement of coronary sclerosis, can be decided only on the grounds of much larger and prolonged series of observation. According to Shaffer[64] a significant role of cholesterolemia in the origin of coronary sclerosis is doubtful.

The objection usually raised against claims of therapeutic results in angina pectoris, that they are "psychogenic" or "imaginary," cannot be upheld against the results of thiouracil treatment in view of the clear-cut relapses occurring under unconscious placebo medication.

The therapeutic efficacy of thiouracil in angina pectoris makes this drug appear as a valuable and preferable substitute for thyroidectomy, and it constitutes a

63. Leblond, C. P., and Hoff, H. E.: Comparison of Cardiac and Metabolic Actions of Thyroxine, Thyroxine Derivatives and Dinitrophenol in Thyroidectomized Rats, Am. J. Physiol. **141**: 32, 1944.

64. Shaffer, C. F.: The Nutritional Role of Cholesterol in Human Coronary Arteriosclerosis, Ann. Int. Med. **20**: 948, 1944.

further step in the clarification of the pathogenesis of angina pectoris as a phenomenon of hormonal chemical interference in myocardial metabolism.

All prolonged therapeutic successes which were reported, up to the present, as being achieved in angina pectoris by therapeutic measures influencing the endocrine system can be explained as being due to a diminution of the acutely anoxiating effect of epinephrine and sympathin on the myocardium whose blood supply is curtailed by coronary sclerosis:

1. Thyroidectomy decreases the sensitivity of the heart to epinephrine (Sawyer and Brown,[52] Eppinger and Levine,[8] Shambaugh and Cutler [9]).

2. Thiouracil, by suppressing the formation of thyroid hormone, acts in the same manner, as evidenced by experiments on animals and man.[65]

3. Roentgen irradiation of the adrenal region (Raab,[22] Hutton,[44] Hadorn,[45] Schittenhelm,[46] Lippross,[47] Raab and Soule [48]) abolishes the abnormally intense discharges of epinephrine and related compounds which are a characteristic of angina patients.[25]

4. Testosterone propionate (Hennsge,[66] Pick,[67] Arndt,[68] Walker,[69] Bonnell, Pritchett and Rardin,[70] Lesser,[71] Hamm,[72] McGavack [73]) normalizes the myocardial metabolic changes which follow on castration (Schumann [74]) and which seem to be due to the presence of increased amounts of epinephrine in the heart muscle.[18] They are qualitatively identical with those elicited by epinephrine (Schumann [74]).

The traditional but inadequate explanations of angina pectoris as a manifestation of acute myocardial anoxia caused by "overwork" or "coronary spasm" served their purpose as long as nothing was known about myocardial metabolism and the fundamental role of neurohormonal factors in its physiologic and pathologic aspects. These factors are becoming increasingly apparent and are likely to make some of the customary mechanistic hypotheses obsolete.

SUMMARY

Treatment with thiouracil proved effective in 7 out of 10 patients with angina pectoris, 4 of whom became entirely symptom free during the treatment. One patient was only slightly improved. Two patients remained unimproved and died from coronary occlusion.

Clinical improvement coincided rather closely with the fall of the metabolic rate and failed to occur in those patients whose basal metabolic rate did not decrease.

Replacement of thiouracil by placebos without the patient's knowledge was followed by a partial or complete recurrence of the anginal symptoms, coinciding with a return of the basal metabolic rate toward its former level within ten days to seven months following discontinuation of the thiouracil medication.

The thyroid hormone, even in physiologic amounts, sensitizes the heart muscle to the anoxiating toxic action of epinephrine. Thiouracil exerts an opposite, heart-protecting effect, obviously through suppression of thyroid hormone formation.

In view of these and many other experimental and clinical facts the efficacy of "functional thyroidectomy" through thiouracil is ascribed to a diminution of myocardial sensitivity to heart-anoxiating, angina-producing epinephrine and sympathin discharges.

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WHY USE SPINAL ANESTHESIA?

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Many reasons have been advanced for using spinal anesthesia, ranging from pure convenience to increased safety for the patient. This type of anesthesia has been utilized for every type of operation, from removal of warts and ingrown toenails to craniotomy. As with other forms of anesthesia, too much emphasis has been placed on the selection of the agent and method rather than on the skill and experience of the one responsible for the administration.

This form of anesthesia is so generally and successfully employed for surgery of the lower part of the abdomen and the extremities that its use for surgery in these areas will not be considered in this paper. On the other hand, the utilization of spinal anesthesia for surgery of the chest, head and neck is considered to be fraught with too many dangers to allow for its general use. This discussion, therefore, will be limited to an attempt to give an answer to the question "Why use spinal anesthesia for upper abdominal surgery?" Irrespective of how many other reasons or excuses may be advanced for the use of spinal anesthesia for surgery in the upper part of the abdomen, the most important one is that a completely successful spinal anesthesia gives working conditions in the abdomen unexcelled and rarely equaled by other methods. Usually all other reasons play a secondary role to this one. Assuming this statement to be correct and that next to the elimination of the actual pain of surgery, with as little disturbance of physiologic processes as possible, the most important function of any anesthesia is to facilitate the work of the surgeon, it would seem to follow naturally that, unless there were important disadvantages and deleterious side effects, spinal anesthesia would be the natural choice for practically all abdominal surgery.

Unfortunately there are several disadvantages and undesirable side effects of spinal anesthesia that, until means could be devised for circumventing or nullifying them, made the selection of this method for upper abdominal surgery often unwise. Many of these objections apply to the use of spinal anesthesia in general, while others have a more special significance when the anesthesia is intended for operations in the upper part of the abdomen.

The disadvantages of spinal anesthesia which must be overcome before it can be employed with uniform success for surgery in the upper part of the abdomen are (1) difficulty in obtaining anesthesia sufficiently high to permit work in this area without discomfort to the patient and with adequate muscular relaxation, (2) insufficient duration of anesthesia necessitating a change

From the Department of Anesthesia, the Lahey Clinic.
Read before the Section on Anesthesiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

to a less satisfactory method during the course of the operation, (3) respiratory depression, (4) circulatory depression, (5) nausea, retching and vomiting during operation and (6) psychic objection on the part of the patient and even of the surgeon and anesthetist to the patient being awake during the operation.

The first three disadvantages and to some extent the fourth are closely related to the distribution of the spinal anesthetic agent in the spinal canal. The height or cephalad distribution of anesthesia is obviously a result of the presence of the agent in the spinal canal at the level from which the corresponding nerve roots arise. Frequently, however, it is not appreciated that the duration of spinal anesthesia at a certain level is to a great extent a direct function of the concentration of the agent. In order to have long lasting upper abdominal anesthesia, the maximum concentration of the agent must be along the nerve roots supplying the upper part of the abdomen and not at the spinal puncture site in the lumbar area. Another factor of great importance is that all of the nerve supply to the abdomen

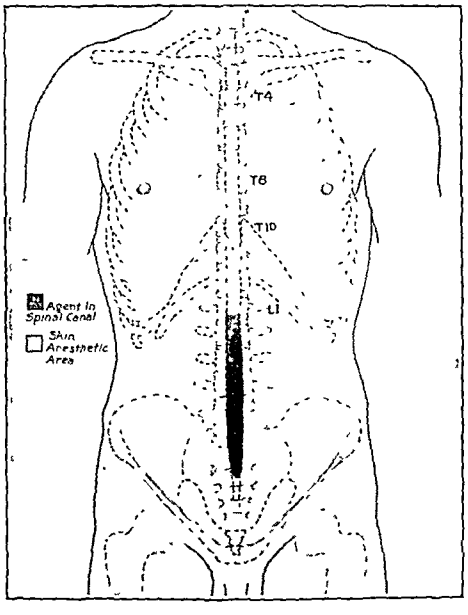


Fig. 1.—Anesthetic level necessary for perineal and lower extremity surgery.

arises in the thoracic segments of the spinal cord. This means that there is almost invariably some impairment of lower intercostal muscle activity with spinal anesthesia for abdominal surgery. Of course, the higher the anesthesia the more intercostal muscles are impaired. If the agent progresses cephalad to the first thoracic segment in sufficient concentration, all intercostal muscles become paralyzed. Paralysis of the diaphragm will ensue if the motor nerves are involved as high as the fourth cervical segment.

A review of some of the anatomic factors involved in the distribution of spinal anesthesia may be helpful in appreciating the problems associated with distributing the major portion of an anesthetic agent on the nerve roots to the upper part of the abdomen and at the same time stopping the agent short of respiratory paralysis. Figures 1, 2, 3 and 4 are representations of the distribution of the spinal anesthetic agent in the spinal canal with the corresponding sensory surface distribution of anesthesia. In order to have anesthesia to the groin, the anesthetic agent must be as high as the first lumbar segment (fig. 1). If the agent is advanced cephalad to the tenth thoracic segment, surface anesthesia will be present to the umbilicus (fig. 2). This level would permit surgery on the perineum, anus, extremities and superficial operations on the lower part of the abdomen.

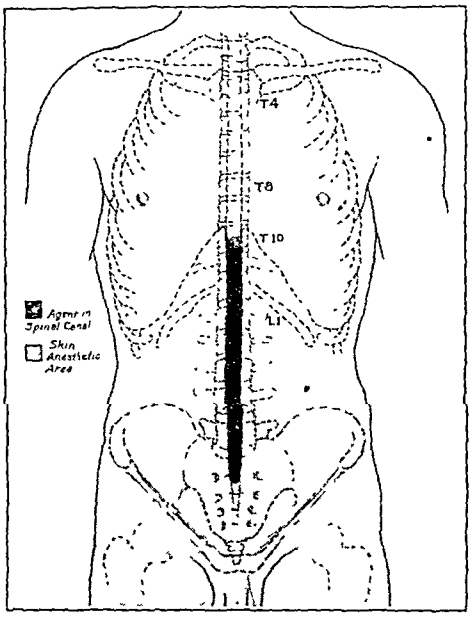


Fig. 2.—Anesthetic level necessary for superficial operations in the lower part of the abdomen.

With sensory anesthesia no higher than this, intra-abdominal operations could be performed only in the lower part of the abdomen and then without abdominal exploration or tension on the viscera. With the agent

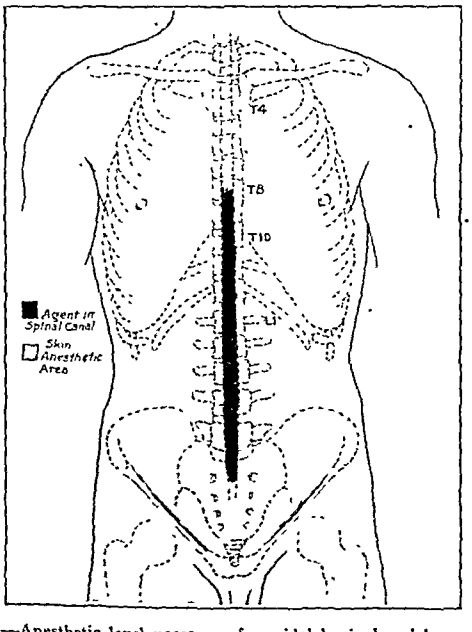


Fig. 3.—Anesthetic level necessary for midabdominal and lower abdominal surgery.

at the level of the seventh thoracic segment, the upper border of sensory anesthesia is at the costal margin (fig. 3). This is still not high enough to permit operations in the upper part of the abdomen or complete abdominal exploration. Completely satisfactory anesthesia for operations such as hysterectomy or appen-

dectomy should not be lower than this. Satisfactory spinal anesthesia for upper abdominal surgery cannot be obtained until the agent has progressed cephalad to approximately the fourth thoracic segment. This gives surface anesthesia to the nipple line (fig. 4). To obtain anesthesia to the groin, in the average adult male

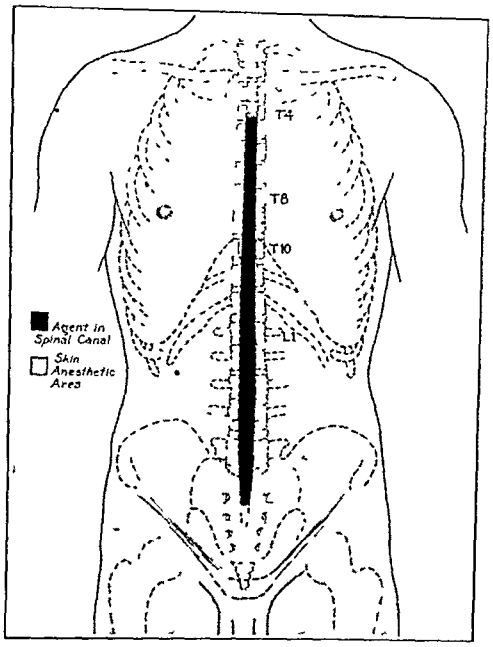


Fig. 4—Anesthetic level necessary for complete abdominal exploration and upper abdominal surgery.

patient the anesthetic agent must reach a level in the spinal canal approximately 18 cm. above the sensory skin level and 7.5 cm. above the usual site of injection (third lumbar interspace). For anesthesia to the level of the umbilicus, the agent is approximately 15 cm. above the skin anesthesia level and 12.5 cm. above the

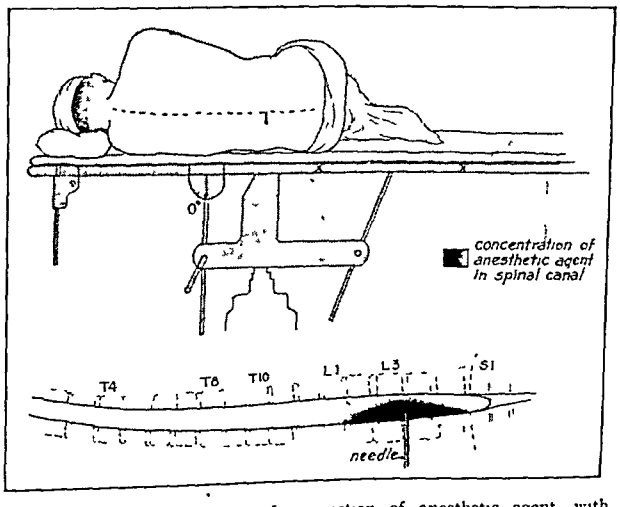


Fig. 5—Position of patient for injection of anesthetic agent, with diagram illustrating distribution of the anesthetic agent in the spinal canal immediately following injection, when diffusion or volume technic is employed

site of injection. If, however, we wish anesthesia to the nipple line for upper abdominal surgery, the agent must travel 26 cm. from the site of injection and will be 7 cm. above the superficial sensory level.

With surface anesthesia to the nipple line, the agent is present in the spinal canal approximately 14 cm. from that level, which may result in respiratory paralysis. This represents the average distance from the fourth thoracic segment to the fourth cervical segment (origin of the phrenic nerve) and leaves only the upper three or four intercostal muscles unaffected (fig. 6).

There are, of course, many factors that influence the distance an anesthetic agent will progress cephalad in the spinal canal. The site of injection often is thought to play an important part in the height of spinal anesthesia. While this factor does play a minor role, it is relatively unimportant as long as the injection is made anywhere in the lumbar area. Other factors of importance are the volume of solution injected, the speed of injection, the amount of barbotage employed, diffusion and, finally, the influence of gravity when there is a difference between the specific gravity of the anesthetic

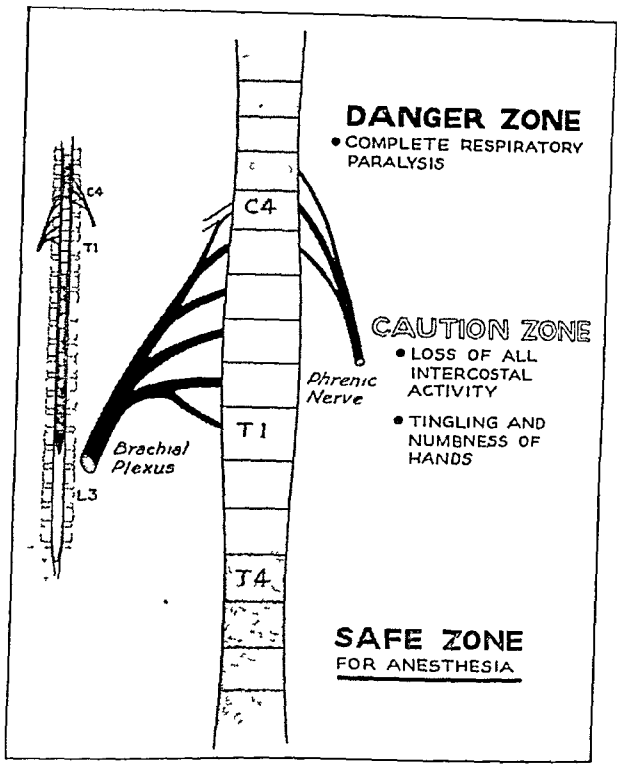


Fig. 6—Diagrammatic section of spinal canal. Note proximity of fourth thoracic segment (level necessary for satisfactory upper abdominal surgery) to origin of phrenic nerve.

solution and the spinal fluid. In addition, there are anatomic factors such as spinal curves and arachnoidal adhesions which may influence the distribution of the anesthetic agent in the spinal canal.

It is unfortunate that the factor usually depended on primarily for distribution of the anesthetic agent in the spinal canal is simple diffusion, a process over which little control can be exercised. When a spinal anesthetic mixture of approximately the same specific gravity as spinal fluid is employed or when the patient is kept level during and immediately following the injection of the agent, diffusion is the factor playing the greatest part in its distribution. However, volume and rate of injection are factors that must be considered. In any event the maximum concentration is at the site of injection, that is, in the lumbar area, which is the level from which the nerves to the lower extremities arise. It follows that the concentration is in inverse ratio to the distance from the site of injection. The

result is longer lasting anesthesia in the extremities, with a gradual decrease in the duration of anesthesia toward the head. Figure 5 is a representation of what is assumed to be the distribution of the agent in the spinal canal during and immediately following its injection, while figure 7 represents the later distribution of the agent with corresponding surface areas of anesthesia where a diffusion technic is employed.

It has been shown experimentally that a fluid with a higher specific gravity can be fairly accurately distributed in a glass tube containing fluid of a lower specific gravity. Clinical experience in employing this principle for more than 15,000 patients has shown that the spinal canal and its contained fluid can be treated almost as though it were a test tube. By maintaining a constant tilt of the operating table (head down from the horizontal) and using an anesthetic mixture of a constant specific gravity, always heavier than the spinal fluid, and a constant rate of injection in the same lumbar interspace, the height of anesthesia can be fairly accurately determined by employing only one variable. This variable is the time that the table and patient are kept in the head down position. By this

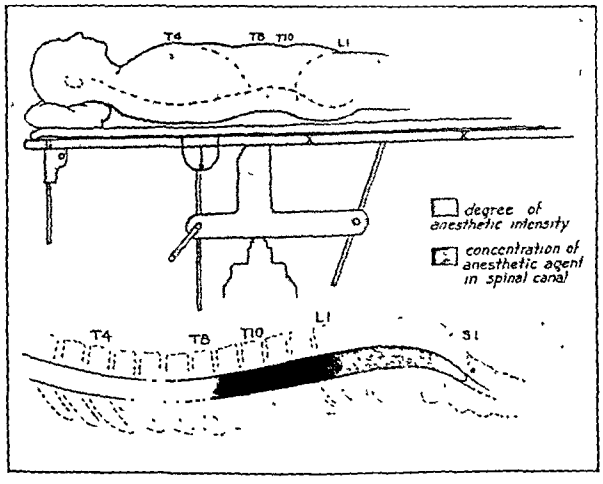


Fig. 7.—Distribution of the anesthetic agent in the spinal canal with corresponding areas of anesthesia intensity after anesthesia has been established, when diffusion or volume technic is employed

method the bulk of the anesthetic solution can be placed at the level desired to give the maximum concentration on the nerve roots supplying the area in which the operation is to take place. For exploration over the dome of the liver it must be as high as the fourth thoracic segment, and for operations on the stomach and gallbladder there must be a rather high concentration of the anesthetic agent as far up as the fifth or sixth thoracic segment.

If an innoxious substance with a fairly high specific gravity compared with that of spinal fluid (specific gravity 1.003 to 1.010) is mixed with the anesthetic solution, a mixture is obtained that is heavy enough to allow the agent to be carried cephalad by gravity more or less as a mass. Ten per cent dextrose with a specific gravity of 1.039 is a satisfactory substance for this purpose. A technic for obtaining anesthesia suitable for upper abdominal surgery employing these principles has been devised.[1] The desired dose of pontocaine (10 to 20 mg.) is made up to a 1 per cent solution in isotonic solution of sodium chloride. To this is added 1.5 parts of 10 per cent dextrose. The specific gravity of this mixture is now 1.027. This mixture is injected slowly (0.25 cc. per second) in the third lumbar interspace with the patient on the side. Prior to starting the injection, the table is turned in

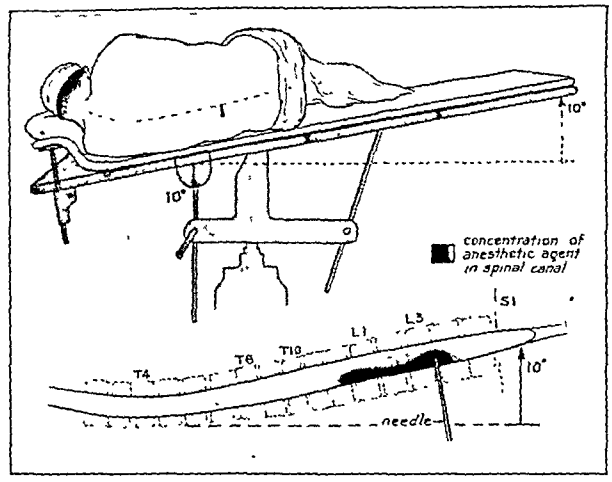


Fig. 8.—Position of patient for injection of anesthetic agent, with diagram illustrating the distribution of the agent in the spinal canal during and immediately following the injection, when hyperbaric gravity technic is employed.

the head down position, 10 degrees from the horizontal, with the patient's head elevated to raise the cervical and upper thoracic spine. The patient immediately is turned on the back, and the height of anesthesia should be tested almost constantly until the desired level is obtained. The level of anesthesia usually will be to the nipple line (fourth thoracic segment) in one to two minutes. The patient should not be left in the head down position longer than one minute unless tests show the anesthetic level to be lower than the xiphoid process (sixth thoracic segment). An accurate determi-

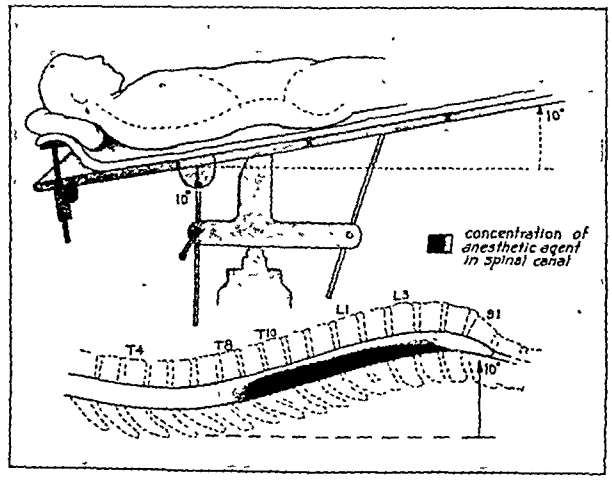


Fig. 9.—Position of patient for obtaining desired level of anesthesia, with diagram illustrating later distribution of the agent in the spinal canal, when hyperbaric gravity technic is employed.

nation of the height of anesthesia should be repeatedly obtained as long as the table is in the head down position and for several minutes thereafter. Figures 8 and 9 represent attempts to demonstrate graphically the course of a hyperbaric (heavier than spinal fluid) anesthetic solution in the spinal canal when the gravity technic is employed.

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Figure 10 represents diagrammatically the distribution of a spinal anesthetic agent in greatest concentration in the upper and midthoracic segments, with corresponding areas of intensity of surface anesthesia.

This technic can be varied for lower levels of anesthesia by changing the tilt of the table or the length of time it is left in the head down position.

When spinal anesthesia is used for upper abdominal surgery the dangers of serious impairment of respiration must be kept in mind. It is of utmost importance that respiratory impairment should be recognized immediately. This, of course, calls for the attendance of one familiar with these dangers and equipped to institute immediate treatment. If the agent is distributed as far cephalad as the fourth thoracic segment, the intercostal muscles below this level usually will be inactive and the elevation of the ribs and expansion of the chest on inspiration will be due to the pull of the upper intercostal muscles. If the agent continues to progress upward, the remaining intercostal muscles become inactive and the chest no longer expands with inspiration. If the patient is asked to take a deep breath at this time, only diaphragmatic breathing can be observed. The chest remains entirely motionless or may even retract on inspiration. This is one of the earliest and most important warning signs that the anesthesia is going too high. At this time or soon afterward the patient may complain of numbness or tingling in the hands. This is, of course, due to involvement of the roots of the brachial plexus (fig. 6). Figure 11 illustrates the normal position assumed by the chest and abdomen on inspiration, as well as their position after complete intercostal paralysis. If the fourth cervical nerve is involved, the diaphragm becomes paralyzed with complete respiratory arrest. Before the phrenic nerves are completely involved, the conscious patient attempts to increase the size of the chest cavity by using the accessory muscles of respiration. This can be detected readily by observing the patient's neck for increased activity of the sternomastoid and platysma muscles. The patient may also lose the voice and become apprehensive. If

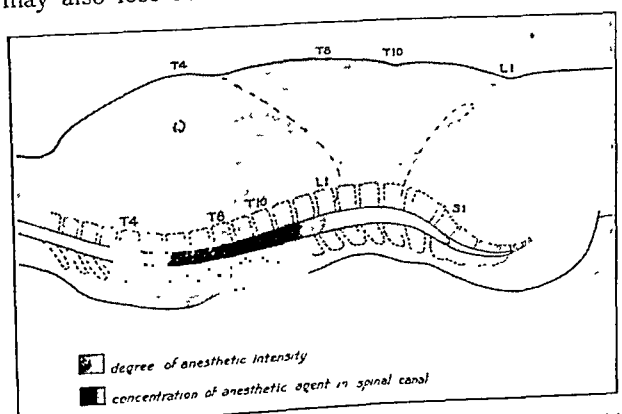


Fig. 10.—Distribution of the anesthetic agent in the spinal canal with corresponding areas of anesthesia intensity after anesthesia has been established, when hyperbaric gravity technic is employed.

unrelieved, this condition may lead to hypoxia, circulatory collapse and death. The treatment is obvious. It consists in the administration of oxygen with some mechanical assistance to inspiration if there is inadequate respiratory exchange. This assistance is absolutely essential if there is complete respiratory arrest. The assistance to respiration can best be accomplished by administering oxygen from a gas machine and exerting rhythmic pressure on the rubber breathing bag coincidental with each attempt at inspiration or about sixteen times per minute. Obviously the establishment of a free and unobstructed airway is imperative. Respiratory stimulants are not indicated and neither

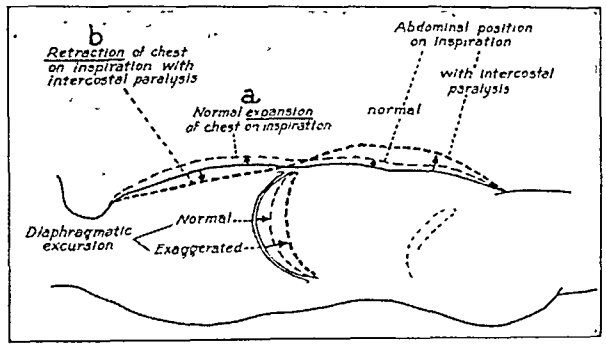


Fig. 11.—Position assumed by chest and abdomen with (*a*) normal inspiration and (*b*) inspiration after complete intercostal paralysis. Note exaggerated diaphragmatic and abdominal motion.

are pressor drugs unless circulatory depression occurs. If immediate and adequate treatment is instituted, this condition need cause no great alarm, and usually secondary circulatory depression does not occur. Furthermore, the surgical procedure need not be delayed. The period of respiratory depression rarely lasts longer than twenty to thirty minutes.

Many theories have been advanced to explain the fall in blood pressure which so frequently accompanies spinal anesthesia. Whether the cause of the blood pressure fall is blocking of the nerves to the adrenal glands, direct action of the anesthetic agent on the nerve centers of the medulla, absorption of the agent into the blood stream, venous stagnation or blocking of the vasoconstrictor fibers in the anterior spinal nerve roots, we are faced with the fact that a rather pronounced fall in blood pressure frequently is observed during spinal anesthesia. Falls in blood pressure are much more frequent with high spinal anesthesia than when the anesthesia is confined to the lower part of the abdomen. This hypotension may be alarming and should always be considered unphysiologic. Surgical manipulation in the abdomen, of course, plays a part in the production of blood pressure fall, and severe circulatory depression always follows unrelieved respiratory depression. While a severe blood pressure fall often is not observed with high spinal anesthesia, one should always remember that such an occurrence may be manifested independent of the operative procedure and without any demonstrable respiratory depression. The routine use of 50 to 75 mg. of ephedrine intramuscularly a few minutes prior to the induction of spinal anesthesia is a valuable safeguard against circulatory depression. Many of the pressor drugs have been employed successfully to combat blood pressure falls which in spite of prophylactic ephedrine have reached a level low enough to require treatment. Epinephrine and neosynephrine are effective in raising blood pressure; however, these drugs often have a rather transient effect and may disturb cardiac rhythm. Intramuscular ephedrine alone is usually effective but is somewhat slow in action. An extract of the posterior part of the pituitary gland (pitressin) is an effective blood pressure raising drug and is usually prompt in action. The fact that this drug may constrict the coronary

arteries and decrease the blood supply to the heart must be borne in mind. This danger may be minimized if it is combined with ephedrine. A combination of 5 units of pitressin and 25 mg. of ephedrine intramuscularly has proved very satisfactory in the treatment of blood pressure falls due to spinal anesthesia.[2] The response is usually prompt and well sustained, and one dose as a rule is sufficient. One fourth to one third of this dose can be given intravenously in the presence of a severe fall in pressure. The heart rate and rhythm usually are changed but little if any with this combination.

Nausea, retching and vomiting are frequent annoying complications of spinal anesthesia. No single factor is responsible for this complication, and probably more than one factor plays a part. The presence of the anesthetic agent in sufficient quantity in the fourth ventricle in dogs will produce vomiting. This may be the cause of vomiting under spinal anesthesia in some instances. Reduced blood pressure with tissue hypoxia, direct action of the drug on centers in the fourth ventricle through the circulation, traction reflexes in the abdomen and side effects of preoperative narcotics may all be factors contributing to nausea and vomiting under spinal anesthesia. If this complication is more than a momentary disturbance, the patient should be rendered unconscious by the use of an inhalation agent such as cyclopropane or nitrous oxide or by the intravenous administration of an anesthetic agent such as pentothal sodium. This enables the surgical procedure to proceed uninterrupted and relieves the patient from an uncomfortable and disturbing experience. The danger of vomitus being aspirated into the trachea should always be borne in mind when a general anesthetic is administered for the relief of nausea and vomiting.

Sometimes patients object to being awake during an operation, although not nearly as often as is generally thought. An additional dose of morphine intravenously after the patient is in the operating room prior to

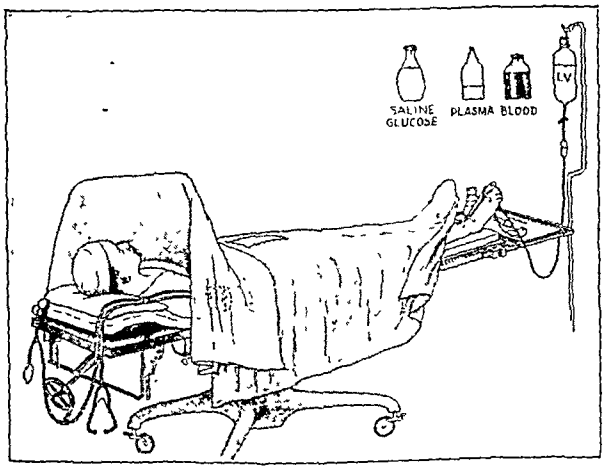


Fig. 12.—Patient ready for operation under spinal anesthesia. Note blood pressure cuff and constant intravenous drip in place (needle in saphenous vein). Supportive fluids and supplementary intravenous agents available.

induction of spinal anesthesia often allays apprehension and nervousness. There is no reason why any patient who objects to being awake during an operation cannot have the comfort of being asleep and at the same time not be denied the advantages of spinal anesthesia. The administration of cyclopropane in concentrations only high enough to maintain unconsciousness is a valuable adjunct to spinal anesthesia. If for any reason the administration of an inhalation anesthetic is undesirable, the patient can be rendered unconscious by the

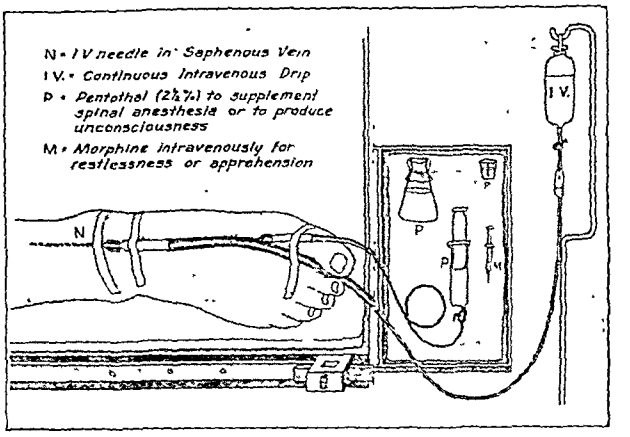


Fig. 13.—Details of intravenous drip and supplementary intravenous agents.

use of an intravenous barbiturate such as pentothal sodium. The placing of an intravenous needle in one of the great saphenous veins near the medial malleolus and maintaining a slow drip of fluid through the needle throughout the entire operative procedure permits the rapid administration of supportive fluids such as glucose, blood and plasma or the administration of an intravenous anesthetic agent (fig. 12).

With the use of a technic which distributes the major portion of the anesthetic solution in the spinal canal at the level from which the nerves supplying the upper part of the abdomen arise, the need for supplementary anesthesia because of insufficient duration becomes less frequent. However, if it becomes obvious that the operation is going to outlast the anesthesia, a supplementary anesthetic must be employed. Pentothal sodium is an excellent intermediary agent facilitating the transition from spinal to inhalation anesthesia. This transition can usually be made without any disturbance of the operative field, provided the supplementary agents are started before the patient begins to feel pain or there is any loss of muscular relaxation.

With the increasing use of continuous spinal anesthesia,[3] the need for supplementary anesthesia for longer surgical procedures is disappearing. This technic is valuable and has made spinal anesthesia practical for a large group of patients for whom it was frequently unsatisfactory or inadequate.

With the use of proper agents and methods and with an appreciation of some of the physical and physiologic factors involved in the production of adequate spinal anesthesia, the distribution of the agent in the spinal canal can be fairly accurately controlled. If this control of the anesthesia is combined with the judicious use of supportive measures and supplementary agents, there are few patients to whom spinal anesthesia need be denied for surgery in any part of the abdomen.

The prime contraindication to spinal anesthesia is still the absence of a spinal anesthetist.

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THE USE OF CONTINUOUS SPINAL ANESTHESIA

UTILIZING THE URETERAL CATHETER TECHNIC

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In a previous communication [1] the methods and indications for continuous spinal anesthesia were described and the fundamental premises of a method (malleable needle technic) originally suggested by Lemmon [2] emphasized. At this time there should be little doubt that the fractional or serial administration of spinal anesthetic agents is safer relatively than single large dose administration—so-called "single shot spinal." However, in certain instances it is not always practical to utilize continuous spinal anesthesia because one is administering a small initial dose of the spinal anesthetic and one does not contemplate or desire to inject any more of the anesthetic; for example, for hemorrhoidectomy or transurethral prostatic resection. Thus, certain surgical procedures do not lend themselves as practical for utilizing continuous spinal anesthesia regardless of the technic employed.

The continuous spinal method is indicated usually and advantageously in such surgical operations as bilateral primary inguinal herniorrhaphy, operations for recurrent hernias (inguinal or ventral), certain abdominal laparotomies in which the surgical risk is good, such as operations on the biliary tract or stomach, lengthy orthopedic procedures on the hips or lower extremities and neurorrhaphies of the sciatic nerve. At this juncture it should be stated again that debility and cachexia and impending surgical shock should deter one from the use of a spinal anesthesia by any method. I believe that there are few if any exceptions in these situations.

The chief difficulties which I have experienced coincidental with the Lemmon technic [2] have resulted from the dislodging of the malleable needle from the subarachnoid space, thus invalidating the effectiveness of the procedure. It is true that on occasion it has been difficult to introduce the malleable needle satisfactorily into the subarachnoid space, but this objection is relatively negligible. Breakage of the needle is a remote but actual hazard to be conjured with continually. In an effort to obviate the difficulty of the malleable needle becoming displaced, a new method of performing continuous spinal anesthesia was devised utilizing a ureteral catheter. Previous reports of the use of a ureteral catheter for caudal anesthesia [3] and for continuous subarachnoid drainage for meningitis as advocated by Love [4] prompted the trial of a ureteral catheter for the purpose of continuous spinal anesthesia. It was my feeling that a number 4 ureteral catheter would be less traumatic to tissues than a needle (malleable) when it is left in position for the duration of an operation, and if the catheter was satisfactorily introduced into the subarachnoid space it would not become dislodged as easily as a needle. The hazard of breakage of the catheter during any portion of the procedure did not appear to be as great as that with a needle, because of the flexibility and mobility of the catheter; nevertheless this complication is potentially a possibility.

TECHNIC

The introduction of the ureteral catheter (x-ray type, leaded with a round tip) number 4 is accomplished by the following method: The patient is placed on the table in the lateral recumbent position, usually on the patient's right side, shoulders and hips perpendicular to the table and close to the edge, the thighs flexed on the abdomen so that the patient's knees and chin are close together. The skin is surgically prepared and sterile drapes are placed about the site of the injection. The space between the third and fourth or fourth and fifth lumbar vertebrae is used for the site of injection. Occasionally the space between the second and third lumbar vertebrae is utilized if the lower lumbar interspaces appear to be rather narrow. The skin and subcutaneous tissues at the site of the injection are anesthetized then with 1 per cent solution of procaine hydrochloride. In most instances 25 to 50 mg. of ephedrine sulfate is injected intramuscularly at the site of injection prior to the administration of the spinal anesthetic. In order to facilitate the introduction of the 15 gage needle which is to guide the ureteral catheter, the skin at the site of the puncture is broken by means of a skin awl. Following this the 15 gage needle, 3 to 3½ inches (7 to 9 cm.) in length, with a flush fitting stylet, is inserted into the subarachnoid space. A definite "snap" is felt when the needle penetrates the ligamentum flavum and thence the dura and arachnoid tissue. On completion of a successful puncture of the arachnoid the stylet is removed and a 20 cc. luer syringe containing 400 mg. of procaine or metycaine hydrochloride (4 cc. of a 10 per cent solution) is attached to the hub of the needle and the anesthetic agent is diluted with spinal fluid up to a total volume of 12 to 15 cc. The resultant mixture is a 3⅓ or 2⅔ per cent solution. The concentration of the solution can be varied at will by altering the amount of spinal fluid withdrawn. Solutions of less than 2 per cent or over 4 per cent concentration seldom are necessary. The more dilute solutions, for example, 2 to 2.5 per cent, are used usually for operations in the upper part of the abdomen because they will allow the injection of a greater volume of solution without increasing the initial total dose, and thus segmental dermatome anesthesia will be produced sufficiently high. The syringe is removed from the needle hub and the ureteral catheter is inserted through the needle into the subarachnoid space. Centimeter markings on the catheter are used to measure with so that one can determine how far to introduce the catheter. The tip of the catheter is advanced about 4 to 5 cm. beyond the end of the point of the needle into the subarachnoid space. This is sufficiently far to prevent the catheter from slipping out of place. The 15 gage needle is removed from the intervertebral space and slid off the free end of the catheter. A 22 gage needle ½ inch (1.27 cm.) in length is inserted into the free end of the catheter and to this needle hub is attached a one way stopcock adaptor. One end of this adaptor fits the hub of the 22 gage needle and the other the syringe containing the

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Read before the Section on Anesthesiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Tuohy, E. B.: Continuous Spinal Anesthesia: Its Usefulness and Technic Involved, Anesthesiology **5**: 142-148 (March) 1944.
2. Lemmon, W. T.: A Method for Continuous Spinal Anesthesia, Ann. Surg. **3**: 141-144 (Jan.) 1940.
3. Adams, R. C.; Lundy, J. S., and Seldon, T. H.: Continuous Caudal Anesthesia or Analgesia: A Consideration of the Technic, Various Uses and Some Possible Dangers, J. A. M. A. **122**: 152-158 (May 15) 1943. Manalan, S. A.: Caudal Block Anesthesia in Obstetrics, J. Indiana M. A. **35**: 564-565 (Oct.) 1942.
4. Love, J. G.: Continuous Subarachnoid Drainage for Meningitis by Means of a Ureteral Catheter, J. A. M. A. **104**: 1595-1597 (May 4) 1935.

anesthetic solution. Originally I did not use a one way adaptor, but without it I have had several cases in which the spinal fluid pressure was sufficient to force the plunger back into the syringe and consequently alter the concentration of the solution; so I have added the one way adaptor and obviated this difficulty. Preparations for injecting the spinal anesthetic via the catheter now are complete. As the bore of the number 4 ureteral catheter is so small, little solution is needed to fill its lumen, and it is not necessary to allow for the minute loss of solution in calculating dosage of the anesthetic agent. Initial doses will vary between 80 and 120 mg. In general the original fractional dose should be a fourth or fifth less than the dose contemplated for a single injection type of anesthesia.

When the initial dose has been injected the patient is turned carefully onto his back and the catheter is brought out to his side and fastened in place to the operative mattress with adhesive plaster. Additional quantities of the anesthetic agent should be injected at the first indication that the patient is having pain or that there is a lack of muscular relaxation. Usually within thirty-five to forty minutes it is necessary to add additional amounts (2 cc., or 52-66 mg.) of the anesthetic agent. Subsequent doses are added in the same manner as they are required.

At the completion of the operation, before an attempt is made to remove the catheter, the patient is turned on his side again and if possible the thighs and head are flexed and then the catheter is withdrawn gently from the subarachnoid space. The purpose of flexing the patient is to relieve any tendency for the interspinous ligaments and spinous processes of the vertebrae to impinge on the catheter.

COMPLICATIONS

There has been no increase in the incidence of spinal puncture headache as compared with single dose spinal anesthesia or routine spinal puncture. There have been no instances of persistent paresthesia in the limited number of cases so far (250). Bleeding from the soft tissues at the site of injection is encountered occasionally, but only if difficulty has been experienced in making the lumbar puncture. Failure to introduce the catheter successfully has occurred in 2 cases. No instances of bladder or rectal dysfunction have been noted. There has been no evidence so far of any infection in the subarachnoid space or in the soft tissue.

COMMENT

At present the catheter technic, as compared with the use of the malleable needle, has been attended by fewer mechanical difficulties in my experience. There have been no situations in which the catheter has inadvertently slipped out of the subarachnoid space. It has been my opinion that the catheter causes less trauma to the soft tissues than does a needle over a protracted period of time.

The failure to insert the ureteral catheter easily in some cases has been found to be due to the fact that the 15 gage needle was advanced too far intrathecally and insufficient space was remaining between the point of the needle and the body of the vertebrae to allow the catheter to pass. If the needle is withdrawn slightly, with an effort meanwhile to advance the catheter, entrance of the catheter into the subarachnoid space will be accomplished. One precaution must be exercised; namely, that the catheter should not be withdrawn through the needle once the catheter has entered the subarachnoid space, because the sharp point and bevel of the needle may shear off the catheter. If the catheter must be removed or partially withdrawn for any reason during the procedure, the needle should be withdrawn first from the lumbar interspace. The direction (cephalad or caudad) which the catheter will advance in the subarachnoid space after the tip of the catheter leaves the end of the guiding needle cannot be predicted positively; however, if the round tip of the catheter is bent slightly before it is introduced into the lumen of the needle, I have found that the catheter will advance cephalad in most cases. This has been verified radiographically by using the leaded ureteral catheters. In the event that the catheter turns caudad on entering the subarachnoid space, this fact can usually be detected shortly after the initial dose of the spinal anesthetic has been introduced because of the segmental distribution of the resulting anesthesia. When this situation occurs it is suggested that the remaining amount of the anesthetic solution in the syringe be diluted with an equal volume of isotonic solution of sodium chloride, and twice as much solution (volume) should be administered in order to produce higher dermatome anesthesia. Barbotage is not recommended, but it can be accomplished via the catheter if it is deemed necessary.

This procedure (ureteral catheter technic) has been taught to student officers in training in anesthesiology and I think the technic cannot be too difficult, as they can successfully use the equipment without perceptible difficulty in a relatively short time. I know that some other anesthetists are using this method, and it appears to be satisfactory also in their experience. The challenge that the 15 gage needle is unnecessarily traumatic for subarachnoid puncture is accepted, but in retaliation I offer the data that up to the present time no untoward effects have resulted from the use of this 15 gage needle, and it has been just as easy to insert this needle as it has been the malleable needle used with the Lemmon procedure. It has appeared to me that the efficient operation of the catheter system is an improvement in achieving the fundamental principles of continuous spinal anesthesia as originally suggested by Lemmon. Naturally it will be necessary to have further experience with a larger series of cases to have a complete evaluation of this method, but I think that it is worthy of trial and is to be recommended as an adjunct to this type of anesthesia. The total cost of this equipment is relatively small as compared with the equipment necessary with other methods of continuous spinal anesthesia. This may or may not be an important factor.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. EVERSOLE AND TUOHY

DR. WILLIAM T. LEMMON, Philadelphia: With an experience of over 15,000 cases and with the record of low mortality, it is hard to have much to say except in complement of the work done by Dr. Eversole. He hit the keynote when he said it is not the drug, it is not the method, but the trained man who is giving the anesthesia. I would rather have a trained anesthetist anesthetize me or my patients than to have a much superior method with an absence of training and experience. When this method is used by others of lesser training and experience it produces death—rapid, sudden and dramatic death. I know that, because I was selected to be on the Anesthesia Study Commission of the Philadelphia County Society with

Dr. Ruth, and we have the cases and the records. The trouble is not with the method, it is not with the drug, but it is either with the patient or with the individual handling the method and administering the drug. Every method that was instituted to help the patient was always instituted too late, and the means of getting out of difficulties were usually injection of epinephrine into the heart, which from our experience should never be used, because every one of those patients died. I know in the hospitals around Philadelphia County that we have the anesthetists on the alert. They know that if anything happens we are going to have not only a hospital investigation but a study of that case, and we want to find out where the fault is. The contraindications to spinal anesthesia are practically nil, but the contraindications to surgery plus spinal anesthesia are many. You cannot improperly prepare a patient for surgery and expect him to take surgery and anesthesia. If a patient is prepared for surgery he will take the handicap of the anesthesia in his stride, so to speak. Anything that is a contraindication must be eliminated before the doctor operates on his patient. I want to compliment Major Tuohy on his ingenious idea and method of using the ureteral catheter in the production of continuous spinal anesthesia, because if its disadvantages are outweighed he has a definite advantage in that his catheter will not become displaced. That, in the hands of the inexperienced, is one of the big troubles.

DR. URBAN H. EVERSOLE, Boston: Dr. Lemmon stressed an important point when he spoke of the dangers of this technic. I assume he meant the dangers of this particular technic in contradistinction to the inherent dangers of all types of spinal anesthesia. I accept that criticism. In my opinion, in the virtue of the technic lies its danger. There is a wide margin between the specific gravity of the solution injected and the specific gravity of spinal fluid. This enables the anesthetic agent to run cephalad rapidly. With this rapid cephalad progression there is the danger that it will go too high, and respiratory paralysis will ensue. As to the question concerning the administration of dextrose into the spinal canal, I am sure that 10 per cent dextrose can be satisfactorily sterilized without chemical change. I do not hesitate to put sterilized 10 per cent dextrose into the spinal canal after having done it in nearly 20,000 cases.

MAJOR E. B. TUOHY, M. C., A. U. S.: With regard to the question which Dr. Romberger brought up concerning the sterilization of the catheters, I agree full well with him, and I feel more safe myself if the catheters are autoclaved under high pressure. This is by far the best technic. However, the catheters do not stand the sterilization quite as well by this means. The lacquer which is on the outside of the catheters will break down a little more rapidly on protracted and repeated sterilization. In my experience so far I have been able to use the catheters for ten or twelve separate cases. This implies, of course, that there is careful scrutiny of the continuity of the catheters and the way in which they are handled. Concerning the indications of whether or not spinal anesthesia will be used for the type of cases which Dr. Romberger mentioned, I have no bone to pick on that score. One has to be a little cautious in what is written in the literature with regard to spinal anesthesia when you say that this method may be used for such and such a type of case. I have had no experience in the use of epinephrine or similar vasoconstrictor substances in conjunction with the subarachnoid injection of anesthetic agents.

Hospital Facilities in Japan.—Hospital facilities in Japan are not sufficient to meet the needs of the people (19 beds per 10,000 people, as compared to the average for the entire United States of 97 beds per 10,000 people). . . . The greatest number of hospital beds (about three fifths) is found in the larger cities, whereas the rural areas have only small dispensaries. The larger hospitals, connected with the medical schools, compare favorably both in reputation and in equipment with teaching hospitals in Europe; but in the smaller cities and towns hospitals are little more-than rest homes.—Simmons, James. S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

INTERNSHIPS AND RESIDENCY TYPE TRAINING IN UNITED STATES NAVAL HOSPITALS

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The Medical Corps of the Navy has been interested for a long time in the development and fullest possible utilization of the notable facilities it possesses for graduate educational training of its medical officers. The United States Naval Hospitals on this continent are as fine as any hospitals in the world; many of the United States Naval Dispensaries are actually small hospitals staffed, equipped and conducted along lines comparable to the best of civilian hospitals of similar size; and some of our fleet hospitals and others in outlying areas even near to combat zones are so conducted that all of these activities and facilities provide outstanding training opportunities for young doctors.

This interest in the development of an educational program was not solely for the benefit of the medical officers assigned to these activities but primarily and fundamentally because we are concerned with everything which counts for improvement and betterment in standards of medical care of our patients. It has been entirely incidental, therefore, that better than average opportunities for internship and residency type training are thus provided for our medical officers. As a morale builder nothing could be more important than that these men may receive substantial training while on active duty, thus increasing their medical stature and affording them opportunities to make better doctors of themselves.

INTERNSHIPS

General rotating internships in naval hospitals were established in 1924. At the present time thirty-eight naval hospitals have been approved by the Council on Medical Education and Hospitals of the American Medical Association for internship training on the same standards as those of civilian hospitals.

Under the accelerated program these naval internships consist of a nine months rotating service, providing all interns with three months on each of the three groups of services according to the following general schedule:

1. Medicine, neuropsychiatry and clinical laboratory.
2. Surgery, urology, ophthalmology, otolaryngology and roentgenology.
3. Obstetrics, pediatrics and gynecology.

These internships are acceptable for credit before state boards of licensure to the same extent as similar internships in civilian hospitals.

In order to maintain approved standards for internships certain essentials are necessary. Following a recent review of the internship training program in naval hospitals by the Board of Honorary Consultants to the Surgeon General of the Navy, the general standards governing internship training in naval hospitals are those outlined by the Council on Medical Education and Hospitals of the American Medical Association [1] for civilian institutions as adapted to naval needs.

1. Essentials of an Approved Internship, J. A. M. A. 118:1497 (April 25) 1942.

RESIDENCY TYPE GRADUATE TRAINING

United States Naval Hospitals in general are organized and staffed along departmental lines in the specialties with standards of practice in these institutions so complete and so competently conducted that the training received by naval medical officers assigned to duty in these activities has long been recognized as the equal of any formal residency in the better teaching and other civilian hospitals. However, these activities had never sought to be formally surveyed and listed as providing residency training according to civilian standards by such organizations as the Council on Medical Education and Hospitals of the American Medical Association and the American College of Surgeons until the middle of last year, when it was determined that such formal recognition would be advantageous to all concerned. One of the important functions undertaken by the newly established Professional Division of the Bureau of Medicine and Surgery of the Navy Department immediately on its inception in 1944 was that of a formal graduate educational program. This included a review of these opportunities for graduate training in medicine and its specialties, and the making certain that all of our naval hospitals would have adequate libraries, staff and departmental conferences, bedside instruction and other essentials to such training along conventional lines.

From the beginning of mobilization many noted medical teachers and specialists had come into service as reserve officers; many younger men in the midst of their residencies in various of the specialties left these to be commissioned in the Navy; many of our regular naval medical officers had been given special courses of varying lengths; and we still have innumerable young medical officers coming to us direct from civilian hospital internships or even fresh from medical schools to intern in our naval hospitals. Consequently we have had the necessary elements for outstanding teaching and instruction with younger men whose careers were otherwise being interrupted and still younger recently graduated officers, eager for opportunities to train and develop themselves. Not all of the latter want to be specialists, nor do we want them to be, but we do wish to make of them the best possible type of doctors primarily and fundamentally, as mentioned before, for the benefit of our sick and wounded, and incidentally for their own benefit.

Any straight service in a single department or through a group of allied specialties, following one year of rotating internship, is classed as a residency. The Council, the American boards certifying in the specialties, the American College of Physicians and the American College of Surgeons are concerned with this subject of residency type graduate training. The Council and the American boards, acting jointly, review and survey facilities for this work in all the specialties; the American College of Surgeons similarly surveys for formal approval of residencies in surgery and the surgical specialties. Lists are published annually by the American Medical Association and the American College of Surgeons carrying the names and locations of hospitals, civilian and others, granted such official approval and recognition. Certain essentials of graduate education in the specialties are required to obtain such approval and listing and these are outlined in detail by both of these organizations.[2] Outstanding among these requirements are adequate library facilities and staff conferences, as well as bedside clinical instruction.

Lists of current periodicals and books considered minimum for an acceptable library are supplied each naval hospital through the Bureau of Medicine and Surgery based on the recommendations of the aforementioned organizations concerned with graduate medical education. The minimum requirements for a good library are thus established by this bureau, and this minimum will be found uniform in all naval hospitals. It is obvious that these libraries will be further augmented by certain additional journals and many other books, especially in hospitals designated for the care of certain special types of diseases or illnesses. Nursing and dental publications are included.

It is directed also that staff conferences include, as a minimum, one departmental staff meeting weekly (interdepartmental conferences may be arranged between related departments) and a general staff meeting at least twice monthly. Clinicopathologic conferences and literature reviews ("Journal Club meetings") at regular intervals may be incorporated as part of either program. In larger activities the latter conferences are preferable in the departmental meetings, while in the smaller activities they may become part of the regular general staff conferences or may be separate from them but including all departments as an additional general conference.

All activities providing residency type training in the specialties must make annual reports in triplicate to the Bureau of Medicine and Surgery of the Navy covering periods of assignment of junior medical officers to such services, so that credit for the time spent may be recorded in the biographic files of (*a*) the American Medical Association, (*b*) the American College of Surgeons (in the surgical specialties) and (*c*) the Bureau of Medicine and Surgery.

Junior medical officers assigned to specialty services in naval hospitals will not be termed residents, nor will such services be designated formally as residencies. However, periods of service in activities approved officially for residency type training are given credit before the American boards and others. Services in unapproved activities are recorded as unclassified, but the officer may be able in many such instances to obtain official American board or other recognition for time spent in assignment to such services. Cumulative credit is obtainable for interrupted periods of service during wartime. Less than six months in any service will usually require individual consideration for credit.

Officers asking credit for eventual certification by one of the American boards have been advised to write to the secretary of the board concerned requesting a copy of the "Record of Professional Assignments" which is kept by him as a log of his activities. The latter are attested by his commanding officers for later use whether his service assignments in a given specialty have all been in officially approved activities or in facilities such as naval dispensaries not so listed but nevertheless providing outstanding experience under qualified supervision.

For the present, only naval hospitals have been directed by this bureau to make formal application for official approval of residency type training. Medical officers in command of other smaller naval facilities where opportunities exist for outstanding graduate training in any of the specialties may make arrangements for similar application through the bureau whenever in the opinion of the commanding officer this is

[2] Essentials of Approved Residencies and Fellowships, J. A. M. A. 113: 794 (Aug. 26) 1939. Minimum Standard for Graduate Training in Surgery, Bull. Am. Coll. Surgeons 29: 432 (Dec.) 1944.

justified. Medical officers serving in naval dispensaries, hospitalizing certain of their patients in affiliated civilian institutions, such as in departments of obstetrics and gynecology, otolaryngology or pediatrics, will receive official board and other credit if these affiliated hospitals are already approved by the Council and the colleges.

WARTIME AND PEACETIME OPPORTUNITIES FOR GRADUATE TRAINING

It is clearly recognized and frankly stated that many naval officers will have little or no opportunity for such training during wartime because of the tremendous pressure and need for medical officers on our ships and in our outlying stations. It is a fact, nevertheless, that many others do have such opportunities while actually performing their military duty if fortunate enough to obtain such assignments as these that have been described. Several notable policies have been consistently followed, as far as this was possible under the circumstances of wartime stress.

A constant effort has been made by the Personnel Division of the Bureau of Medicine and Surgery to assign men with outstanding training in a specialty to service in that specialty where he is obviously most proficient. This policy extends downward through the ranks of those with lesser degrees of proficiency or only partial training.

All naval officers, except those classified for limited duty, are expected to have a period of sea duty fairly soon after their induction into service. On nearing the completion of this they are encouraged to express preference for future assignments nearer home. It is logical that these assignments should be consistent so far as possible with the previous experience and proficiency of the man concerned.

It is true that the assignment of an officer already partially trained in a civilian residency may have to be changed before his full training, according to American board or college requirements, can be completed by us. Credit for this time spent will nevertheless be his and in the meantime that naval hospital will have had the advantage of the partial training this young man had had. He may need to be sent out to some other type of duty, or it may become necessary to assign him to another naval hospital, but in the latter event time will accumulate to his credit. We cannot promise anything in advance about services these days, but to the extent that has been outlined these plans are logical, consistent, and to a large degree workable.

What this program of graduate educational training in naval hospitals will mean to the rehabilitation of medical officers before return to civilian practice, and what it will mean for the future of the regular naval Medical Corps, can be only incompletely estimated. One thing is certain: the establishment of such programs in our institutions will unquestionably be maintained into peacetime. Regular Navy officers of the Medical Corps now and in the future have opportunities for specialization and achievements in the medical profession quite comparable to those of civilian life, whereas heretofore such opportunities have been either limited or not fully promoted. Certification by the American boards, far greater participation in the activities of the colleges and other national organizations and recognition of attainments should follow in the future for officers of the regular Medical Corps along the same lines as those that are so common to the civilian medical profession.

Finally, let it be reemphasized that there is no greater stimulus to good medical care of patients than to incorporate a program of graduate medical education for the officers serving and caring for these patients. This truism applies to all medical officers of any hospital from the top down.

Better study of the patients, careful supervision and personal clinical instruction of younger medical officers by older teachers, departmental and staff conferences for discussion and constructive criticism, the constant use of good libraries, and other similar advancements, even now while we are in the midst of war are both possible and necessary for the basic purpose of maintaining and improving the standards of medical care given the sick in our hospitals. The educational aspects of all this are incidental, it is true, but they are there and the opportunities afforded by them are magnificent.

It will be clear from the foregoing that we intend our good records for medical care of patients in the past shall be not merely maintained but steadily improved. We have the not unwarranted feeling that Navy trained physicians will be well to the front among the leaders of the profession in the future when peace comes again.

BORIC ACID OINTMENT

A STUDY OF POSSIBLE INTOXICATION IN THE TREATMENT OF BURNS

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Boric acid ointment has been used for many years as an antiseptic and bland preparation for the treatment of burns. The favorable results obtained in treatment of the victims of the Cocoanut Grove disaster when boric acid ointment or white petrolatum was used under pressure dressings resulted in an official recommendation of this type of therapy by the Subcommittee on Burns of the National Research Council.[1] On the basis of these findings a circular letter was sent by the Bureau of Medicine and Surgery to all medical officers in which this form of treatment was summarized. At that time Cope[2] suggested that "too rapid absorption of boric acid might result in poisoning." Analyses of the urine of 20 of his patients showed that a maximum of 2.0 Gm. of boric acid might be excreted in the first twenty-four hours by patients with extensive burns. Later when saturated boric acid solution was used to irrigate granulating wounds as much as 2.5 Gm. was excreted in the urine in twenty-four hours. All patients maintained

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Dr. A. C. Ivy suggested the problem to the authors. Dr. William M. Mann of the National Zoological Park supplied the bear. Lieut. W. V. Consolazio, H-V(S), U.S.N.R., made the blood electrolyte analyses. Ensign O. E. McElroy, W-V(S) (H), U.S.N.R., and Dr. H. F. Blum made the spectrographic analyses. Technical assistance was given by H. Holland, PhM1c, V-10, U.S.N.R., E. Jenny, PhM1c, V-10, U.S.N.R., V. Latta, PhM2c, V-10, U.S.N.R., and E. Hornby, PhM2c, V-10, U.S.N.R.

1. New Recommendations on Treatment of Burns and Wound Infections, Medicine and the War, J. A. M. A. **122**: 813-814 (July 17) 1943.

2. Cope, Oliver: Care of Victims of the Cocoanut Grove Fire at the Massachusetts General Hospital, New England J. Med. **229**: 138-147 (July 22) 1943; The Treatment of the Surface Burn, Ann. Surg. **117**: 885-893 (June) 1943.

normal kidney function, and these investigators concluded that prompt excretion did not lead to toxic levels of boric acid in the body.

In May 1943 Dr. A. C. Ivy suggested that in view of this recommendation further studies should be made on the toxicity of boric acid, with particular attention to the effect on bone marrow since severe anemia was one of the constant late findings in extensively burned patients. The immediate need of this study, however, was decreased by the recommendation of a joint session of the Subcommittees on Burns and Surgical Infections on July 17, 1943, in which it was recommended that boric acid ointment be discontinued in the treatment of burns. Since this official ointment has been widely used and will continue to be used by others [3] and since the studies could be prosecuted at a reduced rate along with our more urgent naval medical problems, the question of possible boric acid toxicity has been slowly but exhaustively studied at a relatively low priority level.

HISTORICAL

The literature on boron poisoning may be divided into two categories: instances of poisoning presumably due to absorption of boric acid from wounds and burns, and cases of poisoning due to oral ingestion of boron.

In 1905 Dopfer [4] first noted an intoxication which he ascribed to the application of 10 per cent boric acid ointment to a burn measuring 12 by 3 cm. in the axillary region of a 2 year old child. Eighty Gm. of ointment was applied over a period of four days. When seen by the physician on the fourth day the wound was granulating and not infected. The most evident sign of intoxication was a red rash, which had developed on the back and elbows on the second day and spread over the whole body. The patient was moribund and died in thirty minutes. Pathologic changes were not evident at autopsy. Savariaud [5] in 1914 suggested that, while boric acid solution might be harmless, wounds should never be dusted with powdered boric acid since he had seen serious intoxication develop in twelve hours in an 8 year old child whose burns of the abdomen and thighs were dusted with boric acid. Gissel [6] in 1933 reported probable poisoning of a 4 year old child whose severe burns were treated with 30 Gm. of powdered boric acid. The symptoms noted were fever, "weakening of the circulation," diarrhea, vomiting, conjunctivitis, stupor and terminal bronchopneumonia. At autopsy, four days later, lesions other than the pneumonia and degeneration of the liver and kidneys were not found. Brose [7] in 1883 reported a death following the use of powdered boric acid on a chronic leg ulcer. Best [8] in 1903 noted a similar death of an adult male when 6 ounces (170 Gm.) of powdered boric acid was used in a wound following excision of some inguinal lymph nodes. While these cases leave much to be desired as proof of boron intoxication is concerned, other cases in the literature in which the boron was given by routes in which absorption is certain leave no doubt that serious or even fatal boron intoxication can occur.

Poisoning by enemas of boric acid has been described by Sanders,[9] by Bazin,[10] by Brown and his associates,[11] after accidental injection by Peyton and Green,[12] who had a patient recover after a single subcutaneous dose of 28 Gm., and by McIntyre and Burke,[13] who had a patient recover after 15 Gm. of boric acid had been given intravenously. Owing presumably to the almost complete absorption of boric acid from solutions, by far the most insidious form of intoxication is that which occurs on irrigation of a closed cavity with saturated boric acid solution. Molodenkow, quoted by Tillmanns,[14] and more recently Ross and Conway [15] have reported deaths due to absorption of boric acid from irrigated cavities.

Numerous cases of poisoning from the accidental oral ingestion or oral therapeutic use of boric acid or borax as preservatives have been reported.[16] Poisoning has also been described in infants who have suckled from nipples cleansed with saturated boric acid solution.[17]

From the numerous case histories reported, it appears that the fatal dose of boric acid in an adult is somewhat more than 15 to 20 Gm., in an infant 5 to 6 Gm.[18] The symptoms which may be encountered in poisoning are depression of the circulation, persistent vomiting and diarrhea, followed by profound shock and coma. The temperature is usually subnormal, and most observers describe a scarlatinaform rash, which may cover the entire body. If recovery occurs, the areas affected by the rash usually desquamate and this process may extend to the mucous membranes. The clinical course may take three to five days, and death has occurred frequently four to five days after the source of poisoning was removed.

Only two groups of workers provided proof that the intoxication was due to boric acid by showing on chemical analysis that the patients had relatively large amounts of boric acid in all tissues. McNally [18] was the first to show that the highest level of boric acid occurred in the brain and the liver. Of the 6 infants whose tissues were analyzed they found an average level of 210 mg. per hundred cubic centimeters in the brain and 182 mg. per hundred cubic centimeters in the liver. These infants were accidentally fed 60 to 150 cc. of a saturated boric acid solution and died two days later. Ross and Conway [15] give an excellent account of intoxication in a 3 year old child who had continuous irrigation of the left pleural space with 5 per cent boric acid solution for empyema. Four liters per day for three days was used for this irrigation, at the end of which time the patient was in profound shock and the neck,

3. McClure, R. D., and Lam, C. R.: A Statistical Study of Minor Industrial Burns, J. A. M. A. **122**: 909 (July 31) 1943. Clowes, G. H.; Lund, C. C., and Levenson, S. M.: Surface Treatment of Burns, Ann. Surg. **118**: 761-779 (Nov.) 1943.

4. Dopfer: On a Fatal Accident Following the Use of Official 10 per Cent Boric Acid Ointment in a Burn, München. med. Wchnschr. **52**: 763, 1905.

5. Savariaud, in Serious Poisoning by Boric Acid Dressing, Paris Letter, J. A. M. A. **63**: 593 (Aug. 15) 1914.

6. Gissel, H.: Toxicity of Boric Acid, Quart. J. Pharm. & Pharmacol. **6**: 714, 1933.

7. Brose, L. D.: Death Following the External Use of Powdered Boric Acid, M. News, Philadelphia **43**: 199, 1883.

8. Best, C. L.: Boric Acid Poisoning: Report of a Fatal Case with Autopsy, Tr. Chicago Path. Soc. **6**: 161-168, 1903-1904.

9. Sanders, J. H.: Boracic Acid Poisoning, Brit. M. J. **1**: 605-606 (March 16) 1912.

10. Bazin, A. T.: Acute Boracic Acid Poisoning, Canad. M. A. J. **14**: 419-420 (May) 1924.

11. Brown, W. L.; Brown, C. P., and Murphy, J. L.: Toxicity of Boric Acid, J. A. M. A. **106**: 1221 (April 4) 1936.

12. Peyton, H. A., and Green, D.: Boric Acid Poisoning: Case Report, South. M. J. **34**: 1286-1288 (Dec.) 1941.

13. McIntyre, A. R., and Burke, J. C.: Intravenous Boric Acid Poisoning in Man, J. Pharmacol. & Exper. Therap. **60**: 112-113 (June) 1937.

14. Molodenkow, quoted in Tillmanns, H.: Textbook of Surgery, translated by B. T. Tilton, ed. 2, New York, D. Appleton & Co., 1899, vol. 1, p. 160.

15. Ross, C. A., and Conway, J. F.: The Dangers of Boric Acid, Am. J. Surg. **60**: 386-395 (June) 1943.

16. McWalter, J. C.: Note on the Effects of Borax on Infants, Lancet **2**: 369 (Aug. 10) 1907. Willson, P.: A Case of Boric Acid Poisoning, Washington M. Ann. **14**: 329-331, 1915. Forsythe, D.: Celiac Disease or Boric Acid Poisoning, Lancet **2**: 728-730 (Oct. 25) 1919. Potter, Caryl: A Case of Borax Poisoning, J. A. M. A. **76**: 378 (Feb. 4) 1921. Birch, John: Fatal Poisoning by Borax, Brit. M. J. **1**: 177 (Feb. 4) 1928. Buzzo, A., and [illegible] icity of Boric Acid and of Borates Used as [illegible] ics, Rev. Asoc. méd. argent. **46**: 1493-1495 (J[illegible] Rust.[18]

17. Aikman, J. [illegible] in Children, J. A. M. A. **95**: 1661-1665 (N[illegible]

18. McNally, W. D., and Rust, C. A.: The Distribution of Boric Acid in Human Organs in Six Deaths Due to Boric Acid Poisoning, J. A. M. A. **90**: 382-383 (Feb. 4) 1928.

thorax and extremities were covered with an erythematous rash. Death occurred twenty-four hours after the irrigation had been stopped. Chemical analyses revealed 112 mg. per hundred cubic centimeters in the brain and 13.7 mg. per hundred cubic centimeters in the liver. These authors made a comprehensive summary of the literature and suggest that boric acid is much more dangerous than is generally assumed.

TABLE 1.—*Acute Toxicity of Boric Acid in Various Species By Different Routes of Administration*

Animals	Route	L. D. 50, Mg. per Kg.	Slope	Standard Error, Mg.
60 mice	Subcutaneous	2,070	4.7	± 170
40 mice *	Subcutaneous	1,740	8.0	± 130
40 mice	Intravenous	1,780	8.9	± 121
30 mice	Oral	3,450	14.0	± 158
40 rats	Intravenous	1,330	6.3	± 112
45 rats	Oral	2,660	7.7	± 220
45 guinea pigs	Subcutaneous	1,200	7.3	± 80

* Solution adjusted to p_H 7.4 with sodium hydroxide.

Since the very early (1904) studies by Wiley [19] on borax and boric acid as food preservatives but little additional pharmacologic work has been done to evaluate boric acid as a toxic agent. The unusual distribution of boron in the body, where, in contrast to other poisons, most is found in the brain, should have stimulated additional studies. Certainly, greater knowledge regarding the acute and chronic toxicity of boric acid, including its absorption from wounds, excretion and studies on histopathology, are needed before its possible toxic effect can be properly evaluated.

METHODS

Boric Acid.—Boric acid was determined on aliquot samples of tissue or urine after ashing by direct titration in the presence of glycerol.[20] In a series of 32 urines to which were added varying known amounts of boric acid, the mean recovery on analysis was 89 per cent. Spectrographic analysis for the boron lines in brain and liver fractions was done on an ARL-Deitert grating spectrograph.

Direct titration in the presence of glycerol, without preliminary ashing or hydrolysis, was employed in 1 instance to determine whether the boric acid was free or combined.

TABLE 2.—*Urinary Excretion of Boric Acid After Single Toxic Doses Given Orally*

Number of Dogs	Dosage Level, Gm. per Kg.	Mean Percentage of Boric Acid Excreted in Urine		
		Day 1	Day 2	Day 3
6	2.0	45	12	—
4	1.5	45	4	—
1	0.4	53	9	2
2	0.2	51	3	1

Phosphorus.—Urinary inorganic phosphorus was determined by the method of Youngburg,[21] using a Klett-Summerson colorimeter. Serum inorganic phosphorus and lipid phosphorus were also determined by Youngburg's technic.

Phospholipids.—The phospholipids of the brain and liver were separated by Folch's procedure [22] and the various fractions examined spectrographically for boron and phosphorus lines.

Pathology.—For histopathologic studies the animals were killed by a lethal dose of pentobarbital sodium injected intravenously. Mouse, rat and dog material was fixed in most cases by perfusion with neutral solution of formaldehyde U. S. P. diluted 1:10. A few tissues were preserved by immersion of thin slices. Tissues were embedded in celloidin. Sections of the central nervous system were stained with toluidine blue; other organs were stained with hematoxylin and eosin.

EXPERIMENTAL RESULTS

Acute Toxicity.—(*a*) Determination of L. D. 50: The acute toxicity was determined in rats, mice, guinea pigs and dogs. With regard to the first three species the data were in sufficient numbers for a statistical analysis and the acute toxicity was expressed as the L. D. 50. Forty or more animals were used in each determination. The standard error was calculated according to the method of Litchfield and Fertig.[23] Neutralized boric acid (p_H 7.4) was slightly more toxic than the unneutralized boric acid. The L. D. 50 varies from 1.2 to 3.45 Gm. per kilogram (table 1). Intravenous administration (at a rate of 2 cc. of a 5 per cent solution per minute) was the most toxic. The guinea pig was the most susceptible animal used. The prelethal symptoms in these animals were depression and ataxia (occasionally convulsions), fall in body temperature, violet-red color of the skin and mucous membranes and, in the case of the dog, persistent vomiting and meningismus.

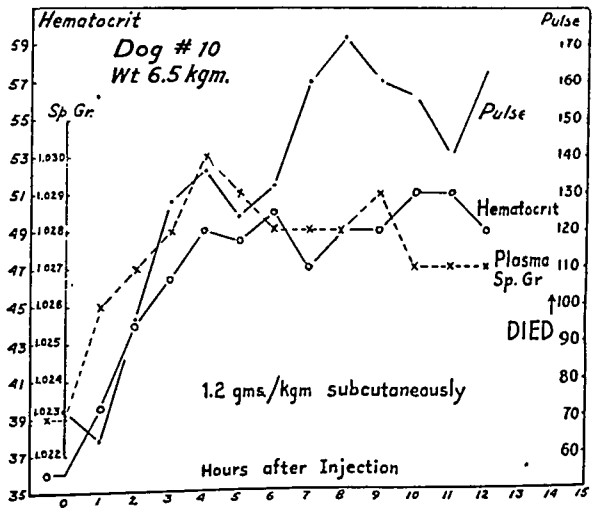


Fig. 1.—Effect of a subcutaneous dose of 1.2 Gm. per kilogram of boric acid on the hematocrit, serum specific gravity and heart rate.

(*b*) Acute Toxicity in Dogs: Dogs were given single oral doses of 2.0, 1.5, 1.0, 0.8, 0.4 and 0.2 Gm. of boric acid per kilogram. Since these doses usually induced emesis, we found that a subcutaneous injection of 30 mg. of morphine had to be given as an antiemetic before the boric acid.

Three of 6 dogs which received 2.0 Gm. per kilogram died within forty-eight hours. This is probably close to the median lethal oral dose. Two of 4 dogs died

19. Wiley, H. W.: Boric Acid and Borax, Circular 15, U. S. Department of Agriculture, Bureau of Chemistry, 1904, p. 27.
20. Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists, ed. 5, 1940, pp. 459-460.
21. Youngburg, G. E., and Youngburg, M. V.: Phosphorus Metabolism: A System of Blood Phosphorus Analysis, J. Lab. & Clin. Med. **16**: 158-166 (Nov.) 1930.
22. Folch, Jordi: Brain Cephalin, a Mixture of Phosphatides, J. Biol. Chem. **146**: 35-44 (Nov.) 1942.
23. Litchfield, J. T., and Fertig, J. W.: On a Graphic Solution of the Dosage-Effect Curve, Bull. Johns Hopkins Hosp. **69**: 276-286 (Sept.) 1941.

with a subcutaneous dose of 1.0 Gm. per kilogram; hence this dosage level is probably near the median lethal dose for parenteral administration. Severe toxic symptoms were noted in 4 of 6 dogs receiving 2.0 Gm. per kilogram and in 2 receiving 1.5 Gm. per kilogram. The most obvious sign of intoxication consisted of cyanosis of all mucous membranes, with the skin becoming mottled reddish violet. The legs were rigid and the animals were unable to stand without support. Convulsions of short duration occurred in 2 animals. In 4 dogs the hematocrits, plasma specific gravity and pulse were determined hourly after subcutaneous doses of 1.0, 1.2 and 1.5 Gm. per kilogram. The changes were entirely consistent with the hypothesis that a shocklike syndrome may cause death within twenty-four hours after a single large dose (fig. 1).

Twenty-four hour urine samples were collected, and after varying intervals the tissues were analyzed for boric acid and examined grossly and microscopically for pathologic changes. Approximately 40 per cent of the dose was retained in the body for more than forty-eight hours (table 2). The mean excretion for the larger doses was 45 per cent in the first twenty-four hours and 4 to 12 per cent in the second twenty-four hour period. Thereafter only small amounts were excreted daily. From 1 dog receiving 1.5 Gm. per kilogram orally, hourly blood samples were taken for several hours. Boric acid could not be detected in either erythrocytes, leukocytes or plasma.

(*c*) Effect of Intravenous Injection on Phosphorus Excretion: Dogs operated on to produce an exstrophy of the urinary bladder were given intravenous injections of 400, 300, 250, 200, 100 and 50 mg. of boric acid per kilogram, and urine samples were collected at half hourly intervals for boric acid and phosphorus determinations. In every case there was a sharp rise in boric acid elimination, reaching a peak in one to two hours, followed by a gradual decline. After an initial inhibition lasting for one to two hours a gradual rise in phosphorus excretion occurred, which at six hours exceeded by five times the control value. This increase was most prominent at a dosage level of 250 mg. per kilogram (fig. 2). Plasma lipid and inorganic phosphorus values also were determined at hourly intervals on 3 dogs receiving 200, 100 and 50 mg. of boric acid per kilogram, but no significant changes occurred over a seven hour period.

(*d*) Effect of Acute Intoxication on Blood Electrolytes: In order to ascertain the degree of alteration which moderately toxic doses of boric acid might produce in the electrolytes of the blood stream, 2 dogs which had received 1.0 Gm. per kilogram were bled twenty-four hours after dosing and the blood was subjected to chemical analysis. With the exception of an increased nonprotein nitrogen and, perhaps, concomitant increase in serum potassium in dog 1, no significant change in the blood electrolytes was found.

(*e*) Identification of Excreted Compounds: In an attempt to determine the exact nature of the boron compound excreted, boric acid was titrated directly, without preliminary ashing or hydrolysis, in several aliquots of a single specimen of urine (965 cc.). The quantity found by direct titration accounted for 96 to 101 per cent of the boric acid found by the usual method of ashing. It was concluded that practically all of the boron in this specimen was present as unmodified boric acid. This is in accord with the findings of Wiley [19] that both boric acid and borax are excreted unchanged.

Chronic Toxicity.—(*a*) Effect of Repeated Injections on the Cellular Elements of the Blood: Because of the frequent occurrence of persistent anemia in patients with extensive burns, the possible depressant effect of boron on the hemopoietic system was considered. After control hematologic studies, 4 dogs were injected subcutaneously twice daily for forty-five days with a dose of 100 mg. of boric acid in a 5 per cent solution per kilogram. The animals were housed in metabolism cages. Hematologic studies were made twice weekly and the urinary excretion of boric acid was determined daily. Significant change in hemoglobin, erythrocytes or leukocytes did not occur during the period of observation. From the standpoint of possible cumulative toxicity it is significant that the plateau of urinary excretion was not reached until the animals had been on this dosage regimen for fourteen to eighteen days. The mean recovery when the plateau of excretion was reached amounted to 85 per cent of the amount of boric acid injected.

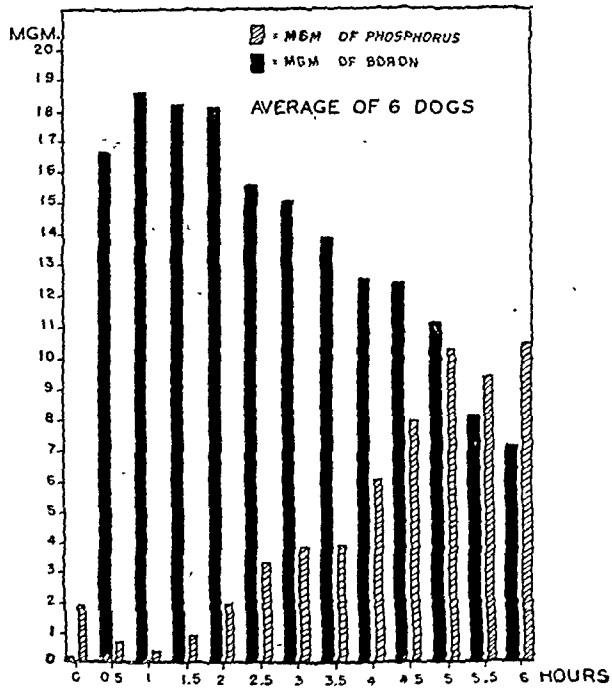


Fig. 2.—Comparative urinary phosphorus excretion after intravenous injections of 250 mg. per kilogram of boric acid.

(*b*) Effect on the Growth of Immature Rats: Five groups of 20 to 24 immature rats each were placed on a standard laboratory diet and given various levels of boric acid in their drinking water and were weighed daily to follow the rate of growth. One-tenth per cent boric acid was without effect on normal rat growth, while 0.25 per cent and all higher levels produced a definite inhibition after twenty to thirty days. The daily fluid intake was constant at 0.14 to 0.12 cc. per gram of rat daily for all three groups. At autopsy no characteristic gross or microscopic pathologic lesions were found. Complete blood counts were done weekly, but no significant change was found in the blood of these animals.

(*c*) Application of 10 per Cent Ointment to Wounds: Under pentobarbital sodium anesthesia a section of skin 13 cm. square was removed from the dorsolumbar surface of dog 204. Fifty Gm. of U. S. P. boric acid ointment was applied daily to the exposed surface and

secured with a pressure bandage. Urine was collected daily for analysis. The area of the wound was measured daily and found to decrease in size. The wound size was expressed in percentage of total surface area as determined by the formula of Benedict.[24] On the twenty-fifth day the animal was killed for autopsy and

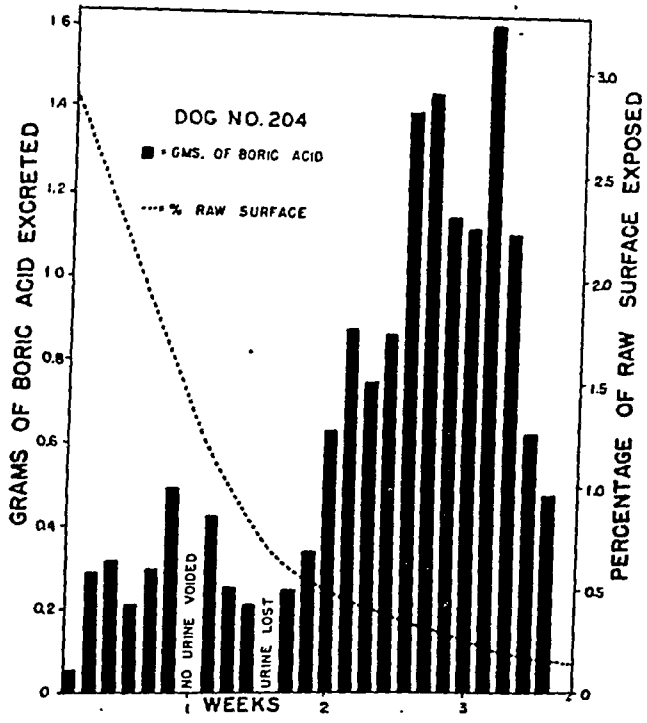


Fig. 3.—Urinary excretion of boric acid for twenty-four days when boric acid ointment was applied daily to a wound involving 3 per cent of the body area.

the tissues were analyzed for boric acid. The brain showed 212 mg., the liver 107 mg. and the body fat 30 mg. of boric acid per hundred cubic centimeters. The urine values and wound size are plotted in figure 3.

A second dog (206) was treated in an identical fashion after an area of skin measuring 13 by 13 cm. had been removed under pentobarbital sodium anesthesia. It was impossible to prevent the dog from licking the wound, and thus the excretion data were of no value. He was treated daily, however, and at the end of twenty-four days the wound had healed sufficiently to discontinue all boric acid dressings. The urine was then assayed daily until a negative turmeric test was obtained on the fourth day. At autopsy the tissues assayed as follows: wound 103 mg., brain 90 mg., liver 73 mg., kidneys 54 mg. and body fat 39 mg. per hundred cubic centimeters and the urine from the bladder was negative.

On a third dog (213) a third degree burn measuring 11.5 by 11.5 cm. was treated with 50 Gm. daily of boric acid ointment under a pressure bandage. Urine values were determined daily for thirty-three days (fig. 4). At the end of this period the brain showed 247 mg., the liver 18 mg., the fat 60 mg. and the wound tissue itself 60 mg. of boric acid per hundred cubic centimeters.

(*d*) Peritoneal Irrigation with Boric Acid Solution: Two dogs were anesthetized with pentobarbital sodium and a 5 per cent boric acid solution was irrigated through the abdominal cavity for a three hour period by means of an inflow cannula in the region of the liver and an outflow cannula in the left lower flank. The rate of flow was adjusted so that 5 cc. per minute entered the cavity. The perfusate was collected hourly, measured and analyzed for boric acid. At the end of three hours the animals were killed and the tissues analyzed for boric acid. The perfusates showed a drop in boric acid content to approximately 1.5 per cent, and on the basis of the total amount recovered 1 animal retained 34.7 Gm. of boric acid, the other 31.0 Gm. (table 3). The average tissue levels were brain 293 mg., body fat 244 mg. and liver 205 mg. per hundred cubic centimeters.

(*e*) Absorption from the Intact Skin: In order to test absorption from the intact skin 2 male subjects wore regulation navy short sleeve undershirts which were saturated and kept moist for an eight hour period with a 5 per cent aqueous solution of boric acid. Repeated analyses of various specimens up to forty-eight hours failed to demonstrate any boric acid in their urine: The turmeric paper test, which is ordinarily sensitive to 1 part in 5,000, was used. In a second experiment boric acid ointment was applied for six hours to the upper half of the body (neck to waist) of 2 normal male subjects. Individual voidings of urine were again negative for boric acid by the turmeric paper test for the entire twenty-four hour period after application of the ointment. In a third experiment 2 subjects, after voiding, immersed their feet to the ankles in a hot saturated (5 per cent) boric acid solution for periods of thirty and sixty minutes respectively. To avoid contamination the subject was not allowed to touch the foot bath at any time. Urine samples at

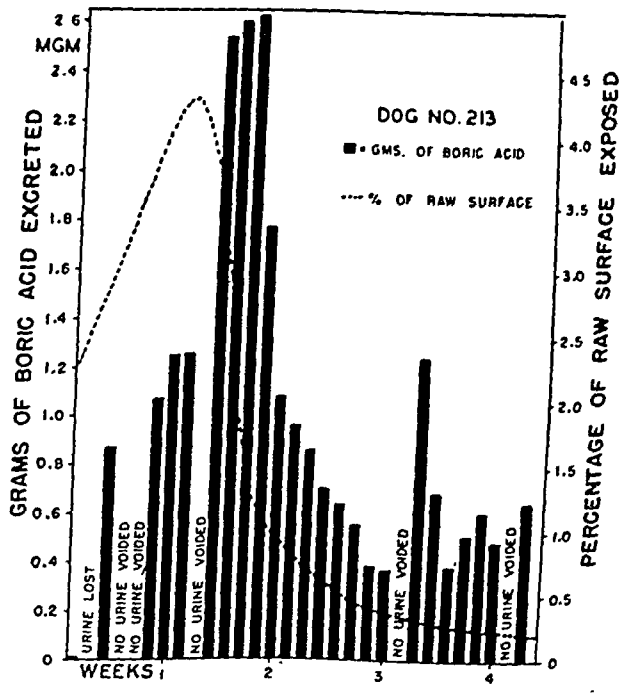


Fig. 4.—Urinary excretion of boric acid for thirty days when boric acid ointment was applied daily to a third degree burn involving 3 per cent of the body area.

one-half, one, three and thirteen hours were negative for boric acid by the turmeric paper test. These samples were alkalized and dried and were found to be almost entirely negative for boron on spectrographic analysis. Only the thirty minute urine samples had very faint boron lines. In the thirty minute urine sample of subject HW the boron line at 2,497 angstroms was

24. Benedict, F. G.: Surface Area Constant in Comparative Physiology, Yale J. Biol. & Med. 4: 385-398 (March) 1932.

slightly less dense than the platinum line at 2,428 angstroms. These densities were reversed in subject CP. Since the only source of platinum was the dish used to ash the urine sample, the amount of platinum and boron in the total ashed specimen can be estimated to be about 10 micrograms. This indicates that the boron

TABLE 3.—*Disappearance of Boric Acid from Perfusate After Peritoneal Irrigation with a 5 per Cent Solution*

Dog Number	Hours	Cc. of Solution Administered	Gm. of Boric Acid Administered	Cc. of Perfusate Recovered	Percentage of Boric Acid in Perfusate	Gm. of Boric Acid Recovered	Gm. of Boric Acid Retained (by Diff.)
22	1st	300	15.4	120	1.35	1.6	13.8
	2d	300	15.4	255	1.47	3.7	11.7
	3d	300	15.4	450	1.35	6.1	9.3
	Total	900	46.2	825	....	11.4	34.8
23	1st	300	15.4	21	1.06	0.2	15.2
	2d	300	15.4	420	1.64	6.9	8.5
	3d	300	15.4	430	1.84	7.9	7.5
	Total	900	46.2	871	. . .	15.0	31.2

TABLE 4.—*Average Boric Acid Content of Organs of 15 Dogs Following Dosage with 2.0 Gm. per Kilogram*

Organ	Boric Acid Content, Mg. per 100 Cc.
Brain	111
Liver	91
Body fat	26

in the original urine sample was in the order of 1 part of boron to 10,000,000 parts of urine.

(*f*) Tissue Levels and Distribution: In an attempt to determine the distribution of boric acid in the tissues, 3 dogs were acutely intoxicated by the administration of 2.0 Gm. per kilogram, and twenty-four to seventy-two hours later analyses of their tissues were made. These results (table 4) show that the brain, the liver and the body fat in the order named are the three organs highest in boric acid content. This fact was confirmed many times in later experiments.

(*g*) Distribution in Fractions of the Brain: Since the studies thus far tended to confirm the findings of previous workers [25] that a large amount of boron accumulated in the brain, an attempt was made to ascertain its distribution within the brain by separating the white from the gray matter. In a dog highly intoxicated with boric acid, whole brain tissue analyzed 214 mg. per hundred cubic centimeters, while the gray matter, obtained by careful slicing with a razor blade, contained 231 mg. per hundred cubic centimeters. The white matter obtained by careful slicing of the corpus callosum contained 142 mg. per hundred cubic centimeters. The data hence indicate a slight preponderance of boric acid in the gray matter. In an attempt to ascertain which chemical fraction of the brain contained most of the boric acid, fresh brains were fractionated for pure phospholipids according to the method of Folch.[22] The brains of 3 dogs and 1 large hybrid polar bear all previously intoxicated with boric acid were used. Each fraction was tested qualitatively for boron and phosphorus by means of the spectrograph. Only the initial acetone extract of brain showed strong boron lines. Although the alcohol and petroleum ether fractions were purified and tested for boron, as well as the remaining residue, none was found. The acetone fraction was further separated into ether soluble and insoluble fractions. The ether insoluble fraction showed the boron lines but none for phosphorus. This fraction was found to be water soluble. The brain of a control animal was fractionated in the same way and showed very faint traces of phosphorus in the same fraction in which boron alone had occurred in the intoxicated animal.

(*h*) Results of Histopathologic Studies: The major pathologic changes in acute boric acid toxicity in mice, rats and dogs involved chiefly the kidney and central nervous system. In all animals there was glomerular and tubular damage. The former consisted of a change in capillary permeability as manifested by glomerular débris in the glomerular spaces in many of the animals. The latter was more serious and involved sometimes pronounced cellular vacuolization, sometimes cellular shedding into the lumen, and nearly always a rich coagulum in the tubule lumens, which in some cases extended into the ducts of Bellini.

In the central nervous system, pathologic changes consisted largely in the presence of an increased number of small cells with dark, round or irregular nuclei (2-4, fig. 5) and in hyperchromatism and shrinkage of certain nerve cells in the spinal cord (5, 6, fig. 5). The small cells are probably microglia. They were most numerous forty-eight hours after injection and were not present in 2 out of 3 brains at seventy-two hours. The density of these small cells was greater with higher dosage and was not closely related to the concentration of boron in the brain at the time of death (table 5). They occurred in 1 case around blood vessels in all layers of

TABLE 5.—*Relationship of Brain Tissue Reaction to Dosage and Boric Acid Levels*

Dog No.	Dose, Gm. per Kg.	Days After Dose	Boric Acid in Brain, Mg. per 100 Cc.	Tissue Reaction
127	2.0	1	78	++++
19	2.0	2	190	++++
215	1.5	2	59	++
167	1.5	3	139	++
227	1.0	2	14	++++
229	1.0	2	14	++
230	1.0	2	12	±
214	0.8	2	140	+
202	0.4	3	102	0
203	0.2	3	15	0
157	1.5	4	188	0

TABLE 6.—*Effect of Polyhydroxyl Compounds and Salt Solutions on the L. D. 50 of Boric Acid Given Subcutaneously*

No. of Mice	Antidote	Antidote Route	L. D. 50, Mg. per Kg.
60	None	....	2,070
40	Sorbitol	Orally *	2,290
40	"	Orally †	1,900
30	"	Subcutaneously	2,110
35	"	Orally ‡	2,600
20		Intravenously §	5,300

* Two doses 2 cc. 20% in 24 hours.
† Two doses 2 cc. 20% in 24 hours.
‡ Four doses 2 cc. each in 24 hours.
§ Four doses of 1.5 cc. daily for 4 days.

the cortex. In others they seemed to be generally distributed throughout the gray matter of the cortex. In several they appeared clustered around large and small nerve cells, particularly in the deepest layer of the cortex but also in other layers. Sometimes the nerve cells themselves were highly vacuolated, and in one preparation small round cells were present within the cell wall. A moderate reaction took place in the

25. Ross and Conway,[15] McWalter,[20] Willson,[16] Forsythe,[19] Potter,[16] Birch,[10] McNally and Rust.[13]

cortex of 1 dog (204) after boric acid ointment had been applied for one month to an area of the body denuded of skin.

The pronounced hyperchromatism and shrinkage of nerve cells in the spinal cord was observed in the dorsal horn, the intermediate cell column and the ventral horn. The degree of reaction was not closely related to the dosage or to the boron content of the brain at the time of death. Moderate changes were noted in dog 204, whose treatment has been described. The absence of reaction in dog 157, which came to autopsy four days after an oral dose of 1.5 Gm. per kilogram indicates that the reaction of nervous tissue to boron probably persists for only seventy-two hours. Other pathologic changes noted were extensive polymorphonuclear reactions in the subdermal connective tissue layers of the skin. The dermal blood vessels were distended with blood, which may account for the erythema seen in man.

(*i*) Attempts to Antidote Acute Poisoning: Since boric acid combines chemically with polyhydroxyl compounds such as mannitol and glycerol, the administration of these compounds might result in a more rapid excretion (or inactivation) of boric acid and a resultant lessened toxicity. Such an effect should be evidenced by a significant increase in the L. D. 50 Accordingly, mice were injected subcutaneously with toxic doses of boric acid, and various polyhydroxyl compounds were given orally or subcutaneously in the same solution as the boric acid. No antidotal effect, however, was found with any of these compounds. Isotonic solution of three chlorides (combined with plasma or bovine albumin) was strikingly effective as an antidote if given repeatedly in large intravenous doses. These data are summarized in table 6



Figs. 5—Histopathology of the brain and spinal cord following administration of boric acid. Sections of 1 Cerebral cortex of normal dog × 78. 2 Cerebral cortex of dog 19 × 78. 3 Cerebral cortex of dog 19 × 78. 4 Cerebral cortex of dog 19 × 202. 5 Lumbar cord of normal dog × 78. 6 Sacral cord of dog 215 × 78. All sections from central nervous system fixed with neutral solution of formaldehyde embedded in celloidin and sectioned 20 microns thick. Stained with toluidine blue

COMMENT

With respect to the absolute dosage of boric acid tolerated by the mouse, rat, guinea pig and dog one can state that boric acid is relatively nontoxic. Death is probably due to a combination of vascular depression and central nervous system intoxication. The fact that repeated intravenous injections of isotonic solution of three chlorides and plasma will allow the mouse to tolerate 2.5 times the usual L. D. 50 of boric acid indicates that the most important antidotal measures are those which will counteract circulatory depression and aid in urinary excretion

The increased excretion of phosphorus after intravenous injections may be entirely incidental to tissue injury or it may be due to the chemical release of phosphorus from some compound which has a greater affinity for boron. In support of the latter hypothesis is the occurrence of this phenomenon at a relatively low dosage, the disappearance of the phosphorus lines from the spectrum of that fraction of the brain which absorbs the boron, and the previous findings of Wiley [19] that phosphorus metabolism is definitely disturbed in man during a period of boric acid or borax administration.

The failure of boron to intoxicate the hemopoietic system probably indicates that no portion of the severe anemia which frequently accompanies extensive burns is caused by the treatment of the burns with boric acid ointment.

While the evidence for cumulative action is not incontrovertible, many of the isolated observations in this study indicate that boric acid is definitely a cumulative

poison. These are (1) the long period (fourteen to eighteen days) needed for urinary excretion to reach a plateau, (2) the relatively low forty-eight hour excretion (60 per cent), (3) the characteristics of the urinary excretion curve when boric acid ointment is applied to burns or wounds, (4) the persistence of appreciable amounts of boric acid in the brain and liver of dogs for as long as four days after stopping the daily dose and (5) the accumulation of greater amounts of boron in the brain than that which occurs in the treated wound.

Because of the phosphorus content of phospholipids and the fact that one of the cephalins is known to contain inositol and hence might be expected to absorb boric acid, considerable care was taken to separate the various fractions of the brain. The boron, however, was entirely separated in the first extraction procedure used; namely, drying the brains with acetone. Since boron is also found in large amounts in the body fat, one can postulate that it probably occurs as boroglycerate. Proof of this assumption must await further detailed studies.

The failure of boric acid to appear in the urine when administered as a saturated solution or ointment to the torso of the normal human subject indicates that absorption through the intact skin is negligible. These results are not in agreement with those of Kahlenberg,[26] who detected boric acid in the urine fifty-five to sixty seconds after he immersed his feet in a warm saturated solution. Ochsner [27] also states that boric acid is absorbed through the intact skin. Since three types of experiments designed to favor skin absorption gave negative results by both the turmeric paper test and spectrographic analysis we must conclude that, if skin absorption occurs, the quantity of boron thus taken into the body is negligible and will not result in systemic toxicity.

The degree of expected absorption of boric acid when a saturated solution is used to irrigate a closed cavity has been accurately determined in these studies. Under favorable circumstances the absorption may be as high as 75 per cent of that contained in the irrigating fluid. This definitely prohibits the use of boric acid for that purpose. The washing of granulation tissue for any length of time is probably also highly dangerous.

Boron can be added to that group of elements which are known to affect the central nervous system. These include lead, manganese and arsenic. Compared to these intoxicants boron is much quicker in its action and recovery is also more prompt and apparently more complete. The use of boron as an antiepileptic,[28] which has been advocated from time to time, is probably in accord with the degree of tissue damage attained, but this assumption would have to be confirmed by functional studies in boron intoxicated animals.

SUMMARY

1. Boric acid is absorbed in toxic quantities from ointments applied to burned areas or to wounds involving loss or damage to large areas of skin.

2. When a 5 per cent boric acid solution is used to irrigate cavities, most of the boric acid is absorbed by the tissues.

3. While boric acid is not toxic when administered in a single large dose, repeated doses result in accumulation in the brain, liver and body fat.

4. The boron occurs in both the white matter and gray matter of all parts of the central nervous system and in the peripheral nerves. The spinal cord and gray matter of the cerebrum contain the highest amounts.

5. The liver is only slightly affected histologically by chronic poisoning. The kidney shows tubular degeneration, while the brain and spinal cord show neuronophagia and hyperchromatosis. The skin shows polymorphonuclear infiltration and vascular engorgement.

6. As little as one third the median lethal dose, or treatment of a burn involving only 4 per cent of the surface area of the body with U. S. P. 10 per cent ointment, will produce pathologic changes in the central nervous system.

7. When repeated daily doses as small as 200 mg. per kilogram are given subcutaneously, fourteen to eighteen days are required before urinary excretion reaches a plateau. This, together with the fact that boric acid can still be found in the brain of animals four days after discontinuation of a series of doses, indicates cumulative action.

8. The growth of immature rats is not influenced by 0.1 per cent of boric acid in the drinking water, but a level of 0.25 per cent retards normal growth after twenty days.

9. The data do not provide any evidence of a depressant action of boric acid on the blood forming organs.

10. A definite increase in urinary phosphorus excretion occurs after intravenous doses of boric acid.

11. The boron found in the brain is not combined with phospholipids or cholesterol but is probably present in some simple combination with glycerol or other polyhydroxyl compounds.

12. Death is due to a shocklike syndrome when large doses are given. If moderate dosage is given over a period of several days, death may result from inanition due to convulsive tremors and meningismus. When intravenous fluids are given to prevent early deaths, some animals develop anuria at 2.5 times the untreated median lethal dose.

13. Polyhydroxyl organic compounds such as mannitol, glucose or glycerol are not antidotal to boric acid. Large intravenous doses of isotonic solution of three chlorides and plasma definitely antidote the toxicity.

CONCLUSION

Boric acid, whether applied in the form of an ointment or a saturated solution to extensive wounds, is a cumulative poison. The weak antiseptic value of boric acid suggests that for medicinal use other more active and less potentially harmful therapeutic agents should be employed.

ABSTRACT OF DISCUSSION

DR. CHARLES G. BARNUM, Groton, Conn.: I am reporting the boric acid poisoning of 20 newborn infants in our hospital at New London, Conn. The poisoning was the sequel of the issuing of granular boric acid powder, which looks like dextrose powder, in a jar plainly labeled "Dextrose." When the jar was returned to our formula room the boric acid was made up in isotonic solution of sodium chloride instead of dextrose in saline solution to be used as a prelacteal feeding. The first noted effect came in one infant within eight hours of the time the solution was taken. There was vomiting, diarrhea and a rapidly progressive prostration, which went on to death in about thirty-six hours from the time the first dose was taken. Four other youngsters succumbed. The first clinical effect was vomiting, but the most striking symptom was a tremendous irritation of the central nervous system. The appearance was that of severe meningitis with retraction of the head, opisthotonos,

26. Kahlenberg, Louis: On the Passage of Boric Acid Through the Skin by Osmosis, J. Biol. Chem. **62**: 149 156 (Nov.) 1924. Kahlenberg, L., and Barwasser, N.: On the Time of Absorption and Excretion of Boric Acid in Man, J. Biol. Chem. **79**: 405-408 (Oct.) 1928.

27. Ochsner, E. H.: Biochemistry of Topical Application: Use of Boric Acid in Septic Infections, J. A. M. A. **68**: 220 (Jan. 20) 1917.

28. Verjaal, A.: Boron as an Antiepileptic, Nederl. tijdschr. v. geneesk. **83**: 1226-1233 (March 18) 1939.

double Kernig sign, Babinski reflex and rather evident spastic deviation of the eyes. The temperature curves were nearly flat. The urine was scanty and contained little albumin. The amount of prostration was remarkable, with rapid loss of weight due to diarrhea and the failure to take any reasonable amount of fluids. In treatment the fluid requirement was made up with a mixture of isotonic solution of sodium chloride and 5 per cent dextrose solutions given by hypodermoclysis. In the more severely poisoned there was intense generalized redness of the skin, after which the surface came off, as though the youngsters had been superficially burned. The less severely poisoned showed a macular eruption followed by desquamation. The postmortems seemed to indicate that there was a similar extensive inflammation of the mucous membranes. One youngster who survived a good deal longer than the others eventually died of the boric acid poisoning, even though the chemical analysis of the organs showed that the boric acid apparently had been entirely excreted before death. Even to the last the clinical picture was similar to that presented by those who died earlier. The area of exfoliation covered practically the whole surface of the body, even the bottoms of the feet.

DR. HENRY N. HARKINS, Baltimore: In my practice of surgery I see no absolute indication for the use of boric acid in any form whatever. The reports made here today and the discussion bear out once again the toxic dangers of this substance. Would it not be in order to have this section send a recommendation to the Council on Pharmacy and Chemistry that it investigate the possibility and advisability that boric acid be entirely eliminated from all hospitals?

DR. LINCOLN S. OPPER, Norwich, Conn.: There were five deaths in connection with the cases of boric acid poisoning at the New London Hospital. I performed autopsies in 4 cases. Three of the examinations were on 6 to 8 day old infants who had received varying amounts (10 to 13 Gm.) of boric acid in the form of a 5 per cent solution over a period of four days and who succumbed one or two days after the error was recognized and the feedings terminated. The fourth infant lived for sixteen days, having survived the final ingestion of boric acid by eleven days. At autopsy all of the infants showed a more or less extensive generalized rash in the nature of a red exfoliative dermatitis. This has been frequently described in the literature. In the first 3 infants fresh petechial and ecchymotic hemorrhages were noted in the pleural and epicardial surfaces as well as within the thymic tissue. This was thought to be related to anoxia. Focal hemorrhages of considerable size involved the pulmonary parenchyma. Despite superficial erosions of the tongue and despite a diffuse redness of the esophageal mucosa and a few focal areas of fresh hemorrhage in the submucosa of the bowel, the gross changes in the gastrointestinal tract were certainly not impressive. Microscopically the degree of epithelial degeneration and regeneration, particularly of the small intestine, was much more striking. The upper part of the gastrointestinal tract was characterized by an extensive hemorrhagic esophagitis with necrosis and sloughing of large patches of epithelium. In the small intestine, and to a lesser degree in the colon, the cells of the glandular epithelium were very large, with hyperchromatic and bizarre shapel nuclei containing large and prominent nucleoli. Mitotic figures were very numerous. The hemorrhagic cystitis, which was also found in the first 3 cases and which has been commonly described in boric acid deaths, resembled in every way the involvement of the esophagus. The microscopic findings in the liver and kidney were rather disappointing in that the amounts of fat within the cytoplasm of the hepatic and tubular epithelial cells were relatively small and could scarcely be considered pathologic. The brains were all decidedly congested and showed mild cerebellar pressure areas. Blocks of cerebral tissue are being embedded in celloidin to be stained by various neuropathologic technics. In the fourth infant, whose death occurred on the sixteenth day, none of the lesions already described in the gastrointestinal tract and bladder of the first 3 were found. The exfoliative dermatitis was still present in wide distribution, and a bilateral focal pneumonia was noted as the cause of death. Quantitative determinations on the brain or liver of each case revealed 0.52, 0.558 and 0.78 Gm. respectively of boric acid per hundred grams of tissue in the first 3 infants. In those deaths of 6 infants resulting from the accidental ingestion of boric acid which occurred in a Chicago hospital in 1927 the amounts of boric acid recovered from the brain and liver represented approximately a third of our figures. However, the amounts of boric acid taken (saturated solution mistaken for distilled water) were correspondingly smaller. No evidence of boric acid could be demonstrated in the liver of the fourth infant, indicating that the survival time had allowed for complete excretion of the drug.

LIEUTENANT CARL C. PFEIFFER, U.S.N.R.: Dr. Barnum of the New London Hospital had 21 severely poisoned infants, and it can be stated definitely that the mortality in this series of 21 infants was much less than in the instances previously described. Pharmacologically we are definitely handicapped in that there is no animal which has a skin like that of the human being. The skin effects from boric acid poisoning are greater in the case of man, and we do not see as severe pathologic changes in animals. We were glad to have the confirmation of the relative lack of liver damage, which we also found in the animals. We can second the pertinent suggestion of Dr. Harkins that boric acid be discontinued in medicine.

TREATMENT OF NEUROSYPHILIS WITH PENICILLIN

A PRELIMINARY REPORT

DOUGLAS GOLDMAN, M.D.
CINCINNATI

The effectiveness of penicillin in the treatment of syphilis has been clearly demonstrated in early cases by Mahoney[1] and in later cases by Stokes and his group.[2] Early results indicated definite therapeutic benefit. It is to be expected that the drug which is so clearly effective against the treponeme in early cases will be effective as well in the late manifestations of the disease. Advantages which are to be expected in the use of this substance are ease of administration, diffusibility and lack of any serious toxic effects. In this respect it differs widely from all the arsenicals which are in common use.

At Longview State Hospital there is a large group of cases of neurosyphilis available for treatment practically at all times. The admission rate for cases of syphilis varies between 16 and 25 per cent. The average yearly admissions, therefore, for neurosyphilis will be approximately 100 cases. These offer a rather unusual opportunity to study the effects of this very interesting drug in such cases.

For the purpose of the study it was decided to use only patients with dementia paralytica who had unquestionable and typical serologic, spinal fluid and clinical manifestations. Patients with less than typical findings were excluded and were treated with the more common methods. The first 18 cases are presented in this report. In addition a small group of patients with tabes dorsalis was available. Their treatment will be described separately because of its apparent importance in spite of the small number of the group treated. No definite technic for the use of penicillin in syphilis has as yet been established, so this study was initiated with the purpose of trying several technics to determine what results may be reasonably expected from the

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From Longview State Hospital, Dr. E. A. Baber, superintendent.

This is the initial report of a project for treatment of neurosyphilis with penicillin organized in Ohio State mental hospitals of the Ohio Department of Public Welfare, Dr. F. Tallman, commissioner of mental diseases.

1. Mahoney, J. F.; Arnold, R. C.; Sterner, B. L.; Harris, A., and Zwally, M. R.: Penicillin Treatment of Early Syphilis, J. A. M. A. **126**: 63-67 (Sept. 9) 1944. Mahoney, J. F.; Arnold, R. C., and Harris, A.: Penicillin Treatment of Early Syphilis, Am. J. Pub. Health **33**: 1387-1391 (Dec.) 1943.

2. Stokes, J. H.; Sternberg, T. H.; Schwartz, W. H.; Mahoney, J. F.; Moore, J. E., and Wood, W. B.: The Action of Penicillin in Late Syphilis, J. A. M. A. **126**: 73-78 (Sept. 9) 1944.

methods tried and what modification of the methods tried should be further studied.

In the treatment of the dementia paralytica patients thus far two methods of management were followed. In the first group the patients were given penicillin by a combination of intrathecal and intramuscular injection. The routine established for the purpose of study was as follows: For six days the patients received intrathecal penicillin: on the first two days 10,000 units each day, and on the subsequent four days 20,000 units each day. The technic of making the intraspinal injection, we believe, is of some importance. The penicillin as obtained on the market was dissolved to contain 5,000 units per cubic centimeter; i. e., the 100,000 units was dissolved in 20 cc. of saline solution in the vial in which the penicillin was purchased in the usual manner. Then 2 or 4 cc. of this solution was drawn into a 20 cc. syringe. After the spinal puncture was made and a specimen of spinal fluid for examination was obtained, the syringe was attached to the spinal needle and spinal fluid was drawn slowly to the 20 cc. mark on the syringe. The syringe was then detached and the spinal fluid and penicillin solution thoroughly mixed. Then the mixed penicillin and spinal fluid was reinjected slowly, approximately five minutes being taken

TABLE 1.—*Results of Treatment with Intraspinal and Intramuscular Penicillin in Dementia Paralytica*

Name	Age	Sex	Color	Duration of Mental Symptoms	Previous Treatment	Physical Condition on Admission	Result *
L. S.	31	♂	Black	3 mo.	Irregular	Fair	A
J. T.	53	♀	White	?	?	Fair	C
J. C.	38	♂	Black	6 mo.	'	Poor	C
J. C.	44	♂	White	1 yr.	None	Very poor	Died
R. C.	35	♂	Black	3 mo.	Irregular	Good	B
L. H.	46	♂	White	1 yr.	Irregular	Poor	B
L. K.	36	♂	White	6 mo.	None	Fair; tbc.	A
A. A.	52	♂	White	?	'	Poor	
J. R.	38	♂	White	6 mo.	None	Very poor	Died
E. B.	51	♀	White	8 mo.	None	Fair	A
E. C.	42	♀	White	4 yrs.	Irregular	Fair	C

* In the tables A is used to designate apparent recovery; B, much improved; C, improved and D, unimproved.

for the injection. The procedure was repeated daily as outlined. During the same period the patient received intramuscular injections of penicillin into the gluteal muscles, 20,000 or 25,000 units being injected every four hours. A total of 900,000 units of penicillin, including the intraspinal injection, was given with the first course. One month after this another series of intramuscular injections alone was given totaling 1,000,000 units, so that the patients received a total of 1,900,000 units altogether. Spinal fluid examinations were made daily during the period of intraspinal injections, one week later and then at the end of thirty, sixty and ninety days to determine changes in the spinal fluid. The patients were not released from the hospital for ninety days, and following this it is projected to observe the patients at three month intervals, including blood and spinal fluid examinations to determine the lasting effectiveness of this form of treatment.

The idea of using intraspinal treatment for neurosyphilis is obviously not new. Swift and Ellis [3] used serum from the patients themselves, drawn immediately after injection of the arsenical. Their method, however, seemed unnecessarily hazardous and burdensome, in spite of frequent brilliant results. The use of penicillin in this manner, on the other hand, is very simple, rapid and completely safe as medical procedures go.

3. Swift, H. F., and Ellis, A. W. M.: The Direct Treatment of Syphilitic Diseases of the Central Nervous System, New York M. J. 96: 53-55, 1912.

The second group of patients with dementia paralytica was treated with a combination of artificial fever and intramuscular injections of penicillin. The patients were given the routine type of fever treatment used in our hospital, administered by means of the diathermy induction current and an insulating blanket. Temperature records were kept on a recording type of electrical thermometer during the treatment. A total

TABLE 2.—*Results of Treatment with Fever and Penicillin in Dementia Paralytica*

Name	Age	Sex	Color	Duration of Mental Symptoms	Previous Treatment	Physical Condition on Admission	Result
J. B.	24	♂	White	3 mo.	Heavy	Good	B
K. J.	33	♂	Black	1 yr.	Irregular	Poor	C
C. P.	41	♂	White	6 mo.	None	Fair	B
M. W.	34	♀	White	1 mo.	Irregular	Good	A
G. D.	60	♂	White	1 yr.	None	Fair	A
M. S.	58	♀	Black	2 yrs.	Irregular	Fair	B
C. G.	42	♂	White	1 yr.	Irregular	Fair	C

of approximately thirty hours of fever was given to each patient. This consisted of three sessions of two and one-half to three hours at 105 F. or over each week for a period of four weeks. After the third or fourth fever treatment penicillin 20,000 or 25,000 units every four hours to a total of 1,000,000 units was given. After one month 1,000,000 units was injected in a similar manner without further fever treatment.

Observations made on the patients receiving intraspinal treatments are of some interest. In spite of the large doses of penicillin injected intrathecally no serious local manifestations from the treatment were observed. Eight of 10 patients had fever on one or more days following the intrathecal injection. In every instance the temperature returned to normal before the treatment was completed and remained normal apparently in spite of continued injections of large doses of penicillin. Pleocytosis in the spinal fluid was observed in almost every instance. This was always a transient effect of the drug, although in some instances it was very pronounced. I believe that the proper interpretation of these changes is to consider them a manifestation of so-called therapeutic shock rather than an effect of the penicillin itself. It is well known that any foreign substance, serum or drug will produce increase in the number of cells in the spinal fluid,[4] yet repeated injections of serum will produce repeated

TABLE 3.—*Results of Treatment with Intraspinal Penicillin in Tabes*

Name	Age	Sex	Color	Duration of Symptoms	Previous Treatment	Physical Condition on Admission	Result
C. S.	38	♀	White	4 yrs.	Heavy	Poor	A
L. P.	38	♂	White	2 yrs.	Heavy	Fair	C
A. E.	..	♀	White	Over 10 yrs.	Heavy	Good	A
A. B.	..	♂	White	3 yrs.	Heavy	Good	C

increase in cells in the spinal fluid, whereas the injection of penicillin produced only temporary increase which diminished in spite of continued administration of the drug by this route. Similarly the fever seems more fairly ascribed to therapeutic shock than to the effect of penicillin.

All of the patients receiving intraspinal injections of penicillin were allowed up and about the ward except while they had fever and except those patients

4. Goldman, Douglas: Serum Meningitis, Arch. Path. 9: 1027-1037 (May) 1930.

who were too weak and physically disabled from their illness to be allowed this privilege. It is an interesting observation that none of the patients suffered from the so-called spinal puncture headache.

The patients who received fever and penicillin showed no toxic effects whatever from the penicillin. No febrile reaction was observed and there was no evidence of increase in spinal fluid cell counts one week after the treatment. The management of the fever was in no way affected by the use of the penicillin. It seems that the administration of three or four fever treatments before injection of penicillin is an effective means of avoiding therapeutic shock.

The patients used for this study were typical of the state hospital admissions for dementia paralytica. All showed recognizable mental symptoms. They were all in an advanced stage of the disease, many had received irregular treatment over varying periods previous to admission and some had received no treatment at all, as indicated in the summarizing tables. The treatment was administered to 2 patients who were practically moribund, not in the hope of producing benefit but to test the safety of the method. One patient with far advanced tuberculosis who had had a therapeutic pneumothorax maintained for over one year was included in the series.

The 2 aforementioned patients died within ten days following the first series of intraspinal treatments. These had been in a state of pronounced physical and mental deterioration before treatment was started and were to be considered tests of safety rather than hopeful attempts at treatment. This in itself is an interesting point, since among a group of deteriorated patients suffering from dementia paralytica 10 to 20 per cent may be expected to die within three months following admission to a state hospital, regardless of their manner of treatment. Some degree of clinical improvement is manifested in practically every one of the remaining patients. Eight cases show evidence of rapid remission which can be expected to lead to complete recovery within a short time. Nine others have shown within the period of observation improvement of varying degree which is sufficiently definite to justify an optimistic outlook for eventual recovery. The only complete failures in the series were the patients who failed to survive. The results in the patients treated with fever and penicillin are practically similar to those in the patients treated with the combination of intraspinal and intramuscular penicillin. A number of the latter, however, were certainly in no fit condition to have fever treatment and would have been considered hopeless for any other means of therapy than the one employed.

Whether this method of treatment with the doses outlined is to be considered the most effective procedure must be settled by longer observation. It is quite likely that the ideal method of treatment of such patients will be by means of multiple procedures, perhaps larger amounts of penicillin and fever. Arsenicals and bismuth are being withheld from this group of patients because (1) improvement seems adequate or better thus far and (2) the results of the single drug should not be obscured.

TABES DORSALIS

The treatment of the patients with tabes dorsalis is particularly interesting. Four such patients were treated, 2 from the hospital and 2 from private practice. Two of the patients showed as their chief manifestations tabetic crises with pronounced abdominal and other sensory root symptoms. In 1 patient the crises were of such severity that she had been committed to the hospital not for syphilis but for a deep suicidal depression which resulted from the severity of her pain. These recurred at intervals of approximately thirty days and lasted from five to twelve days more or less in each bout. The other patient was one who had had more or less chronic pains which had become unendurable for a long period. Both of these patients had had intense antisyphilitic treatment over a long period and were considered well otherwise.

The other 2 patients with tabes were patients who showed typical motor manifestations of ataxia of the lower extremities. These patients had also received large amounts of treatment by means of fever, arsenicals and bismuth, with apparent arrest of the symptoms but certainly inadequate improvement in the chief manifestation of the disorder.

The patients suffering from tabes were treated with intrathecal penicillin only. The method of administration was the same as that used for the dementia paralytica patients. Six daily injections were made with a total of 100,000 units of penicillin. No other treatment was given at the same time. Patient A. B. was further treated with aldarsone beginning one week after the treatment.

The period of observation on the ataxic patients is considered too brief as yet to be conclusive. A certain amount of definite improvement, however, is clearly manifested in at least 1 of these. The patients who suffered tabetic crises, however, showed improvement that was almost immediate and is apparently of an enduring nature. The patient with the worst pain, who had been suicidal because of its severity, has had no recurrence of symptoms for a period of approximately three months in spite of the occurrence of acute pyelitis during this period. The pyelitis responded in the usual way to sulfonamide drugs and was associated with no excessive pain. This woman's personality has changed to one of normal warmth and brightness from its previous distracted depression. The other patient has also enjoyed remarkable relief from pain. The improvement is less striking only because the pain was not so dramatic to begin with. In these patients also the period of observation is too brief to be conclusive for the establishment of a technic, particularly with regard to dosage and frequency of administration of the drug.

CONCLUSION

1. Eighteen patients with dementia paralytica and 4 patients with tabes dorsalis were treated with penicillin.
2. Patients with dementia paralytica were divided into two groups, one of which was treated with a combination intraspinal and intramuscular penicillin, the other with fever and intramuscular penicillin alone.
3. With only 2 exceptions definite clinical improvement occurred in all of the patients in this group. Some of these are apparently recovering rapidly from their disease.
4. The spinal nerve root pains of tabes are apparently rapidly relieved by intraspinal administration of penicillin.
5. Only 2 patients of the entire series died within a short period after the treatment, and these were practically moribund with strong physical and neurologic evidence of deterioration previous to treatment.
6. Early results are sufficiently favorable to justify continued study of the treatment of neurosyphilis with penicillin by various technics.

THE LOW AGGLUTININ TITER OF BOTH SMALL AND LARGE POOLS OF PLASMA

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It is well known that when plasmas obtained from individuals belonging to the different blood groups are pooled there is evident neutralization of the agglutinins in the pooled plasma. This neutralization of the agglutinins occurs between A and B agglutinogens present in solution in the plasma from groups A, B and AB and the anti-A and anti-B agglutinins from groups O, A and B.

The agglutinin titers in pooled plasma are believed to be sufficiently low so that pooled plasma can be administered intravenously in large amounts to individuals of any blood type without fear of causing serious reactions from possibly incompatible agglutinins.[1] This is borne out by an extensive, worldwide experience by a great number of physicians in the therapeutic intravenous use of pooled plasma.

However, when this investigation was started there were no publications of the determination of the agglutinin titers in large numbers of pools of plasma as they are being prepared for use by the armed forces and in civilian practice. In fact, there was no generally accepted single technic for isoagglutinin titration. Some observers read the tests macroscopically and some with low power microscope magnification. Some carry out the tests on regular microscope slides, some in test tubes. Some centrifuge the test tubes before reading, some do not. The time factor before reading the test varies from a few minutes (with the centrifuge technic) to two hours. Temperature varies also, although most tests are carried out at "room temperature." Consequently it has been impossible to compare titrations by different workers using different technics, and this will continue until a standardized method is adopted by all.

At present there appears to be a trend for every one to use a macroscopic test tube technic similar to that described here. This method is simple, requires only simple apparatus, such as test tubes and pipets, is accurate and can be performed by any competent laboratory technician. It is the method of choice when only a few plasmas or serums must be titrated. It becomes arduous when large numbers of samples are to be examined, and for large scale use the large slide method is to be recommended.

This report is based on the determination of the anti-A and anti-B agglutinin titers in liquid samples of 1,354 pools of plasma. (Most of these pools represented by these samples were shell frozen and dried.)

Nine hundred and ninety-eight samples were obtained from eight processing laboratories during their routine preparation of pools of plasma for the armed forces, from citrated blood obtained through the Blood Donor Service of the American Red Cross. One hundred and forty-two samples were obtained from the Surgical Physiology Division, Army Medical School, and 209 samples from the Blood and Plasma Department, Naval Medical School.

These samples were obtained at random as the plasma was being processed, or occasionally samples from every fifth or tenth pool were taken. In the processing laboratories, therefore, these represent random samples from an extremely large number of pools, and a very considerable number of pools from the Surgical Physiology Division, Army Medical School, and the Naval Medical School. There also was no selection of blood groups of the individual plasmas which went into each of these pools; the plasmas were pooled as they came to the laboratory.

METHODS

The titrations were carried out by a large glass slide method,[2] and the readings were made macroscopically. This method was checked repeatedly with the test tube method as used by the Surgical Physiology Division, Army Medical School,[3] and macroscopic readings with both were found to check practically always within one dilution. Duplicate tests with both methods also checked practically always within one dilution. This is the limit of accuracy of both methods.

With this large slide method one can also use an end point by examination under the low power of the microscope. This modification is described so that it may be used for comparison with other methods using a similar end point. We have compared this with Davidsohn's method,[4] in which the end point is determined under the low power of the microscope, and found the titers by both methods to check within one dilution. The low power microscope titers are always one or two dilutions higher than the naked eye titers, and this should be taken into consideration in comparing the two.

However, we recommend that only the macroscopically determined titer be utilized, since it checks well with the test tube method, also read macroscopically.

LARGE GLASS SLIDE METHOD FOR DETERMINING THE AGGLUTININ TITER[5]

1. The A and B cells used in determining the titer of a serum must be of average sensitivity. This is determined by testing the cells of several individuals against a serum or plasma of low titer, using ascending dilutions of the low titer serum. Dilutions of the serum should be in arithmetical progression (1:10, 1:20, 1:30 and so on). It will be found that the end point will vary with the same serum with different cells. The spread may be, for example, from 1:10 to 1:50. In such a case cells showing an end point at approximately 1:30 may be considered of average sensitivity.

A sufficient amount of blood may be taken from a satisfactory donor for one week's work and placed in enough sodium citrate solution to prevent clotting. These cells must be kept refrigerated and a sufficient amount for the day's work removed each morning and washed three times with an 0.85 per cent solution of sodium chloride.[6]

From the American Red Cross Blood Donor Service and the Public Health Research Institute of the City of New York, Inc.

1. Thalhimer, W.: Intravenous Injection of Pooled Normal Plasma or Serum: Is It Dangerous? J. A. M. A. **120**: 1263 1267 (Dec. 19) 1942.

2. Perfected at the Connaught Laboratories.

3. Lozner, E. L., and Newhouser, L. R.: Preservation of Normal Human Plasma in the Liquid State: Studies on Isohemagglutinin Titers, J. Clin. Investigation **23**: 361-363, 1944.

4. Davidsohn, I.: Test for Infectious Mononucleosis, Am. J. Clin. Path. (Tech. Supp.) **2**: 56-60, 1938.

5. This method can be used with accuracy for determining blood types in large numbers of individuals.

6. Usually fresh cells from the same individuals were used.

A 1 or 2 per cent suspension of the cells in an 0.85 per cent solution of sodium chloride should be used for the titration.

2. Final dilutions of the plasma or serum should be made as follows: 1:10, 1:20, 1:40, 1:80, 1:160 and so on (or 1:2, 1:4, 1:8 and so on).

3. The dilutions recorded should be actual dilution of the serum used in the individual tests.

4. The same pipet is used throughout a single test. The most convenient is an eyedropper with a rubber nipple. This will insure all drops being of the same size. Care must be taken to rinse the pipet thoroughly with an 0.85 per cent solution of sodium chloride each time a different solution or different dilution is used.

5. The tests are performed on large plate glass slides, 4 by 10 inches in size, ruled off in 1 inch squares with a wax pencil. The drops of plasma or serum and the suspension of cells are placed in the center of each square. The mixture on each square consists of one drop of original or diluted plasma or serum, one drop of a 1 per cent suspension of cells that have been washed three times in isotonic solution of sodium chloride and one drop of isotonic solution of sodium chloride. The addition of the drop of saline solution has been found to increase the accuracy of the test and prevents drying before the tests are read. (We have corrobrated the findings of Wiener that this small amount of dilution caused by the additional drop of saline solution does not influence the determination of the titer of the plasma. The amount of agglutinin added is the determining factor, and it takes at least six or seven times dilution with added saline solution to influence the degree of agglutination in each individual test.)

The slides are then placed on a mechanical shaker[7] and the rheostat set to give a rotating motion at the rate of about 120 movements to the minute. The slides are left on the shaker for thirty minutes and then taken off and placed on a table for five minutes before being read. The readings are made by naked eye and can be made by low power microscope. (The smooth surface of the plate glass permits more accurate determination of the microscopic end point of minimum agglutination than carrying out the test on slides with depressions. The end point is the observation with the low power microscope of at least three or four small clumps of not less than three or four cells. This end point must be followed by at least two squares with higher dilutions of agglutinins that are completely negative.)

6. Maximum macroscopic agglutination consisting of one or only several large clumps is called 4 plus. Lesser degrees of agglutination are 3 plus and 2 plus; 1 plus, the smallest amount of agglutination that can be detected, has a finely granular appearance and is the end point. (The next weaker agglutination is read with the low power microscope and recorded as plus minus plus [± +] and consists of many clumps made up of at least half of the cells present. Considerably smaller and fewer clumps are recorded as simply plus minus [±], and minimal clumping, consisting of at least three or four clumps of three to six cells in a low power field, is recorded as plus minus minus [± —], and in the negative tests all of the cells lie free. The end point is very sharp. Except for corroboration, microscope readings are not recommended.)

7. Boerner shaking machine number 3623, A. H. Thomas Company. The machine is made with the rheostat incorporated in the machine and under the shaking platform. The heat from the rheostat dries the tests. Therefore the rheostat should be removed and placed in the circuit some distance away from the shaker.

TEST TUBE METHOD FOR DETERMINING THE AGGLUTININ TITER

The test is carried out in a series of ¼ by 3 inch test tubes. The same dilutions of plasma are used in this test as in the large slide test.

In each test tube are placed two drops of the appropriate dilution of the plasma and two drops of 1 or 2 per cent suspension of three times washed cells. The tubes are well shaken and allowed to stand at room temperature for two hours or can be centrifuged at low speed for one minute.[8]

After gentle shaking, naked eye readings are made of the agglutination; 4 plus indicates one large clump, 3 plus when several large clumps appear on gentle shaking, 2 plus indicates many smaller clumps and 1 plus when even a few small clumps are seen or the appearance is granular and is the end point.

When microscopic examination is carried out a drop from each tube is removed with a glass rod, placed on the slide, examined under the low power of the microscope and recorded as in the large slide test.

COMMENT

Of the 1,354 pools, 134 were made of plasma from 50 individual bleedings in each pool, 850 of plasma from 25 bleedings, 355 of plasma from 6 to 10 bleedings, and 15 of plasma from 15 bleedings. The samples of pools containing 15 bleedings had been dried from the frozen state.[9] All other samples were in the original liquid state. Since the plasmas were pooled as they came to each laboratory with no selection of the blood groups of the individual plasmas, the distribution of the blood groups was by chance.

As shown in the table, of the total number of 1,354 pools in our series only 39 pools, or 2.9 per cent, showed a macroscopic anti-A titer of 1:20 or higher, and of these only 3, or 0.2 per cent, a titer of 1:40 or higher (one each 1:40, 1:60 and 1:80), none being higher than 1:80. Eighteen pools, 1.3 per cent, showed an anti-B titer of 1:20 or higher, only one as much as 1:40, and none higher than this. Therefore 97 per cent of the entire series showed both anti-A and anti-B titers less than 1:20 and 99.7 per cent less than 1:40.

From the table it can be seen that the percentage of plasmas falling into these different titration levels, regardless of the number of bleedings constituting each pool, does not show wide variation, with the exception of the group of 15 plasmas each containing 15 bleedings. Here the number examined was small, and the percentages probably cannot be compared statistically with those from the groups with the larger number of samples.

Lozner and Newhouser[3] have recently reported on the anti-A and anti-B isoagglutinin titrations of 1,000 pools of plasma. These were liquid pools containing plasma obtained from 5 to 12 donors. Some of the pools were titrated when they were 1 month old, others 1 to 4 months old, and still others over 4 months old. Our pools were titrated when comparatively fresh, about 1 month old.

They found the titer of the 4 month old pools lower than that of the pools under 4 months. Their total for the entire 1,000 pools, regardless of age, for both anti-A and anti-B agglutinins is 8.9 per cent above the titer of 1:16. Our dilutions were made in multiples of ten, and we found in 1,354 pools a total of

8. The centrifuge technic is useful when saving time is important and is to be highly recommended for cross matching transfusion tests.

9. It has been demonstrated that freezing and drying has little if any effect on agglutinin titer, except possibly to reduce it slightly.

4.2 per cent for both anti-A and anti-B agglutinins, with a titer of 1:20 or higher. Of their pools 3.3 per cent have a titer higher than 1:32, and we found only 0.28 per cent with a titer of 1:40 or higher.

Recently Blum [10] has published the agglutinin titers in forty pools containing liquid plasma from 4 to 7 donors, such as is routine in most hospital blood banks. He used Davidsohn's sensitive technic, with a low power microscope end point, and notes that these titers are higher than those with a macroscopic end point. His titers ranged from less than 1:2 to 1:56, none higher. The averages were 1:9 for anti-A and 1:22 for anti-B. These are even lower than those in Lozner and Newhouser's series.

Even with such a small percentage of pools in our series showing titers higher than 1:40, it seemed important to find out by actual trial if pools with comparatively high titers, definitely higher than the routine pools, could cause any specific reactions or harmful effects when they were administered intravenously to type A or B patients. Consequently the pool which had an anti-A titer of 1:80 was secured, and 500 cc. was administered cautiously by the intravenous route to 10 type A patients. These intravenous injections did not cause any clinical reactions or jaundice in any of the patients.

We then had prepared some pools made up entirely of 25 type O individual plasmas, so that none of the examined soon afterward under the microscope. In none were any agglutinates found.

In our series of 1,354 pools of plasma not a single pool was found with an agglutinin titer higher than 1:80. In this series there were 355 pools made up of plasma from only 6 to 10 donors. These pools are the size that are usually prepared in hospitals. We are particularly interested that in this series of small pools there was only 1 pool that had a titer of 1:40, and none higher. Therefore these small pools are just as apt to be free from high agglutinin titers as larger pools made up of from 25 to 50 individual plasmas.

Since full doses of plasma with titers varying from 1:80 to 1:256 were administered intravenously to patients of types A and B and caused no reactions, it seems clear that plasma with titers up to 1:40 certainly cannot cause incompatible reactions, and can be administered safely, regardless of the blood type of the recipient.

CONCLUSIONS

1. The anti-A and anti-B agglutinin titers were determined in 1,354 pools of human plasma.

2. The number of individual plasmas in the pools varied from 6 to 50.

3. The pools of plasma were either random samples or every fifth or tenth as they were processed routinely.

4. Of the 1,354 plasma pools, only 2 had macroscopic titers of 1:40, 1 of 1:60 and 1 of 1:80. Therefore agglutinins would be neutralized and both anti-A and anti-B agglutinins would be the highest that could possibly occur, should a pool by chance be made up entirely of type O plasma. The highest anti-A titer in these pools was 1:256 and the anti-B titer 1:128. The titers of most of the pools varied from 1:8 to 1:64. We were surprised to find the titers this low, expecting higher levels. The most probable explanation is that plasmas with low titers reduced the high titers by dilution. These results give additional confidence that small pools will have a low titer even if all or most of the individual plasmas belong to type O.

Macroscopic Readings

No. of Plasmas in Each Pool	No. of Samples	Titer 1:20 to 1:39		Titer 1:40		Titer 1:50		Titer 1:60		Titer 1:80	
		Anti-A	Anti-B	Anti-A	Anti-B	Anti-A	Anti-B	Anti-A	Anti-B	Anti-A	Anti-B
50	134	2 (1.5%)	0	0	0	0	0	0	0	0	0
25	850	22 (2.6%)	7 (0.8%)	0	0	0	0	1 (0.1%)	0	1 (0.1%)	0
6-10	355	11 (3.1%)	6 (4.5%)	1 (0.3%)	0	0	0	0	0	0	0
15	15	1 (6.6%)	4 (26.4%)	0	1 (6.6%)	0	0	0	0	0	0
Total	1,354	36 (2.7%)	17 (1.25%)	1 (0.07%)	1 (0.07%)			1 (0.07%)		1 (0.07%)	

These pools yielded about 75 500 cc. units of dried plasma. One third was sent to Capt. L. R. Newhouser (MC), U.S.N., another third to Lieut. Col. D. B. Kendrick, M. C., U. S. Army, and the other third we retained. These pools, when clinical indications arose, were injected intravenously into patients belonging to types A or B.

No patient received less than 500 cc. at one time. One patient received 500 cc. daily for four days and on the fifth day received 1,000 cc.[11] None of these patients showed any reactions, and there were no signs or symptoms of intravascular agglutination or hemolysis. In 6 patients, immediately after the injection, a venous sample was withdrawn from the opposite arm. These samples were collected in citrate solution and

99.7 per cent of the pools had macroscopic agglutinin titers, anti-A or anti-B, of less than 1:40. Also in 97 per cent the titer was less than 1:20.

5. In 355 small pools made up of plasma from 6 to 10 individuals, whereas the percentage with relatively low titers, 1:20 to 1:40, was somewhat higher than in pools of a larger number of plasmas, the percentage with titers of 1:40 or higher was not greater than in the larger pools. Therefore it is perfectly safe to prepare small pools of plasma from 6 to 10 donors. The probability of large plasma pools having a high titer is even less than that of small pools.

6. Pools of plasma were prepared entirely of type O plasma so as to secure the highest possible agglutinin titers, both anti-A and anti-B. These titers ranged up to 1:256. Seventy-five 500 cc. dried units of these plasma pools were reconstituted and administered intravenously to type A or B individuals. No reactions were caused, and there were no signs or symptoms of intravascular agglutination from the relatively high titered plasma.

7. Pooled plasma, as prepared in small pools at hospital blood banks or in larger pools at processing laboratories, the blood groups entering each pool by chance and without selection, can be administered with safety to all individuals, regardless of their blood types, and without fear of causing any harm because of isoagglutinin content or of causing any signs or symptoms of intravascular agglutination.

111 East Eightieth Street.

10. Blum, L. L.: Isoagglutinin and Agglutinogen Contents of Pooled Plasma: Their Role in Transfusion Reactions, Am. J. Clin. Path. 14: 112-118, 1944.

11. Personal communication from Capt. John Elliott, S. C., A. U. S., Surgical Physiology Division, Army Medical School.

Clinical Notes, Suggestions and New Instruments

TREATMENT OF HUMAN PSITTACOSIS WITH PENICILLIN

HARRISON F. FLIPPIN, M.D., MICHAEL J. GAYDOSH, M.D., AND WILLIAM V. FITTIPOLDI, M.D., PHILADELPHIA

Previous reports have indicated that penicillin may be of value in the treatment of human psittacosis. Heilman and Herrell [1] demonstrated the protective effect of penicillin on mice experimentally infected with a strain of psittacosis virus of parakeet origin. According to Parker and Diefendorf [2] penicillin has a very definite effect on the course of the disease induced in chick embryos by the virus of psittacosis. Recently penicillin was employed successfully in a human case of ornithosis, which disease is caused by a psittacosis-like virus [3] Our purpose in this communication is to record a case of human psittacosis in which penicillin seemed to be of definite value.

REPORT OF CASE

History.—E. Q.; a white woman aged 52, was referred to the Philadelphia General Hospital Jan. 5, 1945 by her family physician, Dr. Philip Yuckman, because of a pneumonia that did not yield to sulfonamide therapy. Nine days before admission she complained of malaise, generalized body pains, frontal headache and a watery nasal discharge. By the fourth day of illness she had developed a hacking, nonproductive cough, sore throat, fever and frequent nosebleeds. For the next four days she received a total of 12 Gm. of sulfadiazine without improvement and on the ninth day of illness was admitted to the hospital.

Physical Examination.—The patient was acutely ill, mentally confused and restless, chiefly because of a rather severe unproductive paroxysmal cough. Her temperature was 104 F., pulse rate 100 and respiratory rate 30. The nose was oozing fresh blood and the pharynx was moderately inflamed. Over the left lower lung posteriorly there was some dulness to percussion and increased breath sounds. At both bases were heard many fine moist inspiratory and expiratory rales. The liver and spleen were not palpable.

Laboratory Studies.—The pertinent data pertaining to laboratory and x-ray [4] studies are shown in the accompanying illustrations. A report from Dr. K. F. Meyer [5] stated that a specimen of serum, obtained from the patient on the twenty-third day of illness, fixed complement in presence of psittacosis antigen 1:128 (4 plus). Because other diseases, especially lymphogranuloma venereum,[6] may produce high antibody titers with psittacosis antigen, a Frei test was performed and was negative. Stool and urine cultures as well as routine agglutination tests were all negative. The culture material contained para-aminobenzoic acid and penicillinase. The sputum culture showed a few pneumococci. Differential white blood counts were all normal.

Clinical Course.—The septic fever, paroxysmal nonproductive cough, nosebleeds, frontal headache and mental confusion persisted until the twenty-first day of the disease. Repeated chest x-ray examinations revealed a migratory type of pneumonia. Sulfamerazine was given with no effect, and on the nineteenth day of the illness the drug was stopped and penicillin 100,000 units intramuscularly daily was started. Within thirty-six hours of penicillin therapy there was definite clinical improvement. For the first time since admission the patient was clear mentally, the cough became less severe and the nosebleeds subsided. The administration of penicillin was followed also by a definite improvement in the lungs, as revealed by physical and x-ray examinations. Throughout the entire illness the physical chest signs were always less than the x-ray appearance. A relative bradycardia was present most of the time Recovery was uncomplicated, and the patient is now enjoying apparent good health.



Fig. 1.—Appearance of chest on thirteenth day of disease. Pneumonitis and some pleuritis involving the left lower lobe, with a peculiar irregular bronchopneumonic consolidation. In the right base there is only a small amount of pleural thickening, with early consolidation



Fig 2.—Appearance on twentieth day of disease The left lower lobe now shows much clearing and very little consolidation, but there is now a more recent area of consolidation in the left upper, the lower portion of the right upper and the right lower lobe There is a peculiar ground glass appearance in the consolidated areas



Fig 3.—Appearance on twenty seventh day of disease. There is now only a small amount of pleural thickening in the left base The pneumonic processes have entirely disappeared

Epidemiology.—In late September 1944, about three months before the onset of illness, the patient acquired a parrot Each day the bird was allowed out of the cage and would fly about the house. On Dec. 20, 1944, seven days before the illness began, the parrot bit the patient on her right middle finger. Aside from this episode there was no other history of contact with parrakeets, love birds, pigeons, doves or chickens.

SUMMARY AND CONCLUSIONS

The diagnosis of psittacosis in this patient is based on the history of a recent bite by a parrot, a migratory pneumonia which failed to respond to sulfonamides and a significant titer of complement fixing antibodies for psittacosis in the patient's serum. The Frei test was negative and there was no other history of contact with birds or animals which have been

Dr. Gaydosh is David Riesman Fellow in Medicine.

From the Committee on Chemotherapy, Philadelphia General Hospital. This work was aided by a grant from the Research Fund for Infectious Diseases, University of Pennsylvania

1. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Psittacosis, Proc. Staff Meet., Mayo Clin. **19**: 204 (April 19) 1944.

2. Parker, R. F., and Diefendorf, H. W.: Effect of Penicillin on Certain Viruses, Proc. Soc Exper. Biol. & Med. **57**: 351 (Dec.) 1944

3. Turgasen, F. E.: Human Ornithosis Treated with Penicillin, J. A. M. A. **126**: 1150 (Dec. 30) 1944.

4. H. W. Ostrum, chief roentgenologist, Philadelphia General Hospital, Philadelphia

5. Meyer, K. F. The George Williams Hooper Foundation, University of California, San Francisco

6. Eaton, M. D.; Martin, W. P., and Beck, M. D.: Antigenic Relationship of Viruses of Meningopneumonitis and Lymphogranuloma Venereum, J. Exper. Med. **75**: 21 (Jan.) 1942

shown to harbor psittacosis-like viruses. No attempt was made to isolate the virus, and we agree with Meiklejohn and his associates [7] that this is the only satisfactory positive evidence of specific infection. Nevertheless, we believe that this patient represents a case of psittacosis. Penicillin therapy was

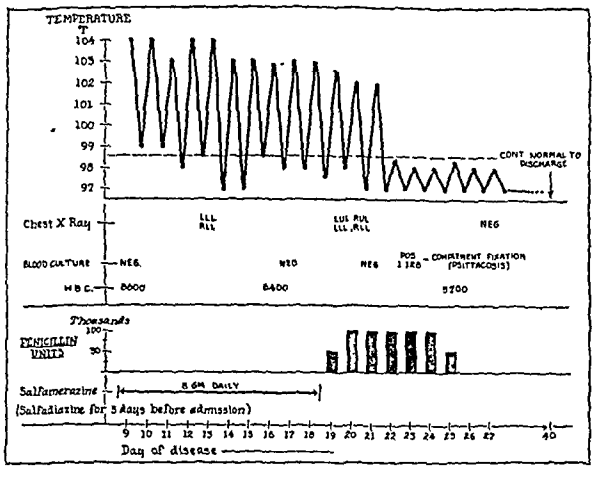


Fig. 4.—Course in case of human psittacosis treated with penicillin.

followed within thirty-six hours by definite clinical improvement. It is our impression that penicillin was of therapeutic value in this case of psittacosis.

255 South Seventeenth Street.

"DIAPER RASH" DUE TO PERM-ASEPTIC

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In recent months a new antiseptic solution has appeared on the market under the name of Perm-Aseptic-Ramplex. The product is sold as Perm-Aseptic for promotional purposes and as Ramplex for industrial purposes. The product is distributed by the Perm-Aseptic Process Company, New York City. The company advertises the new chemical as a fluid of highly concentrated power which combines the properties of germicide, bactericide and fungicide. According to the company's claims its purpose is to make textiles actively antiseptic as a protection to persons and as a prevention of destruction of textiles by bacteria, germs, mold and mildew.

Bacteriologic tests have been made by Foster D. Snell, Inc., and by the United States Testing Company, Inc. The zone of inhibition is claimed to be 3 to 6 mm. and to conform with the standard for laboratory tests as established by the Food and Drug Administration of the United States government.

Perm-Aseptic is becoming widely used among the diaper services. The diapers are passed through the Perm-Aseptic solution as the last rinse. The recommended dilution varies from 1:10,000 to 1:30,000.

Recently I have seen 5 cases of diaper rash which was caused by Perm-Aseptic. Three of these cases were thoroughly studied and followed.

The age of the infants varied from 2 months to 16 months. The rash appeared as an acute erythema accompanied by a mild edema of the areas involved. In 1 case vesiculation was present. Pruritus was moderate in all cases. The areas involved corresponded to the areas of contact with the diaper. The diapers in all the cases were supplied by a diaper service which in recent months added the Perm-Aseptic to the last rinse.

Three of the cases I had the opportunity to study. The mothers were told to boil the diapers and rinse them out in plain water before using. The diaper rash did not disappear but became less severe in 2 cases and remained the same in the third case. The Perm-Aseptic apparently is not completely removed by boiling and washing. It is claimed that even after several washings Perm-Aseptic is still present in the materials. The mothers were then told to use their own diapers for a few days. Each case rapidly cleared up within three to seven days. When wearing of the diapers from the diaper service was resumed the rash immediately reappeared. This was repeated three times in each case, thus confirming our suspicions that the diapers were the causative agent.

The United States Testing Company, Inc., reported on its patch testing as follows: "Twenty-five samples of cotton fabric previously treated with a 1-400 dilution of Perm-Aseptic Germicide, dried, were placed in contact with human tissue for forty-eight hours, removed for twenty-four hours and then replaced for twenty-four hours. No irritated areas developed on any individual." One of my own cases was patch tested with the diaper, which was passed through a 1:30,000 dilution as the last rinse. The patch test after twenty-four hours was positive.

I have communicated with Dr. Louis Schwartz of the U. S. Public Health Service, Bethesda 14, Md. According to the information received Perm-Aseptic is a primary skin irritant in strong concentration and a sensitizer in weak concentrations. So far cases of contact dermatitis from Perm-Aseptic have not been reported but are likely to occur as this new chemical becomes more widely used. It is evident that one exposure is not as likely to sensitize within three days as numerous exposures over a period of weeks. Each of my patients wore the diapers treated with Perm-Aseptic for at least two months before any symptoms of sensitivity appeared. The diaper service involved was most cooperative and because of the potential dangers the Perm-Aseptic was omitted from the washings. The cases involved have cleared up and no recurrence has been noted in several weeks, although the same diaper service is being used. The fact that the Perm-Aseptic was the only ingredient omitted by the laundry confirms the diagnosis of Perm-Aseptic being the offending agent in the cases of diaper rash described.

478 Peachtree Street.

PNEUMONIC PLAGUE

REPORT OF A CASE WITH RECOVERY

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Recovery from pneumonic plague is so rare that for all practical purposes the disease is considered fatal. For this reason a case of proved plague pneumonia with recovery is thought to be worthy of recording.

Dr. J. H. was engaged in research investigations at the Plague Investigation Station of the U. S. Public Health Service, San Francisco, and had been so engaged for a period of eighteen months previous to his illness.

During the week before the onset of this illness he had been working with virulent cultures of Pasteurella pestis but had neither inoculated animals nor handled any that had been inoculated, and he had not made any significant changes in his customary bacteriologic technic. On May 31, 1944 he came to the laboratory as usual but returned to his home shortly after his arrival because of the onset of malaise and chilliness, which increased during the day and was accompanied by an occasional hacking cough. On awakening the following morning he found that his temperature was 104 F. and he coughed up some blood tinged sputum. He was promptly brought by automobile from his home and admitted to the U. S. Marine Hospital, San Francisco, at 10 a. m., June 1.

On admission he complained of malaise, slight pain in the chest, low down on the right side, and a frequent nonproductive cough. The patient was aware that he was confused and disoriented. His temperature was 104 F., the pulse rate 100, respiratory rate 26. His throat was slightly injected, but there were no enlarged cervical nodes noted. There was an area of impaired resonance at the base of the right lung posteriorly;

7. Meiklejohn, G.; Beck, M. D., and Eaton, M. D.: Atypical Pneumonia Caused by Psittacosis-like Viruses, J. Clin. Investigation 23: 167 (March) 1944.

the breath sounds were normal over this area, but there were very fine scattered rales. There was a faint systolic murmur heard at the apex of the heart, but otherwise there seemed to be no cardiac abnormality. The blood pressure was 110/70. The spleen was not palpable. The axillary and inguinal lymph nodes were not enlarged, and the skin of the head, neck, trunk and limbs was clear. The area of impaired resonance over the lung corresponded to a round patch of infiltration, demonstrated by a picture made by a portable x-ray machine (fig. 1).

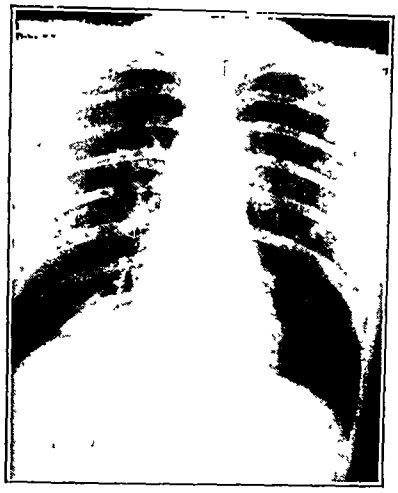


Fig. 1.—Area of consolidation in right lower lobe on entry, June 1.

Blood examination revealed 4,800,000 red blood cells, hemoglobin 13.6 Gm., 18,000 white blood cells, with polymorphonuclears 88 per cent and lymphocytes 12 per cent. The urine was normal. A specimen of approximately 4 cc. of sputum was obtained approximately twenty-four hours after onset through persistent coughing efforts. Examination of the sputum and the bacteriologic, chemical and other laboratory tests were done by the Plague Investigation Station, which is adjacent to the hospital.

The report of Dr. N. E. Wayson, officer in charge of the station, was as follows: "The sputum was very viscid and contained two rather discrete blood tinged portions. A microscopic smear of the blood tinged areas revealed large numbers of bacteria whose morphology and bipolar staining qualities were characteristic of Pasteurella pestis. In some portions of the smear these were the only organisms present and were scattered among leukocytes.

"Cultures of P. pestis were obtained directly from the sputum, checked through differential culture reactions and injected into mice and guinea pigs, which died with the pathologic changes characteristic of plague. Other mice and guinea pigs were inoculated with the sputum in amounts as small as 0.1 cc. by subcutaneous and intracutaneous injections. All died with the pathologic changes characteristic of plague, and pure cultures of P. pestis were obtained from the tissues of several of them. Mice were inoculated with small quantities of the sputum by intraperitoneal injection and their peritoneal contents were examined six to eight hours later for the presence of P. pestis and pneumococci. P. pestis but no pneumococci were found, and the animals were killed twelve and eighteen hours later. Cultures of pestis were obtained from the peritoneal fluid.

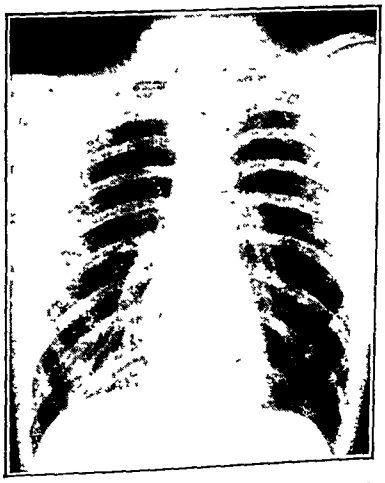


Fig. 2.—Almost complete absorption of lesion forty-one days after onset.

"Ten cc. of blood of the patient was inoculated into Kracke broth, to which para-aminobenzoic acid had been added, and incubated for a period of five days without the appearance of bacterial growth."

The course of the illness was severe and for the first four days the temperature remained between 102.2 and 106.8 F. rectally. Cough was hacking and frequent but not violent, and small amounts of bloody sputum were raised at irregular intervals. During the first six days the patient alternated between periods of delirium and periods of mental clearness, and at times he was so wildly irrational that it required repeated injections of morphine and scopolamine to restrain him. On two occasions, once after a chill and once after maniacal exertion, he developed severe circulatory collapse with cyanosis and dyspnea but improved each time after injections of morphine and of caffeine.

By the sixth day it was obvious that the temperature was falling by lysis, and that the patient's condition was definitely improving. His cough became much milder and the scanty sputum less blood streaked. After the sixth day plague organisms could not be recovered from the sputum by culture or animal inoculation, and after the eighth day he could raise no sputum at all.

The temperature became normal on the eighth day and remained so, but rales could be heard over the area of infection in the lower lobe of the right lung as late as the twenty-first day of the illness. At no time during the illness was there evidence of spread of infection to other lobes of the lung. He was allowed out of bed on the twenty-second day and returned to his home for a long convalescence on the twenty-sixth day. Electrocardiographic tracings taken during convalescence showed no evidence of myocardial damage. X-rays did not show complete clearing of the infiltration in the lung until six weeks had elapsed (fig. 2).

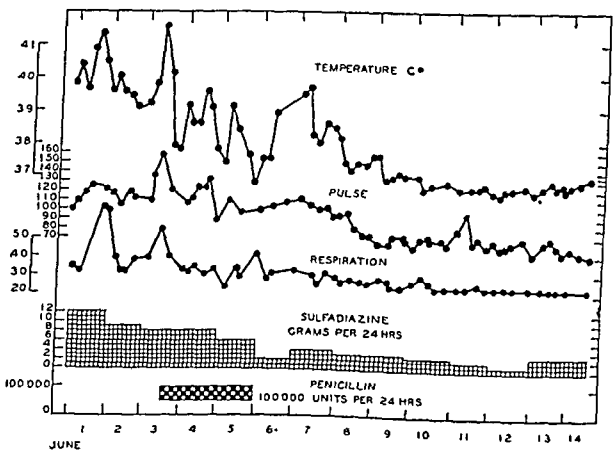


Fig. 3.—Temperature and medication.

Treatment was started immediately with large doses of sulfadiazine, 12 Gm. being given orally in the first twenty hours and 1 Gm. every four hours thereafter. After twenty-four hours the sulfadiazine level was only 4 mg. per hundred cubic centimeters. Two and five-tenths Gm. of sodium sulfadiazine was then given intravenously, and the oral dose was increased to 2 Gm. every six hours. However, the daily blood sulfadiazine level did not rise above 5 mg. per hundred cubic centimeters.

An antiplague rabbit serum was procured from the Hooper Foundation for Medical Research. Small doses of this serum were reported to protect mice against injections of P. pestis.[1] The patient was skin tested with the serum and was found highly sensitive to it and did not respond well to small desensitizing doses. It was believed that his condition was so precarious that a serum reaction might result fatally, and the serum was not used further.

On the fourth day of his illness intramuscular administration of penicillin was started, although it was understood that this drug has not been proved to be effective against infection with plague or other gram negative bacteria. Three hundred thousand units of penicillin was given and there was no evidence that the administration of this drug altered the course of the disease.

1. Meyer, K. F., director, Hooper Foundation for Medical Research: Personal communication to the author.

COMMENT

Primary pneumonic plague is usually fatal and therapeutic methods seem to be fruitless; it is generally attended with the development of secondary cases. However, recovery occasionally occurs [2] and secondary cases do not occur inevitably.

Antiplague serum has been used in the treatment of plague for many years and is reported to have prolonged life in cases of pneumonic plague for several days [3] There have been a number of reports of the favorable action of sulfonamide drugs in plague,[4] but in practically all instances the reference is to bubonic plague. Sulfathiazole has been repeatedly shown to be more efficacious than sulfapyridine in cases of bubonic plague, and animal experiments have seemed to indicate that sulfadiazine would be superior to either [5] In the reports of outbreaks of plague which show the apparent lowering of the bubonic plague mortality rate by the sulfonamides the cases of pneumonic plague have been fatal.

As far as I am aware, this case is the first to be reported in which primary pneumonic plague has been treated by the use of sulfadiazine and the patient has recovered However, the recovery cannot be attributed solely to a favorable action of this drug since other factors may have contributed to it

The patient had received five injections of plague vaccine over a period of six months, approximately one year previous to his illness. This vaccine had been made from virulent P pestis organisms which had been chemically killed Inoculations were made on Jan. 26, 1943, 0.5 cc.; February 2, 1.5 cc , April 3, 1.0 cc.; April 22, 1.0 cc.; June 11, 1.0 cc The total amount of vaccine injected contained approximately 122 billion organisms. Shortly after the last injection the administration of the patient's serum to mice afforded them protection against small doses of P. pestis. However, a rather unsatisfactory mouse protection test performed six months later on his serum showed no evidence of protection.

Further, the nature of the illness was recognized within twenty-four hours after its onset and he was afforded treatment with modern facilities very promptly. He was placed in an oxygen tent within an hour after his admission to the hospital, and his specific therapy was started approximately twenty-six hours after he first began to feel ill. He was given every nursing facility, and continued attention was directed toward the protection of his heart against undue damage by sparing him every possible exertion.

Cases of primary pneumonic plague do not invariably give rise to secondary cases even though there is a complete failure to quarantine or segregate contacts.[3] The absence of coughing, sneezing or otherwise infecting the atmosphere with droplets of the patient's sputum have been offered as the probable explanation of the failure of the secondary cases to develop in such instances. This patient had but little cough, but every effort was made to prevent the dissemination of droplets of his sputum in the surrounding atmosphere. It is believed that his treatment in an oxygen tent made an excellent screen between him and his nurses. The attending physician and the nurses were masked, hooded, gowned and gloved and spent the minimum amount of time necessary in the room occupied by the patient. All attendants other than his physician and the nurses assigned to his case were excluded from the three rooms devoted to his care. In order to enter the room occupied by the patient, it was necessary to go into a dressing room and from this through a second room in which all gowns and gloves used in the care of the patient were deposited in a phenol disinfectant previous to returning to the dressing room. As his physician, I carried on with my duties in other parts of the hospital in a somewhat limited manner, but the nurses remained under quarantine.

The manner in which this patient contracted plague is not known to him or to his laboratory associates. There is no evidence to suggest that the pneumonia was secondary to a septicemia following a local infection.

SUMMARY

A case of primary pneumonic plague was contracted accidentally during laboratory research The nature of the illness was recognized within twenty-six hours after its acute onset, and therapy with sulfadiazine was instituted at once. The patient had received a large amount of plague vaccine a year previous to the illness. He was placed in an oxygen tent promptly on admission to the hospital as a therapeutic and as a quarantine procedure, and other strict quarantine practices were carried out. Secondary cases did not occur.

2. Gale, G. W. Outbreak of Pneumonic Plague in Kalahari, South African M. J. **15**: 369-373, 1941. Clark, B M and Goldberg, S. Pneumonic Plague Recovery in a Proved Case, ibid **17**: 57 60, 1943, and references given in footnote 3.

3. Strong, Richard P, in [illegible] tion and Treatment of Tropical Diseases, ed 6, [illegible] ompany, 1942, pp 660, 661, 695 Wu Lien Teh: Plague, League of Nations' Health Org Rep, 1926 Report of International Plague Conference, Mukden, 1911, Manila, Bureau of Printing 1912

4 Sokhey, S. S Annual Report of Haffkine Institute Studies on Plague, 1939 Girard, G. Treatment of Plague by Sulfonamides, Bull Soc Path Exot. **34**: 37-48, 1941. Plum, D Plague Epidemics in Nairobi, East African M J. **19**: 3 9, 1942 deVillafane Lastra, Gallardo and Videla. Three Cases of Bubonic Plague Treated with Sulfathiazole, Semana med **48**: 1073 1079, 1941. Wagle, P M, Sokhey, S. S; Dikshit, B B, and Ganapathi, K. Chemotherapy in Plague, Indian M. Gaz. **76**: 29 32, 1941. Sokhey, S S, and Dikshit, B. B Sulfathiazole in Bubonic Plague, Lancet **1**: 1040 1042, 1940 deVillafane Lastra, Goobar, Rodeiro and Videla Treatment of Plague, Primer Congr. Nac. Enfermedades, Endemo-epidemicas, Buenos Aires, No 9, pp 586 593, 1942. Cassio, Pedro Plague in Argentina, Bol Sanitario, Buenos Aires **6**: 167-168, 1941. Sokhey, S S, and Wagle, P. M.: Report of Haffkine Institute for 1940 and 1941, pp 37 45

5. Wayson, N. E, and McMahon, M D Plague Sulfadiazine Treatment of Guinea Pigs Infected by Artificial Methods, Pub Health Rep **59**: 385 397, 1944. Girard[4] Wagle, Sokhey, Dikshit and Ganapathi[4] Sokhey and Dikshit[4] deVillafane Lastra, Goobar, Rodeiro and Videla[4] Sokhey and Wagle.[4]

Council on Foods and Nutrition

SPECIAL ARTICLE

This is the fifth of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication.

GEORGE K. ANDERSON, M.D., *Secretary.*

PROTEIN NUTRITION IN PEDIATRICS

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NEW YORK

In addition to the many functions subserved by protein in adults, this foodstuff serves the special function in the child of providing basic building materials for the manufacture of tissues during growth. Protein also acts by virtue of its chemical and physiologic properties as a therapeutic agent in certain ailments peculiar to infancy and childhood; less commonly it may be biologically harmful when administered to children in its native state.

PROTEIN NEEDS FOR GROWTH

Protein needs for human growth are both qualitative and quantitative. Knowledge of these needs stems from studies on animals (notably the young white rat) and human observations including dietary surveys, measurements of nitrogen balance and creatinine excretion in urine and estimations of the rate and composition of growth at varying levels of protein intake and at different ages. Dietary prescription to meet these needs depends on such dietary factors as the biologic value of the proteins (amino acid mixture) ingested, their coefficients of digestibility, the degree of preparatory heating, the caloric, vitamin and mineral intake, sulfonamide medication [1] and such physiologic factors as pregnancy, puberty, the menarche, lactation, the state of nutrition and health, and age. Besides these known

From the New York Hospital and the Department of Pediatrics, Cornell University Medical College.

1. Martin, G. J.: Mixtures of Pure Amino Acids as Substitutes for Dietary Protein, Proc. Soc. Exper. Biol. & Med. **55**: 182 (March) 1944.

conditioning factors, other issues of a more controversial nature preclude complete acceptance of currently established protein quotas for human growth: (*a*) the questionable validity of transposing to infants and children experimental data and conclusions derived from young animals and human adults;[2] (*b*) lack of acceptable clinical criteria for defining optimal as against average and maximal nutrition and protein requirements; (*c*) a paucity of quantitative information of the composition of essential amino acid mixtures conducive to optimal human growth.[2]

In the present state of knowledge an adequate protein intake for the infant and child may be defined as one which contains all the known essential (and perhaps nonessential) amino acids in sufficient amounts and in palatable and digestible form to cover maintenance needs and to provide in addition the surplus for protein deposition within the body compatible with normal growth.

Qualitative Considerations.—Proof is convincing that the young white rat grows in normal fashion when the sole source of dietary protein consists of a mixture of the following ten highly purified amino acids: arginine,[4] histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine.[5] Applicability of these results to other animals and to human beings is suggested by recent observations on the nitrogen balance of dogs,[6] infants [7] and adults [8] and on the manufacture of hemoglobin and serum proteins by animals and man [9] receiving natural proteins, amino acid mixtures as such or as casein hydrolysates. The nitrogen studies showed that positive nitrogen balances of similar magnitude resulted on equivalent intakes, irrespective of the source of dietary nitrogen. Pending long term observations of growth curves and physical fitness of infants and children receiving pure mixtures of essential amino acids, final proof is lacking that the rest of the protein molecule and its fourteen or more constituent amino acids are of no nutritional importance.[10] Furthermore, quantitative data on the relative importance of each of the essential amino acids are still sparse. The absolute amounts and percentage composition of amino acid mixtures conducive to optimal human growth are not yet known. Reliance for growth and maintenance of health remains with the natural protein foodstuffs; use of purified amino acid mixtures and casein hydrolysates is for the present reserved for the treatment of abnormal states in which the ingestion or assimilation of natural proteins is difficult or detrimental.[11]

TABLE 1.—*Percentage Amino Acid Composition of Proteins in Some Foods Commonly Used by Infants and Children* *

	Milk †				
	Lactalbumin	Casein	Egg	Meat	White Bread
Nitrogen	16.0	16.0	16.0	16.0	16.0
Arginine	3.5	4.1	7.0	7.2	3.5
Histidine	2.0	2.5	2.4	2.1	2.2
Isoleucine	4.5	6.5	5.3	3.4	2.8
Leucine	12.2	12.1	13.0	12.1	11.2
Lysine	8.0	6.9	6.0	7.6	2.5
Methionine	2.8	3.5	3.5	3.3‡	2.2
Phenylalanine	5.6	5.2	5.2	4.5	5.1
Threonine	5.3	3.9	4.9	5.2	2.5
Tryptophan	2.2	1.5	1.1	1.2	1.3
Valine	4.0	7.0	5.4	3.4	3.1

All values determined on a basis of 16 per cent nitrogen.

* Block, R. J., and Bolling, D.: The Amino Acid Composition of Proteins and Foods, Springfield, Ill., C. C Thomas, Publisher, 1945.

† The protein content of human milk averages 1.25 per cent (0.2 per cent nitrogen), the casein fraction comprising 0.0 per cent and the whey proteins (chiefly lactalbumin), 0.7o per cent. Corresponding values for cow's milk are 3.5 per cent protein (0.56 per cent nitrogen), 2.8 per cent casein, and 0.7 per cent whey proteins.

‡ Stare, F. J., and Hegsted, D. M.: The Nutritive Value of Wheat Germ, Corn Germ and Oat Proteins, Federation Proc. 3:120 (June) 1944.

Quantitative Considerations.—The quantity as well as the quality of dietary protein must be adequate to cover (*a*) maintenance needs [12]—the replacement or wear and tear quota and fecal loss—and (*b*) the growth quota. The wear and tear quota is a measure of metabolized protein. It varies with the caloric and protein intake and with the energy expenditure of the subject. It is estimated by analysis of the urinary nitrogen ($\times 6.25$). The fecal loss is a measure of the coefficient of digestibility of ingested protein and it is determined by similar analysis of the stools. In the absence of diarrhea and with the types and amounts of protein foods commonly used by infants and children, fecal loss of protein averages 10 per cent of the intake at all ages. The difference between the intake and the combined excretion in urine and feces or the magnitude of the nitrogen balance ($\times 6.25$) affords an estimate of the protein deposited in the body for physical growth and pre-

2 Kinsey, V. E., and Grant, W. M.: Adequacy of the Essential Amino Acids for Growth of the Rat, Science 99:303 (April 14) 1944. Almquist, H. J.: The Amino Acid Requirements and Protein Metabolism of the Avian Organism, Federation Proc. 1:269 (Sept.) 1942. Rose, W. C., Haines, W. J., Johnson, J. E., and Warner, D. T.: Further Experiments on the Role of the Amino Acids in Human Nutrition, J. Biol. Chem. 148:457 (May) 1943. Holt, L. E., Jr.; Albanese, A. A., Shettles, L. B., Kadji, C., and Wangerin, D. M.: Studies of Experimental Amino Acid Deficiency in Man: I. Nitrogen Balance, Federation Proc. 1 (Pt. 2):116 (March 16) 1942.

3 Hier, S. W.; Graham, C. E., and Klein, D.: Inhibitory Effect of Certain Amino Acids on Growth of Young Male Rats, Proc. Soc. Exper. Biol. & Med. 56:187 (June) 1944. White, A., and Sayers, M. A.: Accelerated Rat Growth Rate on Dietary Nitrogen Obtained from Pancreas, ibid. 51:270 (Nov.) 1942.

4 Arginine is synthesized by the animal organism but not at a rate rapid enough to meet the demands for normal growth.

5 Rose, W. C.: The Nutritive Significance of Amino Acids, Physiol. Rev. 18:109 (Jan.) 1938. Rose, W. C., and Fierke, S. S.: The Relation of Aspartic Acid and Glucosamine to Growth, J. Biol. Chem. 143:113 (March) 1942.

6 Rose, W. C., and Rice, E. E.: The Significance of the Amino Acids in Canine Nutrition, Science 90:186 (Aug. 25) 1939.

7. Hartmann, A. F., Meeker, C. S.; Perley, A. M., and McGinnis, H. G.: Studies of Amino Acid Administration, Utilization of Enzymatic Digest of Casein, J. Pediat. 20:308 (March) 1942. Shohl, A. T.; Butler, A. M., Blackfan, K. D., and MacLachlan, E.: Nitrogen Metabolism During the Oral and Parenteral Administration of the Amino Acids of Hydrolyzed Casein, ibid. 15:469 (Oct.) 1939.

8 Albanese, A. A., Holt, L. E., Jr.; Brumback, J. E., Jr.; Kadji, C., and Wangerin, D. M.: Nitrogen Balance in Experimental Lysine Deficiency in Man, Proc. Soc. Exper. Biol. & Med. 48:728 (Dec.) 1941. Holt, L. E., Jr.; Albanese, A. A.; Brumback, J. E., Jr., Kadji, C., and Wangerin, D.: Nitrogen Balance in Experimental Tryptophan Deficiency in Man, ibid. 48:726 (Dec.) 1941. Rose, Haines, Johnson and Warner.

9 Besling, C. A., and Lee, R. E.: Treatment of Hypoproteinemia by Oral Administration of Protein Hydrolysates, Arch. Surg. 42:735 (Nov.) 1941. Robscheit Robbins, Frieda S.; Miller, L. L., and Whipple, G. H.: Hemoglobin and Plasma Protein Simultaneous Production during Continued Bleeding as Influenced by Amino Acids, Plasma, Hemoglobin and Casein, J. Exper. Med. 77:375 and Digests of Serum, Hemoglobin and Casein, J. Exper. Med. 77:375 (April) 1943. Madden, S. C., Carter, J. R., Kattus, A. A., Jr.; Miller, L. L., and Whipple, G. H.: Ten Amino Acids Essential for Plasma Protein Production Effective Orally or Intravenously, ibid. 77:271 (March) 1943. Elman, R., and Lischer, C.: The Occurrence and Correction of Hypoproteinemia (Hypoalbuminemia) in Surgical Patients, Surg., Gynec. & Obst. 76:503 (June) 1943.

10 Lewis, H. B.: Proteins in Nutrition, J. A. M. A. 120:157 (Sept. 19) 1942. Albanese, A. A., and Irby, V.: Observations on the Biological Value of a Mixture of Essential Amino Acids, Science 98:275 Sept. 24) 1943. Bauer, C. D., and Berg, C. P.: The Amino Acids Required for Growth in Mice and the Availability of Their Optical Isomers, J. Nutrition 26:51 (July) 1943.

11 Elman, R.: Parenteral Replacement of Protein with the Amino Acids of Hydrolyzed Casein, Ann. Surg. 112:794 (Oct.) 1940. Farr, L. E.: Instances for the Therapeutic Use of Intravenous Amino Acids, Current Ther. & M. J. 5:24 (Jan.) 1941.

12 The specific dynamic action of protein is a by-product and not an integral part of the maintenance need for this foodstuff. On the usual milk diet of infants and in a ward diet of children this effect produces a rise of between 5 and 10 per cent above basal metabolic levels. Similarly, exercise does not raise the protein requirement, provided the total dietary calories are adequate.

sumably for other anabolic functions such as the manufacture of serum proteins and formation of enzymes, hormones and antibodies above antecedent levels.

Besides measurements of nitrogen balance, adequacy of the protein intake for growth is also judged by the rate and composition of gain in body weight. The latter may be estimated from the creatinine output in the urine and from the ratio of nitrogen retained to total accretion of body weight. A total gain of body weight conforming to the normal growth curve for height and age as estimated from standard weight tables, with the concurrent deposition of protein per unit of weight gain in amounts approximating the nitrogen content of the body as chemically determined (from 2.0 per cent in the newborn to 2.6 per cent in adults),[13] presumably characterizes an optimal state of quantitative and qualitative growth and nutrition.

Based on such evidence, the Food and Nutrition Board of the National Research Council has recently proposed daily allowances which may be accepted as an approximate guide of the protein requirements during growth. For physicians having a special interest in children, these allowances will serve a more useful purpose if they are amplified to include premature infants and broken down into shorter age intervals for the infantile period.

Provided the dietary protein is chiefly of animal origin and in digestible form and the regimen is adequate in all the other known nutrients, these allowances afford a good margin of safety for healthy infants and children. If a child does not thrive on this regimen the fault probably rests with him, his parents or the environment and not with the diet per se. On the other hand, it should be stressed that all dietary regimens are subject to modification. A diet should conform to the needs of the individual child and not the child to the diet.

TABLE 2.—*Recommended Daily Allowances for Protein, Expanded for the Growing Period*

Subject	Age	Protein in Grams * Total 1	Per kg 2	Per Lb. 3	% of Dietary Calories Average
Premature †	1 week to 1 month		6.0-4.4	2.7-2.0	17
Premature ‡	1 week to 1 month	4.3	5.0-4.4	2.3-2.0	15
Premature	1 to 3 months	per	4.4-3.3	2.0-1.5	13
Full term	2 days to 3 months	Kg	4.4-2.3	2.0-1.5	13
All infants	4 months to 1 year		4.0-2.0	1.8-1.4	13
Toddlers	1 through 3 years	40	(4.2-2.9)	(1.9-1.3)	(13)
Preschool	4 through 6 years	50	(3.7-2.5)	(1.5-1.1)	(13)
School	7 through 9 years	60	(2.6-2.1)	(1.2-1.0)	(12)
School	10 through 12 years	70	(2.2-1.8)	(1.0-0.8)	(11)
Youths, female	13 through 15 years	80	(1.8-1.5)	(0.8-0.7)	(11)
Youths, male	13 through 15 years	85	(2.0-1.7)	(0.9-0.8)	(11)
Youths, female	16 through 20 years	75	(1.6-1.4)	(0.7-0.6)	(13)
Youths, male	16 through 20 years	100	(2.1-1.7)	(1.0-0.8)	(11)

* Column 1 gives the allowances recommended by the Food and Nutrition Board, columns 2 and 3 the suggested modifications for infants. The figures in parentheses in these columns, beyond 1 year, represent the total allowances in the original recommendations (column 1) per unit of body weight on the basis of average weights for age groups derived from the tables of Baldwin and Wood.

† Premature infants weighing less than 2,000 Gm. (4 pounds 6 ounces).

‡ Premature infants weighing 2,000 Gm. and over.

The high level of protein intake advocated for young premature infants calls for an explanation. Many of these infants have difficulty in digesting and absorbing fat.[14] Their dietary calories are therefore preferentially derived from protein and carbohydrate. Human milk, when fed in the amounts needed to meet the high requirements for maintenance and growth (120 calories per kilogram, 55 per pound), furnishes, per kilogram of body weight, 180 cc. of fluid (2.7 ounces per pound), 2.2 Gm. of protein (1 Gm. per pound), 6.7 Gm. of fat (3 Gm. per pound) and 13 Gm. of carbohydrate (6 Gm. per pound). Although this level of dietary protein in the form of human milk is compatible with positive nitrogen balances of appreciable magnitude (between 0.2 and 0.25 Gm. per kilogram) the total fluid intake is excessive and the level of dietary fat frequently exceeds the fat tolerance of these subjects, especially of those weighing 1,500 Gm. (3 pounds 6 ounces) or less. For these and other reasons[15] heated cow's milk mixtures are preferred in the routine feeding of small and young premature infants.

TABLE 3.—*Formulas for Feeding Premature Infants per Kilogram of Body Weight and in Percentages of Dietary Calories*

Milk Type	Milk Amount, Cc.	Milk Sugar, Gm.	Milk Water, Cc.	Protein Gm.	Protein Per Cent	Fat Gm.	Fat Per Cent	Carbohydrate Gm.	Carbohydrate Per Cent	Calories
Human	180	..	0	2.2	7	6.7	50	12.9	43	120
Cow's										
Whole	100	13	50	3.5	13	3.5	27	17.8	60	120
Lactic acid	140	6	..	4.8	16	5.5	41	12.9	43	120
Evaporated	70	6	80	4.8	16	5.5	41	12.9	43	120
Powdered half skimmed (Alacta)	18	11	150	6.0	20	2.2	16	19.4	64	120

In isocaloric amounts (120 calories per kilogram) cow's milk mixtures may be prepared to provide less total fluid and fat, higher protein, and equivalent or higher carbohydrate. Examples of such mixtures are given in table 3. Comparative studies of such mixtures of heated cow's milk and of unmodified human milk for the past ten years in the premature unit of the New York Hospital[16] favor the former feedings. The daily gain in total body weight is more constant and at higher levels (25 to 30 Gm. as against perhaps 15 to 20 Gm.), the nitrogen balances are of higher magnitude (0.3 Gm. or more per kilogram as against 0.25 Gm. or less) and the coefficient of digestibility of the more liberal protein intakes is not reduced (85 to 90 per cent at all levels of dietary protein). It may further be pointed out that intakes of human and heated cow's milk of equivalent but lower protein content (2 to 3 Gm. per kilogram) yield absolute and percentile retentions of nitrogen of similar magnitude (0.2 + Gm. per kilogram and above 50 per cent of the intake[17]). This parity of utilization above maintenance levels of the proteins of human and cow's milk for growth in premature infants, contrary to the findings in animals,[18] is in accord with expectation on the basis of the qualitative similarity of amino acid composition of the milk proteins, casein and lactalbumin, noted in table 1. For

13. Vierordt, H.: Anatomische, physiologische und physikalische Daten und Habellen, Jena, G. Fischer, 1906.

14. Gordon, H. H., and McNamara, H.: Fat Excretion of Premature Infants: I. Effect on Fecal Fat Decreasing Fat Intake, Am. J. Dis. Child. 62:328 (Aug.) 1941.

15. Catherwood, R., and Stearns, G.: Creatine and Creatinine Excretion in Infancy, J. Biol. Chem. 119:201 (June) 1937. Benjamin, H. R.; Gordon, H. H., and Marples, E.: Calcium and Phosphorus Requirements of Premature Infants, Am. J. Dis. Child. 65:412 (March) 1943.

16. These studies have been carried out by Dr. H. H. Gordon with the aid of the Children's Bureau of the United States Department of Labor. The results have not yet been fully analyzed and tabulated.

17. Gordon, H. H.; Levine, S. Z.; Wheatley, M. A., and Marples, E.: Respiratory Metabolism in Infancy and in Childhood. XX. The Nitrogen Metabolism in Premature Infants—Comparative Studies of Human Milk and Cow's Milk, Am. J. Dis. Child. 54:1030 (Nov.) 1937.

18. Kik, M. C.: Nutritive Value of Lactalbumin versus Casein, Proc. Soc. Exper. Biol. & Med. 37:129 (Oct.) 1937.

heavier and older premature infants, better able to tolerate fat and high fluid intakes, human milk is as satisfactory as cow's milk mixtures of higher protein content.

As the absolute rate of growth decelerates in later infancy, the protein intake may be correspondingly reduced to the recommended daily levels of 3 to 4 Gm. per kilogram of body weight. Concomitant with this decline in total increment of daily weight gain, the absolute and percentile retentions of dietary protein at equivalent and adequate intakes has been found to decline from average levels of 0.3 Gm. of nitrogen per kilogram or above 50 per cent of the intake in premature infants and of 0.2 Gm. or less than 40 per cent in full term infants under 3 months of age to average levels of 0.15 Gm. or 15 per cent for infants 5 months of age and older.[19] Analysis of available data for infants under 1 year establishes that the recommended daily allowances of protein as modified in table 2 are compatible with a normal rate of total weight gain and a ratio of nitrogen retained to total increment of gain which approximates the rising nitrogen content of the body (from 2.0 per cent at birth to more than 2.5 per cent during the growing period [20]).

Protein intakes below 2.2 Gm. per kilogram (1 Gm. per pound) in infancy may lead to negative nitrogen balances; levels above those recommended are wasteful since there are no body depots for reserve protein, absorbed amino acids in excess of the needs for growth and maintenance entering interchangeably with fat and carbohydrate into the energy exchange; excess of dietary protein may tax the kidneys by increased excretion of nitrogenous end products, and some of the incoming amino acids may be incompletely metabolized by the young infant in the absence of added vitamins.[21]

With further deceleration in the growth curve with increasing age beyond infancy, lower levels of dietary protein per unit of body weight are required for nitrogen retention and protein deposition. The daily allowances recommended by the National Research Council are generally acceptable. Based on average weights for each group, these allowances progressively fall from a maximal level of 4 Gm. per kilogram at 1 year of age to 1.4 Gm. per kilogram for girls of 20 years. The percentage of dietary calories (at the recommended levels) derived from protein remains constant between 11 and 13 per cent for all ages. The bulk of available evidence indicates that the recommendations are compatible with normal qualitative and quantitative nutrition as judged by dietary surveys, nitrogen balance studies, urinary excretion of creatinine, growth curves and clinical appraisement.[22] Some observers report improvement in measurements of children of preschool and school age on higher protein intakes of 4 Gm. as against 3 Gm. per kilogram.[23] Whether such acceleration is desirable raises the perennial question of maximal versus optimal nutrition, a problem which awaits further study and clarification. It seems valid to state that in the presence of undernutrition from any cause the higher allowances are preferable.[24]

Dietary Prescription.—Human or cow's milk ordinarily comprises the sole protein-containing food in early infancy. The protein content of human milk averages 1.25 per cent (0.75 per cent whey proteins, 0.50 per cent casein), that of cow's milk, 3.5 per cent (0.7 per cent whey proteins, 2.8 per cent casein). Since both casein and the whey proteins of milk contain abundant and comparable amounts (per gram of protein) of all the amino acids (except leucine) essential for growth in young animals and presumably in infants (table 1), the protein needs for growth are automatically met by providing sufficient milk. The concept of a higher biologic value of human over cow's milk, erroneously postulated on the basis of a deficiency of cystine in the casein fraction, has been discarded since it has been shown [25] that methionine and not cystine is the sulfur-containing amino acid required for growth and that cow's milk contains the latter amino acid in concentrations as high as or higher than human milk. From the standpoint of protein alone, it seems fair to conclude on the basis of current information that in equivalent content of protein above maintenance levels the two milks are equally nutritious.

A daily allowance (from the first few days after birth) of 175 to 200 cc. of human milk per kilogram of body weight (2½ to 3 ounces per pound) or of 100 to 130 cc. of heated cow's milk (1½ to 2 ounces per pound) covers the protein needs of young full term infants. The daily allowance of cow's milk for young premature infants, as previously indicated, is better set at somewhat higher levels (130 to 140 cc. per kilogram). For older infants in both groups the lower levels are adequate.

When the infant is old enough to take additional foods, other proteins of animal origin (eggs, meat, cheese, fish) and some vegetable proteins (cereals, bread, potato, legumes) progressively replace milk as the sole source of protein. It is a good rule to limit the daily intake of milk in the infantile period to a maximum of 1 liter (quart) and to introduce solid foods in the diet at around 4 months. In children above infancy, from two thirds to three fourths of the total protein intake is preferably derived from animal sources, approximately 50 per cent of total dietary protein being supplied by milk (750 cc. or 1½ pints), 25 per cent by meat and eggs, 15 per cent by bread, cereals and potato, and the remaining 10 per cent by fruits, vegetables and other foods.[26] Dietary surveys reveal that the amounts and distribution of protein in the daily diets of growing children are below the

19 Levine, S. Z.; McEachern, T. H., Wheatley, M. A.; Marples, E., and Kelly, M. D.: Respiratory Metabolism in Infancy and in Childhood. XV. Daily Energy Requirements of Normal Infants, Am. J. Dis. Child. 50: 596 (Sept.) 1935. Marples, E. Creatinuria in Infancy and in Childhood. II. Creatinuria of Premature Infants, ibid. 64: 996 (Dec.) 1942. Gordon, Levine, Wheatley and Marples.[17] Gordon and McNamara.[14]

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26. Butler, A. M. Nutritional Requirements in Infancy and in Childhood, Am. J. Dis. Child. 61: 898 (Nov.) 1942. Boyd, J. D. Prescribed Diets for Normal Children, J. Pediat. 24: 616 (June) 1944.

recommended levels in many parts of the country.[27] The quantities and sources of proteins in the common foodstuffs are reviewed in another paper of this series.[28]

PROTEINS IN DISEASE

The role of proteins and their constituent amino acids for growth in health is likewise important in such abnormal states as malnutrition, obesity treated by reduction diets, epilepsy treated by ketogenic diets, diabetes mellitus, recovery from acute illness and in the course of chronic disease. Fever, starvation and malnutrition further deplete the already meager stores of body protein, which are of lower magnitude to begin with in children than in adults and in those whose rate of metabolism is higher. The heightened needs in these conditions require attention in planning dietary regimens.

Besides this generally increased demand for protein in illness, this foodstuff by virtue of its unique properties serves a specific role as a therapeutic agent in certain states. The roles of protein and amino acid therapy in pregnancy, lactation and disease are reviewed in other papers of this series.[29] This section presents a brief outline of the use of protein in some disorders common to infants and children.

Disorders of the Alimentary Tract.—In health the coefficient of digestibility of protein is high, only 10 per cent or so of the intake being lost in feces. This high tolerance for protein is least impaired of all the organic foodstuffs in most digestive disturbances of infants and children. This fact, doubtless ascribable to the high levels even in early infancy of gastric rennin and pepsin, pancreatic trypsin and chymotrypsin and intestinal peptidases, explains the usage of properly heated milk mixtures, relatively high in protein and low in fat and carbohydrate, as the common method of resumption of enteral feeding in the recovery period of epidemic diarrhea of the newborn and infantile diarrhea of enteral and parenteral origin. Such mixtures include protein milk, skimmed lactic acid milk and skimmed milk with or without added casein. For analogous reasons, diets of high protein content form the basis of regimens in such specific disturbances of the alimentary tract as pancreatic fibrosis, the celiac syndrome (chronic intestinal indigestion) and ulcerative colitis, in the absence of an allergic basis for the two latter conditions.

Since ample evidence is at hand to show that the minimal amounts of unaltered protein normally absorbed into the blood stream are increased in digestive disturbances in early life,[30] predigested proteins in the form of enzymatic casein hydrolysates are gradually replacing native proteins in treatment during the acute stage of many of these conditions.[31] This form of therapy has the advantage of minimizing the hazard of subsequent hypersensitiveness.

Conditions Associated with Edema.—The importance and explanation of action of the blood serum proteins in regulating oncotic pressure relationships and fluid balance in the body are well known. They rise normally from average levels of 5.5 Gm. per hundred cubic centimeters at birth (albumin 3.8 per cent, globulin 1.7 per cent) to 7.0 Gm. per hundred cubic centimeters (albumin 5.0 per cent, globulin 2.0 per cent) at 2 years. The specific property of the serum proteins, particularly the albumin fraction, of combating edema forms the basis for the abundant administration of this foodstuff in such conditions of infancy and childhood as nutritional edema, infectious colitis, lipoid nephrosis, extensive burns, other states inducing shock, and juvenile cirrhosis of the liver. The hypoproteinemia common to all these conditions is explained in the 6 instances respectively by inadequate intake, excess fecal loss, excessive urinary excretion, skin seepage, plasmapheresis or hemorrhage, and defective production within the body. Natural proteins by mouth, enzymatic casein hydrolysates enterally and parenterally, whole blood, plasma and serum transfusions have been used with varying effect. The reader is referred to the other papers of this series and to other articles[32] which review the relative efficacy and the amounts of these substances recommended for therapy.

Allergic States.—Food allergies are more common in infants and young children than in later life. This predilection is probably explained by the greater permeability of the intestinal tract of these subjects to unaltered protein.[33] The most commonly implicated protein foods are milk, egg, meat, fish and wheat. In order of increasing age, clinical sensitivity to protein is manifested by infantile eczema, angioneurotic edema, mucous colitis and bronchial asthma. Detection of the responsible protein or proteins is made preferably by therapeutic test (ingestion) or by skin tests. If possible, avoidance of the specific foodstuff with the substitution of other protein foods is the therapeutic method of choice. If this cannot be done, immunization (desensitization) may be attempted. Because of the biologic nonspecificity of amino acids, such mixtures, as they become more readily available, will undoubtedly serve an increasingly important therapeutic role in these conditions.[34]

An attempt has been made in this brief review to evaluate the specific role of protein in pediatrics. It should be emphasized, in closing, that many conditioning factors, both dietary and physiologic, influence the requirements for this foodstuff, and that they must be given consideration in the dietary prescription of protein for infants and children in health and in disease.

525 East Sixty-Eighth Street.

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SATURDAY, MAY 26, 1945

PERMISSION FOR MEETING OF HOUSE OF DELEGATES DENIED

On April 23, 1945 application for a permit to hold an annual meeting of the House of Delegates of the American Medical Association in Chicago July 23 to 25, 1945 was forwarded to the War Committee on Conventions of the Office of Defense Transportation in Washington. On May 17 the following letter was received from the secretary of that Committee:

WAR COMMITTEE ON CONVENTIONS
Washington 25, D. C.
May 15, 1945.

American Medical Association
Dr. Olin West, Secretary
535 N. Dearborn Street
Chicago 10, Illinois

Dear Dr. West:

Your application for a permit to hold an annual meeting of House Delegates at Chicago, Illinois, July 23-25, 1945, at the Palmer House, has been reviewed by the Committee.

It is the consensus of the Committee that this meeting should be deferred. Therefore, permit is denied.

This action does not preclude your holding a meeting attended by not more than 50 persons from out of town, plus local attendance without numerical limitation.

Very truly yours,
(Signed) Frank Perrin
Frank Perrin, Secretary.

Having been informed that it would not be possible to secure permission for a meeting of the House of Delegates during the month of June, it was requested in the application for a permit that a meeting might be held on July 23 to 25 with the view that those dates would antedate the movement of large numbers of troops from the European areas to the United States. It will be noted in the letter from the secretary of the War Committee on Conventions that it is the feeling of the members of that committee that the meeting of the House of Delegates should be deferred.

Application for a permit to hold a meeting at a later time will be submitted to the War Committee on Conventions.

ARTIFICIAL KIDNEY

Abel, Rowntree and Turner[1] devised in 1912 a method by which the blood of a living animal may be submitted to dialysis outside the body and again returned to the circulation without exposure to air, infection by micro-organisms or any alteration which would be prejudicial to life. The apparatus constituted a sort of artificial kidney, and the process was called by the authors "vivi-diffusion." An extract of hirudin prepared from the heads of leeches was used to keep the blood from coagulating. Excretion of salicylic acid by the apparatus showed that 19.1 per cent of the drug injected into the femoral vein of a dog was excreted in seven hours. The principle of the method consists in connecting an artery of the animal by a cannula to an apparatus made of celloidin or other dialyzing membrane in the form of tubes immersed in a saline solution or serum, and providing for the return of the blood to the animal's body by another cannula attached to a vein. These authors were interested primarily in obtaining, by the process of dialysis of blood, a large quantity of the nonprotein amino bodies for purposes of study. They did, however, indicate therapeutic possibilities of the process.

Thalhimer[2] in 1938 reported experiments in which "exchange transfusion" was practiced. Blood from an animal rendered azotemic by a bilateral nephrectomy performed the day before the transfusion was transferred into a normal dog, and the reverse. A small amount of heparin was injected intravenously into each animal. The exchange of blood was carried out twenty to forty times. The azotemia of the nephrectomized animal was much reduced; correspondingly, azotemia was produced in the donor animal. The donor animal's condition was normal the morning after, and the blood urea had returned to a normal level. The kidneys of the donor animals, killed from one to three weeks later, were found to be normal both on gross and on microscopic examination. Thalhimer repeated the experiments of Abel and his associates, using cellophane tubes as a dialyzing membrane and heparin as the anticoagulant. In from three to five hours 200 to 700 mg. of urea nitrogen passed from the blood through the cellophane membrane into the surrounding isotonic solution of sodium chloride. Thalhimer suggested that the method could be used on human beings in certain conditions in which, as a result of accident, operation or disease, previously competent kidneys become incompetent, leading to azotemia and death.

Thalhimer, Solandt and Best[3] repeated exchange transfusion experiments on dogs, utilizing a specially designed pump which had a capacity of at least 30 liters

1. Abel, J. J.; Rowntree, L. G., and Turner, B. B.: On the Removal of Diffusible Substances from the Circulating Blood of Living Animals by Dialysis, J. Pharmacol. & Exper. Therap. 5: 275 (Jan.) 1914.

2. Thalhimer, William: Experimental Exchange Transfusions for Reducing Azotemia. Use of Artificial Kidney for This Purpose, Proc. Soc. Exper. Biol. & Med. 37: 641, 1938.

3. Thalhimer, William; Solandt, D. Y. and Best, C. H.: Experimental Exchange Transfusion Using Purified Heparin, Lancet 2: 554 (Sept. 3) 1938.

an hour in each direction. Sufficient highly purified heparin was injected intravenously before and during the transfusion to prevent thrombus formation. The heparin did not appear to have any toxic action. The urea of the azotemic animal was rapidly excreted in the urine of the normal dog. The donor dog may recover completely after the termination of the experiment.

Kolff and his associates [4] working at Kampen (the Netherlands) developed a dializer consisting of a cellophane tube 25 mm. wide and 30 meters long. This tube is only partly filled with blood, giving a much larger surface area. The tube is wound spirally around the cylinder, the motion of which moves the blood from left to right. The rinsing bath contains 70 to 100 liters of tap water warmed up to 37 to 39 C. To this solution is added 0.7 per cent of sodium chloride, 1.5 per cent of glucose and 400 mg. of heparin. The patient receives a similar amount of heparin at the beginning and 100 mg. every half hour. The apparatus, according to the calculations of the authors, represents a dialyzing area of 23,000 sq. cm., the total area of the human glomeruli being 20,000 sq. cm. With this apparatus the Netherlands workers were able to reduce the blood urea and keep it at the same level for twenty-six days in a woman aged 29 who was in a state of impending uremia, with blood urea of 164 mm., blood pressure of 220/140 and uremic breath. The clinical symptoms of uremia in the course of the treatment were considerably improved after each dialysis. Unfortunately a number of intervening complications, such as pericarditis, parotitis and purulent bilateral otitis media, compromised the beneficial effect of blood washing and led to death. In their larger dialyses in this patient, 24, 40 and 35 Gm. of urea were dialyzed out respectively. The largest quantity of urea excreted by the patient in twenty-four hours in her urine amounted to 12 Gm. In addition to urea, uric acid, creatinine and residual nitrogen are being removed from the blood by dialysis. If it is desired to compensate the loss of sodium chloride or glucose from the blood, these substances can be added to the rinsing bath, since the molecules pass both in and out through the dialyzing membrane. If necessary, other substances, such as calcium, magnesium or potassium, may be added to the bath water. The authors treated 2 more patients with the artificial kidney, but both were hopeless from a clinical standpoint. However, 100 Gm. of urea was removed from 1 patient in six hours, the blood urea of the patient showing a decline from 460 to 290 mg.

From the experiences of these authors the artificial kidney of the future apparently would not find its greatest usefulness in patients with chronic nephritis and uremia; these lesions are irreversible. As originally suggested by Thalhimer, dialysis of the blood may find its application in instances in which an individual with previously competent kidneys suddenly develops loss of renal function, as after a severe burn, in a prostatic patient who develops anuria after relief of intravesicular pressure, and in anuria after operative procedures. Conceivably if the renal secretion is temporarily taken over by the artificial kidney the patient's kidneys may return to their previous competence.

4. Kolff, W. J., and Berk, H. T. J.: *The Artificial Kidney: A Dialyzer with a Great Area*, Acta med. Scandinav. **117**: 121 (May 27) 1944.

NASAL STAPHYLOCOCCI AND WOUND INFECTION

Staphylococcus aureus can be isolated from the nasal cavity and skin of healthy human subjects with amazing frequency. Miles and his associates [1] have demonstrated that the nasal carrier rate for Staphylococcus aureus among people of the working class of Birmingham who come to the hospital for the first time fluctuated between 19 and 65 per cent during the period October 1942 to July 1943. The mean rate, 47.4 per cent, agrees with carrier rates that have in the past been determined mainly in hospital patients and personnel. The people studied in Birmingham consisted of three groups: (1) outpatients attending the hospital for the first time with newly inflicted wounds, (2) male inpatients in a ward with established wound sepsis and (3) the nursing staff of the same ward. The 479 outpatients had a gross nasal carrier rate of 47.4 per cent and a wrist carrier rate of 18.4 per cent. The nasal carrier rate of the 536 inpatients, calculated from their admission swabs, was 49.4 per cent. The nasal carrier rate among the nurses was significantly higher than for the newly admitted patients. The authors also demonstrated that a patient found to be a carrier on a given date had a 70 to 75 per cent probability of carrying the organism at the time of wounding, if that occurred within fourteen days of the date of swabbing. There is a similar probability that he would be capable of contaminating his wound with nasal staphylococci for at least fourteen days after that date. The carriage or noncarriage of staphylococci therefore appears to be a more or less persistent phenomenon. There appears to be a relationship between the nose and skin carriage of staphylococci; although only 24.7 per cent of nasal carriers were also skin carriers, the percentage of skin carriers among those not carrying in the nose was only 12.7. In a limited study of 16 cases the authors found by phage typing that in 15 the strains from nose and skin were identical, and in only 1 were they dissimilar. Gillespie and his associates [2] demonstrated a similar degree of association and showed that in a number of their cases the nasal and the skin strains were of the same serologic type. The greater incidence of nasal carriage and the greater profusion of staphylococci found in the nose

1. Miles, A. A.; Williams, R. E. O., and Clayton-Cooper, B.: The Carriage of Staphylococcus (Pyogenes) Aureus in Man and Its Relation to Wound Infection, J. Path. & Bact. **46**: 513 (Oct.) 1944.

2. Gillespie, E. H.; Devenish, E. A., and Cowan, S. T.: Pathogenic Staphylococci: Their Incidence in the Nose and on the Skin, Lancet **2**: 870 (Oct. 21) 1944.

of carriers as compared with that on the skin of the wrist suggests that the nose is the primary source of the cocci found on the hand.

The course of wounds on the hands of patients whose nasal and skin carrier state was determined on the day of wounding suggested to the authors a relationship between carriage on the wrist of one hand and early staphylococcus contamination of a wound on the other. This supposition finds some support in the fact that in a limited study of 18 patients similar phage types in the wound and on the skin were found in 13 patients, while in 5 they were dissimilar.

Self infection, therefore, while probably not as important or prevalent as cross infection of wounds, appears from this study to be a definite factor requiring special preventive measures in medical and surgical wards.

MITOTIC STIMULATION OF WOUND HEALING

In 1943 Claude and Potter [1] of the Rockefeller Institute isolated chromatin threads from the resting nuclei by purely mechanical means. The frozen spleens of leukemic rats were thawed and ground gently for three minutes with an equal weight of beach sand. With the temperature below 5 C. the resulting mixture was suspended in six times its weight of isotonic solution of sodium chloride, the suspension being maintained at p_H 7.4 throughout the experiment. The suspension was then centrifuged for one minute in an ordinary laboratory centrifuge (1,500 × gravity) and the resulting sediment discarded. The supernatant fluid was then submitted to ten minutes' centrifugation at the same speed. This "long run", centrifugation brought down an abundant sediment of threadlike material. The threadlike precipitate was resuspended in slightly more than an equal volume of saline solution and the "long run" centrifuging repeated two times. The entire process was completed within one hour. Rapid separation and low temperature are essential to prevent autolysis.

Microscopically the chromatin mass thus obtained was composed of filaments ranging from 0.5 to 1 micron in diameter. These were apparently identical in size and shape with the preformed chromatin strands of resting nuclei. Chemical analyses and tinctorial reactions confirmed this identity.

Aside from its general biologic interest the new chromatin preparation may have clinical value owing to its stimulating effect on the rate of mitosis when administered to experimental animals. Marshak and Walker [2] of the University of California found that, administered intravenously, Claude's chromatin extract from rat tissues hastens the rate of mitosis in the regenerating rat liver. Applied locally the chromatin preparation greatly accelerates the rate of healing of superficial skin wounds.

For a quantitative study of the rate of wound healing the California investigators [3] devised a technic for producing skin wounds of uniform depth and size. A stainless steel tube was ground at one end to make a circular cutting edge 6.6 mm. in diameter. With this trephine a depression was made in the skin on the back of the neck of an anesthetized rat. Along this line the skin was cut with a pair of iridectomy scissors through the dense connective tissue of the dermis but not through the loose connective tissue of the hypodermis. The skin thus circumscribed was lifted off without dissection. There was usually no bleeding. What little did occur was easily controlled with a small swab so that the wound did not contain blood clots. A thick solution of methacrylate polymer dissolved in toluene was then dropped on the wound, and the adjacent skin painted with the same solution to make a coat extending 3 to 5 mm. beyond the wound. On drying, contraction did not occur, as was the case with some other plastics. The plastic dressing did not adhere to the wound but did cling to the surrounding normal skin, where it acted as a splint, preventing contraction.

To study the effect of chromatin on the rate of wound healing 2 or 3 small drops of 0.12 per cent chromatin extract in saline solution was placed on the wound so as to fill the skin defect. The plastic dressing was applied over the filled wound and the adjacent normal skin. Control animals were treated in the same way except that sterile saline solution was substituted for dilute chromatin. In a typical control experiment only 3 of 15 rats showed any signs of wound healing by the fifth day. This appeared as a band of granulation tissue less than 1 mm. in width about the periphery of the wound. In contrast, 13 of the 16 chromatin treated wounds of the same series showed granulations covering from one fourth to two thirds of the entire wound area, an average of twenty-five times the average area covered in the untreated controls.

The granulation tissue in the chromatin stimulated wounds was bright red, as compared with the light pink of the untreated controls. Microscopic sections showed greater vascularization. After epithelization was complete, the elevation of the chromatin treated wound above the surrounding skin was no greater than that of the untreated controls.

Subsequently Howes [4] showed that chromatin extract administered intravenously to rabbits maximizes the rate of healing of superficial wounds of the ear. The chromatin preparation also causes greatly increased

1. Claude, Albert, and Potter, J. S.: J. Exper. Med. 77: 345 (April) 1943.
2. Marshak, Alfred, and Walker, A. C.: Proc. Soc. Exper. Biol. & Med. 58: 62 (Jan.) 1945.
3. Marshak, Alfred: Proc. Soc. Exper. Biol. & Med. 58: 63 (Jan.) 1945.
4. Howes, E. L.: Personal communication.

growth rate of fibroblasts in tissue cultures. Detailed studies of its immunochemical specificity and of its stimulating effects on the rate of mitosis in regenerating internal organs are now in progress.

Current Comment

INDUSTRY NEEDS MEDICINE

Plant 1 of the Eastern Aircraft Division of General Motors Corporation is located at Tarrytown, N. Y. Recently the Westchester County Medical Society was invited to hold its regular monthly meeting at this plant. Two hundred and fifty members attended a most interesting session. Events included a tour of the plant, inspection of the facilities and methods employed in the medical department, and dinner in the plant cafeteria. During the formal program later a film on industrial hygiene was shown. The plant medical director described relations with the medical profession, and the chief medical consultant to the corporation described medicine's contribution to the war effort in terms of maintaining industrial manpower in good health and on the job. Here intelligent industrial management demonstrated its need for medical service. This medical requirement can and should be part of the fabric of community medical service and planning. The physicians of Westchester County realize better than before that conflict need not exist between the proper objectives of industrial medicine and the best interests of their patients. The Council on Industrial Health feels that improved standards of industrial medicine depend largely on local medical organization, education and leadership expressed through committees on industrial health in state and county medical societies. The results in Westchester County indicate that opportunity awaits mutual understanding and instruction between industry and the allied professions of medicine, dentistry, engineering and nursing.

THE ROCKEFELLER FOUNDATION IN 1944

During 1944 the Rockefeller Foundation appropriated about $4,500,000 for public health and the medical sciences. The largest part of the budget was devoted to the International Health Division. In his presidential report, Fosdick [1] suggests that the most significant contribution of this division has been in the field of public health education. During 1944, for example, substantial sums were appropriated for fellowships and travel grants and for the support of schools of hygiene and public health nursing. A dramatic aspect of the activities of the International Health Division was the work of the typhus team under Dr. Fred L. Soper. The foundation has continued its activities also in yellow fever and in psychiatry. The accelerated program of medical education and the consequent comparative inadequacy of training of many young medical graduates has been studied by the foundation. In December 1943 the foundation made an appropriation to extend the postwar training of medical graduates returning from the armed services, and an additional sum was appropriated in 1944. The purpose of the foundation's new fellowship program is to make it possible for twenty-one leading medical schools to offer a limited number of residencies to the best of the younger medical graduates when their war work is done. The residencies thus offered are to pay stipends adequate for the individual case. One of the grants of the foundation was to the University of Michigan School of Public Health for the teaching of medical economics under Nathan Sinai, Ph.D., well known as a fluent and persistent advocate of federally controlled socialized medicine. He recently appeared in California as a guest of the governor's office, in a legislative hearing, to support compulsory sickness insurance in that state. The Rockefeller Foundation, with funds that are small compared with present day government spending, has until recently exerted a profound and on the whole beneficial influence in medical and public health fields.

1. The Rockefeller Foundation—A Review for 1944, by Raymond B. Fosdick, New York, 1945.

WORLD AREAS OF RAPID POPULATION GROWTH

Medical practice and public health procedure will be influenced inevitably by the enormous changes in total and relative populations of various sections of the world during the next fifty years. The medical profession should have a basic conception of what present trends may mean to medical care and to the world's health. A study of areas of rapidly growing populations containing chapters on the demography of Japan, India, eastern and southern Europe, the Near East and Egypt has been published recently by the Milbank Foundation Memorial Fund.[1] India, for example, increased its population by over 50,000,000 between 1931 and 1941; the population now almost certainly exceeds 400,000,000. If this growth should continue at the rate of the relatively favorable years from 1931 to 1941 the population would double itself in fifty-seven years, i. e. reach a total of over 800,000,000. In the primarily agricultural economies both the birth and the death rates are exceedingly high in comparison with the more urbanized and economically developed countries of western Europe and the United States. Part of the dilemma facing the world is indicated by the certainty that improved sanitary, dietary and personal hygienic measures, if applied to such countries as India, would reduce the death rate with little, if any, early effect on the birth rate. The inevitable result would be an enormous increase in population which would be faced by extremely low standards of living and a greatly increased probability of starvation and epidemic disease. As pointed out by Notestein in the final chapter of this book, there is no easy solution. Certain procedures can reduce the dangers inherent in the continued rapid and enormous increase in population of some areas. The provision of medical care and public health administration to these areas of rapid growth will doubtless be a colossal problem.

1. Demographic Studies of Selected Areas of Rapid Growth, New York, Milbank Memorial Fund, 1944.

MEDICINE AND THE WAR

ARMY

WOMEN DOCTORS ASSIGNED TO IMPORTANT TASKS

Eleven commissioned women doctors are serving with the U. S. Army Medical Service in the European theater of operations in capacities that range from general hospital ward surgeon to assistant medical military attaché in the American Embassy, London.

Three of these women doctors arrived in England late in 1941 at the request of the British Ministry of Health because of the critical shortage of surgeons and physicians after Dunkirk. Major Marion C. Loizeaux, Wellesley, Mass., was the first woman doctor to be commissioned in the European theater. Formerly an assistant physician at Wellesley College, she is serving on the staff of Major Gen. Paul R. Hawley, theater surgeon, as a special consultant in all matters pertaining to the medical care of the Wacs.

The two other doctors who were volunteers and are in the European theater are Capt. Eleanor Peck, Poughkeepsie, N. Y., who is assigned to the Shaef Dispensary, and Capt. Josephine Stephens of Monongahela, Pa., who is assigned to a general dispensary in Paris. A fourth, Capt. Mila Pierce, Chicago, who was a general hospital ward officer, was returned to the United States recently after she had fallen and broken her hip.

These four physicians—among twelve women doctors selected from five thousand applicants by the British Ministry of Health—were in England to greet the American Army when it arrived overseas. The four were first accepted by the U. S. Army medical service as contract surgeons and were later commissioned. Major Loizeaux was made a captain in September 1943, and the others were commissioned shortly thereafter.

Another of the twelve women doctors who served with the British as a volunteer is Major Sally Bowditch, Boston. She is assistant medical attaché to the American Embassy in London—the first woman attaché in the embassy's history. She returned to the United States at the request of Johns Hopkins University and was commissioned there in November 1943.

Included on the medical staff of a newly arrived general hospital are four women doctors: Capt. Jessie D. Read, Westfield, N. J.; Capt. Clara Raven, Youngstown, Ohio; Russian born and educated Capt. Bronislava Z. Reznick, Chicago, and 1st Lieut. Elvira C. Seno, Burlington, Wis.

Capt. Martha Howe, New York, is a recent arrival in England from the Mediterranean theater and is now a surgical ward officer in a general hospital. First Lieutenant Jean Dunham, North West Washington, D. C., anesthetist with a general hospital in England, was recently promoted to the rank of captain. Capt. Katherine E. Jackson, Fort Wayne, Ind., is an anesthetist with a general hospital. She spent five weeks doing forward area work with field and evacuation hospitals before her own unit began actual operation. A member of the twelve original women doctors who went to England as volunteers, Major Barbara Stimson, Royal Army Medical Corps, is serving with a British hospital in Italy.

There are approximately seventy-five women doctors in the U. S. Army Medical Department in all theaters.

CHEMICAL WARFARE SERVICE DESIGNS GAS MASKS

The War Department recently announced that the Chemical Warfare Service recently designed three gas mask sizes which will fit all soldiers in the Army. Ten different head types were established, five normal and five unusual. The selection on types was made by correlating measurements representing breadth, depth and length of the face. The normal type comprises an average head and two large and two smaller sizes. The unusual types are those in which two of the principal measurements correspond with normal heads but whose third major measurement does not. It was found that 65 per cent of the soldiers measured normal medium, 19 per cent medium small and 11 per cent medium large. Four per cent of the heads were small, 3 per cent large. In the unusual size, 7 per cent had "short fat faces," the largest single category in that group. The study was carried on at Camp Sibert, Alabama, where 3,075 men representing every state in the Union, Alaska and the Philippines were tested for facial and cranium measurements. The birthplace of the soldier, and the nationality of his father were taken. Facial characteristics such as fleshiness of the face, prominence of the cheek bones, pointedness of the face, prominence of the forehead, structure and shape of the nose, size of lips and whether ear lobes were attached to the face were also noted.

HOSPITAL TRAIN UNIT RECEIVES MERITORIOUS SERVICE PLAQUE

While evacuating wounded from the Seventh Army front, members of the veteran 42d Hospital Train were notified that they were awarded the Meritorious Service Unit Plaque for "outstanding devotion to duty." The train is commanded by Major Samuel S. Gordon, Louisville, Ky., and the chief of medical service is Capt. Harold F. Goulston, New Bedford, Mass. The citation reveals that the 42d was the first hospital train to operate in southern France after the August 15 landing on the Riviera and was in continuous operation through the campaign which routed the Germans from southern and central France and on into Germany. In this period they carried 14,727 patients in forty-four round trips over a distance of 25,000 miles, as well as carrying 1,370 medical personnel and many tons of medical supplies to the Seventh Army.

Prior to the invasion of southern France the 42d operated in Italy, where it was cited by Major Gen. Arthur R. Wilson, then commanding general of the Peninsular Base Section, for evacuating wounded members of the American Fifth and British Eighth armies to rear areas. In North Africa the train took a direct part in the Sicilian campaign, receiving wounded by air evacuation at Constantine in Algeria. For services there the nurses of the unit were cited by the commanding general of the Mediterranean Base Section.

The 42d Hospital Train was activated on June 1942. Three fourths of present personnel have been with the unit since its activation at Camp Rucker, Alabama. After further training at Fort McPherson near Atlanta, Ga., the staff proceeded to North Africa, arriving there in April 1942.

NEW ARMY GUIDE FOR INDUSTRIAL MEDICAL PROGRAM

The Preventive Medicine Service, Office of the Surgeon General, recently announced the publication of a new manual prepared by the Occupational Health Division designed to serve as a guide in standardizing the medical program of dispensaries in army industrial installations. It is listed as ASF Manual M210 and is entitled "Operating Procedures for Industrial Dispensaries."

BEDSIDE DENTISTRY IN ARMY HOSPITALS

A portable dental unit is now being used in certain army hospitals to assure bedridden patients more complete dental care and speed convalescence. Plans are now under way to standardize this unit for all army general hospitals here. The portable dental unit carries equipment for a wide variety of dental operations from simple dental prophylaxis to treating fractured jaws and making complete new dentures.

ARMY AWARDS AND COMMENDATIONS

Lieutenant Colonel Elmer M. Smith

Lieut. Col. Elmer M. Smith, formerly of State Center, Iowa, was recently awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services in Italy from April 1 to Sept. 15, 1944. Confronted with the responsibility of malaria control for the headquarters and seven groups of the 306th Fighter Wing, Lieutenant Colonel Smith, as wing surgeon, accomplished outstanding work in combating malaria. The area occupied by the flying fields of the wing were considered among the worst malaria districts in Europe, where 99 per cent of the local Italian population had had malaria at one time or another. Lieutenant Colonel Smith immediately organized a survey of the district and visited the swamps to investigate the possibility of draining them. By his hard and thorough work, tools, screening, extra repellent and freon bombs were immediately secured at a time when they were vitally needed. In order to oil and clean the scores of swamps and streams in the area before the summer months he adopted the use of airplanes and chemical warfare equipment for spraying large areas and the use of special plows for the digging of swamp drainage ditches. His capable organizing ability in making malaria surveys, in gathering tools and labor to drain the marshes and in instituting and advertising malaria discipline among troops assured the malaria control projects of success, thereby reflecting great credit on himself and on the Medical Corps of the Army of the United States." Dr. Smith graduated from the State University of Iowa College of Medicine, Iowa City, in 1935 and entered the service Oct. 1, 1940.

Captain Lal. D. Threlkeld

The Bronze Star was recently awarded to Capt. Lal. D. Threlkeld, formerly of Syracuse, N. Y., "for meritorious service in connection with military operations against an enemy of the United States in France, Belgium, Holland and Germany from Aug. 1, 1944 to Jan. 30, 1945. When his squadron spearheaded a drive into Brittany, France, Captain Threlkeld displayed great ingenuity and remarkable stamina in treating many cases while on the move and in caring for all the wounded until evacuation was practicable, so that fatalities were kept to a minimum. His thorough professional knowledge and personal interest in the welfare of every member of his unit have greatly contributed to the efficiency and morale of the squadron and reflect credit on Captain Threlkeld's character as an officer of the Medical Corps of the Army." Dr. Threlkeld graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1940 and entered the service in June 1942.

Lieutenant Colonel H. D. Chalke

The United States of America Typhus Commission Medal was recently awarded to Lieut. Col. H. D. Chalke, assistant director of hygiene, Royal Army Medical Corps (British). The citation read "In connection with the work of the United States of America Typhus Commission during the epidemic of typhus fever in Naples and southern Italy in the winter of 1943-1944, Colonel Chalke had heavy responsibilities for the extension and application of typhus control measures pertaining to British troops and involving civilians in areas under British control. A particularly important part of these activities, carried out by him with notable success under the most difficult conditions, was the disinfection of refugees entering Italy from across the Adriatic. The services rendered by Colonel Chalke were an essential element in preventing spread of typhus in southern Italy."

Major Ira Teicher

Major Ira Teicher, formerly of Brooklyn, was recently awarded the Bronze Star. The citation accompanying the award read "for meritorious service in action during the period Jan. 25, 1945 to Feb. 6, 1945. Commanding the —— Portable Surgical Hospital, Captain Teicher performed 211 operations, 145 of which were in a three day period of continuous work. The combination of surgical skill and administrative ability exhibited by Captain Teicher under extreme conditions reflects great credit on himself and the armed forces of the United States." Dr. Teicher graduated from Cornell University Medical College, New York, in 1936 and entered the service in June 1942.

Captain Roy S. Averill

The Silver Star and an Oak Leaf Cluster were recently awarded to Capt. Roy S. Averill, formerly of Canonsburg, Pa., for gallantry. First cited for his heroism at Maknassey in March 1943, when his battalion was attacking a strongly fortified point, for which he was presented the Silver Star, Captain Averill in January 1944 near Cassino performed the action winning him the Oak Leaf Cluster in lieu of a second Silver Star. He carried three units of blood plasma through two unmarked mine fields under artillery fire and direct observation and administered treatment under fire, after which he helped the wounded men to the battalion aid station. Dr. Averill graduated from Western Reserve University School of Medicine, Cleveland, in 1940 and entered the service in July 1941.

Captain Edward O. Groeber

Capt. Edward O. Groeber, formerly of Brooklyn, was recently awarded the Bronze Star for meritorious service in combat from May 21 to 25, 1944, in Italy. The citation reads "With great efficiency Captain Groeber supervised the establishment and maintenance of lines of evacuation, over trackless stretches of mountains, using with great ingenuity mules and untrained Italian soldiers, as well as regularly assigned litter bearers. At the same time he rendered personally the highest degree of professional medical and surgical care." Dr. Groeber graduated from Long Island University College of Medicine, Brooklyn, in 1931 and entered the service June 19, 1942.

Captain James Gordon

Special commendation was recently extended to Capt. James Gordon, formerly of New York and now with the 155th Station Hospital "somewhere in the South Pacific," for splendid assistance rendered by his generous, willing and professionally excellent contribution to the dermatologic section of his unit. "By his professional ability and his eagerness to cooperate, this officer has set a high standard and has reflected credit on himself, his profession and his organization," the commendation read. Dr. Gordon graduated from New York University College of Medicine, New York, in 1929 and entered the service Aug. 18, 1942.

Captain Benjamin L. Falcone

A Certificate of Merit was recently awarded to Capt. Benjamin L. Falcone, formerly of Bridgeport, Pa. The citation read "From May 25, 1944 to June 29, 1944, as a medical officer with the First Army Medical Detachment, Captain Falcone landed on the continent on D day plus two and rendered valuable service in the treatment of large numbers of Allied and enemy casualties under difficult and trying circumstances." Dr. Falcone graduated from Hahnemann Medical College and Hospital of Philadelphia in 1936 and entered the service Sept. 3, 1942.

Captain William S. M. Ling

The Bronze Star was recently awarded to Capt. William S. M. Ling, formerly of New York, for his heroism on the Anzio beachhead in Italy. Dr. Ling, a physician of Chinese extraction, interned at Misericordia Hospital, Manhattan, and served in North Africa, Tunisia, Salerno and northern Burma as well as in Italy. He graduated from the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, in 1940 and entered the service Sept. 1, 1941.

Captain Donald W. Cheff

Capt. Donald W. Cheff, formerly of Wilmington, Del., was recently awarded the Bronze Star for heroic achievement in action during the Leyte campaign. He is company commander of the medical battery of the famed 77th Infantry Division, which also participated in the invasion of Guam. Dr. Cheff graduated from the University of Nebraska College of Medicine, Omaha, in 1937 and entered the service June 20, 1942.

MEDICAL ADMINISTRATIVE CORPS OFFICERS

Typical illustrations of the heroic part being played by Medical Administrative Corps officers in this war is found in the recent citations which name Lieut. Paul F. Kerkhoff and Lieut. Allen E. Meeks for their gallant actions under fire.

Lieutenant Kerkhoff, Cincinnati, was awarded the Silver Star for his heroism with the 45th Armored Medical Battalion of the 3d Armored Division during the Ardennes breakthrough in December. One ambulance was knocked out and the medical supply trucks were isolated. Lieutenant Kerkhoff organized a group that went through heavy fire to rescue the trucks, which contained valuable life-saving cargo.

Lieutenant Meeks, San Bernardino, Calif., was awarded the Bronze Star for his service as assistant battalion surgeon. "In many instances," the citation reads, "this diligent officer risked his life in evacuating the wounded while exposed to heavy, small arms, mortar and artillery fire. His aggressive, energetic actions and untiring devotion to duty saved the lives of many men."

The work of the Medical Administrative Corps officers is not restricted to the combat zones. They handle administrative work in almost every phase of the Medical Department's activities, thereby permitting doctors to confine most of their activities to professional duties. The growth in the past three years of the Medical Administrative Corps from a strength of 75 to 17,000 is an indication of the extent of their help to the Medical Corps.

RATE OF RECOVERY FROM CHEST WOUNDS

In a recent release from the War Department, Major Gen. Norman T. Kirk, Surgeon General of the Army, reported that the rate of recovery from chest wounds is triple that of the first world war. The death rate of wounded men who lived long enough to reach surgery in the first world war was 24 per cent. Now it is 8, and this low rate has been achieved in spite of the fact that chest wounds are more serious in this war because of the increase in bomb fragments. The teams of young surgeons on the battle lines believe that if the wounded man can be got alive to an evacuation hospital, the surgical station closest to the front lines, the chances are that he will live.

ARMY DOCTORS TO CONSERVE X-RAY FILM

According to the Office of the Surgeon General, Army Medical Officers have been ordered to conserve x-ray films and photographic paper because of serious civilian and military shortages of these materials. Medical case histories will continue to be prepared on all troops being redeployed, but routine chest x-rays will not be made. This step will not be necessary, the Office of the Surgeon General explained, because chest x-rays were made of these men when they went overseas and the Army has kept a critical eye on them ever since. However, if the redeployment examination indicates tuberculosis or any other chest disease, an x-ray will be made promptly.

ARMY HAS NEW HEALTH EDUCATION UNIT

A new health education unit was recently set up as part of the Preventive Medicine Service, Office of the Surgeon General, U. S. Army, to develop educational material for the various divisions of the Preventive Medicine Service. Capt. Granville W. Larimore is chief of the new unit.

MERITORIOUS SERVICE PLAQUE AWARDED

The 1777th Service Command Unit, Schick General Hospital, Clinton, Iowa, was recently awarded the Meritorious Service Unit Plaque for "superior performance and devotion to the hospital duties performed during the last sixteen months."

NAVY

NAMED HEAD OF MUSEUM COMMITTEE

Rear Admiral Harold W. Smith, chief of the research division of the Bureau of Medicine and Surgery, was recently designated chairman of a Medical Museum Committee and curator for the medical department in conformity with the projected plan for establishment of a naval museum in Washington. The appointment was made by Vice Admiral Ross T. McIntire, Surgeon General of the Navy. The Medical Museum Committee is responsible for the selection, collection, preparation and preservation of trophies, relics, pictures, models, dioramas and other materials of historical interest for exhibit in the contemplated naval museum in Washington.

NAVAL HOSPITAL HEADS MAY AWARD PURPLE HEART

The Secretary of the Navy recently authorized the presentation of the Purple Heart award by medical officers in command of all hospitals within the continental limits in order to eliminate delay between time of wound and award presentation. In addition, fleet commanders are authorized to delegate authority to award the Purple Heart "to commanding officers of such hospital ships, advance base or other hospitals within their commands as they may deem necessary for this purpose."

HISTORY OF PSYCHIATRY

Capt. Forrest M. Harrison, chief of the neuropsychiatric division of the National Naval Medical Center, Bethesda, Md., was recently ordered to the Bureau of Medicine and Surgery on a special assignment to write the history of psychiatry in the Navy in World War II.

NAVY AWARDS AND COMMENDATIONS

Captain Rolland R. Gasser

Capt. Rolland R. Gasser, formerly of Brooklyn, was recently awarded the Bronze Star "for meritorious service to the government of the United States as medical officer in command of a fleet hospital in the South Pacific area from March 31, 1944 to April 7, 1945. During this period Captain Gasser displayed exceptional ability in handling the many detailed medical problems which arose and worked tirelessly to establish and maintain excellent operating conditions throughout his command. By his initiative and thorough knowledge of medical administration he effected an efficient hospital service for the sick and wounded in the South Pacific and evacuees from adjacent areas. His leadership and professional skill were in keeping with the highest traditions of the United States Naval Service." Dr. Gasser graduated from Jefferson Medical College of Philadelphia in 1914 and has been in the service since June 11, 1917.

Lieutenant Commander Gerald O. Poole

Lieut. Comdr. Gerald O. Poole, formerly of Lindamere, Del., was recently cited by Admiral Harold R. Stark. The citation accompanying the award read "Your performance of duty prior to and during the invasion of France on June 6, 1944 has been brought to my attention. As senior medical officer at a U. S. naval advanced amphibious base your professional skill was responsible for averting a serious delay in training programs and preparations for the invasion. When, shortly before D day, food poisoning broke out involving in varying degrees some 500 officers and men of both base and small boat personnel,

your untiring devotion in caring for these men and your thorough analysis of the cause of the outbreak enabled all personnel to resume their duties quickly. For your professional skill and your devotion to duty you are hereby commended. This commendation carries with it the privilege of wearing the commendation ribbon." Dr. Poole graduated from Hahnemann Medical College and Hospital of Philadelphia in 1931 and entered the service Oct. 19, 1942.

Lieutenant Commander Clinton P. O'Connell

The Navy and Marine Corps Medal was recently presented to Lieut. Comdr. Clinton P. O'Connell, formerly of Paterson, N. J., for "heroism displayed in attending the wounded and evacuating casualties while under enemy fire during amphibious operations in the Southwest Pacific Area from April 1944 to July 1944. A member of the surgical unit of the Seventh Amphibious Force accompanying assault waves, Lieutenant Commander O'Connell, by his courage and skill in providing medical care, helped save many lives and aided in making possible the transportation of casualties over greater distances than ever attempted previously." Dr. O'Connell graduated from Columbia University College of Physicians and Surgeons, New York, in 1932 and entered the service July 28, 1941.

Lieutenant James C. Owens

The Bronze Star was recently awarded to Lieut. James C. Owens, formerly of Beloit, Wis., who was cited for his heroism and his outstanding professional ability during an amphibious assault operation against Saipan and Marianas islands. Through his efforts and under adverse conditions when other medical units were disorganized, lives of many casualties were saved. Dr. Owens graduated from Marquette University School of Medicine, Milwaukee, in 1942 and entered the service March 8, 1943.

Commander John F. Woodward Jr.

The Navy Commendation Ribbon for outstanding performance of duty as senior medical officer at the U. S. Naval Dispensaries at Oran and Naples was recently awarded to Comdr. John F. Woodward Jr., formerly of New York. The citation accompanying the award read, in part, "Your thorough and untiring efforts contributed materially to the maintenance of a high standard of health and well being among the personnel of the fleet and supporting shore establishments and to the prompt and efficient handling of battle casualties during the amphibious invasions of Italy and southern France." Dr. Woodward graduated from the University of Virginia Department of Medicine, Charlottesville, in 1928 and entered the service in May 1942.

Lieutenant Commander Victor S. Falk

The Silver Star was recently awarded to Lieut. Comdr. Victor S. Falk, formerly of Wauwatosa, Wis., for treating wounded Marines under fire on Guadalcanal. The citation read, in part, "for conspicuous gallantry and intrepidity while serving with the First Marine Aircraft Wing during action against enemy Japanese forces on Guadalcanal, Solomon Islands, on the night of Oct. 13-14, 1942." Dr. Falk graduated from the University of Wisconsin Medical School, Madison, in 1939 and entered the service Nov. 28, 1941.

Lieutenant Robert M. Collins

The Navy and Marine Medal was recently awarded to Lieut. Robert M. Collins, formerly of Council Bluffs, Iowa, for "distinguishing himself by meritorious achievement and service in connection with operations in the Southwest Pacific as a member of the surgical unit of the 7th Amphibious Force during the period of April 1944 to July 1944." Dr. Collins graduated from the University of Nebraska College of Medicine, Omaha, in 1931 and entered the service Sept. 7, 1942.

MISCELLANEOUS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, May 12, page 137)

ILLINOIS

Columbus Hospital, Chicago. Capacity, 180; admissions, 3,501. Reverend Mother M. Grace, R.N., Superintendent (2 interns).

Mother Cabrini Memorial Hospital, Chicago. Capacity, 144; admissions, 3,931. Mother Agnes, R.N., Superintendent (2 interns).

Oak Park Hospital, Oak Park. Capacity, 182; admissions, 5,479. Sister St. Colette, Superintendent (intern, July 1).

KANSAS

University of Kansas Hospitals, Kansas City. Capacity, 400; admissions, 7,606. Dr. J. Harvey Jennett, Medical Director (resident—anesthesia; assistant resident—surgery, July 1, disqualified for military service).

KENTUCKY

Louisville General Hospital, Louisville. Capacity, 587; admissions, 9,971. Dr. John Walker Moore, Medical Director (resident—medicine; 2 assistant residents—surgery).

MASSACHUSETTS

Boston City Hospital, Boston. Capacity, 2,537; admissions, 35,559. Dr. James W. Manary, Medical Director (resident—dermatology, July 1, disqualified for military service).

MISSOURI

St. Louis City Hospital, St. Louis. Capacity, 1,104; admissions, 14,098. Dr. Leo J. Wade, Medical Director (resident—pathology, July 1, disqualified for military service).

NEW YORK

Herman M. Biggs Memorial Hospital, Ithaca. Capacity, 250; admissions, 204. Dr. N. Stanley Lincoln, Superintendent (residents—tuberculosis and thoracic surgery).

St. John's Riverside Hospital, Yonkers. Capacity, 220; admissions, 4,429. Mr. S. Chester Fazio, Superintendent (4 interns, February 1, 1946).

OHIO

Glenside Hospital, Cleveland. Capacity, 135; admissions, 3,411. Mr. A. B. Harris, Superintendent (resident—mixed, disqualified for military service).

TENNESSEE

Nashville General Hospital, Nashville. Capacity, 337; admissions, 6,586. Mr. T. F. Connally, Administrator (intern, July 1).

UTAH

St. Mark's Hospital, Salt Lake City. Capacity, 238; admissions, 4,838. Mrs. Olive V. Wardrop, Superintendent (intern).

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

U. S. Naval Air Training Station, San Diego: Rh Factor, Capt. George Macer, June 1.

Camp Haan, ASF Regional Hospital, Riverside: Thoracic Surgery, Dr. John Jones and Lieut. Comdr. J. E. Dailey, June 5.

Torney General Hospital, Palm Springs: Management of Simple Skin Diseases, Lieut. Col. Everett R. Seale, June 5.

AAF Regional Hospital, Santa Ana Army Air Base: Blood and Blood Substitutes, Lieut. Comdr. W. M. Cashman, June 5.

Station Hospital, Camp Cooke, Lompoc: Internal Derangements of the Knee, Dr. John C. Wilson, June 6.

Hoff General Hospital, Santa Barbara: Internal Derangement of the Knee, Dr. John C. Wilson, June 6.

U. S. Naval Hospital, San Diego: Diabetes, Drs. H. F. West and J. W. Sherrill, June 7.

Birmingham General Hospital, Van Nuys: Spondylitis, Major A. J. Present, June 13.

U. S. Naval Hospital, Santa Margarita Ranch: Surgery of Traumatic Urinary Tract, Lieut. Comdr. John B. Wear, June 14.

U. S. Naval Hospital, Corona: Diabetes, Drs. H. F. West and J. R. Sherrill, June 14.

U. S. Naval Air Training Station, San Diego: Dentistry, Comdr. E. P. Garvey (DC).

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

May 21, 1945.

Drug Cartels and the National Health

Following a warning by Wendel Berge, assistant U. S. attorney general, that drug cartels and monopolies have seriously retarded national health, a House subcommittee investigating aid to the physically handicapped has proposed war on monopolies and cartels in industries relating to health. Elimination of such monopolies, said Mr. Berge, would be "one of the most constructive tasks of our generation." He said that the "time had come for Congress to consider the cartel problem in all its aspects." He asserted that monopoly practices in the medicinal and pharmaceutical field led to suppression of research data, prevented introduction of improved processes and products and kept outsiders from engaging in research. He declared that "because of artificial and exorbitant price structures the low income groups in particular have been unable to obtain the benefits of advances in science or better physical aids." He stated, among his charges, that: 1. Thirty-four thousand Americans need spectacles and cannot buy them because of controlled prices. 2. Despite an annual world death of more than 3 million people, 500 million sufferers from malaria were dependent in prewar days on quinine obtained from a few thousand acres of cinchona trees in Java. 3. Production and distribution of all types of surgical supplies is controlled by a monopoly group. 4. The public has been forced to pay "excessive and arbitrary prices by a monopoly controlling the vitamin D industry." 5. A "small ring of producers" of insulin "exploited" 2 million sufferers of diabetes in this country by "imposing arbitrary prices and unreasonable conditions of distribution." 6. A plastic, methyl methacrylate, was sold to industrial concerns for 85 cents a pound and to dental users for $45 a pound, although "the dental profession soon learned that there was no difference in the material." 7. German I. G. Farben-Industrie once attempted to sell the secret of Bayer 205, a cure for sleeping sickness, for restoration of Germany's lost African colonies.

The subcommittee also heard Henry Miller, director of the Trade Practices Conference of the Federal Trade Commission, and R. P. Whiteley of the FTC legal staff, on advertising of drugs, eye glasses and hearing aids.

Lay Control of Veterans Administration Hospitals

Representative Walter Judd of Minnesota, a physician, has charged that Veterans Administration hospitals are too much controlled by laymen, which he says will "inevitably develop whenever and wherever government bureaus under nonmedical men tell doctors how to practice." It has been pointed out that the House Veterans Committee under Chairman John Rankin of Mississippi, now investigating the Veterans Administration, does not include any physicians, fifteen of the twenty-one members being lawyers. This fact has been criticized editorially, one paper stating that none of the members have any obvious qualifications "to pass judgment on highly technical questions of medical expertness or hospital management. Picture the indignation among Congressmen if a committee of doctors should undertake to dissect their performance as legislators." Also criticized were the Rankin sponsored visits to veterans' hospitals, which were described as "Cook's tours." It has also been pointed out that Representative Rankin is the strongest Congressional defender of Veterans Administrator Brigadier General Hines. The latest development in the hearing is a contempt citation by the committee against a *New York* reporter for refusal to tell the names of Veterans Administration officials who supplied information used in his articles criticizing veterans' hospital care. President Truman has denied that there will be a shake-up in the agency or that he will replace General Hines by former Senator Bennett Champ Clark of Missouri.

Institute at Ann Arbor for Placement of Handicapped

Medical, industrial, social welfare and labor groups will be represented at the five day institute for discussion of the War Manpower Commission's selective placement program for the handicapped at the University of Michigan, Ann Arbor, May 28 through June 1. An important phase will be panel discussions on placement of returning veterans who have suffered severe service connected disabilities. The conference will lay the groundwork for an expanded program to disabled through local USES offices. Among the speakers will be Holland Hudson, director of rehabilitation for the National Tuberculosis Association; Dr. W. C. Strang of the Civil Service Commission; Dr. F. J. Brady of the U. S. Public Health Service; Dr. Raymond Hussey, dean of the School of Occupational Health, Wayne University; Dr. Carl Peterson, Secretary, Council on Industrial Health, American Medical Association; Dr. Clarence Selby, medical director of General Motors; Dr. H. L. Krieger, medical director of the Ford Motor Company; Capt. H. H. Montgomery of the Bureau of Medicine and Surgery, U. S. Navy, and Col. E. G. Solomon of Selective Service.

Amputation Cases in Army Hospitals

Surg. Gen. Norman T. Kirk announces that on May 1 there were approximately 11,000 amputation cases in army hospitals in this country, including cases already discharged. He said there are still no "basket cases," a term used to describe a person who has lost both arms and both legs. There are 6 amputees who have lost three extremities and 1 case of a nonbattle casualty who lost part of four limbs through freezing after an airplane crash. About 5 per cent of the patients have lost more than one limb, General Kirk said. Of these, 77 per cent are leg amputations, of which 49 per cent are below the knee and about 28 per cent above the knee. Half of the arm cases are below the elbow. Almost 4,000 of the amputees have been discharged to civilian life. Some soldiers are remaining in the service and have been assigned to assist in training other amputees.

Red Cross to Increase Personnel in the Pacific

In a statement issued at Pearl Harbor and received here, Basil O'Connor, national chairman of the Red Cross, said that the organization will double its facilities in the Pacific and increase to 60,000 nurses and 32,000 other workers within a year. O'Connor is en route to the Philippines for discussions with Gen. Douglas MacArthur and later with Fleet Admiral Chester W. Nimitz. "The Red Cross is now working on terra firma in Europe, but here we must leap forward from island to island," he said.

Capital Notes

Reports indicate that returns in the national cancer campaign to raise $5,000,000 are exceeding expectation but that continued support is required.

Despite reports of an anticipated increase in malaria through return of men from disease infected war areas, the Maryland Bureau of Communicable Diseases reports that it has experienced no such increase.

Chairman Bilbo of the Senate District Committee has introduced in the Senate a bill to strengthen District of Columbia contagious disease control. A companion measure was placed before the House earlier by Representative McMillan, Democrat of South Carolina.

Although nineteen blood donor centers in the country were to close May 19, the District of Columbia center will continue with renewed effort, reports Red Cross National Chairman O'Connor.

Bureau of Information

COUNTY SUMMARY SHEETS FROM KENTUCKY, MISSOURI AND NEW MEXICO

Kentucky, through Dr. P. E. Blackerby, secretary of the Kentucky State Medical Association, Missouri, through Mr. T. R. O'Brien, executive secretary of the Missouri State Medical Association, and New Mexico, through Dr. L. B. Cohenour, secretary of the New Mexico Medical Society, have returned completed county summary sheets.

Kentucky

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Adair		15,502	4	3,875	50
Barren		24,545	7	3,506	17
	Glasgow	5,815			
Bell		39,762	16	2,485	38
	Middlesborough	11,777			
	Pineville	3,882			
Boyd		42,800	18	2,378	10
	Ashland	29,537			
Christian		35,813	16	2,238	19
	Hopkinsville	11,724			
Fayette		77,085	67	1,151	9
	Lexington	49,304			
Pulaski		31,294	12	2,608	30
	Somerset	6,154			
Scott		12,773	4	3,193	14
	Georgetown	4,420			
Union		17,083	4	4,271	19
	Morganfield	3,070			
Webster		16,149	7	2,307	27
	Providence	4,397			

Missouri

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Atchison		10,410	3	3,470	5
Barry		19,435	5	3,887	13
	Monett	4,395			
Bollinger		9,643	3	3,214	27
Boone		33,128	25	1,325	6
	Columbia	18,399			
Butler		29,526	8	3,691	21
	Poplar Bluff	11,163			
Clark		8,770	1	8,770	6
Dallas		9,429	2	4,715	21
Howard		10,423	5	2,085	7
	Fayette	2,608			
Jackson		485,893	302	1,609	6
	Kansas City	399,178			
	Independence	16,066			
Miller		12,354	1	12,354	11
	Eldon	2,590			

New Mexico

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Bernalillo		69,794	52	1,342	11
	Albuquerque	35,449			
Colfax		15,194	5	3,039	16
	Raton	7,607			
Curry		20,452	11	1,859	19
	Clovis	10,065			
De Baca		4,825	2	2,413	56
Dona Ana		27,128	5	5,426	27
	Las Cruces	8,385			
Lea		16,311	4	4,078	24
	Hobbs	10,619			
Rio Arriba		20,604	5	4,121	261
San Juan		10,308	1	10,308	33
San Miguel		23,099	4	5,775	34
	Las Vegas	6,421			
Socorro		8,658	3	2,886	60
	Socorro	3,712			

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

Data from five representative counties of each state are presented in the accompanying table. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. They are not included in computing physician population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Medical Legislation

MEDICAL BILLS IN CONGRESS

EMIC Program

An additional appropriation of $44,189,500 will be made available for the EMIC program by H. R. 3199, a bill making appropriations for the Department of Labor, the Federal Security Agency and related independent agencies for the fiscal year ending June 30, 1946. In its report on the bill, which has now passed the House, the Committee on Appropriations referred to prior efforts to prevent what it described as "discrimination between persons licensed under state law to practice obstetrics." The committee thought that some progress had been made in "eliminating the discrimination" but suggested an additional proviso to the language inserted by the committee last year, as follows: "Provided further, That a state plan shall include standards for professional services prescribed by the state health agency within the limitations contained in this title and such standards so prescribed shall be approved by the chief of the Children's Bureau." On motion of Representative Judd, Minnesota, this proviso was amended to read "Provided further, That any state plan which provides standards for professional obstetric services in accordance with the laws of the state shall be approved by the chief of the Children's Bureau."

Veterans Administration

Representative Miller, Nebraska, has introduced H. R. 3254 to authorize the furnishing in private facilities of medical and hospital treatment to certain veterans. This will be accomplished by defining the term "Veterans Administration facility" as used in the existing law to include any private facility for which the Administrator of Veterans' Affairs may deem it necessary to contract in order to provide medical and hospital treatment (1) in emergency cases; (2) for veterans of any war, in any case where neither a facility under the exclusive jurisdiction of the Veterans Administration nor a government facility utilized by the Veterans Administration is within a reasonable distance of the place of residence of the veteran; (3) for women veterans of any war, and (4) for veterans of any war in the territories and possessions.

Food and Drugs

A bill introduced by Representative Lea, California, H. R. 3266, proposes to amend the Federal Food, Drug and Cosmetic Act by providing for the certification of batches of drugs composed wholly or partly of any kind of penicillin or any of its derivatives. The language of the bill is similar to that of the existing law safeguarding the purity of insulin.

U. S. Employees' Compensation Act

A subcommittee of the Senate Committee on Education and Labor held a hearing, May 16, on S. 178, a bill to permit chiropractors to treat the beneficiaries of the U. S. Employees' Compensation Act. Only witnesses who supported the bill testified, including the sponsor of the bill, Senator Murdock, Utah, Representative Tolan, California, who has introduced a companion bill in the House, representatives of the National Association of Letter Carriers, of the National Federation of Post Office Clerks, of the Rural Mail Carriers' Association, and the Director of Education, National Chiropractic Association, John J. Nugent, D.C. Witnesses in opposition to the bill will be heard on a later date. The following members of the Senate Committee on Education and Labor comprise the subcommittee: Senators Fulbright, Arkansas, chairman; Walsh, Massachusetts; Chavez, New Mexico; Smith, New Jersey, and Morse, Oregon.

STATE LEGISLATION

Alabama

Bill Introduced.—H. 148 proposes to appropriate $150,000 annually for the next biennium to the state board of health for acquiring and distributing whole blood and blood plasma to persons in need thereof.

Florida

Bills Introduced.—S. 435, to amend the medical practice act, proposes, among other things, to make it unlawful (1) for any physician to fail or neglect to register by January 1 annually and to provide a penalty of $50 for such an offense; or (2) for any person to sell or fraudulently obtain or furnish any medical diploma, license, record or registrations or to practice medicine under such fraudulent credentials, or advertise to practice medicine under a name other than his own. S. 436, to amend the medical practice act, proposes (1) to make it the specified duty of the state board of health, of all peace officers and of all prosecuting attorneys to enforce the provisions of the act and (2) to authorize the state board of medical examiners to proceed by injunction to restrain any continued violation of the act. H. 664 proposes to prohibit the operation of a private nursing home in counties having a population of from 65,000 to 74,000 unless licensed to do so by the state board of health.

Illinois

Bills Introduced.—S. 466 and H. 649, to amend the medical practice act, propose that students matriculating or entering on a course of study of any system or method of treating human ailments without the use of drugs or medicines and without operative surgery during the years 1940 to 1947, inclusive, shall be entitled to examination for licensure if they have graduated from a healing art school and if the course of instruction pursued therein has not been less than thirty-two months. Under the present law the course of instruction must not be less than thirty-six months.

Massachusetts

Bills Introduced.—S. 551 proposes to create a special commission to study the advisability of establishing a state university, including a medical and dental school. S. 554, to amend the medical practice act, proposes that the authority approving medical schools shall consist, in addition to its present members, of an osteopathic member of the board of registration in medicine and a layman. H. 1905 proposes to create a special commission of two senators, four representatives and three persons appointed by the governor to investigate all institutions, other than educational, maintained by the commonwealth with respect to the conduct of such institutions, the adequacy of their facilities and such other matters as the commission may deem advisable. H. 1923 proposes to provide what is designated as a voluntary system for the payment of hospital, surgical operation, sickness and bodily injury and maternity benefits to employees.

Texas

Bills Introduced.—H. Con. Res. 34 proposes to create a state commission to make a comprehensive survey of existing hospital facilities and the need, if any, for additional hospitals, clinics and health services and to serve as the state agency for executing the hospital program that may be enacted by the federal Congress. S. 216 proposes to require the state department of health to survey hospital facilities, health centers, clinics and related public health needs as provided for in S. 191 now pending before the federal Congress. The bill proposes to authorize the board of health to make and/or approve applications for funds as may be provided in any future federal law.

Official Notes

DOCTORS LOOK AHEAD

Radio broadcasts by the American Medical Association under the title Doctors Look Ahead and other titles have emphasized medical progress. There remains however the unfinished business which confronts the medical profession about which little is said. Doctors Look Ahead therefore will broadcast a program devoted exclusively to looking ahead at the challenge of tomorrow, at the unfinished business, at the progress that has not been made. This program will be broadcast May 26 and the guest speaker will be Dr. Morris Fishbein, Editor of THE JOURNAL.

Other programs in the Doctors Look Ahead series scheduled in the next four weeks are as follows:

June 2. Fit to Live: A program devoted to the topic of fitness as distinguished from health and illustrating the nation's needs and its opportunities for greater efficiency through greater physical fitness.

June 9. They Shall Hear Again: A program devoted to the needs of the hard of hearing and indicating new opportunities for them through the use of hearing aids, lip reading, medical treatment and occasionally surgery. Guest speaker, Howard A. Carter, B.S. in M.E., Secretary of the American Medical Association Council on Physical Medicine.

June 16. Home Was Never Like This: A program devoted to the possibilities of the American health resort or spa in the treatment of disease. Guest speaker, Dr. Walter S. McClellan, chairman of the American Medical Association Committee on Health Resorts, speaking from New York.

June 23. Postwar Doctor: Problems in medical education and their influence on the public health. Guest speaker, Dr. Victor Johnson, Secretary of the American Medical Association Council on Medical Education and Hospitals.

When no speaker is announced the summary will be given by Dr. W. W. Bauer, Director of the Bureau of Health Education. Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting Company network each Saturday at 4 p. m. Eastern War Time (3 p. m. Central War Time, 2 p. m. Mountain War Time and 1 p. m. Pacific War Time). Beginning May 26 the program will be heard at 4:30 p. m. Eastern War Time and corresponding times in other time zone areas.

Woman's Auxiliary

New Jersey

A symposium on Postwar Problems of Community Health was recently sponsored by the Woman's Auxiliary to the Essex County Medical Society. Lieut. Col. Stuart Z. Hawkes, chief of Surgical Service, Army Air Force Convalescent Center at Mitchel Field, was guest speaker.

Ohio

The Hamilton County auxiliary has had three forum meetings since October, the subjects being "Juvenile Delinquency," "Health in Our Schools" and "Global Medicine."

The Marion County auxiliary recently purchased a new incubator and bed oxygen unit for the City Hospital.

Members of the Chillicothe auxiliary were recently entertained by Miss Alice Myers, who gave a travel talk on Mexico City and Guatemala. The auxiliary has planned a bridge party and rummage sale to raise funds for purchasing an incubator for the Chillicothe Hospital.

The auxiliary to the Columbus Academy of Medicine sponsored a two part discussion, one devoted to "Health Examinations for School Children and Employees" and the second to the Kellogg school education plan. The superintendent of schools, several school nurses and the coordinator of school health projects took part in the discussion.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

District Meeting.—The First Councilor District Medical Society held its eighty-fifth semi-annual meeting at Jonesboro Country Club, May 15. The speakers were:

Dr. Allie C. Kolb, Little Rock, War Neurosis in Returning Soldiers.
Dr. Joseph F. Shuffield, Little Rock, Discussion of Medical Legislation.
J. P. Womack, Jonesboro, A Layman Looks at the Doctor.

CALIFORNIA

Veterans Studying Professions.—Forty-one veterans were studying medicine, dentistry and pharmacy on the San Francisco campus of the University of California May 4, according to the university *Clip Sheet*. Thirty-eight of the veterans were registered under the G. I. Bill of Rights and three are under Public Law 16, which provides scholarships for veterans in need of rehabilitation. Ages vary from 20 to 44 years.

Prevalence of Diphtheria.—The report of 28 cases and 5 deaths from diphtheria in San Francisco for 1945 indicates an upward trend, according to Dr. Jacob C. Geiger, director of public health of the city and county of San Francisco. Of the 28 cases, 11 were from the military forces and had not been immunized. Ten were in adults ranging from 24 to 72 years, none of whom had ever been immunized. Of the 11 children affected 6 were newcomers to the community and had not been immunized. Of the 5 remaining children, 4 being newcomers, there was some history of immunization from one to fourteen years before the disease occurred in this group. Dr. Geiger points out that of these 5 none had ever been checked by the Schick test as to the efficiency of the immunization and no "booster" injections were given. There was no common source of the infection of these cases, except in one family, the source not having been traced up to May 7. There was no concentration of cases in any area or in any school. From 1941 to 1945 about 10 cases a year was the average, less than 1 a month, generally in adults with none of these immunized. Up to this year one could further consider the disease to be not one of childhood, Dr. Geiger stated.

CONNECTICUT

Student Members.—One hundred and sixty-seven applications for membership as student members have been approved by the council of the Connecticut State Medical Society. This is the first time that the student members have been included as special members of the society, an action voted by the house of delegates (THE JOURNAL, Dec. 16, 1944, p. 1039).

FLORIDA

Changes in Health Officers.—Dr. Frank V. Chappell, Tampa, has been appointed director of the Hillsborough County Health Department, succeeding Dr. Charles W. Pease, Tampa, who was named epidemiologist of the department.——Dr. Kolbein L. K. Waering, Jacksonville, director of the Duval County Department of Health, has resigned.——Dr. Smith L. Turner, Williston, has been named health officer of Levy County.——Dr. Joseph A. Markley, U. S. Public Health Service, has been appointed health officer of Duval County, succeeding Dr. Waering.

ILLINOIS

Changes in Status of Licensure.—The Illinois Department of Registration and Education on March 6 took the following action:

Dr. Lawrence T. Browning, formerly of Holden, W. Va., license revoked for conviction of violation of the National Motor Vehicle Act.
Dr. Oscar F. Roberts, Chicago, license revoked for conviction of violation of Internal Revenue Code.
Dr. Toros Sarkisian, formerly of Denver, license revoked for conviction in the Colorado courts of performing an abortion.

Personal.—Dr. W. W. Bauer, Director of the Bureau of Health Education, American Medical Association, Chicago, will deliver a talk before the Citizens' Public Health Association of St. Clair County in Belleville, May 22, on "Health for All People."——Dr. Edward B. Miller has been appointed health officer for district number 2 including counties of Boone, Lake and McHenry, with headquarters in Woodstock. Dr. Miller, who was recently in the medical corps of the Army of the United States, succeeds Dr. Fred O. Tonney.

New Society of Ophthalmology and Otolaryngology.—The Central Illinois Society of Ophthalmology and Otolaryngology was recently formed for the benefit of those practicing in these specialties in the central part of Illinois. Officers include Drs. Watson Gailey, Bloomington, president; Walter D. Stevenson, Quincy, and Stuart Broadwell Jr., Springfield, vice president, and William F. Hubble Jr., Decatur, secretary-treasurer. The membership is limited to 50 and is open to members of the national board or those eligible to membership in it. Three meetings a year will be held, the first of which was in Bloomington, April 21-22.

Chicago

The Maurice Lamm Blatt Memorial Fund.—Colleagues of the late Dr. Maurice Lamm Blatt on the pediatric staff of the Cook County Hospital are sponsoring the establishment of the Maurice Lamm Blatt Memorial Fund. Proceeds would be used to create either an annual prize for a resident or intern doing outstanding work in pediatrics or, if sufficient funds are forthcoming, a fellowship, scholarship or lectureship in pediatrics. Three categories have been designated for membership in the project: any amount up to $25, contributing membership; $25 or more, sustaining membership, and $100 or more, life membership. Checks should be made payable to Dr. Meyer A. Perlstein, chairman of the Maurice Lamm Blatt Memorial Fund, 185 North Wabash Avenue, Chicago 1.

Personal.—Dr. Herman L. Kretschmer, President of the American Medical Association, has been named chairman of a committee to raise funds to pay for transferring the 276 ton Louis Pasteur Memorial statute from Grant Park to the Medical Center district on the west side, newspapers reported May 14. Ray. McCarthy, president of the Medical Center Commission, said title to the memorial has been conveyed by the Chicago Park District Board. The Pasteur Memorial, a 51 ton statue on a 225 ton base, stands on the west lawn of the Chicago Natural History Museum.——Dr. Max Thorek will deliver the commencement address of the Iowa Wesleyan College, Mount Pleasant, Iowa, May 27, on "Medicine in a Mad World." Dr. Thorek will receive on this occasion the honorary degree of doctor of science.

Malcolm MacEachern Award.—The Johnson and Johnson Research Foundation has created an annual award at Northwestern University consisting of a silver medal and an honorarium of $250 to be known as the Malcolm T. MacEachern Award. The award honors Dr. MacEachern, associate director of the American College of Surgeons and director of the program in hospital administration at the school. The award was announced at a National Hospital Day celebration in the auditorium of the American College of Surgeons, May 12, simultaneously with an announcement of a five year grant of $75,000 to the program in hospital administration, including scholarships, also from the Johnson and Johnson Research Foundation, to supplement $15,000 granted two years ago. A renewal of scholarship grants by the American Hospital Supply Corporation was also announced. Since the program in hospital administration was started in September 1943, 113 students coming from seventeen states have enrolled in one or more of the nine new courses offered, in addition to taking background courses in other departments of the university. An advisory committee, board of consultants and faculty consisting of authorities in the hospital field assist in formulating policies of the program, conduct the courses and demonstrations and supervise the internships required before conferring degrees. Dr. Irvin Abell, Louisville, Ky., chairman of the board of regents of the American College of Surgeons, spoke on "The Significance of National Hospital Day, 1945."

KENTUCKY

Past President Honored.—Dr. John H. Blackburn, Bowling Green, was recently given a dinner in honor of his completion of forty-five years in the practice of medicine. Dr. Blackburn was councilor of the Kentucky State Medical Association from 1921 to 1928, when he was elected to the presidency.

Distinguished Service Medal.—The Kentucky State Medical Association is now accepting names for the distinguished service medal approved in 1944 to be awarded annually to one of its members. Any member of the association is eligible to be nominated by any other member as an applicant

for the medal. All names will be considered by the council of the association, three to be selected as being worthy and these three to be submitted to the house of delegates for final selection.

Sigma Alpha Affiliates with Alpha Epsilon Delta.—On April 29 Sigma Alpha, premedical fraternity of the University of Louisville, became affiliated with Alpha Epsilon Delta, national honorary premedical fraternity, on its installation as the Kentucky Alpha chapter. The initiation of eighteen active and three honorary members was conducted by Hugh E. Setterfield, Ph.D., associate professor of anatomy, Ohio State University, Columbus, and national president of the Alpha Epsilon Delta. Dr. Setterfield's subject at the banquet was "What Kind of Doctor?" Sigma Alpha was organized on March 29, 1933 at Louisville under the auspices of Alfred W. Homberger, Ph.D., professor and head of the department of chemistry and premedical adviser. Alpha Epsilon Delta was founded at the University of Alabama in 1926 and now includes thirty-four chapters.

Personal.—Dr. Percival Bailey, professor of neurology and neurologic surgery at the University of Illinois College of Medicine, was commonwealth visiting professor of neurology and neurologic surgery at the University of Louisville School of Medicine during the month of April.——James T. Lowe, Ph.D., has been appointed director of nutritional research for the Nestle's Milk Products, Inc., New York. Dr. Lowe has been research associate for the Wisconsin Alumni Research Foundation, Madison, Wis., for the past ten years.——Dr. Bohdan G. Giel, U. S. Public Health Service, has been temporarily assigned as health officer in Perry County.——Dr. William H. Smith was chosen president of the Boyle County Board of Health recently to succeed the late Dr. John D. Jackson, who had held the position for twenty-two years. Dr. Perry C. Sanders was elected secretary of the board and health officer of Boyle County for another two year term. He and Dr. Smith have also been members of the board for twenty-two years. All are of Danville.

MICHIGAN

County Society Creates Administration Plan.—The Calhoun County Medical Society has elected an active policy committee to direct and coordinate the administrative program of the society. Dr. Joseph E. Rosenfeld, Battle Creek, as chairman of the committee, will be in charge of all publicity; Dr. George A. Zindler, Battle Creek, as secretary is in charge of coordinating all postgraduate and postwar educational problems in the local hospitals for returning military members, including the raising of funds for the committee program. Dr. Carl G. Wencke, Battle Creek, will have charge of political medicine. Dr. Russell L. Mustard, Battle Creek, will develop plans for a central office and executive secretary and a central telephone agency. Dr. Duward L. Finch, Battle Creek, will have charge of the rehabilitation problems of members returning from war service as well as the responsibility of keeping in communication with them, sending bulletins and other useful information. Dr. Alpheus T. Hafford, Albion, is to coordinate all the activities in the county areas outside of Battle Creek.

Provision for Accident Care.—Effective May 1, new certificates greatly broadening the protection of enrolled physicians and their office employees were issued by Michigan Hospital Service and Michigan Medical Service. The new certificates make the hospital service virtually all inclusive for the average case and extend the surgical plan in all respects, including the addition of a provision for accident care. Certificates will be provided at a moderate increase in rates for the hospital protection and at no increase in rates for the surgical protection. The benefits show an increase in the number of full days' service from twenty-one to thirty for patients, the provision of the same amount of care for every disability rather than a limitation of care by the year, and the addition of such former "extras" as basal metabolism examinations, accident room care, physical therapy, extensive laboratory service and penicillin. Recent changes in the surgical benefit contract of the Michigan Medical Service include a $150 maximum providing for full surgical service for those conditions requiring multiple stage operations, such as tuberculosis and cancer. In maternity benefits the waiting period will apply only to childbirth and is reduced from ten to nine months. Miscarriage, ectopic pregnancy and the like will be covered from inception of the contract, while the former exception to self-inflicted injuries has been eliminated. Emergency surgical service in the outpatient department of the hospital will be provided for accidental injuries but will not include outpatient x-ray service. In addition, a special rider contract provides pathologic laboratory services to all subscribers to Michigan Hospital Service.

MINNESOTA

Personal.—On April 1 Dr. Donald W. Pollard, who has been absent from the superintendency of Minneapolis General Hospital because of war leave, was to return to the Minneapolis General Hospital, having been placed on inactive duty. Dr. Francis E. Harrington, formerly city health officer, has been acting superintendent since August 1942 (THE JOURNAL, Aug. 19, 1944, p. 1150).——Dr. Sidney A. Slater, superintendent of Southwestern Minnesota Sanatorium, Worthington, since 1919, will receive the honorary degree of doctor of science at the University of Richmond, Richmond, Va., April 27. He will be presented with a Phi Beta Kappa key which was previously awarded. Dr. Slater graduated at the University College of Medicine, Richmond, in 1909.

Airlines Contribute to Mayo Fund.—The Northwest Airlines gave $5,000 to the Mayo Memorial Fund recently as a tribute to the contributions of the Mayo Clinic to both wartime and peacetime aviation in pioneering scientific researches with especial attention to high altitude flying. The donation, voted by the company's board of directors, was accompanied by a resolution calling attention to the establishment by the state legislature of a research center at the University of Minnesota and emphasizing the "close collaboration of the Northwest Airlines with the Mayo Clinic for many years" (THE JOURNAL, January 13, p. 111). An announcement credits the work of the clinic before the war, in charge of Col. William R. Lovelace, M. C., now in charge of the Army Air Forces research center at Wright Field, Dayton, Ohio, and discusses the studies of the use of oxygen in high altitude flying in which the Northwest Airlines cooperated.

NEBRASKA

State Medical Election.—Dr. Earle G. Johnson, Grand Island, was named president-elect of the Nebraska State Medical Association at a meeting of the house of delegates in Lincoln, May 8. Dr. Charles McMartin, Omaha, is president.

Society News.—The Omaha-Douglas County Medical Society was addressed May 8 by Mr. J. W. Holloway Jr., Director of the Bureau of Legal Medicine and Legislation of the American Medical Association, Chicago, on "Trends in Federal Legislation" and Dr. Victor E. Johnson, Secretary, Council on Medical Education and Hospitals, American Medical Association, on "Postwar Problems and Plans in Medical Education."

National Broadcast Features Hospital Day.—Dr. Donald C. Smelzer, Philadelphia, president of the American Hospital Association, gave a special talk May 13 at Creighton Memorial St. Joseph's Hospital, Omaha, which was delivered over one hundred and twenty-three stations as a National Hospital Day feature. The talk was a part of the program "Your America," sponsored by the Union Pacific Railroad. The program also included an interview over the radio of Dr. Adolph Sachs, Omaha, medical director of the Union Pacific Railroad, with Ray Olson, Omaha radio newscaster. The official celebration was observed May 12 but the Sunday broadcast was a part of the program.

NEW · YORK

Retirements at Rochester University.—John R. Murlin, Ph.D., professor of physiology and director of the department of vital economics, University of Rochester School of Medicine and Dentistry, Rochester, will retire July 1. Dr. Edwin Fauver will retire at the same time as head of the physical education department and college physician. Both men have been connected with the Rochester faculty for twenty-eight and twenty-nine years respectively.

Civic Medal Goes to Dr. Kaiser.—On May 3 the Rochester Museum Association presented to Dr. Albert D. Kaiser, recently appointed health officer of Rochester, the Rochester Civic Medal. John Edward Hoffmeister, Ph.D., Rochester, president of the museum association, cited Dr. Kaiser for "civic responsiveness, his standing as a physician, his professional interest in public health and his achievements in the fields of exploration, scholarship and leadership."

County Society Opens New Headquarters.—The Richmond County Medical Society recently opened a permanent office in the Medical Arts Building, 100 Central Avenue, St. George, Staten Island 1. While the society does not plan to

engage a full time executive secretary, an information bureau will be maintained giving service concerning medical conferences in the hospitals, civilian and military, and miscellaneous data. Mrs. R. Hefftner will continue the secretarial services of the society, a position she has held for the last five years.

Physical Fitness Check-Up Week.—The week of June 4-8 has been designated physical fitness check-up week for high school pupils in New York State. The observance was held last year for the first time. The program this year will include medical and dental examinations, follow-up services, health instruction and practice, and achievement in physical activities based on statewide standards that were issued last September. These standards were developed in cooperation with the Selective Service System and the Army and Navy and represent achievements in individual developments that will mean better physical fitness for boys and girls in both wartime and postwar living.

Albert Fisher Honored.—Dr. Albert K. Fisher, Ossining, was honored with a dinner at the Cosmos Club, Washington, D. C., recently to celebrate his eighty-ninth birthday. Dr. Fisher, who graduated at Columbia University College of Physicians and Surgeons, in 1879, left the practice of medicine to enter the field of natural history. In 1883 he helped found the American Ornithologists' Union. On July 1, 1885, he became associated with the U. S. Department of Agriculture when a unit was set up there to study the interrelation of birds and agriculture. Dr. Fisher was associated with the unit for forty-six years, was a member of the Death Valley Expedition of 1891, of the Harriman (Alaska) Expedition of 1889 and the Pinchot South Sea Expedition of 1929 and from 1902 to 1906 assistant chief of the U. S. Biological Survey, later serving as senior biologist in charge of the division of economic investigations, under which the field organization of cooperative predatory animal and rodent control was built up. In 1931 he was retired from the department and was given an honorary appointment as collaborator in biology in the U. S. National Museum.

New York City

Grants to Columbia.—Columbia University recently announced $50,428 in gifts. The contributions for medical work include $15,000 from the Josiah Macy Jr. Foundation for research in the school of medicine and $8,000 from the Rockefeller Foundation for research in neuropathology.

Alumni Meeting.—The Alumni Association of the New York University College of Medicine is holding its ninth annual Alumni Day at the college, May 26. Dr. Donal Sheehan, acting dean, will review the college activities in the past year and discuss plans for the development of the new medical center, and Dr. George G. Deaver will discuss "Plans for the Development of the Baruch Division of Physical Medicine and Rehabilitation."

The Medical Quarterly.—The Alumni Association of the New York University College of Medicine has begun the regular publication of the *Medical Quarterly*. Dr. Arthur C. De Graff is editor and Dr. Hippolyte M. Wertheim is chairman of the publications committee. This is the first time the alumni association has attempted any such publication, the first issue of which appeared in April containing articles of general interest to the alumni regarding the school's history, its present activities and its plans for development, news items about the college and college organizations, and news and personals about individual alumni and members of the faculty.

Personal.—Dr. Nolan D. C. Lewis, medical director of the New York State Psychiatric Institute and Hospital, has been appointed editor of the *Journal of Nervous and Mental Disease* succeeding Dr. Smith Ely Jelliffe, Huletts Landing, who retired because of ill health.——Dr. John Mark Hiebert has been elected vice president of Sterling Drug, Inc., in charge of the Frederick Stearns and Company Division. Dr. Hiebert has been a member of the Sterling organization since 1934, advancing from the position of divisional vice president and general manager of the Stearns division, to which he was appointed when Stearns was acquired about a year ago (THE JOURNAL, June 17, 1944, p. 505).——Dr. Jacob Sobel has been appointed medical director of the Home and Hospital of the Daughters of Israel for the Aged.

Welfare Council Opens Conference Service.—On May 10 the Welfare Council of New York City announced the establishment on an experimental basis of a conference service for its 600 member agencies. The new service will be made available to the council's membership in eight broad functional groups: health services, family service and related case work services, child care, employment and vocational guidance, correctional and allied services, care of the aged, group work and recreation, and services for seamen. The purpose of the new service is "to facilitate the work of the council's standing committee on welfare and health services by establishing direct channels of communication between it and member agencies of the Welfare Council and by providing a means of exchanging information among agencies in functional groups." The conference service will operate experimentally for one year.

PENNSYLVANIA

Philadelphia

New Auditorium at Woman's Medical College.—On May 1 the Mary Dern Goodrich Auditorium was opened at the Woman's Medical College of Pennsylvania. The new section is named for the wife of Judge Herbert F. Goodrich, president of the college, who spoke at the official opening. The redecoration of the room and its equipment for motion picture and sound projection are the gifts of Mr. William Goldman. Dr. William G. Leaman Jr., professor of medicine at the medical college, showed the first and latest medical films taken at the college.

The Ulrich Memorial Lecture.—Dr. Roy E. Nicodemus, director of the department of obstetrics, George F. Geisinger Memorial Hospital, Danville, delivered the first George A. Ulrich Memorial Lecture, April 26, at Jefferson Medical College of Philadelphia. His subject was "The History of American Obstetrics." The lecture, which is named for Dr. George A. Ulrich, who died July 18, 1944, will be sponsored annually by the Epsilon charter of Alpha Kappa Kappa fraternity of Jefferson Medical College. Dr. Ulrich was clinical professor of obstetrics at Jefferson, where he graduated in 1901.

Program on Health Education.—On May 2 the Philadelphia Department of Public Health launched a concentrated year round educational campaign to improve the health of the citizens of Philadelphia. Attention is to be focused on pertinent facts concerning those diseases which constitute the greatest menace, and the medical schools, local professional groups and allied agencies are cooperating. A steering committee has been set up and the department of health will provide speakers and educational material, including sound motion picture films. The first program is devoted to tuberculosis and a slogan chosen to be used throughout the campaign is "*Is There Tuberculosis in Your Home? Find Out!*" Similar programs will be carried out for rheumatic heart disease, nutrition, child health, diabetes, cancer, venereal disease, labor, industry and industrial medicine, respiratory diseases, clubs, personal hygiene and mental hygiene.

RHODE ISLAND

Personal.—Dr. John F. Kenney, Pawtucket, has been installed as president of the New England Conference of Industrial Physicians, succeeding Dr. Daniel L. Lynch, Boston. Dr. Thomas P. Kendrick, Boston, is the president-elect.

Proposed Institute of Pathology.—The establishment of a central Institute of Pathology to serve many or all of the hospitals in Rhode Island has been proposed by the committee on university, hospital and medical society relations of the Rhode Island Medical Society. It is recommended that the staff of the institute be large enough so that each hospital can have the personal attention of experts for frozen sections, conferences, staff meetings, tumor clinics, teaching of interns and residents and perhaps some lecturing to student nurses. It was also recommended that the work of all technologists be supervised by experts in bacteriology and biochemistry, the hospital technologists to be kept up to date by periodic review and training at the central laboratories of the proposed institute. Under the proposed setup a system of residency in pathology in preparation for national board certification would be an important part of the organization. Men qualifying for this work would receive a part of their training, third or fourth year, as resident pathologists in the larger of the participating hospitals. The institute would have a board of directors representing participating hospitals and a medical advisory committee consisting of one representative from each participating hospital. According to the outline of the plan, two or more technologists would fill in at hospitals while their regular technologists were at the institute for additional training and during vacations. Surgical specimens could be collected each day and examined at the institute, and pathologists would go out from the institute to the hospitals for frozen sections and necropsies. All serologic tests would be done at the institute, as would less common and more com-

plicated chemical and bacteriologic procedures. The proposal suggests that costs be shared by participating hospitals on the basis of the number of beds or other arrangements made by the board of directors. Each hospital would continue to charge its own patients for laboratory work according to its own plan.

SOUTH CAROLINA

Personal.—Dr. Franklin L. Geiger, Columbia, assistant director of rural sanitation, state board of health, has been appointed medical director of a tuberculosis survey which is being carried on in South Carolina.——Walter L. Hard, Ph.D., assistant professor of histology, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, has been appointed assistant professor of anatomy at the Medical College of the State of South Carolina, Charleston, *Science* reports.

New President of State Society.—At the executive meeting of the council of the South Carolina Medical Association in Columbia, April 17, Dr. William Thomas Brockman, Greenville, was installed as president. Dr. William R. Wallace, Chester, had asked to be relieved of his activities as president. The action of the council was over the protest of Dr. Brockman, who took the position, it is reported, that the constitution and by-laws provided that his installation should occur at the annual meeting of the association and that, if Dr. Wallace wished relief and resigned, the vice president should automatically assume the presidency.

PUERTO RICO

University News.—Dr. Leland E. Hinsie, professor of psychiatry of the Columbia University College of Physicians and Surgeons, New York, gave a series of lectures on psychosomatic medicine at the School of Tropical Medicine in San Juan recently. Dr. Hinsie also addressed the Ponce District Medical Society on "The Person in the Body," the student body of the Polytechnic Institute at San Germán on "What Is Psychiatry?" and the students of social work at the University of Puerto Rico on "Psychosomatics in Social Work."

Funds for New Construction.—The legislative assembly of Puerto Rico recently passed bills for the construction of a new district charity hospital in Caguas to cost $1,500,000. This hospital is included in a six year financial plan of the government. Other legislation was passed appropriating $500,000 for expansion of the Psychiatric Hospital of Puerto Rico, Rio Piedras, and $500,000 for the Cancer Institute. Similar legislation provides for new additions to the Municipal Hospital at Trujillo Alto and one in Anasco. Plans allow for the construction of municipal hospitals in Naranjito, Corozal and Rincon.

GENERAL

International Surgical Assembly.—The fifth International Assembly of the International College of Surgeons and tenth anniversary of its foundation in Geneva, Switzerland, will be celebrated at the invitation and under the auspices of the Peruvian government and the Peruvian chapter of the International College of Surgeons in Lima, Peru, September 10-12. Dr. Francisco Graña, head of the surgical department of the University of Lima, Peru, is general chairman. Additional details may be obtained from Dr. Max Thorek, general secretary of the college, 850 Irving Park Road, Chicago.

Pan American Congress of Otolaryngology.—The first Pan American Congress of Oto-Rhino-Laryngology and Broncho-Esophagology, to be sponsored by the American Academy of Ophthalmology and Otolaryngology, will take place October 12-13 at the Palmer House, Chicago, immediately following the 50th anniversary meeting of the academy. If transportation conditions permit, a representative attendance is expected from all of the Latin American countries. The academy committee has been in touch with the officers of the various Latin American otolaryngologic societies and through them has received assurance of fullest cooperation in this congress. Dr. Chevalier L. Jackson, Philadelphia, is chairman of the committee on Pan American Congress of Otolaryngology of the academy.

Report of International Health Division.—Chief activities of the health commission of the International Health Division of the Rockefeller Foundation in 1944 were louse control studies in Mexico, typhus and malarial control in Italy, malarial work in Egypt, the study of infective jaundice and other infectious diseases, nutrition studies in England and the manufacture and distribution of yellow fever vaccine. These projects were financed by $1,000,000 earmarked for this emergency work out of the total budget of $3,200,000 for the entire division. In 1944 attention was concentrated on twelve specific diseases, the most important of which were yellow fever, malaria, typhus, and the deficiencies related to nutrition. Perhaps the most significant contribution of the International Health Division to public health has been in the field of public health education. In 1944 fairly substantial sums were appropriated for fellowships and travel grants and for the support of schools of hygiene and public health nursing and to support nursing schools in Canada, Colombia, Brazil, Ecuador, Argentina, Venezuela and Portugal. According to the annual report, the division carried on operations in twenty-three different countries. In its research program the report of the division indicates that significant was the discovery of active virus of yellow fever in a sick monkey, a marmoset. The animal was seriously ill and soon died after it had been trapped in June 1944 by the laboratory at Ilhéus, Brazil. Exhaustive laboratory tests showed conclusively that it had died of yellow fever. The episode is historically interesting, the report points out, because it is the first time in any country that a wild animal has been picked up in its natural habitat suffering from yellow fever and holds support to the thesis that yellow fever is primarily a disease of jungle animals transmitted by "jungle mosquitoes."

Services in Alcohol Hygiene.—The National Committee on Alcohol Hygiene, Inc., Baltimore, announces the availability of a bimonthly publication, *Alcohol Hygiene*, to be used for educational purposes. The committee also announces the following services:

Scientific medical worker speakers for lay and other seriously minded students of alcoholism
A research staff to organize and sponsor institutes
A clearing center for proper evaluation of published material by the scientific research committee and for distribution of acceptable reprints
Consultation service for Community Chest and other groups to aid in the organization of medically and psychiatrically supervised alcoholic diagnostic and treatment clinics.
Material on fundamental preventive measures based on practical medical psychiatric knowledge and experience, and on treatment of the individual who has an alcohol problem.

Dr. Robert V. Seliger, Baltimore, is executive director of the National Committee on Alcohol Hygiene and Robert M. Lindner, Ph.D., Lewisburg, Pa., director of educational and editorial projects. Dr. Lawrence F. Woolley, Baltimore, is director of clinical investigators, and Victoria Cranford is director of scientific investigators.

CANADA

The Jackson Memorial Lecture.—Dr. Stanley Cobb, Bullard professor of neuropathology, Harvard Medical School, Boston, delivered the tenth annual Hughlings Jackson Memorial Lecture of the Montreal Neurological Institute, May 9, on "Some Observations on Neurocirculatory Asthenia." Following the address, a specially bound volume of the "Selected Writings of John Hughlings Jackson," edited by James Taylor, was presented to the lecturer.

Changes in Health Personnel.—John T. Phair, D.P.H., Toronto, chief medical officer of the Ontario Department of Health, has been appointed deputy minister of health to succeed the late Dr. Bernard T. McGhie. Dr. Aquila Lapierre, Outremont, Quebec, has been appointed director general of the administrative and technical services of the ministry of health and social welfare of the province of Quebec. He held the position from 1936 to 1939.

Canadian Medical Meeting.—The seventy-sixth annual session of the Canadian Medical Association will be held at the Mount Royal Hotel, Montreal, June 11-15, under the presidency of Dr. John Harris McPhedran, Toronto. The preliminary program includes the following speakers:

Dr. Gabriel Nadeau, Rutland, Mass., Obstetrics and Gynecology in New France.
Dr. Albert D. Ruedemann, Cleveland, Use of Beta Radium in Lesions of the Eye.
Dr. Alexander E. MacDonald, Toronto, New Treatment of Entropion
Dr. Owen H. Wangensteen, Minneapolis, The Management of Bowel Obstruction
Dr. Reginald P. Vivian, Port Hope, Ont., minister of health for Ontario, Role of Public Health in the Practice of Medicine.
Surg.-Lieut. Comdr. Donald S. Mitchell, Experiences of Penicillin in Dermatitis in the Forces.
Dr. Frederick A. Willius, Rochester, Minn., Critical Evaluation of Methods of Diagnosis in Cardiac Disease, with Special Reference to Electrocardiography.

Other groups meeting simultaneously will include the Canadian Orthopaedic Association, Canadian Association of Radiologists, Canadian Society for the Study of Diseases of Children, Federation of Medical Women of Canada, Canadian Medical Protective Association, Canadian Society for the Control of Cancer and Royal College of Physicians and Surgeons of Canada.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 21, 1945.

The Physiologic Problem of Tickle Due to Wool Next the Skin

The director of research to the Wool Industries Association, Mr. B. H. Wilsdon, states in his annual report that a physiologic problem arises in the use of wool next the skin—that of tickle. This he describes as an *idiosyncrasy* for which no adequate explanation has been given. There is evidence that the reaction can be moderated when wool is given chemical treatment, such as that afforded by papain, which reduces the scaliness of the fiber. But he avoided claiming that this treatment produces "nontickle fiber." He believed that certain sensitive subjects may still react. The type of reaction may be quite dissimilar in different cases. The possibility must not be disregarded that some degree of tickle may be of hygienic value in stimulating the skin and controlling the peripheral circulation.

Consultants and the Proposed National Health Service

Two meetings of London consultants—one for those attached to hospitals south of the Thames and the other for those attached to hospitals north of the Thames—were called by the British Medical Association and the Royal Colleges to discuss the government's proposals for a national health service. Lord Moran, president of the Royal College of Physicians, who presided at the former meeting, urged that any central health services council should have real powers and not be a reproduction of many old advisory bodies with purely negative functions. Even more important was it that power should be given to the regional councils—expert bodies which would have to deal with local authorities. A committee of ninety-three representative of the Royal Colleges, the British Medical Association, the teaching hospitals and the universities had unanimously urged that these *councils should be planning bodies*, with advisory powers over finance. The crux of the whole problem was the medical profession's fear of interference by local authorities in clinical work. If the regions were based on university centers and the planning was done from these in such a manner as to afford consultants a voice, they would not be at the mercy of local bodies. As far as negotiations with the government had proceeded, any substantial concessions gained had been in the field of general practice, not in that of consultant or specialist practice.

Sir Alfred Webb-Johnson, president of the Royal College of Surgeons, who presided at the other meeting, concurred in Lord Moran's view as to the need for investing the regional councils with real powers. Among matters which he hoped would still be pressed on the government were the separation of the medical service from the general social insurance, the introduction of the service by stages (the development of the hospital system coming first) and the bringing together of all health services under the Ministry of Health. In closing the meeting he said that he thought we were getting near to an administrative structure which would be acceptable to the profession.

Sir Thomas Lewis

The death of Sir Thomas Lewis at the age of 64 has removed from British medicine a great investigator of disease. The method which he made his own and never tired of advocating he termed "clinical science," the main innovation being to bring the methods of the laboratory to the bedside. He condemned the usual separation of clinical and laboratory work into the hands of different persons. The clinician should perform both. He regarded the chief weapon of medicine to be the experimental method directly applied to man. His most important work was done on diseases of the heart. He was turned in this direction by the influence of Mackenzie, the leading cardiologist of the day, a position to which Lewis succeeded. Mackenzie was deeply interested in the mechanism of persistent cardiac irregularity, which his polygraphic studies led him to attribute to "nodal rhythm"; but the introduction of Einthoven's string galvanometer enabled Lewis (simultaneously with two Austrian workers) to show that the cause was auricular fibrillation. The discovery of auricular flutter followed. Experience in the war of 1914-1918 led to investigation of soldier's heart, which he embodied in the book "The Soldier's Heart and the Effort Syndrome." Other works, all of which became standard, were "Mechanism and Graphic Registration of the Heart Beat," "Clinical Disorders of the Heart Beat" and "The Blood Vessels of the Human Skin and Their Responses." He investigated dermatographia and produced evidence for the independent contractility of the capillaries. He described "a triple response" of the tissues of the skin to injury, due to release from the injured cells of a histamine-like substance. Experimental and clinical studies were embodied in a remarkable book entitled "Pain," in which he showed that pain arising from the skin was of a different kind from pain arising deeply. He showed the intervention of chemical agents in the production of cutaneous pain and tenderness. He attributed the latter to axon reflexes through fibers not previously known, which he termed "nocifensor." He also showed the segmental distribution of pain arising from deep structures. His work received early recognition in the United States. In 1914, at the early age of 33, he delivered the Herter lectures at Baltimore and a Harvey lecture in New York. For a period he was visiting physician attached to the Peter Bent Brigham Hospital, Boston. All his advances were made by the experimental investigation of disease in man, which he was always strenuously advocating. He was editor of two journals devoted to research: *Heart* from its foundation in 1908 and its successor *Clinical Science* until last year.

German Ill Treatment of British Prisoners of War

Plans are completed for the reception in this country of 160,000 liberated British prisoners of war. Camps are being prepared for them at coastal resorts with staffs of doctors, specialists and welfare officers. Many men will require building up after the malnutrition and ill treatment endured in German prison camps. Every man will receive the usual forty-two days' leave and double rations. A report from Hanover describes 100 prisoners too ill to move. Among them were 32 who had survived a grueling march of 500 miles across Germany to prevent their liberation by the approaching Allied army.

Marriages

FRANCIS LEO DENZER, Brooklyn, to Miss Marie Loretta Mooney at Flushing, N. Y., May 8.

WILLIAM CLARKE QUINN, Crisfield, Md., to Miss Jean Quinn of Statesville, N. C., March 31.

JOHN B. BLALOCK to Miss Margaret Ashe Tutwiler, both of Birmingham, Ala., April 14.

EDWARD M. POSER, Columbus, Wis., to Miss Elizabeth Ann Shearer of Edgerton recently.

HAL E. BENNETT, Troy, Tenn., to Miss Joan Ottilee Tabor of Belvidere, Ill., April 11.

LAWRENCE V. LITTIG, Madison, Wis., to Miss Sally Margaret Ebert, Cuba City, recently.

WILLIAM BROWN to Dr. Elizabeth L. Brown, both of New York, April 12.

HARRY A. SHEARER to Miss Violet Lundt, both of Beloit, Wis., recently.

Deaths

Walter Gray Crump Sr., ⊕ New York; New York Homeopathic Medical College and Hospital, New York, 1895; emeritus professor of surgery at his alma mater, now known as the New York Medical College, Flower and Fifth Avenue Hospitals; served as professor of surgery at the New York Polyclinic Medical School and Hospital and as professor of gynecology at the New York Medical College and Hospital for Women; member of the Academy of Pathological Science; member of the board of governors and fellow of the American College of Surgeons; director of the National Association for the Advancement of Colored People; a founder of the Broad Street Hospital, where he had been medical director and attending surgeon; a founder of the Beekman Street Hospital; consulting surgeon, Evangelical Deaconess and Prospect Heights hospitals, Brooklyn, Yonkers (N. Y.) General Hospital, Southside Hospital, Bay Shore, N. Y., Mount Vernon (N. Y.) Hospital, Dobbs Ferry (N. Y.) Hospital, Fitkin Memorial Hospital, Neptune, N. J., and the Flower and Fifth Avenue Hospitals; consulting gynecologist at the United Hospital in Port Chester, N. Y.; trustee, Howard University in Washington, D. C., and the Tuskegee Institute in Alabama; in 1934 received the honorary degree of doctor of science from the Albright College in Reading, Pa.; died in the Flower and Fifth Avenue Hospitals May 1, aged 75.

Charles Morgan McKenna ⊕ Chicago; Rush Medical College, Chicago, 1905; professor and head of the division of urology in the department of surgery at the University of Illinois College of Medicine which he had joined in 1913 as instructor in senior surgery; specialist certified by the American Board of Urology, Inc.; member of the American Association of Genito-Urinary Surgeons and the Institute of Medicine of Chicago; member and in 1922-1923 president of the Chicago Urological Society; member of the American Urological Association and past president of the North Central Branch; fellow of the American College of Surgeons; a captain in the medical corps of the U. S. Army during World War I; head of genitourinary surgery at the Research and Educational Hospitals and St. Joseph Hospital; attending urologist at the Norwegian-American Hospital; attending urologist at the Cook County Hospital from 1927 to 1938; contributed a chapter on "Tuberculosis of the Urogenital Tract" in Clinical Tuberculosis by Dr. Benjamin Goldberg; died May 13, aged 65, of coronary occlusion.

Henry W. Grady Shytles, Abilene, Texas; University of Tennessee College of Medicine, Memphis, 1914; president of the Taylor County Medical Society in 1930 and of the Scurry-Dickens-Kent-Garza-Borden-King-Stonewall Counties Medical Society from 1939 to 1943; member of the American Medical Association; during World War I associated with the U. S. Public Health Service, inspecting army camps throughout the country; for three years physician and surgeon for the Pima Indian reservation in Arizona; while residing at Snyder, Texas, served as chairman of the Procurement and Assignment Advisory Committee for that area; formerly medical superintendent and chief surgeon of the Snyder (Texas) General Hospital; at one time assistant city physician in Fort Worth; a captain in the medical corps, Army of the United States, from April 1943 to August 1943, when he was honorably discharged because of his physical condition; on the staffs of St. Ann and the Hendrick Memorial hospitals; died Nov. 16, 1944, aged 53, of coronary thrombosis.

James Thomas Wayson ⊕ Honolulu, Hawaii; University of California Medical School, San Francisco, 1891; surgeon in the U. S. Cutter Service from 1892 to 1895; member of the House of Delegates of the American Medical Association in 1905; served as assistant administrator and member of the board of health of Hawaii; city and county physician of Honolulu from 1911 to 1918 and general health officer of Hawaii from 1918 to 1931; in 1932 was instrumental in setting up a separate board of hospitals and settlement to administer the leprosy phase of public health; held the position of board physician from the time of its inception until his retirement in 1943; served as chairman of the Hawaii Territorial Medical Examiners; member of the American Academy of Dermatology and Syphilology; at one time physician in charge of the Kalihi Boys' Home and superintendent of the Kapiolani Girls' Home; died January 11, aged 74.

Archibald Henry Busby, New Canaan, Conn.; Columbia University College of Physicians and Surgeons, New York, 1898; decorated for gallantry in the Battle of San Juan Hill during the Spanish-American War; served in France with the New York Hospital Unit, Base Hospital number nine during World War I; fellow of the New York Academy of Medicine; charter member of the New York Roentgen Society; for many years head of the radiology department of the New York Hospital in New York, where since 1932 he had been consulting radiologist; at various times on the staffs of the Babies Hospital, French Hospital and St. Mary's Hospital for Children, all in New York; died April 25, aged 69, of heart disease.

James Herbert Lawson, New York; Columbia University College of Physicians and Surgeons, New York, 1902; one of the early officers of the medical reserve corps of the army, receiving his commission from President Taft in 1912; was with the American troops on the Mexican border in 1916; received a decoration from the French government for service during World War I; served at St. Vincent's and Lying-In hospitals; formerly attending surgeon at the Memorial Hospital and had been chief surgeon of the outpatient department at the Babies Hospital and of St. Mary's Hospital for Children; surgeon for many American Olympic teams; died April 25, aged 69, of coronary arteriosclerosis.

Edmond Henri Sauvignet ⊕ Laredo, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1898; formerly secretary and president of the Webb-Zapata-Jim Hogg Counties Medical Society; served as health officer of Webb County and of the city of Laredo; a charter member of the International Congress on Tuberculosis; examining physician for Webb County Draft Board during World Wars I and II; first resident physician and surgeon at the Santa Rosa Hospital in San Antonio from 1898 to 1900; on the staff of Mercy Hospital; district surgeon for the Missouri Pacific Railroad from 1901 to 1945; died January 27, aged 70, of uremia.

Rebekah Wright, Brookline, Mass.; Northwestern University Woman's Medical College, Chicago, 1896; member of the American Medical Association, American Psychiatric Association and the New England Society of Psychiatry; for many years associated with the Massachusetts State Department for Mental Diseases as a consultant in hydrology for all of the state's hospitals for mental and nervous diseases; since February 1, 1945 consulting hydrologist at the Connecticut State Hospital in Middletown, Conn., where she died March 29, aged 72, of arteriosclerotic myocarditis.

Charles Berger Campbell ⊕ Washington, D. C.; Georgetown University School of Medicine, Washington, 1894; also a pharmacist; major, medical corps, U. S. Army, not on active duty; served as chairman of the public health committee of the Federation of Citizens Associations of the District of Columbia and its delegate from the Medical Society of the District of Columbia; in 1944 was awarded the Evening Star Trophy for outstanding civic work; died in the Emergency Hospital February 5, aged 74, of uremia, hypertrophy of the prostate and pneumonia.

John George Abele, Portland, Ore.; University of Oregon Medical School, Portland, 1907; formerly city epidemiologist and city health officer; served during World War I; died in the Veterans Administration Facility, Roseburg, March 14, aged 74.

Homer C. Ballard, Lakewood, Ohio; Western Reserve University Medical Department, Cleveland, 1896; formerly on the staffs of the Lutheran and St. John's Hospital in Cleveland; on the staff of the Lakewood Hospital, where he died March 27, aged 77.

George Louis Bartruff, Brooklyn; Long Island College Hospital, Brooklyn, 1893; died March 10, aged 77.

Ira Floyd Bean, Melbourne, Fla.; Atlanta College of Physicians and Surgeons, 1912; member of the American Medical Association; died in a hospital at Jacksonville February 18, aged 59.

Theophilus Henry Boysen ⊕ Egg Harbor City, N. J.; Jefferson Medical College of Philadelphia, 1905; also a pharmacist; past president of the Medical Society of Atlantic County; served as medical examiner in the public schools, as a member of the board of health and at one time as councilman; died in the Jefferson Hospital, Philadelphia, March 30, aged 63.

Benjamin Harrison Breakstone, Chicago; Rush Medical College, Chicago, 1899; member of the American Medical Association; formerly professor of surgery at the Bennett Medical College; attending surgeon at the Cook County Hospital from 1902 to 1908; served on the staffs of the Mary Thompson Hospital for Women and Children, the People's Hospital and various other hospitals in Chicago; died April 23, aged 68.

William Lewis Colquhoun MacBeth, El Monte, Calif.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1909; member of the American Medical Association; died March 1, aged 58.

William Henry Dale, Eugene, Ore.; Rush Medical College, Chicago, 1904; member of the American Medical Association; past president of the Central Willamette Medical Society; served as a member of the board of health; at one time medical superintendent of the Harrisburg Private Hospital in Harrisburg; died March 14, aged 66.

James Francis Dennis ⊕ Waterloo, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; died March 29, aged 62, of carcinoma of the sigmoid.

Albert Powell Donoho, Merchantville, N. J.; Medico-Chirurgical College of Philadelphia, 1900; served during World War I; died in the Temple University Hospital, Philadelphia, February 16, aged 69.

Louis Warner Flanders ⊕ Dover, N. H.; University of Vermont College of Medicine, Burlington, 1885; past president of the New Hampshire Medical Society; honorary member of the Strafford County Medical Society; died January 16, aged 80.

Edward Richard Gookin ⊕ Washington, D. C.; Baltimore Medical College, 1906; served overseas during World War I; formerly clinical instructor in ophthalmology at the George Washington University School of Medicine and assistant and later instructor in clinical ophthalmology at the Georgetown University School of Medicine; died March 6, aged 62, of coronary occlusion.

Daniel Wesley Gray, Searcy, Ark.; Memphis (Tenn.) Hospital Medical College, 1908; died suddenly February 5, aged 65.

Forest Jackson Green, Mineola, Texas; Dallas Medical College, 1903; member of the American Medical Association; examining physician and member of a draft board during World War I; died January 11, aged 66, of coronary occlusion.

Thaxton Richardson Guill ⊕ Donelson, Tenn.; University of Nashville Medical Department, 1900; served as director of the Bank of Donelson; died March 22, aged 67, of heart disease.

William Dandridge Haden ⊕ Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1910; served three terms as mayor and twelve consecutive years as a member of the city council; member of the board of visitors of the University of Virginia; president of the National Bank and Trust Company; died in the University Hospital April 8, aged 60.

James Thomson Hardy ⊕ Brooklyn; New York Homeopathic Medical College and Hospital, New York, 1900; veteran of the Spanish-American War; on the staffs of the Bushwick, Lutheran and Wade hospitals; died in the Nassau Hospital, Mineola, March 10, aged 68, of arteriosclerotic heart disease, auricular fibrillation and hypertrophy of the prostate.

Richard Henry Harris, Elkins Park, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the American Medical Association; on the staff of the Abington Memorial Hospital, Abington, where he died March 29, aged 75, of cardiac insufficiency and cerebral thrombosis.

Victor Hugo Hasek, Cedar Rapids, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1916; member of the American Medical Association; city physician and health officer; served during World War I; on the staffs of the Mercy and St. Luke's hospitals; died February 25, aged 53, of cerebral embolism of the left middle cerebral artery.

Walton Hewetson, Groveport, Ohio; Columbus Medical College, 1888; died February 18, aged 78.

Edwin Carlton Higgins, Manchester, Conn.; Tufts College Medical School, Boston, 1925; member of the American Medical Association; interned at St. Francis and Hartford Isolation hospitals in Hartford; on the staff of the Manchester Memorial Hospital; died March 31, aged 47, of coronary occlusion.

Bayard Holmes, Chicago; Rush Medical College, Chicago, 1904; on the consulting staff of the Illinois Masonic Hospital; on the courtesy staffs of St. Luke's and Henrotin hospitals; life member of the Art Institute of Chicago; died March 13, aged 65, of congestive heart disease and angina pectoris.

John Howorth ⊕ Wilkes-Barre, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1909; fellow of the American College of Surgeons; past president of the Luzerne County Medical Society; served on the medical advisory board during World Wars I and II as well as on the surgical staff of the local induction center during the present war; chief of staff, Wilkes-Barre General Hospital; surgeon for the Lehigh Valley Railroad; died March 24, aged 65, of myocarditis.

Marion Mercer Hursh, Grand Rapids, Minn.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1908; served on the staff of the Itasca County Hospital; died January 20, aged 67.

Harvey Green Johnston, Pearisburg, Va.; University College of Medicine, Richmond, 1899; served as county medical examiner for the Selective Service during World Wars I and II; died March 21, aged 66.

Moses Randolph Kahn, Baltimore; University of Maryland School of Medicine, Baltimore, 1912; member of the American Medical Association; clinical professor of ophthalmology at his alma mater; formerly instructor of clinical ophthalmology at the Johns Hopkins University School of Medicine; served during World War I; at various times on the staffs of the Baltimore Eye, Ear and Throat Charity Hospital, Home for Incurables, Sinai Hospital and the U. S. Veterans Bureau; died January 11, aged 57.

James William Kautz, Cincinnati; Cincinnati College of Medicine and Surgery, 1890; died March 8, aged 80, of lobar pneumonia and grip.

Theodore Wilbert Kemmerer, Jackson, Miss.; State University of Iowa College of Medicine, Iowa City, 1901; for many years director of the state hygienic laboratory; at one time adjunct professor of clinical laboratory diagnosis at the University of Mississippi School of Medicine; formerly associated with the hygienic laboratory of the U. S. Public Health Service in Washington, D. C.; veteran of the Spanish-American War and World War I; died April 5, aged 67, of edema of the lungs and auricular fibrillation.

Albert Koehler, Baker, Ore.; Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau, Prussia, Germany, 1877; member of the American Medical Association; died March 1, aged 98.

Werner Adolph Reinhold Lagus, Warrenton, Ore.; Helsingfors Universitet Medicinska Fakulteten, Helsingfors, Finland, 1896; died in a hospital at Astoria March 19, aged 79, of coronary occlusion.

Francis James Lawler ⊕ Carthage, N. Y.; Albany Medical College, Albany, 1916; health officer; served overseas during World War I; died in the Syracuse Memorial Hospital, Syracuse, March 23, aged 53, of myelogenous leukemia.

Oscar Leslie Long, Portland, Maine; Baltimore Medical College, 1898; for many years member of the city health department in Baltimore; died March 9, aged 71, of pulmonary edema, cerebral hemorrhage and arteriosclerosis.

William F. MacLennan, Gloucester City, N. J.; Medico-Chirurgical College of Philadelphia, 1896; also a pharmacist; died in Trenton March 24, aged 76.

Clib B. May, Little Rock, Ark.; University of Louisville Medical Department, Louisville, Ky., 1914; member of the American Medical Association; died February 23, aged 64.

Luster Clark McCutcheon, Green Bank, W. Va.; Chattanooga (Tenn.) Medical College, 1910; served a term as mayor of Richwood; died April 26, aged 61.

Robert Davis McKinney, Troy, N. Y.; Chicago Homeopathic Medical College, 1894; died January 3, aged 75, of carcinoma of the head of the pancreas.

Allan McLean, Morganton, N. C.; University of Maryland School of Medicine, Baltimore, 1908; member of the American Medical Association; for many years on the staff of the State Hospital; died February 22, aged 60.

Jason E. Montgomery, Weslaco, Texas; Baylor University College of Medicine, Dallas, 1908; member of the American Medical Association; local surgeon for the Missouri Pacific Railway; died suddenly January 30, aged 73.

Carl G. Muehlmann, Pekin, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; also a pharmacist; for twenty years a surgeon for the Illinois Central Railroad; surgeon for the Pekin Terminal Railroad; for many years served on the U. S. Pension Board; until the time of his death examining physician for U. S. Civil Service applicants; health officer of Pekin; died in the Pekin Public Hospital March 13, aged 80.

Arthur Lapham Murray, Washington, D. C.; George Washington University School of Medicine, Washington, D. C., 1904; served during World War I; for many years medical adviser in the Bureau of Mines, Department of the Interior; died February 28, aged 63.

James Ball Naylor, Malta, Ohio; Starling Medical College, Columbus, 1886; at one time health commissioner of Morgan County; author of many books; died April 1, aged 84, of heart disease.

Herman J. Neubauer ⊕ Hinckley, Ill.; Chicago College of Medicine and Surgery, 1917; on the staffs of the DeKalb Public Hospital and St. Mary's Hospital in DeKalb, where he died March 23, aged 51, of fractured ribs received when he accidentally fell beneath the wheels of a farm machine on his farm.

William Peter Rice, Rhinelander, Wis.; Chicago College of Medicine and Surgery, 1915; died February 6, aged 63, of coronary occlusion.

Charles Orean Rickenbrode ⊕ Farrell, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; died February 10, aged 60.

Ivan Webster Riggins, Indianapolis; Kentucky University Medical Department, Louisville, 1906; University of Louisville Medical Department, 1907; medical examiner for the Indianapolis Life Insurance Company and Acacia Mutual Life Insurance Company; on the staffs of the City Hospital, St. Vincent's Hospital and the Methodist Hospital, where he died March 15, aged 71, of coronary occlusion.

William Ernest Risque, *Midway, Ky.; University of* Louisville Medical Department, Louisville, 1893; past president of the Midland Medical Society; died March 9, aged 85, of coronary sclerosis.

William Penn Roberts, Sioux Falls, S. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1894; honorary member of the South Dakota State Medical Association; member of the American Medical Association, died January 12, aged 75.

Thomas Peter Rothnem, Fargo, N. D.; *University of* Minnesota College of Medicine and Surgery, Minneapolis, 1912; specialist certified by the American Board of Radiology, Inc.; member of the Radiological Society of North America, Inc.; on the staffs of St. Luke's Hospital and Fargo Clinic; died January 19, aged 61.

Daniel Ralph Russell, Kansas City, Mo.; University Medical College of Kansas City, 1908; member of the American Medical Association; died March 22, aged 64.

Ord Ledyard Sands, Binghamton, N. Y.; *University and* Bellevue Hospital Medical College, New York, 1911; member of the American Medical Association; died January 23, aged 73, of coronary occlusion.

Eugene Schumaker, Rensselaer, Ind.; Rush Medical College, Chicago, 1934; interned at St. Joseph Hospital in Chicago; on the staff of the Jasper County Hospital; died March 12, aged 38, of coronary occlusion.

Charles Young Seagle ⊕ Bertrandville, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1904; died January 29, aged 67.

Sam L. Segraves, Era, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1889; died February 21, aged 91, of general senility.

Ebert T. Simpson, Butler, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1908; member of the American Medical Association; died January 2, aged 63, of coronary embolism.

Clyde Leroy Smith ⊕ Fremont, Ohio; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; past president of the Sandusky County Medical Society; since 1940 city health commissioner and registrar; on the staff of the Memorial Hospital; died February 28, aged 66, of coronary occlusion.

Dorland Smith ⊕ Bridgeport, Conn.; Yale University Medical School, New Haven, 1899; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, American Ophthalmological Society and the Association for Research in Ophthalmology, Inc.; fellow of the American College of Surgeons; on the staff of the Bridgeport Hospital; died February 5, aged 69, of carcinoma of the pancreas with metastases to the liver.

William Curtis Smith, Scottsville, N. Y.; University of the City of New York Medical Department, New York, 1881; member of the American Medical Association; for many years St. Lawrence County coroner and supervisor of the town of Stockholm, where he was also health officer; served as director of the First National Bank of Winthrop from its inception in 1916 until his resignation in 1942; died March 2, aged 87, of lobar pneumonia.

Fred Clifford Soper, Dilworth, Minn.; State University of Iowa College of Medicine, Iowa City, 1905; coroner of Clay County; on the staff of the St. Ansgar Hospital in Moorhead; died in St. John's Hospital, Fargo, N. D., February 7, aged 63, of pneumonia.

Albert A. Sprague, Silverton, Ohio; Medical College of Ohio, Cincinnati, 1898; for many years secretary of the Silverton Building and Loan Company; died February 19, aged 82.

Neile Spooner Storer ⊕ Republic, Ohio; Northwestern University Medical School, Chicago, 1906; served as mayor of Republic; on the staff of the Mercy Hospital in Tiffin; died February 28, aged 61, of coronary thrombosis.

Ernest Bernard Studer, Los Angeles; St. Louis Medical College, 1890; University of Pennsylvania Department of Medicine, Philadelphia, 1891; served on the staff of St. Vincent's Hospital; died March 19, aged 78, of cerebral hemorrhage.

Gustave Herman Taubles ⊕ Carmel, Calif.; Cooper Medical College, San Francisco, 1908; served as chairman of the Carmel chapter of the American Red Cross; died January 24, aged 64.

John Allen Thomson, Sioux City, Iowa; Sioux City College of Medicine, 1904; member of the American Medical Association; formerly a member of the county board of health; member of the Selective Service Board number 2; died February 28, aged 65, of cerebral hemorrhage.

Clarence Scott Trimble ⊕ Emporia, Kan.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1902; member of the American Academy of Ophthalmology and Otolaryngology and the Kansas City Eye, Ear, Nose and Throat Society; served during World War I; at one time health officer of Buckeye, Iowa; on the staffs of the Newman Memorial and St. Mary's hospitals; ophthalmologist for the Santa Fe Railroad for twenty-two years; died March 16, aged 67, of carcinoma of the stomach.

Joseph C. Tufford, San Diego, Calif.; Detroit College of Medicine, 1894; died February 16, aged 77, of uremia.

Urania Tyrrel, Philadelphia; New York Medical College and Hospital for Women, New York, 1890; died in the Hahnemann Hospital January 29, aged 77, of arteriosclerosis and coronary artery insufficiency.

Thomas Mervelle Watson ⊕ Greenville, N. C.; Tulane University of Louisiana School of Medicine, New Orleans, 1919; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; formerly vice president of the North Carolina Pediatric Society; served during World War I; interned at St. Vincent's Hospital in Birmingham, Ala., and St. Louis Children's Hospital in St. Louis; on the staff of the Pitt General Hospital; died March 12, aged 50, of coronary thrombosis.

Morris Weissberg ⊕ Brooklyn; Long Island College Hospital, Brooklyn, 1914; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served in France during World War I; consulting physician at St. Luke's Hospital in Newburgh and at the Bushwick and Evangelical Deaconess hospitals; died March 17, aged 58, of coronary occlusion.

John Westall, Fall River, Mass.; Dartmouth Medical School, Hanover, N. H., 1892; served as president of the board of aldermen and a member of the board of health; died in the Truesdale Hospital, March 15, aged 83, of pyelonephritis and hypertrophy of the prostate.

Furman Chairs Whitaker, Bradenton, Fla.; the Hahnemann Medical College and Hospital, Chicago, 1895; died in the Tampa Municipal Hospital, Tampa, March 8, aged 88, of injuries received in a fall.

Reuben H. Wood, Stockton, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1896; on the staffs of the Deaconess and St. Francis hospital in Freeport; died March 2, aged 85, of angina pectoris.

Henry Wilson Wooden, Orlando, Fla.; University of West Tennessee College of Medicine and Surgery, Memphis, 1914; Meharry Medical College, Nashville, 1916; died February 12, aged 53, of injuries received in an automobile accident.

Sarah Delia Wyckoff ⊕ Kingston, Pa.; Johns Hopkins University School of Medicine, Baltimore, 1899; died in the Wilkes-Barre General Hospital, Wilkes-Barre, Pa., March 19, aged 72, of acute cardiac failure and ruptured appendix.

George W. Young, Pennington Gap, Va.; Hospital College of Medicine, Louisville, Ky., 1898; died March 2, aged 70, of hypertensive heart disease.

DIED WHILE IN MILITARY SERVICE

Arthur Eynon Beddoe ⊕ Surgeon, Lieutenant Commander, U. S. Navy, retired, San Diego, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1910; entered the medical corps of the U. S. Navy as a lieutenant (jg) on May 21, 1914; retired on May 1, 1937 for incapacity resulting from an incident of the service; returned to active duty; promoted to the temporary rank of commander on Jan. 3, 1942; died July 18, 1944, aged 59.

James Russell Bell ⊕ Canonsburg, Pa.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1932; interned at the Mercy Hospital in Pittsburgh; began active duty as a captain in the medical corps, Army of the United States, on June 5, 1942; later promoted to major; died near Prestwick, Scotland, in an aircraft crash in routine flight, Dec. 10, 1944, aged 40.

John Birge Byers, Grand Rapids, Mich.; Northwestern University Medical School, Chicago, 1941; interned at St. Luke's Hospital in Chicago; formerly a fellow in medicine in the Mayo Foundation, Rochester, Minn.; began active duty as a first lieutenant in the medical corps, Army of the United States, on June 6, 1942; later promoted to captain; a flight surgeon attached to an aircraft group in England, where he died Dec. 20, 1944, aged 32, of acute hemorrhagic pancreatitis.

Richmond Cranston Holcomb ⊕ Medical Director, Captain, U. S. Navy, retired, Upper Darby, Pa.; Long Island College Hospital, Brooklyn, 1896; entered the navy in December 1898 with the rank of lieutenant (jg); while in Culebra, Virgin Islands, carried on special investigations in connection with intestinal parasites, especially schistosomiasis; the fluke was shown to be a distinct species, leading Sambon to naming it Schistosomum mansoni; assistant to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., from April 1914, until April 1918; was medical officer in command of the U. S. Naval Hospital, League Island, Philadelphia, was the representative of the Bureau of Medicine and Surgery in connection with the building of the U. S. S. *Relief*, the first hospital ship, which he served as its first commanding officer; was in command of the Naval Hospital, Norfolk, Va., from August 1926 to June 1930, with additional duty as medical officer in command, Pharmacist's Mates School, Naval Hospital, Norfolk; district medical officer in the Fourth Naval District, and from January until December 1931 commanded the Naval Hospital, League Island, Philadelphia; retired in December 1932; before being recalled to the service in 1943, was state medical director for Delaware and Chester counties, Pennsylvania; besides the Navy Cross, awarded him in World War I, received numerous honors for his activities in the Spanish-American War, the Boxer Rebellion and the Philippine campaign; an authority and liberal writer on venereal diseases, leprosy and bone surgery; a delegate representing the Navy Department at the fifteenth International Congress of Hygiene and Demography and Second Pan American Scientific Congress; a member of the War Relief Board, American Red Cross, 1914-1917, of the General Medical Board of Council of National Defense, 1917, of the Board for Development of Navy Yard Plans, 1916, of the Interbureau Logistics Committee, 1916-1917, of the General Munitions Board organized at the outbreak of World War I; in charge of the exhibit of the Medical Department of the Navy at the sesquicentennial exhibition, Philadelphia, which was awarded a gold medal; member of the American Association for the Advancement of Science, American Association of the History of Medicine, American Social Hygiene Association, Association of Military Surgeons of the United States and the American Public Health Association; fellow of the American College of Surgeons; senior medical officer for the V-12 program at the University of Pennsylvania; died suddenly in Darby April 2, aged 70, of edema of the lung.

Francis Rivers Lawther, Wilmington, N. C.; University and Bellevue Hospital Medical College, New York, 1934; member of the American Medical Association and the South Carolina Medical Association; fellow of the American College of Surgeons; interned at the Bellevue and Roosevelt hospitals in New York, where he served a residency at the Memorial Hospital for the Treatment of Cancer and Allied Diseases; served as medical director of the Berkeley County Hospital in Moncks Corner, S. C.; commissioned a captain in the medical corps, Army of the United States, on May 21, 1942; later promoted to major; chief surgeon at Kelly Field, Texas; killed in an airplane accident in Tucson, Ariz., January 20, aged 37.

Carl Henning Mattson ⊕ St. Paul; University of Minnesota Medical School, Minneapolis, 1930; served an internship and residency at the Ancker Hospital; began active duty as a lieutenant commander in the medical corps of the U. S. Naval Reserve on Sept. 24, 1943; died in the Pacific area, January 15, aged 43, of a generalized gasoline burn received in a plane crash while on his way back to the Admiralties following his participation in the Luzon invasion.

Frank Hugh Maxwell ⊕ Mansfield, Ohio; University of Michigan Medical School, Ann Arbor, 1930; served an internship at St. Luke's Hospital in Cleveland and a residency at the Mansfield General Hospital; began active duty as a captain in the medical corps, Army of the United States, on April 26, 1942; died in Mindora, P. I., March 7, aged 39.

Ned Robert McKrill, Weston, Mass.; Tufts College Medical School, Boston, 1942; diplomate of the National Board of Medical Examiners; served an internship and residency at the Charity Hospital in New Orleans; began active duty as a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on Oct. 10, 1944; accidentally drowned in the Pacific area February 1, aged 30.

Samuel Fletcher Parker ⊕ Colonel, M. C., U. S. Army. Jackson, Miss.; Hospital College of Medicine, Louisville, Ky., 1905; served during World War I; entered the medical corps of the regular U. S. Army as a major in 1920; promoted to lieutenant colonel in 1937; later promoted to colonel; stationed in Hawaii for six years; in 1925 was transferred to Western Reserve University School of Medicine in Cleveland, where for five years he was professor of military science and tactics; chief of the pediatric service at the Army General Dispensary in Washington, D. C., from 1930 to 1935 and chief of the outpatient department at Walter Reed Hospital from 1939 to 1941; chief of the medical service at Fort Monroe, Va., from 1935 to 1937, serving in the same capacity at Gorgas Hospital in Ancon, Canal Zone, from 1937 to 1939 and at La Garde General Hospital, New Orleans, from 1941 to 1943; supervised the building of Foster General Hospital, becoming its first commanding officer in 1943; died in the Kennedy General Hospital, Memphis, Tenn., February 6, aged 62, of heart failure following pneumonectomy.

Warren David Robbins, Cape May, N. J.; Cornell University Medical College, New York, 1926; member of the American Medical Association; past president, secretary and treasurer of the Medical Society of Cape May County; diplomate of the National Board of Medical Examiners; served as county physician and police surgeon; interned at the Philadelphia General Hospital and served a residency at St. Christopher's Hospital for Children, Philadelphia; began active duty as a captain in the medical corps, Army of the United States, Sept. 21, 1942; died in Italy Aug. 9, 1944, aged 43, of acute subarachnoid hemorrhage.

Robert Sanderson ⊕ Arlington, Va.; Harvard Medical School, Boston, 1932; member of the Massachusetts Medical Society; diplomate of the National Board of Medical Examiners; interned at the Beverly Hospital in Beverly, Mass., and the Boston City Hospital; commissioned a lieutenant in the medical corps of the U. S. Naval Reserve on Aug. 8, 1942; stationed in the Navy Department in Washington, D. C.; died February 21, aged 41.

Karl McCormick Scott, Lakewood, Ohio.; University of Michigan Medical School, Ann Arbor, 1912; member of the American Urological Association; served during World War I and later in the regular U. S. Navy; commissioned a lieutenant commander in the medical corps, U. S. Naval Reserve, on July 8, 1944; died in the U. S. Naval Hospital, Portsmouth, Va., Sept. 29, 1944, aged 54, of atrophic cirrhosis of the liver.

Correspondence

IRREVERSIBLE ORGANIC CHANGES IN CASES OF PSYCHIATRIC DISTURBANCE

To the Editor:—Col. Howard A. Rusk, chief of the Convalescent Service Division, Office of the Air Surgeon, Army Air Forces, has referred to us the following problem:

"From observations in the field of 'operational fatigue,' stress reaction, anxiety state from combat and so on, there are certain endocrinologic and physiologic changes, some of which are apparently irreversible even after the psychiatric problems have been adequately treated. All pertinent data on this subject with its interpretation by experts in the field, research projects and any other material or work that could be undertaken to increase the knowledge in this field would be deeply appreciated."

I would welcome any further citations in this field.

Sincerely yours,

DAVID R. SALMON, 1775 Broadway, New York 19.
Executive Director, National
Council on Rehabilitation.

TESTS FOR URINARY BILIRUBIN

To the Editor:—After reading the editorial entitled "Methylene Blue Test for Urinary Bilirubin" in THE JOURNAL, April 21, it seemed probable that a practical solution of the clinical problem of detecting small amounts of bile in the urine had been attained. According to the recent article by Myers (*J. Indust. Hyg. & Toxicol.* **27**:52 [Feb.] 1945), whose work is based on that of Franke and of Fellinger and Menkes (*Wien. klin. Wchnschr.* **46**:133 [Feb.] 1933), when 2 drops of Loeffler's methylene blue are added to 10 cc. of urine containing bilirubin the urine turns a brilliant green. Consequently the occurrence of such a "positive" test with the second normal urine specimen which we tested according to directions was disturbing. As the specimen, though containing no bile, was a concentrated, yellow sample from a normal subject, it appeared to be possible that the "positive" test was entirely nonspecific for bilirubin.

That a chemical reaction with bilirubin is clearly not involved was demonstrated by the fact that "positive" tests were observed whenever distinctly yellow but bile free specimens of urine from normal persons were tested according to Myers' directions. Moreover, when a bile containing urine was diluted with water to the same strongly yellow color as that of a concentrated normal urine containing no bile, the addition of methylene blue to each gave identical green colors. Finally, various shades of green were obtained with solutions of such different blue pigments as Loeffler's methylene blue, brilliant cresyl blue or prussian blue in such yellow or reddish yellow liquids as meat infusion broth or aqueous solutions of potassium dichromate, ferric chloride, istizin (dihydroxyanthraquinone) or hemolyzed blood.

Fellinger and Menkes, as well as Myers, expressed uncertainty but recognized that the test probably depended on a mixture of pigments. That such an optical effect was largely, if not wholly, responsible for the change of color of these dyes from blue to green when placed in the yellow liquids was made clear by the following simple experiment:

Ten cc. of distilled water was placed in a test tube, and in two similar test tubes were placed 10 cc. of one of the aforementioned distinctly yellow liquids. To one of the tubes containing the yellow liquid were added 2 drops of Loeffler's methylene blue. To the tube containing distilled water was added the same amount of dye. Now, when the test tube containing the blue dye in distilled water was viewed in daylight through the test tube containing the yellow liquid, it appeared to have exactly the same green color as did the tube of yellow liquid to which the blue dye had been added directly.

According to Myers, "the only known false positive tests encountered in these tests were found in urine containing blood and in several cases where there was an elevated temperature above 101 F." A few drops of blood hemolyzed in 10 cc. of distilled water give a yellowish red solution with slight turbidity. The urine of febrile patients is often concentrated and yellow or yellowish red. Istizin, an orange-yellow cathartic drug, when secreted in the urine also gives a false positive according to Fellinger and Menkes. However, from our experiments it appears that any sufficiently yellow liquid or urine, whether containing bilirubin or not, will give a "positive" test. Consequently it is disappointing to be forced to the conclusion that the methylene blue test merely substitutes, for the problem of whether a urine is more or less yellow, the equally subjective question as to whether after the addition of methylene blue the sample of urine appears more green than blue. Unfortunately for the usefulness of the test in the clinic, bilirubin is only one of several substances which may impart, when present in sufficient concentration, a yellow color to normal or pathologic urines.

JANET WATSON, M.D.
MANSON MEADS, M.D.
W. B. CASTLE, M.D.
Thorndike Memorial Laboratory,
Boston City Hospital,
Boston.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, May 19, page 227.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, July 16-18. Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Philadelphia, June 6-8 and Chicago, June 27-29. San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, May 28. Sec., Dr. Paul Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY: *Part II. Oral.* Atlantic City, June 13-19. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: New York, June 13-16; Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, October. Final date for filing application is Aug. 1. Sec., J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Failure to Sterilize Open Wound Before Placing Fractured Leg in Cast.—The plaintiff, a boy of 19, was struck by an automobile in Virginia, Jan. 17, 1942, and was thrown into a sandy ditch, suffering a compound comminuted fracture of the right leg, just below the knee. He was taken to a hospital in Williamsburg and given temporary attention. January 19 the defendant physician, who "specializes in bone and joint surgery," took charge of the case. According to the plaintiff there was an open wound in his lower leg with the broken bone protruding, and the defendant did nothing to sterilize or cleanse the wound except to wipe off the blood and then immediately put on a closed cast extending from the patient's toes to his groin. Thereafter gravel, sand and pus came out from the cast at the top at the groin. Eighteen days after the application of the cast the patient's brother-in-law cut an opening in the cast over the wound, and pus and sand came from the opening. Subsequently the defendant placed another cast on the leg and left a window in it for dressing. The plaintiff returned to his home in North Carolina March 6 and consulted other physicians, who on April 5 performed an operation on the leg, removing pieces of bone. Apparently on the back of the leg along which the pus had run the epidermis had been damaged or removed as a result of a maliguant infection that had set in. Eventually the right leg became about an inch shorter than the other. Subsequently the patient instituted an action for malpractice against the defendant, alleging that the physician failed to use reasonable care and diligence and failed to exercise his best judgment and skill in treating him, resulting in increased pain to the patient, necessitating the operation performed in North Carolina, and causing the shortening of the leg. At the trial there was medical testimony that a failure to disinfect and cleanse the wound and limb would be improper treatment, that it would not be proper to put a cast on the leg without sterilizing the wound and that failure to sterilize an open wound with sand in it would tend to set up or increase infection. Evidence was presented on behalf of the defendant tending to show that he had properly cleaned and sterilized the wound and had treated his patient in the best approved manner. At the close of the evidence the trial court sustained a motion for a nonsuit and dismissed the action. The patient then appealed to the Supreme Court of North Carolina.

The only question presented, said the supreme court, is whether or not there was sufficient evidence adduced at the trial to require the submission of the case to the jury. On a motion for judgment of nonsuit the defendant's evidence cannot be considered unless favorable to the plaintiff, and the plaintiff is entitled to every fact and inference of fact pertaining to the issues involved which reasonably may be deduced from the evidence. The plaintiff was injured in Virginia and was treated by the defendant in that state. It follows therefore that in an action for damages for malpractice the standard of the physician's duty in the premises as affecting his liability for negligence must be determined by the law of the place in which the tort complained of was committed. The court accordingly cited a number of applicable decisions of the Supreme Court of Appeals of Virginia and from them concluded that the pertinent law in Virginia is as follows: A physician is bound to bestow on the treatment of his patient such reasonable and ordinary skill and diligence as those practicing in the same general line ordinarily exercise in like cases and one who accepts employment as a specialist must not only possess that degree of skill and knowledge ordinarily possessed by those engaged in that specialty but must also exercise his best judgment in the application of his skill and in the use of ordinary care. That degree of skill and care is to be exercised both in the performance of the operation and in the subsequent necessary treatment following. A physician, however, is not an insurer of a cure or even of beneficial results, nor is he held to the highest degree of care known to his profession. The mere fact that his treatment was not successful or was deleterious will not alone raise a presumption of negligence. The physician must exhibit only that degree of skill and diligence employed by the prudent practitioner in his field. The standard for the measurement of the skill exercised is to be shown largely by the testimony of expert witnesses, and where there is conflicting testimony of the expert witnesses as to the standard of professional skill and care, as well as to the ultimate facts on which the expert evidence is based, a question for the consideration of the jury is presented.

The principles just announced, continued the North Carolina court, are not in conflict with the standards of professional conduct established by the decisions of this court. For instance, it has been repeatedly held in North Carolina that a physician who undertakes to treat a patient implies that he possesses the degree of professional learning, skill and ability that others similarly situated normally possess; that he will exercise reasonable care and diligence in the application of his knowledge and skill to the patient's care; and exert his best judgment in the treatment and care of the case entrusted to him. *Nash* v. *Royster*, 189 N. C. 408, 127 S. E. 356; *Covington* v. *Wyatt*, 196 N. C. 367, 145 S. E. 673; *Lippard* v. *Johnson*, 215 N. C. 384, 1 S. E. (2d) 889. Accordingly this court has held that a physician may be held liable for an injury to his patient only when the injurious result flows proximately from want of that degree of knowledge and skill ordinarily possessed by others of his profession, or from the omission to exercise reasonable care and diligence in the application of his knowledge and skill to the treatment of his patient. *Davis* v. *Wilmerding*, 222 N. C. 639, 24 S. E. (2d) 337; *Groce* v. *Myers*, 224 N. C. 165, 29 S. E. (2d) 553. Specifically in the Davis case, supra, this court said:

> A departure from approved methods in general use, if injurious to the patient, suffices to carry the case to the jury on the issue of negligence.

Inferences of want of due care may be drawn from evidence tending to show that harmful foreign substances were introduced into a patient's body during surgical operations and left there. *Pendergraft* v. *Royster*, 203 N. C. 384, 166 S. E. 285; *Mitchell* v. *Saunders*, 219 N. C. 178, 13 S. E. (2d) 242. Applying these principles, it is apparent that, while there was no evidence adduced at the trial that the physician defendant did not possess requisite knowledge and skill in his profession, the plaintiff did offer some evidence of negligence on the part of the defendant with respect to his failure to cleanse and sterilize the open wound before applying the closed cast.

The physician, however, sought to justify the action of the trial court in sustaining a nonsuit on the ground that there was no substantial evidence that any negligence in this respect was the proximate cause of the result complained of. While all of the injurious results, answered the court, complained of may not be attributed to the negligence of the attending physician, if established, we think there is some evidence tending to show that suffering on the part of the patient was aggravated, another operation necessitated, and the epidermis on the patient's leg removed as a result of malignant infection set up or increased by the physician's want of due care as alleged. While the physician's evidence tended to deny the facts alleged by the patient, as well as the inferences and conclusions therefrom on which the patient's action was based, we think there was sufficient evidence produced to warrant submission of the case to the jury and that the trial court was in error in granting the motion for nonsuit.

Accordingly the judgment in favor of the physician was reversed and the case remanded for a new trial.—*Buckner* v. *Wheeldon*, 33 S. E. (2d) 480 (N. C., 1945).

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

69:71-140 (Feb.) 1945

Clinical Appraisal of Infants' Head Size. J. D. Boyd.—p. 71.
*Immunity to Tetanus Induced by Third Dose of Toxoid Four Years After Basic Immunization, Based on Study of 25 Allergic Children. M. M. Peshkin.—p. 83.
Changes in Vibratory Sense of Patients with Poliomyelitis as Measured by Pallesthesiometer. W. O. Frohring, P. M. Kohn, J. F. Bosma and J. A. Toomey.—p. 89.
Normal Standards in Treatment of Young Persons with Diabetes. J. H. Barach.—p. 92.
*Erythroblastosis Fetalis in Mothers with Rh Positive Blood: Report of 6 Cases, with Comment on Isoimmunization with A and B Agglutinogens. S. H. Polayes.—p. 99.
Hemorrhagic Uremia. M. G. Peterman.—p. 103.
Congenital Ileal Atresia with Gangrene, Perforation and Peritonitis in Newborn Infant: Staged Operations: Obstructive Resection, Ileocolostomy and Excision of Exteriorized Ileum. E. E. Arnheim.—p. 108.

Immunity to Tetanus.—Peshkin administered to 25 allergic children, four years after completion of the basic immunization with two 0.5 cc. doses of combined alum precipitated diphtheria and tetanus toxoids, a third, or "booster," dose of 0.5 cc. of alum precipitated tetanus toxoid alone. No febrile or systemic allergic reaction occurred. Prior to the administration of the "booster" dose and from one to six months thereafter, reactions to scratch tests with undiluted combined alum precipitated diphtheria and tetanus toxoids and with alum precipitated tetanus toxoids alone gave negative results. The injection of a third or "booster" dose was followed in all instances within one month by an adequate tetanus antitoxin titer. This titer was always higher and lasted for a much longer period than that which followed basic immunization as well as that which followed administration of a "booster" dose three to fifteen months after basic immunization. The titer was comparable to the maximum antitoxin response following a "booster" dose of toxoid given two years after the basic immunization. The highest antitoxin values thus far obtained followed a "booster" dose injected three years after the basic immunization. In a child with basic immunization with two doses of combined alum precipitated diphtheria and tetanus toxoids, the third injection to be administered two to four years later should be of alum precipitated tetanus toxoid alone in order to keep local and systemic allergic reactions at the minimum level.

Erythroblastosis Fetalis in Mothers with Rh Positive Blood.—Polayes reports 2 cases of erythroblastosis in detail. The 2 fulfil all the clinical criteria for the diagnosis of erythroblastosis fetalis (icterus gravis neonatorum). One patient recovered after a transfusion of blood; the other died despite similar therapy. Necropsy showed the anatomic changes of erythroblastosis fetalis, including kernicterus. In both cases the mother's blood group was group O, Rh positive and the child's group A, Rh positive. The Rh factor and all its known variants, as well as the Hr antigen, were excluded as possible immunizing antigens. In both cases the anti-A agglutinin in the mother's serum showed a high titer (1:700 and 1:750), a fact which strongly suggests isoimmunization of the mother with the A antigen of the baby. Although more statistical data are required to establish the frequency of such cases, nevertheless it is believed that (*a*) isoimmunization by the A and B agglutinogens may occur and that (*b*) erythroblastosis fetalis may result from A or B isoimmunization by a mechanism similar to that already established for the Rh factor.

American Journal of Ophthalmology, Cincinnati

28:243-354 (March) 1945

Ariboflavinosis. Ida Mann.—p. 243.
Space Eikonometer Test for Aniseikonia. A. Ames Jr.—p. 248.
Perforating Ocular Injuries. A. C. Snell Jr.—p. 263.
Trachoma Virus and Morphology of Inclusion Bodies. A. Loewenstein.—p. 282.
Iodide Therapy for Senile Macular Degeneration. R. G. Laird.—p. 287.
Errors in Diagnosis of Intraocular Tumors (Suspected or Real). W. E. Bruner.—p. 297.
Some Observations on Chemical Nature of Pterygium. H. H. Beard and T. J. Dimitry.—p. 303.
Bacteriologic Study of Human Conjunctival Flora. F. H. Rodin.—p. 306.

Annals of Internal Medicine, Lancaster, Pa.

22:161-334 (Feb.) 1945

*Treatment of Addison's Disease by Implantation Method. C. F. Kemper.—p. 161.
Perspectives of Psychiatry.. W. C. Menninger.—p. 170.
Cholelithiasis in Sickle Cell Anemia. H. S. Weens.—p. 182.
Studies on Pathophysiology of Sickle Cell Disease. R. C. Lowe and C. C. Adams.—p. 192.
Treatment of Obesity by Appetite Control: Use of Autonomic Substances and Their Synergists. L. Pelner.—p. 201.
Evaluation of Erythrocyte Sedimentation Test in *Leprosy: Statistical Study of More than 2,000 Tests in More than 500 Patients. G. H. Faget.—p. 213.
Syncope on Exertion: Relationship to Coronary Artery Disease. H. T. Engelhardt and W. A. Sodeman.—p. 225.
*Calcific Aortic Valve Stenosis: Clinicopathologic Correlation of 22 Cases. N. E. Reich.—p. 234.
Aneurysms of Abdominal Aorta. J. Epstein.—p. 252.

Implantation Therapy of Addison's Disease.—Kemper recommends a daily dose of from 3 to 6 Gm. of sodium chloride and elimination of foods rich in potassium. If the patient is not able to carry on in his usual occupation, daily injection of desoxycorticosterone acetate should be begun until the adequate daily dosage is determined. Sodium chloride treatment should be continued. Within two or three months just enough pellets should be implanted to meet the patient's calculated need. It has been determined that one pellet of desoxycorticosterone acetate, weighing 125 mg., when implanted under the skin, gives off approximately 0.5 mg. of the hormone in twenty-four hours. If the patient's daily dosage requirement has been determined to be 5 mg. of the steroid compound, it will require implantation of ten pellets to meet his daily hormonal needs. The sodium chloride treatment should be continued. Pellets should be reimplanted about once a year. De Maio suggests implantation by means of a small trocar and glass rod obturator. The method reduces the length of the skin incision and simplifies the implantation technic. Symptoms that may develop because the implanted pellets fail to regulate the carbohydrate metabolism should be corrected by dietary supervision and supplemental adrenal extract injections. The complication of crises should be met by supplemental sodium chloride, adrenal extract and additional synthetic hormone.

Calcific Aortic Valve Stenosis.—Reich studied 22 necropsies in cases of pure calcific aortic valve stenosis found at Kings County Hospital from 1934 to 1942. Rheumatic fever and arteriosclerosis have been established as the etiologic factors. Subacute bacterial endocarditis with calcification is a rarer cause. The occurrence was four times greater in males than in females in the rheumatic group. Arteriosclerotic involvement occurred seven times more frequently among males. Dizziness and syncope were due to cerebral anemia. The anginal attacks were due to myocardial ischemia. Left ventricular failure manifested itself frequently in varying degrees of dyspnea. Reasons for the failure to make an accurate diagnosis were the misinterpretation of the murmur, the confusion caused by the presence of other murmurs and the lack of corroborative findings, such as a systolic thrill and absence of an aortic second sound. The presence of apical murmurs during systole was either due to transmission from the base or due to a relative mitral insufficiency caused by the dilatation of the left ventricle. Presystolic murmurs at the apex were of the Austin-Flint type. The pulse pressure was usually normal or decreased but was sometimes increased because of concomitant aortic regurgitation or hypertension. Clinical enlargement of the heart closely paralled the weight, which was increased considerably. Fluoroscopy and roentgenographic examination is capable of almost doubling the frequency of diagnosis. Left axis deviation and

T wave negativity were helpful in differentiating aortic insufficiency and mitral lesions, since these tend to produce hypertrophy in the right chambers as well, with resultant right ventricular strain The degree of calcification closely paralleled the degree of stenosis. Cardiovascular and extracardiovascular causes of death were about equally divided. In the absence of hypertension and definite mitral valve involvement a systolic murmur at the aortic area should suggest calcific aortic valve stenosis.

Archives of Surgery, Chicago

50:63-124 (Feb) 1945

Testicular Tumors V. Vermooten —p 63.
Early Repair of Neural Wounds with Penicillin Therapy. N. C. Norcross —p 67.
*Convulsive Factor in Commercial Penicillin A E Walker and H C. Johnson, with technical assistance of W H Funderburk —p 69.
Ménière's Disease in a Deaf Mute W E Dandy —p 74
Syndrome of Trauma to Psoas Muscle E Michelson —p 77
Experience with Calculus of Bladder in North Carolina P B Price —p 82
Masked Traumatic Rupture of Spleen J K Narat, A. L. Vincenti and A F Cipolla —p 87
Progress in Orthopedic Surgery for 1943 XVIII Amputations, Apparatus and Technic J W. White —p 89
Id XIX Research A Steindler —p 97

Convulsive Factor in Commercial Penicillin.—Walker and Johnson found that application of commercial penicillin to the cerebral cortex of cats, dogs, monkeys and human beings has given rise to convulsive manifestations The antibiotic and convulsive factors of penicillin appear to be closely related, for they are affected about equally by aging, boiling and acidifying the penicillin solution and by dissolving the penicillin in alcohol. In human beings penicillin applied to the cerebral cortex in doses of 10,000 to 20,000 Oxford units may produce convulsive manifestations

Bulletin New York Academy of Medicine, New York

21:59-114 (Feb.) 1945

Combined Use of Anti Infectives and Anticoagulants in Treatment of Subacute Bacterial Endocarditis L Loewe —p 59
Penicillin and Sulfonamides in Treatment of Osteomyelitis and Pyogenic Arthritis J. A Key —p 87
Histology of Normal and Diseased Pancreas G Gomori —p 99.

21:115-168 (March) 1945

Scientific Humanism in This Changing World Presidential Address W. W. Herrick —p 115
Address of Retiring President A. F Chace —p 123
Treatment of Burns and War Wounds L K Ferguson —p 127.
Reactions of Tissues Following Infection and Their Place in Environmental Conception of Nature of Disease W D Forbus —p 145.
Medical Libraries and Medical History Gertrude L Annan —p. 163.

Canadian Medical Association Journal, Montreal

52:123-226 (Feb) 1945

Tuberculosis in Canadian Army 1939 to 1944 J D Adamson, W P. Warner, R F. Keevil and R E Beamish —p 123
Gastrointestinal Symptoms in Cardiovascular Disease J. W. Scott. —p. 128
Indications for Shock Therapy in Mental Illness L D Proctor —p 130.
Physician's Role in Protecting Worker's Health Through Control of Industrial Environment. F. M R Bulmer and G. R. McCall.—p. 136
Medical Care of Industrial Worker. R B Robson —p 143
Thiamine Requirement of Man and the Bread Problem E W McHenry. —p 147
*Effect of Vitamin E on Impaired Kidney Function E Shute —p 151.
Toxic Reactions Following Salicylate Therapy Review of Literature and Clinical Reports. H. Z. Sable —p 153
Müllerian Duct Cyst in Male E Smith and A Strasberg —p. 160
Sequelae Following Spinal Anesthetic D C Aikenhead —p 162
Role of Hemorrhage in Mortality Rates in Pregnancy and Childbirth. M Blair —p 166
Report on Use of Continuous Caudal Anesthesia in 65 Obstetric Cases G W. Myles —p 169
Problems in X Ray Localization of Foreign Bodies In and About the Eye J. A MacMillan —p 173
Gonorrheal Keratosis W. P. Hogarth —p 175
Benzene Poisoning M C. Dinberg —p 176.
Congenital Syphilis F Kalz —p 179

Effect of Vitamin E on Impaired Kidney Function.—Shute presents observations on 13 women who gave evidence suggesting either chronic nephritis or impaired renal function, such as chronic edema not cardiac in nature or hypertension. In some of the women the impairment of the renal function followed toxemia of pregnancy. Whenever possible two separate tests of the kidney function were made before treatment was begun. Therapy consisted in two weeks' trial of 25 mg. synthetic alpha-tocopherol per day. At the end of the two weeks the two hour test was repeated and the patient examined for clinical improvement Benefit was obtained in 10 of the 13 women. The histories which are presented indicate that treatment with vitamin E may improve damaged kidney function even when the damage has been of some duration. The improvement develops quickly but is transient unless therapy is continued

Cancer Research, Baltimore

5:129-192 (March) 1945. Partial Index

Attempts to Induce Stomach Ulcers IV. Effects of (a) Cholesterol Esters Heated to 300 C. and (b) Cholesterol Heated to 430 C. A H. M Kirby —p 129
Tumors Induced with Heated Cholesterol. S. Beck, A H. M. Kirby and P. R Peacock —p 135
Response of Central Nervous System of Rat to Methylcholanthrene: Induction of Tumors Derived from Nervous Tissue W. O Russell —p 140
Methylation and Demethylation of Certain Carcinogenic Azo Dyes in Rat. J A. Miller, E C. Miller and C. A. Baumann —p 162.
Effects of Roentgen Radiation on Thymonucleic Acid Content of Transplantable Mammary Carcinomas. R. E. Stowell —p. 169.
Chromosomal Enlargement in Neoplastic Rabbit Tissues J. J. Biesele —p 179.

Illinois Medical Journal, Chicago

87:65-112 (Feb) 1945

Present Day Status of Venereal Disease Control and Treatment. A. J. Aselmeyer —p. 76
Observations on Development of Silicosis H E Davis —p 80
Radiation Therapy in Chronic Leukemia T. G. Clement —p 84
Effects of Drugs on Electrocardiogram. T. R VanDellen and J. R. Miller —p. 88
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Journal of Aviation Medicine, St. Paul

16:1-46 (Feb.) 1945

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Medical Training at A A. F. School of Applied Tactics M. S. White. —p. 32.

Journal of Clin. Endocrinology, Springfield, Ill.

5:1-60 (Jan.) 1945

Hyalinization of Seminiferous Tubules Associated with Normal or Failing Leydig Cell Function: Discussion of Relationship to Eunuchoidism, Gynecomastia, Elevated Gonadotropins, Depressed 17-Ketosteroids and Estrogens C G Heller and W. O. Nelson —p. 1.
Id: Microscopic Picture in Testis and Associated Changes in Breast. W. O. Nelson and C G. Heller —p. 13.
Hyalinization of Seminiferous Tubules and Clumping of Leydig Cells: Notes on Treatment of Clinical Syndrome with Testosterone Propionate, Methyl Testosterone and Testosterone Pellets C. G. Heller and W. O. Nelson —p 27.
Vaginal Cornification Phases During Pregnancy: Their Prognostic Significance G J. Hall —p 34.
Absorption of Pellets of Progesterone R B Greenblatt and L. Q Hair —p 38.
*Vaginal Smear in Diagnosis of Uterine Cancer. M. Fremont-Smith, Ruth M Graham, L T. Janzen and J. V Meigs —p 40.
Hyperplastic Disease of Adenohypophysis J E Kraus —p. 42.

Vaginal Smear in Diagnosis of Uterine Cancer.—Fremont-Smith and his associates report 813 cases in which Papanicolaou's vaginal smear method for diagnosis of uterine cancer was employed. Negative smears were obtained in 635. The rest were either positive or doubtful. Cancer of the uterus can be diagnosed by vaginal smear even in the early stage. The method is applicable to the screening of large numbers of women. A negative smear does not exclude cancer. A positive smear usually means cancer. In the presence of a positive smear a biopsy should be done immediately, even though there is no clinical evidence of cancer. The diagnosis of the smears is not easy. It is not an office procedure. Familiarity with the vaginal cytology is important, and training in a laboratory doing this special work is essential.

Journal of Experimental Medicine, New York

81:233-314 (March) 1945

Study of Tissue Culture Cells by Electron Microscopy: Methods and Preliminary Observations K. R. Porter, A. Claude and E. F. Fullam. —p. 233

Passive Immunity to Poliomyelitis in Chimpanzee. H. A. Howe and D. Bodian.—p. 247.

Nonparalytic Poliomyelitis in Chimpanzee. D. Bodian and H. A. Howe. —p. 255

Studies in Rodent Poliomyelitis: VI. Further Observations on Interference Between Murine and Simian Strains of Poliomyelitis Virus. C. W. Jungeblut.—p. 275.

Cardiotoxic Action of Preparations Containing Oxygen Labile Hemolysin of Streptococcus Pyogenes: I. Increased Sensitivity of Isolated Frog's Heart to Repeated Application of Toxin. A. W. Bernheimer and G. L. Cantoni.—p. 295

Cardiotoxic Action of Preparations Containing Oxygen Labile Hemolysin of Streptococcus Pyogenes: II. Inhibition of Cardiotoxic Effect by Substance Released from Frog's Heart. G. L. Cantoni and A. W. Bernheimer.—p. 307.

Journal Industrial Hygiene & Toxicology, Baltimore

27:37-58 (Feb.) 1945

Toxic Properties of Silica: I. Bronchoconstrictor Effect of Colloidal Silica in Isolated Perfused Guinea Pig Lungs. G. F. Tilley, J. G. Hawley and G. W. Wright.—p. 37

Occupational Illnesses in Cotton Industries. II. Chronic Respiratory Problems. W. L. Ritter and M. A. Nussbaum.—p. 47.

Use of Methylene Blue in Testing for Bilirubin in Urine. C. P. Myers. —p. 52

Protection of Workers Against Noise. H. Davis.—p. 56

Journal of Urology, Baltimore

53:1-264 (Jan.) 1945

Hypertension and Its Relation to Nephroptosis. W. F. Braasch and R. Goyanna.—p. 1

Congenital Solitary Kidney: Case Reports and Consideration of Military Significance. T. F. Conroy and J. H. Walker.—p. 4

Clinical and Statistical Study of 471 Congenital Anomalies of Kidney and Ureter. E. C. Smith and L. A. Orkin.—p. 11.

Renal Decapsulation: Review of Literature and Report of 10 Cases. B. S. Abeshouse.—p. 27

Evaluation of Different Types of Nephrectomy: Review of 247 Cases. C. P. Mathe.—p. 85

Conservative Surgery in Certain Benign Tumors of Ureter. S. A. Vest. —p. 97

Rupture of Bladder: Case Report. H. T. McGee.—p. 131

Side Effects Caused by Diethylstilbestrol and Correlated with Cancer of Prostate Gland. C. A. Wattenberg and D. K. Rose.—p. 135

Early or Late Orchiectomy for Carcinoma of Prostate. E. P. Alyea. —p. 143.

*Analysis of 40 Cases of Carcinoma of Prostate. W. C. Stirling.—p. 154

Carcinoma of Prostate Gland. A. Paloma.—p. 166

Cure of Cancer of Prostate by Radical Perineal Prostatectomy (Prostato seminal Vesiculectomy): History, Literature and Statistics of Young's Operations. H. H. Young.—p. 188

Heterologous Transplants of Human Carcinoma of Prostate: I. Is Human Cancer of Prostate Gland Autonomous? M. H. Masina.—p. 257.

New Sound Tip for Cystoscope. W. W. Scott.—p. 263

Carcinoma of Prostate.—The 40 cases presented by Stirling are divided into 4 categories: (1) those in which orchiectomy was performed, (2) those in which orchiectomy preceded or followed resection, (3) those in which resection, orchiectomy and diethylstilbestrol were combined and (4) those in which diethylstilbestrol was used. Of 4 patients subjected to orchiectomy 2 responded favorably and lived at least two years. A third patient was bedridden and had extensive metastases to the sacrum and lumbar vertebrae. He had lost 30 pounds (14 Kg.), was anemic and suffered intense pain. Within seventy-two hours after orchiectomy the pain became less, and within a week he was able to return home without taking an opiate. He died nine months later. The fourth patient died four months after orchiectomy from cachexia. The second group, in which resection preceded or followed orchiectomy, comprised 18 patients. Ten of these succumbed after an average survival of fourteen months, but none of these 10 died from prostatic causes. Early favorable responses were obtained. Of the 8 surviving patients, 5 were entirely relieved of their pain, 2 were partially relieved and 1 obtained no relief. The third group in which resection, castration and diethylstilbestrol was used comprised 12 patients, 10 of whom are living. This is the most favorable survival group in the entire series. The 2 patients who died survived for an average period of twenty-four months following operation. They were relieved of the pain but died from cachexia. In the fourth group of 6 patients for whom estrogen therapy was used alone, 3 patients are living and 3 are dead. The author concludes that castration and estrogen therapy seem to be palliative. Neither modality prevents recurrence or retards metastasis. Resection should be utilized when partial or complete obstruction of urination is encountered. Estrogen therapy is indicated for patients refusing castration or as a supplement to orchiectomy.

Military Surgeon, Washington, D. C.

96:209-292 (March) 1945

Modern Concepts of International Quarantine, with Special Reference to Military Traffic. T. B. Magath and P. T. Knies.—p. 209.

Medical Problems of Submarine Warfare. C. W. Shilling.—p. 223

Reconditioning Program in United States Army. A. Thorndike.—p. 227

Value of Oxygen in Abdominal Surgery. W. S. Bainbridge.—p. 229

*Equine Encephalomyelitis of Virus Type. R. Randall.—p. 233

Organization and Operation of Veterinary Corps Food Inspection Service. H. K. Moore.—p. 237.

Suprapubic Cystostomy. F. C. Hamm.—p. 241.

Enuresis in Adult. W. Bisher.—p. 244

Wartime Activities of Dental Corps of U. S. Public Health Service. R. S. Lloyd.—p. 246

Present Dental Objectives and Policies of Veterans Administration. L. Y. Beers.—p. 251

Plastic and Reconstructive Surgery. C. R. Straatsma.—p. 255

Oral Surgery: Its Practice and Problems in Army Dental Corps. A. J. Hemberger.—p. 257

Erythema Multiforme Exudativum or Bullosum. H. F. Robertson and T. J. Donovan.—p. 259

Advantages of Supplemental Radiographic Studies at Time of Induction. A. C. Gallucci.—p. 262.

Observations on Morale Factors in Overseas Noncombat Service. J. M. Flumerfelt.—p. 265

Use of Acrylics for Enucleation with Implant and as Temporary Prosthesis. M. M. Greenberg.—p. 269

Effective Three Hour Treatment of Scabetic Patient. S. S. Rubin and H. Blank.—p. 271

Simple Apparatus for Body Section Radiography. P. A. Robin.—p. 273

Equine Encephalomyelitis of Virus Type.—Randall maintains that equine encephalomyelitis is the most important horse disease in the United States at the present time. The knowledge that the three types of equine encephalomyelitis enzootic in the Western Hemisphere (eastern, western and Venezuelan) are pathogenic for human beings and the relatively high mortality rate of the human disease emphasize their importance from the public health standpoint. The evidence is ample that the disease is transmitted through insects, particularly mosquitoes, and its control involves antimosquito measures. Horses and mules may be protected against the disease by the annual administration of chick tissue vaccines. A vaccine suitable for human use can be made available if indications for its use develop.

Missouri State Medical Assn. Journal, St. Louis

42:131-192 (March) 1945

Nutritional Recovery Following Removal of All but 3 Feet of Jejunum and Half of Colon. R. Elman and J. A. Read.—p. 145

Coordination of Medical and Blue Cross Plans. L. H. Perry.—p. 161.

New England Journal of Medicine, Boston

232:241-266 (March 1) 1945

Seventy Five Years of Public Health in Massachusetts. M. E. Champion.—p. 241

Acute Phosphorus Poisoning: Report of Case with Recovery. T. E. Chretien.—p. 247

Hematology. W. Dameshek.—p. 250

232:267-300 (March 8) 1945

Epochs in History of Worcester District Medical Society. R. J. Ward. —p. 267.

Differentiation of Bronchiogenic Carcinoma and Pulmonary Tuberculosis. N. R. Pillsbury and J. D. Wassersug.—p. 276

*Thermal Burns in Diabetes Mellitus. H. I. Root.—p. 279.

Hematology (concluded). W. Dameshek.—p. 280

Burns in Diabetes Mellitus.—Root describes the metabolic changes which accompanied serious burns in 2 diabetic patients. A woman aged 66, who had undergone two leg amputations and who had diabetes of the typically mild degree often associated with gangrene, had not taken insulin regularly because her urine was sugar free with diet alone. The fasting blood sugar level had varied from 110 mg. to 210 mg. She entered the Deaconess Hospital with a second degree burn on the right arm and a large eschar on the left buttock. The blood sugar level was 480 mg. She received 195 units of insulin in the first two days. At first the burns showed no evidence of serious sepsis, but this later developed and she died

on the nineteenth day. A man aged 35 had had diabetes for fifteen years, which likewise was mild and controllable by diet. As the result of a severe sunburn on the shoulders and back the skin became infected, with the formation of multiple carbuncles. He developed phlebitis and osteomyelitis and later prostatic and paranephric abscesses. When hospitalized he had to be given insulin. During the period when he suffered severe sunburn and carbuncles developed, his diet was not weighed or measured and the urine was not sugar free. The failure to control the diabetes may well have been an important factor encouraging the spread of infection.

New Orleans Medical and Surgical Journal

97:383-432 (March) 1945

Ruptured Intestines: Result of Nonpenetrating Trauma: Case Report. J. M. Bodenheimer.—p. 383.
*Aseptic Antenatal Thrombophlebitis (Phlebothrombosis). M. D. Steiner. —p. 385.
Certain Etiologic Factors Concerned with Headache. E. Warren.—p. 389.
Treatment of Amebiasis. J. Arosemena.—p. 392.
Effect of Vitamins on Intestinal Function. L. D. Wright Jr.—p. 400.
Filariasis. Future Problem in United States. C. D. Knight.—p. 406.

Aseptic Antepartum Thrombophlebitis.—Aseptic antepartum thrombophlebitis was observed by Steiner in a woman aged 36. The number of reported cases (17, including the 1 reported) is too small for significant analysis. Both unilateral and bilateral involvement occurred and both the saphenous and femoral veins with their branches were affected. Fever was seldom a part of the picture, and the diagnosis of aseptic thrombophlebitis (phlebothrombosis) was warranted. Recovery was usually complete, though not all patients went to term. The author's case differs from most of the reported cases in the early onset of the complication at the end of the third month of pregnancy, when the uterus, although enlarged, is not yet large enough to cause much pressure on the pelvic structures. The only factor in the history which can be related to the development of thrombophlebitis was the prolonged period of rest in bed to avert a threatened abortion.

New York State Journal of Medicine, New York

45:337-448 (Feb. 15) 1945

Advanced Cancer of Prostate: Consideration of Value of Radical Prostatectomy in Selected Cases. A. L. Parlow.—p. 383.
Anomalies of Upper Urinary Tract. J. E. Heslin and W. A. Milner. —p. 388.
Significance of Hyperglycemia in Myocardial Infarction. E. Goldberger, J. Alesio and F. Woll.—p. 391.
*Prevention of Hemorrhagic Anemia After Blood Donation in Normal Adults. S. Shapiro, C. P. Segard and Estelle N. Tabachnick.—p. 394.
Pneumatology. F. P. Ansbro.—p. 397.

Ohio State Medical Journal, Columbus

41:202-296 (March) 1945

Acute Laryngotracheobronchitis. R. E. Howard.—p. 225.
Efficacy of Whooping Cough Vaccine. J. A. Garvin.—p. 225.
Rectoperineal Fistula: Unusual Obstetric Complication. W. M. Silbernagel, O. P. Burt and J. B. Patterson.—p. 231.
Blood Sedimentation Rate: Factors Influencing Its Determination and Interpretation. R. G. Lehman.—p. 233.
Use of Penicillin in Streptococcus Viridans Blood Stream Infection. K. E. Martin and R. F. Schneider.—p. 237.
Alleviation of Anxiety During Pregnancy: Series of Answers to Questions Most Commonly Asked by Patients. L. H. Biskind.—p. 239.
Anesthesia in Thoracic Surgery. N. E. Lenahan.—p. 243.
Mycotic Aneurysm of Sinus of Valsalva. C. F. Vilter and R. J. Ritterhoff.—p. 246.

Quart. J. of Studies on Alcohol, New Haven, Conn.

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Relation of National Prohibition to Incidence of Mental Disease. C. Landis and Jane F. Cushman.—p. 527.
Syndrome of Alcohol Addiction. H. M. Tiebout.—p. 535.
Psychotherapy of Alcohol Addiction in Private Mental Hospital. J. H. Wall.—p. 547.
Group Psychotherapy of Alcohol Addiction. R. G. Heath.—p. 555.
Alcoholic Hallucinatory States. J. P. Norman.—p. 563.
Drinking in an Indian-White Community. J. J. Honigmann and Irma Honigmann.—p. 575.
Study of Wives of 20 Alcoholics. Gladys M. Price.—p. 620.
Science and Legal Responsibility of Drunkard. E. G. Baird.—p. 628.

Radiology, Syracuse, N. Y.

44:107-212 (Feb.) 1945

Roentgen Appearance of Lobar and Segmental Collapse of the Lung: Preliminary Report. L. L. Robbins and C. H. Hale.—p. 107.
*Roentgenographic Changes in Bone Infections Treated with Penicillin. G. B. Higley and J. C. Rude.—p. 115.
Lethal Dose Studies with X-Rays. F. Ellinger.—p. 125.
Foreign Bodies in Digestive Tract. S. Brown.—p. 143.
Atypical Pneumonia with Roentgen and Pathologic Findings. H. W. Grimm and J. Denton.—p. 151.
Anatomic X-Ray Studies of Lung, Primarily for Tuberculosis. E. C. Koenig.—p. 158.
Factors Influencing Mortality in Head Injury. H. C. Voris.—p. 166.
Revascularization of Carpal Bones. J. J. Callahan, W. R. Cubbins, C. S. Scuderi and E. Hamilton.—p. 171.
Close Range Technic in Diagnostic Roentgenology. J. Arendt.—p. 177.

Bone Infections Treated with Penicillin.—Higley and Rude used penicillin in 25 cases of bone infection, in some of which there were old chronic infections; in these the response was not dramatic, although in the majority there was a decrease in drainage, with improvement in the general physical condition. In some of the cases it was possible to do elective surgery concurrent with the administration of penicillin, with no extension of the infection. In the acute cases which proved susceptible to penicillin, clinical improvement preceded the x-ray signs of healing and clinical recovery occurred. The authors present summaries of 6 cases which represent several types of bone infection in which definite improvement followed the use of penicillin. In general the treatment of bone infections with penicillin has been satisfactory. The response varies in individual cases. In most instances the period of active infection was considerably decreased. Roentgenographic studies in the treated cases revealed apparent arrest of the spread of the infection, with little or no sequestration of bone and little or no involucrum. There was evidence of healing, in the form of a reactive recalcification throughout the cortex of the bone, approaching the normal architecture of the bone much more closely than does the ordinary involucrum in osteomyelitis. The area of recalcification was of slightly greater density than normal bone. Since the progress of the infection was apparently arrested and the reparative process began before extensive spread, sequestration and involucrum had appeared, the resultant end sclerosis was less than has been commonly seen in extensive osteomyelitis.

Southern Medical Journal, Birmingham, Ala.

38:161-228 (March) 1945

Diverticulitis: Indications for Resection. C. Rosser.—p. 161.
Isthmus Defects of Fifth Lumbar Vertebra. R. B. Raney.—p. 166.
Evaluation of Treatment in Thromboangiitis Obliterans (Buerger's Disease). E. J. C. Hildenbrand.—p. 176.
Roentgenologic Examination of Stomach with Patient Under Sodium Pentothal Anesthesia. H. E. Plenge and J. N. Ross.—p. 183.
Problems of Filariasis. L. T. Coggeshall.—p. 186.
Rheumatic Fever. W. Weston Jr.—p. 189.
*Fever Therapy with Intravenous Foreign Protein in Neurosyphilis. D. C. Smith, J. C. Shafer and A. J. Crutchfield.—p. 194.
Penicillin in Treatment of Syphilis and Gonorrhea. A. W. Neilson, F. H. Chard, L. J. Hanchett, E. Ayers, C. T. Stepita and J. Rodriquez.—p. 204.
Management of Breech Presentation. R. F. Vogt, G. W. Bryant and W. T. McConnell.—p. 206.
Factors Influencing Morbidity and Mortality Rates in Gynecologic Surgery, Based on Analysis of 500 Consecutive Cases in Private Practice. J. T. Sanders.—p. 209.
Significance of Blood Volume Alterations in Surgical Patients. E. I. Evans.—p. 214.
Relationship Between Anesthetist and Surgeon. R. F. Bonham.—p. 221.

Fever Therapy with Foreign Protein in Neurosyphilis.—Smith and his collaborators present the histories of 19 patients with dementia paralytica who were treated with intravenous triple typhoid vaccine. The average number of fever bouts per individual was ten. Except for those treated during 1943, no attempt was made to insulate during fever; in 1943 only blankets and hot water bottles were used. During 1944 a cradle and light technic has been developed. Ninety patients were treated with hyperpyrexia induced by intravenous triple typhoid vaccine. About 750 episodes of fever have been given, and untoward reactions have been of minor nature with the exception of a fatality in a man with moderately advanced dementia paralytica and hypertension. Of the 19 patients whose condition is described, 16 have shown clinical improvement.

Union Médicale du Canada, Montreal

74:275-416 (March) 1945

Factors which Influence Function of Normal and Pathologic Thyroid. J. H. Means—p 278
Action of Cortin in Burns A. Houot—p 289
Nonspecific Ulcerative Colitis. Therapeutic Observations J. LeSage—p. 297.
Unrecognized Syphilis: Two Clinical Observations. V. Panaccio—p. 305.
Vertigo J. Saucier.—p 308
Feeding of Children R. Benoit—p 313.
Exclusion of Doubtful Paternity by Comparative Study of Blood Groups A. Bertrand—p 315.

United States Naval Med. Bulletin, Washington, D. C.

44:453-680 (March) 1945. Partial Index

*Penicillin: Progress Report Based on 1,455 Cases Treated at National Naval Medical Center, Bethesda, Md W. M. Craig, G. J. Thompson, A. M. Hutter, E. E. Barksdale, C. C. Pfeiffer and P. V. Woolley Jr.—p 453
Penicillin in Pneumonia A. G. Lueck and C. O. Edge—p 480
Gram Negative Bacilli Susceptibility to Penicillin In Vitro Experiments M. Steiner—p 486
Salt Water Ulcers of Extremities: Occurrence in Japanese Survivors C. W. McLaughlin Jr. and J. L. Holland—p 494
Transverse Incision for Repair of Inguinal Hernia P. Shambaugh.—p. 498.
Epicondylitis of Humerus C. E. Cooper.—p 501
Repair of Direct Hernia E. V. Parsonnet—p 507
External Malleolar Fracture H. A. Barnes—p 509
Rupture of Rectus Abdominis Muscle Simulating Intra Abdominal Tumor. C. F. Ward—p 515
Plight of Ulcer Patient in Military Service: Study of 306 Enlisted Personnel with Duodenal Ulcer. F. R. Hook and R. H. Keane—p 519
Vitamins Essential in Nutrition L. E. Smale—p 530
Gastrointestinal Tract Disturbances: Functional Disturbances on Psychogenic Basis W. T. Carleton—p 538
Group Therapy of Psychiatric War Casualties J. B. Dynes and F. J. Hamilton.—p 549.
Psychologic Study of Desertion and Overleave in Navy W. Bromberg, A. A. Apuzzo and B. Locke—p. 558
Functional Amenorrhea in Waves T. B. Marwil—p 569
Eosinophilia Caused by Atabrine. H. K. Russell—p 574.
Filariasis in West Indian Laborers R. F. Platzer and W. K. A. Lawlor.—p. 576.

Penicillin in Treatment of 1,455 Cases.—Penicillin has been used at the Bethesda Medical Center in 1,455 cases. Gonococcic infections numbered 740 and syphilis amounted to 324. Of this number 250 were early cases and 237 of these remain symptom free. Of the remainder 7 have had evidence of relapse while 6 have had what appear to be new infections. The other 87 have been instances of latent infection or central nervous system involvement. The results with penicillin in gonorrhea, early syphilis and infections due to streptococci and staphylococci are better than with any drug hitherto available. Penicillin appears to be on a par with the better sulfonamides in the treatment of infections caused by pneumococci. The usefulness of penicillin in meningococcic meningitis is not yet clearly defined. The throat cultures became negative for hemolytic streptococci within two to five days in the 14 cases of scarlet fever that were treated with penicillin. Subjective improvement was noted in two or three days. Three patients with erysipelas responded promptly to penicillin. Penicillin, administered for stomatitis and Vincent's angina, gave good results. Penicillin has been used in 36 cases of acute otitis media and acute mastoiditis with satisfactory results. Penicillin is the drug of choice in abscess complicating pharyngeal and laryngeal infections, and it was effective in 2 cases of corneal ulcer. Penicillin was used in 32 cases of surgical infections, that is, in cellulitis, postoperative infected wounds, infected hematoma, infected surgical wounds and bullet wounds. Its use was successful in 27 cases. Of 29 cases of osteomyelitis 24 were successfully treated with penicillin. Penicillin has been used in 7 cases of peritonitis associated with ruptured appendix. All recovered from this complaint, although 1 patient died of a pulmonary embolus. Penicillin was found to be ineffective in tuberculosis, lymphosarcoma, carcinoma, infectious mononucleosis, chronic ulcerative colitis, leukemia, brain tumor, primary atypical pneumonia, rheumatic fever, malaria, filariasis and mumps.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:175-208 (Feb. 10) 1945

Medical Corps in Red Army Operations: Its Tasks and Their Fulfilment V. Smirnov—p 175
Treatment of Gunshot Fractures of Extremities in Evacuation Hospitals of U. S. S. R. N. N. Priorov.—p 177.
Amputation of Extremities, and Prosthesis, in U. S. S. R. N. N. Priorov—p 178.
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Traumatic Uremia C. G. Parsons—p 180.
Cephalin Cholesterol Flocculation Reaction as Test of Hepatic Function. A. Dick—p 182
Employment of Postnatal Woman J. V. O'Sullivan and L. B. Bourne.—p 185.

1:209-246 (Feb. 17) 1945

Influenza Epidemics and Influenza Viruses C. H. Stuart Harris.—p 209.
Drying Penicillin by Sublimation in United States and Canada. E. W. Flosdorf—p 216
Gas Gangrene After Secondary Suture of Shell Wound of Thigh J. H. Barclay.—p 218.
Two Cases of Tetanus. L. Cole—p 219.
Tibial Bone Marrow Transfusions in Infants F. W. Gunz and R. F. A. Dean—p 220

1:247-284 (Feb. 24) 1945

Hunterian Museum: Yesterday and Tomorrow G. G. Turner.—p 247.
Influenza Epidemics and Influenza Viruses. C. H. Stuart Harris.—p. 251
Duodenal Ileus in Newborn V. Smallpeice—p 258
Burns and Their Treatment Among E. M. S. Hospital Inpatients. Eileen M. Brooke.—p 259.
*Treatment of Patient with Burns, with Reference to Proflavine Powder Technic R. W. Raven—p 261.
Prophylaxis of Trench Foot R. Greene—p 270.

Proflavine Powder in Burns.—Raven uses powdered proflavine for burns. Treatment is carried out under aseptic conditions. Contaminants are mopped away with isotonic solution of sodium chloride and pieces of dead tissue are lifted off. Normal skin surrounding the wound is cleansed. Blisters are evacuated by pricking with a sterile needle. Dry proflavine powder is lightly smeared over the wound, the whole lesion being thinly coated. The area is covered with one layer of wide meshed gauze impregnated with petrolatum and over this two layers of wide meshed gauze with a liberal supply of absorbent cotton. The dressing is bandaged firmly to form a pressure dressing with either plaster of paris or calico bandages. After the first redressing the time interval between dressings is increased from ten to fourteen days. Proflavine powder is dusted on the wound at each redressing. Two illustrative cases are described. A comparison of these cases shows that the general condition of the patient treated with proflavine was much better and the toxicity much less than that of the patient who had received sulfonamides both orally and locally. Proflavine powder does not retard healing, and the healed area showed a remarkable freedom from scarring, the skin being supple and of excellent quality.

Lancet, London

1:167-198 (Feb. 10) 1945

Inguinal Hernia. The House That Bassini Built W. J. M. Brandon—p 167.
Treatment of Thyrotoxicosis with Thiouracil J. C. Eaton—p 171.
Shovelers' Fracture J. H. Annan—p 174
*Urea and Sulfonamide Treatment of Bacterium Coli Meningitis A. D. Ecker—p 176.
*Allergic Reactions to Penicillin A. N. Barker—p 177
Effect of Rubber Tubing on Solutions of Penicillin S. T. Cowan—p 178

Urea and Sulfonamide Treatment of Escherichia Coli Meningitis.—A soldier received a penetrating wound of the brain. A meningitis due to Escherichia coli failed to respond to sulfadiazine and penicillin, but the patient recovered after receiving 2 Gm. of sulfadiazine and 30 Gm. of urea introduced into the stomach every four hours. Ecker says that combinations of sulfonamides and urea possess a bacteriostatic effect even in the presence of the sulfonamide inhibitor, para-aminobenzoic acid. Urea is a diuretic, so it is especially important to

maintain an adequate fluid intake in patients who are receiving it. The sulfadiazine level in the blood in this case ranged from 7 to 9 mg. per hundred cubic centimeters at a time when the patient was receiving 2 Gm. of sulfadiazine and 1.2 Gm. of sodium bicarbonate every four hours.

Allergic Reactions to Penicillin.—Barker presents 2 cases of skin reactivity to penicillin. The first patient was a medical officer, who noticed a pruritus of the face the day after he started dispensing penicillin. Two days later he went on leave and the irritation disappeared. On his return he continued to dispense the penicillin solutions, and within two days an acute dermatitis of the face and neck developed which was accompanied by edema of the upper and lower eyelids and a feeling of tightness of the rest of the skin of the face. Next day vesiculation with a serous exudate was observed on the chin. The patient stopped dispensing but continued laboratory work with penicillin. The rash subsided within a week. When all clinical signs of dermatitis had disappeared, patch tests were performed with a solution of penicillin. An eczematous reaction developed within twelve hours. The control with autoclaved penicillin was negative. The second patient was a soldier who developed a giant urticarial reaction on the trunk and the extremities after having received intramuscular injections of penicillin for four or five days. The urticaria persisted for four weeks. The patient was covered with large confluent wheals on the trunk and extremities and exhibited dermographism. Scratch and intradermal tests with penicillin produced an urticarial wheal. An autoclaved solution of penicillin did not have this effect.

Acta Medica Scandinavica, Stockholm

113:467-614 (April 17) 1943

The Galactose Tolerance Test in Peptic Ulcer E. Ask-Upmark and Elisabeth Berg.—p. 467.
*Involvement of the Central Nervous System in Mumps. H. O. Bang and J. Bang.—p. 487.
*Spondylarthritis Ankylopoietica (Spondylosis Rhizomelica) Combined with Peripheral Arthritis. H. J. N. Dekkers.—p. 506.
Hematology in Experimental Tuberculosis: The Hemogram in Anaphylactic-Allergic and Anaphylactic-Iathergic Tuberculous Guinea Pigs. K. Birkhaug and H. Schjelderup.—p. 527.
*Clinical Investigations of Methyl Alcohol Poisoning, with Special Reference to the Pathogenesis and Treatment of Amblyopia. O. Roe.—p. 558.

Mumps Meningitis.—During the epidemic of mumps in the winter of 1941-1942 458 patients with mumps were admitted to the Blegdams Hospital in Copenhagen. Spinal puncture was performed on 372, or 81 per cent, of these patients. Spinal pleocytosis was observed in 235 (65 per cent). Of these 235 cases 106 presented meningitis and 129 presented latent meningitis with pleocytosis as the sole indication of the disturbance of the central nervous system. There was no age predisposition, and the two sexes were equally susceptible. The severity of parotitis and the presence of other complications did not influence the incidence of meningitis. Pleocytosis varied between 3,000 and 7,000 cells per cubic millimeter of spinal fluid; high cell counts were frequent also among the cases of latent meningitis. The pleocytosis was entirely or predominantly mononuclear. The proteins were not increased, or only moderately so, the spinal sugar was normal and the spinal fluid was sterile. Manifest meningitis appeared most frequently after the onset of the swelling of the parotid glands (up to thirty-eight days after, but mostly about the fifth day), occasionally simultaneously with, and in 10 per cent of the cases before the swelling (up to seven days before). The meningeal symptoms were mild and of short duration. Encephalitis and myelitis were not observed. One case showed involvement of the labyrinth. Unilateral deafness persisted. All the remaining patients were discharged without sequels. The immediate prognosis was always good. The high incidence of meningitis suggests that meningitis is to be considered as a manifestation rather than as a complication of parotitis. This suggestion is supported by the occurrence of the so-called prodromal forms in which the meningitis precedes the parotitis and by the autonomic forms of meningitis of parotitis virus etiology but without swelling of the parotid glands. Thirteen cases presenting benign lymphocytic meningitis of the latter type were admitted to the Blegdams Hospital during the aforementioned epidemic of mumps. The parotitis virus consequently seems capable of affecting the meninges as the single organ. Epidemic parotitis is therefore to be considered as a possible etiologic factor in cases of benign lymphocytic meningitis of unknown origin. Mumps is to be considered as a general infection whose essential clinical manifestation most frequently, but not necessarily always, is a swelling of the parotid glands.

Rhizomelic Spondylosis Associated with Peripheral Arthritis.—Dekkers reports experience gained from 120 cases of rhizomelic spondylosis at the Consulting Office on Rheumatic Diseases in Amsterdam during the decade of 1931 to 1940. Only 10 of the 120 patients were women. Nine cases presented rhizomelic spondylosis associated with peripheral arthritis. Six of these 9 patients suffered from gonorrhea. In 4 of these patients the rheumatic complaint started in connection with this infection or was aggravated by it. Two patients suffered from rheumatic fever and 1 from a subacute polyarthritis some time before the spondylosis developed. All these cases presented the clinical picture of rheumatoid arthritis, a relatively infrequent occurrence, which made diagnosis very difficult; in fact, many years had passed before the diagnosis was clarified. Dekkers emphasizes the importance of examining the spine also in patients suffering from acute or chronic polyarthritis, especially when the patient complains of low back pain. In doubtful cases the roentgenologic examination of the sacroiliac joints and of the spine should not be omitted. Stress is laid on the necessity of not overlooking an existing spondylosis in patients suffering from rheumatoid arthritis, especially when they do not react well to gold salt injections. X-ray treatment of the spine and of the sacroiliac joints in combination with physical therapy (ultraviolet light, heat applications, exercises) may be most effective.

Alcoholic Amblyopia.—Roe reports 16 cases of alcoholic amblyopia in 14 men between the ages of 24 and 69 and in 2 women aged 32 and 40. The action of methyl alcohol is due to inhibition of the process of oxidation caused by formic acid. This forms, by a reversible process, a complex compound with the iron in the respiration enzyme. Acidosis follows inhibition of the process of oxidation and is due mainly to lactic acid. Amblyopia does not as a rule appear till acidosis has become severe, i. e. sometime after the manifestation of general symptoms such as nausea, headache, dyspnea and vomiting. If the eyes are exposed to strong light, amblyopia may precede clinical signs of acidosis. Increase of metabolism favors acidosis and may thereby provoke amblyopia or may aggravate it if already present. A milder course of poisoning may be manifested if ethyl alcohol is consumed just before or after the drinking of methyl alcohol, the oxidation of which is thereby checked. All signs of poisoning may be averted if ethyl alcohol is drunk repeatedly on the first day after the drinking of methyl alcohol even though it has been consumed in large quantities. It is suggested that the intake of much fluid may exert a beneficial effect on the course of the poisoning. A secondary decline of vision was observed in all the cases in which normal acuity of vision was not restored while amblyopia persisted. It is suggested that this gradual decline and the gradual developing limitation of the field of vision may be due to atrophy of the blood vessels. Strong light, fever and muscular exertion may hasten this decline. The individual predisposition is believed to play a minor part in the tolerance to methyl alcohol. Treatment of alcoholic amblyopia consists in rapid correction of the acidosis, the supply of large quantities of fluid and the protection of the eyes against light. The author recommends administration of an isotonic (1.3 per cent) solution of sodium bicarbonate, the dosage of which may be calculated according to Van Slyke's nomogram. Liberal flushing with fluid to combat dehydration and to promote profuse diuresis is suggested. Isotonic solution of sodium chloride may correct any hypochloremia present. Ethyl alcohol helps to prevent a recurrence of acidosis. Gastric lavage should not be carried out till an intravenous injection of sodium bicarbonate has been given. There was no reliable evidence in support of the assumption that lumbar puncture may be beneficial in amblyopia. Treatment with sweat baths and thyroid seems to be contraindicated.

Book Notices

Savill's System of Clinical Medicine Dealing with the Diagnosis, Prognosis, and Treatment of Disease for Students and Practitioners. Edited by E. C. Warner, M.D., F.R.C.P. Twelfth edition. Cloth. Price, $9. Pp. 1,168, with 192 illustrations. Baltimore: William Wood & Company, 1944.

The present edition of this popular book has been carefully revised under the editorship of Dr. E. C. Warner, but the essential character of the book remains unchanged from Dr. Thomas Savill's original plan. For the reader who is not familiar with this type of organization, it is essentially directed at the symptoms presented by the patient, the illness from which he suffers and what can be done about it. Each chapter is divided into three parts: the symptom which may indicate disease of the organ or region under discussion and its differential diagnosis, the physical signs of disease in that region and the various methods used to elicit them, and finally the clinical classification of various maladies affecting that region and a summary of the routine procedure to be adopted. This arrangement is unique among textbooks in medicine and serves a useful purpose for medical students on clerkships and physicians in their practice. Apart from this special feature of organization the book contains much concise modern information commonly found in textbooks of medicine. Some of the newer aspects of medical progress have been added on hypertension and its mechanism, vitamin K, sulfonamide therapy, carotid sinus, effort syndrome, Rh factor, electroencephalogram and wartime entities such as immersion foot, frost bite and trench foot. Other revisions have been added in keeping with the progress of medicine since the last revision. The chapter on the central nervous system is particularly well done. However, the chief virtue of the book is its unique plan of organization and its value as a diagnostic aid. Generally the treatment given is not in keeping with our standard textbooks on medicine. It is poorly defined, lacks critical insight and is generally inadequate. For this reason its value to the reader is restricted to its diagnostic guidance, which is usually sound and in keeping with good medicine.

L'inhibition et la facilitation dans le système nerveux central et périphérique. Par Miguel Ozorio de Almeida, directeur du Laboratoire de physiologie de l'Institut Oswaldo Cruz, Rio de Janeiro. Les publications savantes de l'École libre des hautes études au Brésil, 1. Paper. Pp. 135. Rio de Janeiro: Atlantica Editora, 1944.

This volume is intended to be a critical presentation of what is known about inhibition and facilitation as basic functions of the central and peripheral nervous system. The bibliographic index of 258 publications presents only the most characteristic publications, omitting the better known classic treatises.

The introduction directs the attention of the reader to the process of inhibition as an essential factor in coordinated movements and in the adaptation of purposeful reactions. Inhibition and facilitation are the indispensable factors of the functions of correlation and integration. Only the most elementary facts can be understood from the antiquated aspect of being the positive results of excitation or stimulation. Twelve chapters, almost the whole volume, contain the facts pertaining to inhibition and facilitation presented in a truly enlightening, critical and evaluating manner, and fifteen pages deal with the theories of facilitation and inhibition. Chapter 1 discusses the literature on inhibition and facilitation in lower animals, chapter 2 the phenomenon of facilitation and inhibition of similar phenomena as observed in the nerves and muscles of vertebrates. The Wedensky effect regarding the conduction of faradic current in a narcotized nerve is discussed through twelve pages, but its nature remains largely obscure in spite of the work of Lorente de No and others. Chapter 3 deals with facilitation and inhibition in reflexes, demonstrated already in the classic experiments of von Goltz, clinically observed for the first time by Nothnagel and elucidated by the work of Sherrington, Bethe, Frölich and others. Facilitation and inhibition in the rebound phenomena in decerebrate rigidity and in reciprocal innervation are discussed in chapters 4, 5 and 6. Chapters 7 and 8 deal with inhibition in strychninization and in tonic reflexes. The action of higher centers on reflexes and on the activity of lower centers, constant inhibition and facilitation, reciprocal action of cortical centers and extinction are discussed in chapter 9. Chapter 10 is dedicated to the analysis of spinal shocks, as an interruption of the facilitation brought about by stimuli from higher nerve centers. In general the spinal shock results from the abolished normal equilibrium of facilitation and inhibition. In chapters 11 and 12 the author discusses the role of inhibition and facilitation in tonus and in conditioned reflexes.

Inhibition and facilitation in their phenomenologic diversity can be interpreted only as the result of variable mechanisms. So-called peripheral inhibitory nerves demonstrate basically the same properties of excitability as other nerves. The same nerves may serve inhibition as well as excitation. Inhibition does not depend on the properties of a peripheral nerve but results from the function of the central nervous system, of ganglionary centers, of neuromuscular junctions. General theories of inhibition are those of "interference," "assimilation" or "drainage." A "colloidal" theory supposes modifications of electrolyte concentration, another is based on the "refractory period." The "chemical" theory assumes the formation of inhibitory substances. It appears that the central nervous system displays functionally the same properties which characterize the peripheral nerves, but in complicated combinations.

This interesting and inspiring treatise terminates with the discussion of several modern morphologic conceptions of the process of inhibition and facilitation.

The Male Hormone. By Paul de Kruif. Cloth. Price, $2.50. Pp. 248. New York: Harcourt, Brace and Company, 1945.

According to the flyleaf, this book is supposed to tell the story of the discovery of the male hormone. Actually the reader will find comparatively little concerning the discovery of any hormone. If the reader is credulous, he will turn to hormones instead of vitamins to stimulate his sexual activities, relieve fatigue and make him a business tycoon.

The book is written in the inimitable style peculiar to the author. Sensitive readers may object to reference to the possibility that if Ponce de Leon in a search for the elixir of youth "had only had a few shots of testosterone" he would have "proceeded to make all the Indian maidens of the land of the blue Caribbean." Others will merely think it comical for an allegedly scientific work. It offers enthusiasm but not the caution necessary for such potent agents as hormones. Once again de Kruif relieves himself of his pent up emotions and frustrations. He states "When the medical big bugs were out to get me on the one-day syphilis cure. . . ." Is this a persecution complex?

Sex seems to be the predominant theme of the book. Early in the volume de Kruif admits worry concerning degeneration and presumably death; soon he weaves a story around the sexual properties of a hormone; then he concludes that he will continue taking methyltestosterone, a product known as the male sex hormone.

Here is a sample of de Kruifian science: "We know that both the St. Louis Cardinals and St. Louis Browns have won championships, supercharged by vitamins." Does the author know this? He insists that he will "go on supercharging myself with vitamins just to be on the safe side, since God has played the trick on us of putting not quite enough vitamins in our food, even on the best balanced diet."

The Council on Pharmacy and Chemistry of the American Medical Association, which the author admits early in the book "is an excellent body of men," is attacked for pointing out what the author himself admits in his writing, namely, that much of the material which he has used to argue his points is still in need of further investigation. The fact that the members of the Council must have sufficient facts, not theories or provocative suggestions, to recommend a drug may appear immaterial to him. While presenting the virtues of the male hormone, he fails to leave with the reader a clear impression that the male hormone like any other hormone will be effective only in certain individuals, not all, and that it alone will not prevent or cure all forms of tiredness, diseased blood vessels and other common problems. Too little attention is devoted to the many questions yet unanswered; for example, effects of overstimulating the body with blood vessels and heart just on the verge of col-

lapse; effects on other endocrine glands; effects of long continued use. Too frequently science has seen the enthusiastic promotion of substances at first claimed to be practically miraculous and harmless but which later are shown to be lacking in therapeutic efficacy and even to be harmful, especially when carelessly used.

Here is a writer who, "being only a reporter and not a doctor of medicine," becomes enthusiastic about an experiment on a horse, the outcome of which made him "feel more confident than ever" concerning experiments made on older men. After considering what he believes to be the possible virtues of "my hero, testosterone," he is disturbed apparently and writes:

> This simply scares me. This smacks of rejuvenation. This can't be so. This gives me a bad case of buck fever. It pulls my writing wallop. I can't let myself go. To be honest, I doubt my hero, testosterone, the rebuilder.
>
> This is my mood this snowy morning.
>
> I actually begin holding back and soft-pedaling other scientific facts, suggesting other astounding rebuilding virtues of testosterone. I sabotaged my hero. Well, let's out with those new facts now.

And he does.

We have then in this book an enthusiastic, if sometimes maudlin and premature, report on the possibilities, mostly sexual, of the so-called male hormone. Some of the unknown factors in the problem of the use of hormones remain to be solved; such trifles are lightly brushed over in this book. Those qualified to speak concerning endocrinology will say that the book is premature and will do more harm than good by circulation among the general population.

Familial Susceptibility to Tuberculosis: Its Importance as a Public Health Problem. By Ruth Rice Puffer, Dr.P.H., Tennessee Department of Public Health. Harvard University Monographs in Medicine and Public Health [No. 5]. Cloth. Price, $2. Pp. 106, with 9 illustrations. Cambridge: Harvard University Press; London: Oxford University Press, 1944.

The author has made an earnest and honest attempt to determine why certain persons fall ill with clinical tuberculosis and others do not, with the idea of applying the information to modern tuberculosis control measures. In the introduction she states that the majority of the population in many sections of the country become infected with tubercle bacilli before reaching adult life. Therefore, on the assumption that all adults are infected with tubercle bacilli, the possibility of familial susceptibility is discussed at some length. Chapters are devoted to such subjects as tuberculosis in siblings, in consorts, in parents and in children of the tuberculous, and the control of tuberculosis.

Valuable data from various studies are presented. Considerable emphasis is placed on the tubercle bacillus, but the question is frequently raised as to whether this alone is adequate to produce tuberculosis. That inherited susceptibility may be necessary to permit the development of clinical tuberculosis is discussed at some length. In the discussion of observation on those who have previously been in contact with contagious cases of tuberculosis, only persons who later have manifestations of gross lesions such as can be demonstrated by x-ray shadows or which cause illness are regarded as having developed tuberculosis. Little consideration is given to those who develop the disease to a lesser degree, the presence of whose lesions can be detected only by the tuberculin reaction or postmortem examination. All such persons actually have tuberculosis and must be considered along with those who fall ill or die.

Appropriate warning is issued of the great danger of exposure to contagious cases of tuberculosis. This applies to the known cases. In this connection the tuberculin reaction is not mentioned, which is the only accurate method of detecting the individuals who have been effectively exposed in any group. No mention is made of the vast areas in the United States where the infection attack rate has been reduced to 1 per cent or less annually, of the corresponding decline in morbidity and mortality of numerous whole counties where 10 per cent or less of the seniors in the high schools have been infected with tubercle bacilli or of the reports of the American Student Health Association, showing that only 18 per cent of college students have been infected and in many Midwestern and Western colleges and universities less than 10 per cent.

One explanation of the decline in morbidity and mortality from tuberculosis in this country is that many members of susceptible families have died, and therefore such families are greatly reduced in number. At this point one must take into consideration the vast educational program of the National Tuberculosis Association and other organizations, which has resulted in the protection of the community against infection with tubercle bacilli. Of no small significance is the almost complete eradication of tuberculosis in the bovine species. Not long ago the bovine type of tubercle bacillus was responsible for a sizable segment of both primary and reinfection types of tuberculosis among human beings in this country. If the dying out of families with familial susceptibility were capable of solving the tuberculosis problem one would expect a different situation in nations with large populations, such as China, than exists at present. There tuberculosis has been known to exist more than five thousand years, but illness and death from tuberculosis among the Chinese constituted a tremendous problem even before the present war began.

Good methods of tuberculosis control are presented, such as periodic examinations of contacts of contagious cases, including students of nursing and medicine; however, these are extremely limited. By more modern methods the disease can be practically controlled in any community without much worry about those who may have familial susceptibility.

Most of Dr. Puffer's work and analyses and references are from communities where tuberculosis is still rife, where nearly 100 per cent of the adult population is thought to be infected, a situation not greatly different from that found in many European countries at the present moment. In such places it is difficult to bring the important factors in tuberculosis control into the limelight. Under such circumstances her presentation is splendidly done. It would be fine if she could now make a similar study and publish the report of her observations from a few of the many counties in the United States where the tuberculosis mortality has been reduced to less than 10 per hundred thousand of population and where the infection attack rate among children, including those of high school age, has been reduced to one half or one third of 1 per cent.

Aids to Orthopædic Surgery and Fractures. By I. E. Zieve, M.A., F.R.C.S., Surgical Registrar, Charing Cross Hospital, London. Second edition. Cloth. Price, $1.75. Pp. 270. Baltimore: Williams & Wilkins Company; London: Baillière, Tindall & Cox, 1944.

In rewriting this volume, which Mr. Eric Crook of Charing Cross Hospital first wrote in 1929, Zieve discusses the effects of abnormal development, injury, inflammations and new growths on bones, joints, muscles and tendons. He discusses these same influences on the nervous system. Free reference has been made to such standard works as Watson Jones's "Fractures and Other Bone and Joint Injuries," McMurray's and Mercer's works on orthopedic surgery and Bankart's "Manipulative Surgery." The book was not intended to take the place of larger books on orthopedic surgery in general or those on special regions. Many recent American contributions to the subject are omitted. This, the smallest book on orthopedic surgery, can easily go in a side pocket. Some subjects are treated with no more than a definition. On the whole, the book is an excellent publication and is well worth the small investment.

Experimental Studies on the Toxicity and Potential Dangers of Trinitrotoluene (TNT). By W. F. von Oettingen, Principal Industrial Toxicologist, and others. From the Industrial Hygiene Research Laboratory, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service, Public Health Bulletin No. 285. Paper. Price, 15 cents. Pp. 78, with 22 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1944.

Trinitrotoluene has toxicity of a low order, but its manufacture and handling are not without risk to the health of the workers concerned. This series of studies raises a number of questions with respect to these hazards and brings their answers up to date by means of observations on animals and on man. The long debated question as to whether or not pure TNT is less dangerous to handle than an impure product is raised but not answered. This interim report is essential to all physicians concerned with the industrial hygiene of high explosives.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

GLUTAMIC ACID FOR EPILEPSY

To the Editor:—How effective is the glutamic acid therapy of petit mal? Please give the recommended dosage and any reactions or contraindications to its use. Where can it be obtained?

Howard F. Munro, M.D., Freeport, N. Y.

ANSWER.—Glutamic acid has been reported as effective in the therapy of petit mal, psychic equivalents and personality disorders in patients with epilepsy. Accurate statistics as to its value are not available; perhaps half of the patients not benefited by other means respond favorably to glutamic acid. It is not effective against major seizures and indeed may precipitate them unless the patient is receiving some other anticonvulsant. The usual procedure is to place the patient on diphenylhydantoin sodium in gradually increasing doses until symptoms of intolerance appear. Attention should be paid to hygiene and especially to getting the patient into athletic training. If minor seizures or irritability are still troublesome, glutamic acid may then be added in large doses. The average dose for an adult is 12 Gm. a day, but twice this amount may be given safely. The dose for children is roughly in proportion. As glutamic acid is a normal constituent of the diet and widely used as a flavoring, no toxic symptoms are to be expected even from massive doses. Some patients find glutamic acid slightly nauseating, however. Glutamic acid is manufactured by Parke, Davis & Company in 0.5 Gm. tablets.

Reference:

Price, J. C.; Waelsch, H., and Putnam, T. J.: *dl*-Glutamic Acid Hydrochloride in Treatment of Petit Mal and Psychomotor Seizures, THE JOURNAL, Aug. 21, 1943, p. 1153.

THROMBOSIS OF OVARIAN AND RENAL VEINS

To the Editor:—What is the clinical picture in thromboses of the left ovarian vein with and without involvement of the left renal vein? I should think that such a condition would be relatively common following operations involving the ovary and oviduct or those involving the pampiniform plexus in the male.

William C. Stephenson Jr., M.D., Roanoke, Va.

ANSWER.—As far as is known, thrombosis of an ovarian vein produces no pathognomonic signs or symptoms. Occasionally a thrombosis is found in one and rarely in both ovarian veins at the time of operation for fibroids, ovarian cyst or other condition, yet questioning has failed to elicit any unusual symptoms which might be attributed to these thromboses. Likewise there seem to be no sequelae from the discovery of thromboses in an ovarian vein at the time of a laparotomy. Involvement of the left renal vein may produce signs and symptoms involving the kidney; however, thromboses of these small deeper veins rarely produce symptoms or symptom producing thromboses of the renal vein. Should such occur, however, grave symptoms of general sepsis with localizing symptoms toward the involved kidney will be definitely present.

FREQUENCY OF URINATION IN ELDERLY MAN

To the Editor:—A man aged 70 has polyuria. His father died at 73 of uremia and prostate trouble. The blood pressure of the patient is 150/90, and he weighs between 160 and 165 pounds (73-75 Kg.). He has had no sickness during life with the exception of malaria forty years ago. He is 6 feet (183 cm.) tall, of erect posture and well preserved. The polyuria is intermittent. Repeated examinations of the urine microscopically and chemically reveal no abnormalities. Recently he finds that, after sitting for awhile, on getting up he is urged to urinate; it appears that gravitation of the bulk of urine acts on the trigone and the desire to urinate is pressing. If something attracts his attention at that time the desire passes off. There is no pain in the bladder and no pain at urination. A report from a urologist indicates some hypertrophy of the prostate, especially the left lobe; the prostate is not painful on examination. There are no obstructions to urination, no dribbling, no retention or residual urine and no cystitis. The urologic consultant thinks that a neuropsychiatric condition may exist.

M.D., South Carolina.

ANSWER.—In the absence of any pathologic elements in the urine, the cause of frequent micturition may be difficult to determine. It would first be desirable to ascertain the exact amount of urine that is secreted during the day and night periods and the amount of fluid intake. An apparent polyuria may be excluded in this way. The absence of any pathologic elements in the urine, and the fact that the patient's frequency is greater when he is on his feet, would suggest an irritable condition at the vesical neck or in the prostatic urethra.

Roentgenographic studies of the urinary tract are not mentioned. These should be made, particularly to exclude the possibility of prostatic stones as well as stones in the bladder; such stones may exist in the presence of a normal urine. The possibility of chronic prostatitis should also be considered. If a study of the prostatic secretion on massage reveals prostatitis, massage and instillations into the deep urethra may relieve the frequency of urination.

In view of the fact that there is some hypertrophy of the lateral lobes of the prostate gland as determined on rectal examination, it is very possible that the median lobe is similarly enlarged. Frequent desire to urinate often is brought on by an enlarged median lobe of the prostate gland protruding into the lumen of either the bladder or the urethra. In such cases the urine may be quite normal. Enlargement of the prostate gland and consequent deformity of the bladder neck may cause dysfunction of the neck of the bladder during micturition; as a result a small amount of urine may escape into the prostatic urethra and cause a frequent desire to urinate. If cystoscopy and urethroscopy show definite hyperplasia and deformity of the neck of the bladder, a transurethral resection may be considered if other means of eliminating the symptoms have failed.

POSSIBLE FROELICH'S SYNDROME

To the Editor:—A boy aged 13 had undescended testes when born. They did not descend until he had received several doses of antuitrin, and they were very small, about the size of a navy bean. At 12 he weighed 155 pounds (70 Kg.). His mentality seems to be normal, as the state of Kansas gave him a 99 plus; he makes good grades at school and has an even temper. His secondary sex development is normal. He sticks to a job very well, eats well, has a good appetite, sleeps well, does not suffer from incontinence—in fact he seems to be normal in every way except that the testes are but little larger now than a small navy bean. His height is 63 inches (160 cm.) and his weight 160 pounds (73 Kg.). What is suggested to increase the size of the testes, and what are the prospects for increasing the organs to normal size?

M.D., Oklahoma.

ANSWER.—There is no hormone that will increase the size of the testis; the male sex hormone will, however, increase the size of the genitalia. It is not clear whether the boy has previously had male sex hormone or gonadotropins. Before any form of therapy is given, it would be well to get an x-ray of his skull for the possibility of detecting a pituitary disorder; he should also have a test made of the basal metabolic rate.

From the query it would appear that the boy may have Froehlich's syndrome. If this is so and the testes are atrophied he should be given male sex hormones, possibly 75 to 100 mg. per week in divided doses. This form of therapy may be continued until the desired results are obtained.

CONGENITAL HORSESHOE KIDNEY, RENAL CALCULI AND INFECTION

To the Editor:—I have a patient with a congenital horseshoe kidney. Hematuria is present and numerous small calculi are passed. The x-ray film shows several opaque shadows in the right renal silhouette. One of these calculi was analyzed; it contained calcium oxalate. Examination of the bladder urine revealed 12 to 15 pus cells, singly and in clumps, per high power field, a rare red blood cell, occasional medium sized round epithelial cells and no casts. The urine of the right kidney showed 25 to 30 pus cells, singly and in clumps, per high power field, a few epithelial cells and an occasional red blood cell. The urine of the left kidney showed a rare leukocyte, a rare small epithelial cell and rare red blood cells; no clumps of pus cells and no casts were found. Cultures of all samples of urine show Bacillus pyocaneus and a few gram positive cocci. The patient has received sulfathiazole and sulfadiazine, but there has been no improvement in his condition. His p_H has been 6. Kindly give me suggestions as to treatment of this patient.

M.D., New York.

ANSWER.—This patient obviously has a congenital condition which makes for a poorly draining kidney. Infection in the presence of multiple stones makes it absolutely impossible to treat this kidney successfully as far as the infection is concerned, at least until the stones have been removed. It cannot be said, however, that surgical removal is indicated, as there are many circumstances which must be known before this can be determined. The combination of infection and the presence of calcium oxalate stones is not an indication for the administration of large and intermittent doses of any one of the sulfonamide drugs or of any other type of urinary antiseptic, since they will be of benefit only for the period during which the drug is being taken. It would be better to see that this patient has large amounts of fluid to keep the urine at the p_H level of 6.

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DISABILITY FOLLOWING POSTVACCINAL (YELLOW FEVER) HEPATITIS

A STUDY OF 200 PATIENTS MANIFESTING DELAYED CONVALESCENCE

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AND
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MEDICAL CORPS, ARMY OF THE UNITED STATES

Epidemics of jaundice have occurred among troops in the armies of many nations in the past. The French have referred to the disease as the "jaundice of camps," and the English have often called it the "jaundice of campaigns." Outbreaks of jaundice in civilian communities in this country and abroad have been well described. Jaundice of the usual so-called catarrhal type occurs frequently among troops of our armed forces. Such outbreaks are characterized by an incubation period of twenty to thirty days or less and a spread by contact.

The occurrence of large numbers of soldiers with jaundice at widely separated locations here and abroad, early in 1942, had certain characteristics differing from the well known infectious or catarrhal jaundice. Of special interest was the fact that the outbreaks were invariably associated with administration of certain lots of yellow fever vaccine. Noteworthy were the observations that incidences were reported simultaneously from locations widely separated from the Pacific to the Atlantic and from the North to the South and the absence of demonstrable contact between these units as well as the absence of secondary outbreaks in locations at which this type of jaundice had occurred.

The clinical course of the disease was strikingly uniform in the great majority of patients. It resembled closely so-called "catarrhal jaundice." The onset was gradual, or imperceptible, until the appearance of jaundice. The incubation period was from forty to one hundred and twenty days. Increased susceptibility to fatigue, anorexia, nausea, vomiting and diarrhea were among the prodromal symptoms. There was usually a normal temperature and leukocyte count, with occasional relative increase in the monocytes. Then there was noted darkly colored urine, lightly colored stools and yellowing of the skin and scleras.

The liver was enlarged in about 20 per cent of the cases. Bile pigments appeared in the urine and blood; the icterus index ranged from 15 to 200 or higher, the prothrombin levels were reduced and the results of liver tests indicated various degrees of disturbance of hepatic function.

The vast majority of cases were mild, with recovery in four to eight weeks. In a small number the disease was more severe, and there were a few deaths, a case fatality rate of approximately 0.2 per cent.

The chief pathologic lesions were those of acute yellow or red atrophy of the liver, with frank necrosis of liver cells in the central parts of the lobule. The process is a diffuse necrosis, varying in different parts of the organ, with little damage to the stroma. Fatty changes were inconspicuous. The livers were very small. Edema and inflammation were noted in the gastrointestinal tract, most pronounced in the cecum, and not infrequently the kidneys showed cholemic nephrosis.

Etiologic investigations served to exclude bacterial infection, any type of leptospiral infection or yellow fever in any form as causative factors. That the component of human serum in certain lots of vaccine administered may have carried an icterogenic agent is strongly suspected.

Doubtless the great majority of soldiers who had postvaccinal hepatitis recovered fully or sustained only slight hepatic damage. On the other hand there were some patients who were considered well enough to return to their army duties but who subsequently were found unequal to such demands and were rehospitalized. A study has been made of 200 soldiers returned from overseas because of failure to achieve satisfactory convalescence after postvaccinal (yellow fever) hepatitis.

CLINICAL ASPECTS

These patients had been in overseas hospitals for several months, and some still appeared definitely ill on their arrival five to nine months after their original attack of jaundice. As a group they were pale, thin, exhausted and utterly devoid of animation. Their reactions, mental and physical, were slow and indifferent. They had had no military training whatever since their original illness. Their complaints were (1) extreme weakness, (2) overpowering fatigue, (3) indigestion (for fatty foods), (4) anorexia, (5) pain (especially in the right upper quadrant), (6) nausea and vomiting, (7) backache, (8) nocturnal insomnia, (9) nervous irritability and tremor and (10) anxiety and apprehension (fear of recurrence of jaundice).

From Lovell General Hospital, Fort Devens, Massachusetts.

Pfc William A. Atchley and Miss Mary R. Shields rendered invaluable clerical assistance.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

The following officers contributed valuable assistance in the appraisal of conditions observed in these patients touching on their individual specialties: Richard P. Stetson, Lieutenant Colonel, M. C., medicine; Duncan Whitehead, Lieutenant Colonel, M. C., psychiatry; Thomas B. Jones, Lieutenant Colonel, M. C., surgery; Arthur A. Thibodeau, Major, M. C., orthopedics; Theodore B. Bayles, Captain, M. C., arthritis; Harry L. MacKinnon, Captain, M. C., psychiatry, and Drs. Mandel Cohen, William Chapman and Chester Jones, Harvard Medical School.

Early in the study it was apparent that for purposes of study the patients could be divided into four main groups:

GROUP A (39 patients).—These patients showed every evidence of having recovered from their hepatitis during their long hospitalization overseas. Their complaints were indefinite, centering mostly about their digestive tracts and more particularly about their supposed inability to digest fatty foods, although investigation showed that their ideas as to what constituted fatty foods were for the most part erroneous. For these patients an extensive program of retraining and rehabilitation was instituted, with the result that all were returned to full duty. Laboratory studies indicated that normal hepatic function had been reestablished. This group, therefore, was considered as being made up of individuals who had completely recovered from their hepatitis during their long hospitalization overseas and who only were in need of rehabilitation. Fifteen patients were neurotic.

GROUP B (94 patients).—These patients appeared on physical examination to be exhausted, pale and underweight. They were wholly indifferent to war activities or any other topic. Two prominent symptoms were profound anorexia and pain in the right upper quadrant. This pain appeared either soon after eating or soon after attempting mild exercise, such as walking. Tests of liver function showed that varying degrees of hepatic dysfunction remained in only 4 cases, and 19 per cent had palpable, tender livers. The members of this group were considered to have prolonged convalescence. There were 40 patients with a neurotic background.

GROUP C (30 patients).—Investigation by the neuropsychiatric service yielded abundant evidence that these patients had been neurotic before their attack of hepatitis and in many cases before induction, and that they had developed psychoneurotic disabilities as a result of their prolonged illness. Their neuroses focused largely on their digestive tracts and embraced such typical symptoms as anorexia, nausea, vomiting and pain in various regions of the abdomen, or low back pain. Many of these men gave past histories of sensitive stomachs, and their appetites had been catered to since youth. These patients were considered as being disabled primarily by neuroses which had been activated by antecedent liver disease.

GROUP D (37 patients).—These patients were obviously sick. Although they were classified as ambulatory, many spent the major part of the day in bed because of extreme degrees of weakness and exhaustion. They suffered frequently from nausea and vomiting, precipitated either by the first bite of food, eaten without zest, because of profound anorexia, or by walking even a short distance. The vomiting observed was frequently explosive and urgent. Eight patients were considered to be neurotic.

Of particular interest in this group were tremor and extreme vasomotor disturbance. The former manifested itself by a persistent, coarse tremor of the hands and feet, which was much accentuated by the slightest muscular effort, such as shaking hands or making a fist. The vasomotor phenomena consisted of icy cold, dripping, red hands and feet. When these patients were examined in the erect posture it was not unusual for them to drip perspiration from the tip of each finger.

Only 10 patients in this group still had evidence of hepatic insufficiency according to the results of serial sulfobromophthalein tests at thirty minutes. (Fourteen patients showed retention of 10 per cent at twenty minutes.) Thus the majority had no evidence of dysfunction. The liver edge was palpable and tender in 25 of these patients, the meaning of which remains obscure.

LIVER FUNCTION TESTS

Data contained in the records from overseas hospitals gave clear evidence that each of these patients had suffered with jaundice of varying magnitude and that this was related to the previous administration of yellow fever vaccine. Frequent icterus index and serum bilirubin determinations were made, and oral hippuric acid liver function tests were done. The results of these tests overseas indicated that, at some time during their hospitalization but many months after their acute illness, 125 patients had evidence of disturbed liver function (icterus index 20 to 40, quantitative van den Bergh determinations 1 to 3 mg.). In addition, the clinical histories indicated an uninterrupted chronicle of illness following the initial acute episode.

After the arrival of these patients at the Lovell General Hospital, tests of liver function were repeated (table 1). It was found that some patients still retained elevation of serum bilirubin (9 cases), palpable, tender liver edges (40 cases), and little or no evidence of subjective clinical improvement. Oral hippuric acid liver function tests done at this hospital gave uniformly negative results, which are in keeping with the lack of sensitivity of this test.

TABLE 1.—*Liver Tests*

Test	Overseas	Lovell General Hospital
Oral hippuric acid test abnormal * in...	20 (10%)	0
Icterus index abnormal † in.....	200 (100%)	9 (4.5%)
Sulfobromophthalein excretion abnormal ‡ in	.....	14 (12%)
Liver edge palpable in.....	.....	40 (20%)

* Three Gm. or over is considered normal.
† Indexes greater than 8 are considered abnormal.
‡ Any retention at the end of thirty minutes is considered abnormal.

In addition, it was found expedient to employ the serial sulfobromophthalein test for this entire group of 125 as laboratory evidence of disturbed hepatocellular function (chart 1). The amount of dye administered was 2 mg. per kilogram, and results showed that at the end of twenty minutes 40 patients retained more than 10 per cent of the dye and at the end of thirty minutes 14 patients still showed retention up to 15 per cent (chart 2). It was agreed that the thirty minute determination would be the laboratory criterion for evidence of disturbed liver function, giving an incidence of 12 per cent for the entire group tested by this method.

The following case reports are typical of the group considered to have hepatic damage:

CASE 1.—F. S., a private aged 26, became jaundiced four months after receiving yellow fever vaccine. Although he was jaundiced and voiding "dark urine" he continued on duty for twenty-seven days and was then hospitalized. A diagnosis of "catarrhal jaundice" was made. He was transferred to a convalescent hospital four days later where many such cases were treated, but his progress was discouragingly slow. When after four months he was still unable to do duty because of extreme fatigability and epigastric distress after meals, he was ordered back to the United States. His past medical and family

histories were noncontributory. Physical examination on admission to Lovell General Hospital was negative except that he was pale and complained of vague epigastric tenderness and weakness. The liver edge was palpable 1 fingerbreadth below the costal margin and was tender to pressure. The spleen was not palpable.

The pertinent laboratory findings are given in table 2. Additional studies, including barium meal with particular attention to the small bowel pattern, gastric analysis and oral cholecystogram, revealed no evidence of disease. The psychiatric consultant thought a mild psychogenic component was present.

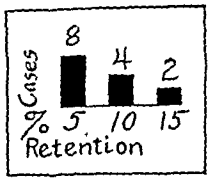


Chart 1.—Serial sulfobromophthalein tests, twenty minutes' retention.

In view of the soldier's history and his laboratory findings, it was the opinion that he had evidence of some degree of residual hepatocellular dysfunction ten months after his original illness and that a diagnosis of chronic hepatitis was inescapable.

A feature of interest in this case, and one seen not infrequently in the group, was the relatively high normal serum bilirubin on admission to our hospital and the subsequent return of subclinical and clinical jaundice. The exact significance of this was a matter of conjecture, although it would appear that the liver parenchyma was quite sensitive to relatively minor environmental changes. For example, a rise in the icterus index was noticed in several soldiers who had been allowed home on furlough, during which time they had indulged in alcoholic beverages. It was thought that in these instances the elevation of the serum bilirubin was directly related to this overindulgence. Incidentally, alcohol in any form was badly tolerated by these men.

Further, if one could use this patient's icterus index, serum bilirubin and sulfobromophthalein determinations as criteria of progress, one would be reasonably safe in concluding that there had been no improvement in liver function during his stay at Lovell General Hospital. However, this did not hold true for the majority of the group, in that the general trend of the laboratory findings was toward improvement.

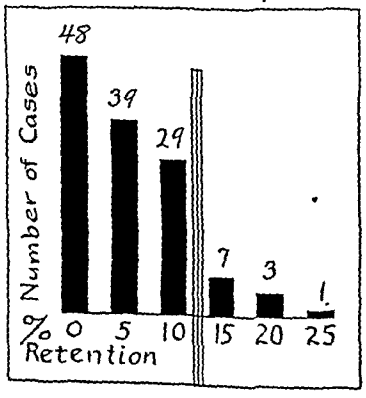


Chart 2.—Serial sulfobromophthalein tests, thirty minutes' retention in 125 cases.

CASE 2.—J. B., a young private, had received yellow fever vaccine on May 14, 1942 and was hospitalized because of anorexia, weakness and jaundice on July 14. His past medical history was negative except for "stomach trouble" described as low abdominal cramps, nausea and vomiting following the eating of foods as cheese, bananas and tomatoes. There was no history of allergy.

A diagnosis of acute hepatitis was made overseas. His acute course did not appear especially severe, but his convalescence was disappointingly slow, because of persistent anorexia, extreme fatigability and weakness.

On admission to Lovell General Hospital he was pale and thin, and he complained of fatigue, weakness, inability to digest "fatty foods" and anorexia. The physical examination was unimpressive. The liver edge was at the costal margin. His laboratory studies were all within normal limits except for the sulfobromophthalein determinations, which are given in table 3.

Additional studies, including cholecystogram, barium meal, stool studies and gastroscopy, failed to reveal evidence of organic disease.

It was the opinion that this soldier's acute hepatitis had resulted in some degree of hepatic dysfunction as evidenced by a rather pronounced degree of sulfobromophthalein retention. The essentially normal serum bilirubin in face of this retention was an interesting feature. Subjectively the clinical picture remained unaltered.

TABLE 2.—*Results of Laboratory Examinations in Case 1*

	Icterus Index
A. Overseas	
Aug. 22, 1942	15
Aug. 25, 1942	30
Sept. 9, 1942	12
Sept. 28, 1942	10
	Oral Hippuric Acid Conversion Test (Gm. Benzoic Acid)
Aug. 26, 1942	3.7 Gm.

B. Lovell General Hospital

Date	Icterus Index	Van den Bergh	
		Direct	Indirect
Dec. 18, 1942	10	Negative	Normal
Jan. 1, 1943	15.3	Negative	3.4 mg.
Feb. 17, 1943	20.8	Negative	4.7 mg.
March 2, 1943	15	Trace Delayed	3.2
March 18, 1943	16.8	Negative	2.3
March 25, 1943	11	Negative	1.4
April 6, 1943	14.6	Negative	2.2
April 14, 1943	15	Delayed	2.2
April 21, 1943	13.5	Delayed	1.7
April 29, 1943	16	Delayed	1.9

	Serial Sulfobromophthalein Determination, 2 Mg. per Kilogram		
Date	10 Minutes	20 Minutes	30 Minutes
Jan. 15, 1943	45%	15%	10%
Feb. 22, 1943	48%	25%	15%
May 10, 1943	15% (25 minutes)		12%

TABLE 3.—*Sulfobromophthalein Determinations in Case 2*

	10 Minutes	20 Minutes	30 Minutes
Jan. 23, 1943	45%	20%	10%
May 10, 1943	....	25%	15%
May 11, 1943	Single specimen 20% at 27 minutes		

It must be noted that in many instances there was poor correlation between liver function tests and clinical findings. Subjective manifestations were usually out of all proportion to laboratory evidence of liver involvement. Clinical improvement in some did not follow improvement in liver function tests, nor did completely normal tests always indicate a healthy person. On the other hand, there were some soldiers who were returned to full duty in good health still showing abnormal sulfobromophthalein retention.

NEUROPSYCHIATRIC SURVEY

The psychiatrist investigated 135 patients. A positive diagnosis of psychoneurosis was made in 115 cases, and in 4 others a diagnosis of probable psychoneurosis was justified, although the evidence was not so complete. Analysis of 103 of these neuroses revealed that 37 had a typical anxiety state and 66 had a mixed type of psychoneurosis.

TREMOR SYNDROME

The 37 patients included in group D presented clinical features of extraordinary interest. While it is true that vasomotor disturbances of varying magnitude are known to be associated with liver disease, the degree of imbalance was excessive in these soldiers. Reference has been made to the icy, red, wet extremities and to the constant pronounced tremor so intensified by muscular effort. Of even greater interest was the devastating and overwhelming weakness so apparent in all of these patients. For example, it was impossible for many to complete the writing of a postcard without resting at least once, nor could they dress themselves without noticeable exhaustion.

In an attempt to evaluate this weakness, 20 members of this group were studied in the Fatigue Laboratory at Harvard University. Here they were subjected to the "pack test," in which the subject is made to mount a 20 inch step at a certain cadence until he becomes exhausted or for a maximum of five minutes. A formula which takes cognizance of the duration of exercise and the rate at which the pulse returns to normal gives an index of physical efficiency. It was found by this test (table 4) that these patients turned in the lowest score of any group ever tested. Their

TABLE 4.—*Test for Physical Fitness*

A. Pack weighs about ⅛ the weight of the subject
B. Subject steps up and down 20 inch step, 30 round trips per minute
C. Index of physical efficiency,

$$I = \frac{\text{Duration of exercise in seconds} \times 100}{2 \times \text{sum pulses } ([1'\text{-}1\tfrac{1}{2}'] + [2'\text{-}2\tfrac{1}{2}'] + [3'\text{-}3\tfrac{1}{2}'])}$$

D. Average scores

Athletes	95
Normal unselected males	61
Men with neurocirculatory asthenia	30
Hepatitis	15

average score was 15, while that of soldiers with neurocirculatory asthenia was 30, of normal unselected males 61 and of athletes 95. These results corroborated the patients' statements that they were unable to exert themselves to any appreciable degree.

It is also of note that there was a masklike facial expression in 20 patients not unlike that seen in parkinsonism. There was, in addition, lack of free swing of the arms in walking.

Under a reconditioning program but little improvement could be noted in this group, as contrasted with the decided improvement in group A. They failed to gain in weight, and sweating of the extremities was still excessive. Tremor remained constant.

There was, however, objective evidence of improving liver function, and at the termination of these observations 23 patients (63 per cent) had fully recovered in this respect. Palpable, tender liver margins, varying considerably from day to day, were still noted in 20 patients (54 per cent). Biopsy specimens in 2 of these patients revealed normal liver tissue.

LIVER TESTS

The greatest caution must be exercised in arriving at final decisions where disturbed liver function is concerned. The organ has such varied functions that no laboratory test, done singly or in multiples, may be relied on implicitly to proclaim its state of disturbance. Attention has been directed to the impossibility of correlating the subjective complaints of these patients, the liver function tests and the size of the liver. This was manifest throughout the studies. It was not unusual for patients to return to full army duties clinically recovered but with adverse results of the last serial sulfobromophthalein tests. The reverse also was seen. Experience has indicated that this is not unusual in individuals who have suffered liver insult. Such organs also seem to react to subsequent somatic disturbances or even mild infections by mild or moderate relapses a long time after the original illness. It is of interest that, in a few of those patients who had recovered from early attacks of postvaccinal hepatitis and who came to autopsy after death from other causes, entirely normal livers were found. Likewise, biopsies performed on 2 of our patients revealed normal appearing but enlarged livers with histologically sound tissue. The importance of the evidences of liver dysfunction which our tests have revealed cannot be properly evaluated until the same tests are applied to a group of individuals who have had hepatitis and who are without any significant symptoms. It has been shown by Kornberg [1] and others that impairment in excretory function of the liver was present in a significant percentage of medical students who considered themselves in good health. That there are parenchymal and stromal lesions in the acute stage of epidemic hepatitis, which the disease in question so closely resembles, has been ably demonstrated by Dible and his associates [2] in a series of punch liver biopsies on patients so affected.

Abdominal Pain.—Mention has been made of pain in the right upper quadrant, elicited so often by exercise or by eating. Frequently it was almost a trigger response similar to angina pectoris. Sudden in appearance and severe enough to cause the patient to double up, the distress subsided in like manner after resting in the one case or vomiting in the other. This observation was verified at the Fatigue Laboratory during tests for physical fitness. Examination during such attacks revealed a tender liver edge but not one that had materially altered in size incident to effort. Whether peripheral blood counts done before and after these episodes might show change in cell counts would be an interesting point for investigation.

Gastrointestinal Symptoms.—The various digestive complaints were similarly difficult to evaluate. In many the symptoms arose almost immediately after taking the first bite of food or very shortly thereafter, and in either case too soon for any digestive action to have started. In others, nausea, distention, eructation and vague abdominal distress appeared from half an hour to one hour after eating small amounts of food. The patients cited so-called "fatty foods" as the prime offenders, but at the same time there was no intelligent appreciation of what comprised fatty foods. Meats, fried or otherwise, seemed to cause the most trouble, while butter, cream and even eggs apparently were well tolerated. Moreover, gastrointestinal x-ray studies on 60 patients and gastroscopies performed on 27 patients failed to disclose any pertinent findings. Then too, only a few of the arch sufferers retained any laboratory evidence of hepatic dysfunction, so that the clinical picture and laboratory findings were largely unrelated or

1. Kornberg, A.: Latent Liver Disease in Persons Recovered from Catarrhal Jaundice and in Otherwise Normal Medical Students, J. Clin. Investigation **21**: 299 (May) 1942.
2. Dible, J. H.; McMichael, J., and Sherlock, S. P. V.: Pathology of Acute Hepatitis, Lancet **2**: 402 (Oct. 2) 1943.

at least difficult or impossible to correlate. One is led to believe, therefore, that there is a strong neurotic aspect to these complaints.

PSYCHIATRIC FINDINGS

Of interest were the findings of the psychiatrists in their investigations of these patients. The final opinion handed down was that, for the most part, the individuals were disabled by a neurosis which had been latent but was rekindled and made manifest by an organic physical illness, in this instance hepatitis with jaundice. Aside from the gastrointestinal symptoms, it was felt that the total picture might well be that of increased tension, so frequently seen in a true neurosis, as a direct manifestation of anxiety. The gastrointestinal symptoms were considered continuations of those of the acute illness unconsciously prolonged as an escape from a difficult situation. In group A, and in a few other instances, the prolonged period of hospitalization, overseas service and concern by many physicians were thought to be adverse factors, since it is doubtless true that psychologic disturbances become more and more prominent in hospital wards.

TREATMENT

The vast majority of these patients were not in need of any specific type of therapy. However, the regimen which was finally adopted had as its goal (1) restoration of an adequate diet, with special attention to protein, carbohydrate and vitamin B complex requirements and (2) reconditioning and indoctrination.

Briefly, a very large number of these soldiers had to be instructed in the essentials of dietetics. Their prolonged illness and residence in hospitals and the continual discussions regarding their "interesting" disease were instrumental in creating vagaries about foods and indifference as to eating. In addition, actual aversion to the odors and first tastes of food had helped reduce consumption of necessary foods to a point where many were undernourished. With the eventual resumption of adequate diets, notable general improvement was noted. Clinical evidence of avitaminosis was not apparent, but the vitamin B complex was added in every case.

The most striking benefits were obtained from a carefully planned program of rehabilitation in which the patients were put into uniform, became once again part of the armed forces and spent a portion of each day at the sports arena indulging in graduated games and calisthenics. Movies and lectures designed to direct and educate these soldiers in the ideals for which they were fighting were also most helpful.

By adopting these simple methods, only 87 of the entire group (34 per cent) were eventually discharged from the service, and over half of these were released because of neurotic disorders which had existed prior to enlistment. Very little subjective improvement was noted in the group manifesting the tremor syndrome.

COMMENT

The actual number of soldiers who were originally vaccinated against yellow fever and who sustained liver inflammation is not stated for obvious reasons. It is of importance only as abundant evidence that the vast majority of those affected recovered quite promptly and, in all probability, completely. Likewise there are other features which stand out prominently. Complete restoration of function in a diseased liver may require a considerable time—for some, as long as six months to a year or even longer. That restoration does occur eventually has been observed in most of these soldiers. One must conclude that 12 per cent of the entire group still have some evidence of liver disease, as evidenced by the laboratory finding of some dye retention at the end of thirty minutes. This is a small number but interesting at this distance from the initial disease.

The tremor syndrome, so called, remains a noteworthy observation. Whether the entire picture will eventually subside, only time will tell. The question has been raised whether this symptom complex has arisen as the result solely of antecedent liver disturbance or largely anxiety neurosis. That the syndrome itself constitutes a real disability cannot be gainsaid. Fortunately, only 15 per cent of the study group fell into this category—a very small number.

CONCLUSIONS

1. A study was made of 200 patients with prolonged convalescence after postvaccinal (yellow fever) hepatitis.

2. Only a small number of those soldiers originally suffering from postvaccinal hepatitis sustained prolonged disabling illness.

3. Psychoneurotic patterns may develop as a complication of this illness. Antecedent patterns may be reborn.

4. The sulfobromophthalein test for liver function in 125 cases showed that at the end of twenty minutes 40 patients (32 per cent) had some dye retention and that at the end of thirty minutes 14 patients (11 per cent) showed some dye retention. None of the other patients had objective evidence of liver dysfunction.

5. Improvement in damaged liver function is still continuing at the end of six months to a year.

6. Correlation of symptoms, laboratory tests and incidence of palpable liver edges were not possible in most cases.

7. Thirty-seven patients (18.5 per cent) have a vasomotor disorder manifested by pronounced tremor, icy cold, red, dripping hands and overpowering weakness.

ABSTRACT OF DISCUSSION

DR. JOSEPH STOKES JR., Philadelphia: Our studies began in June 1942, when a pool of convalescent mumps plasma from a large army post, plasma which we used in 1 case for experimental treatment of mumps, produced jaundice in this man seventy-five days after his infection. This pool of plasma has been used since that time for the intravenous injection of 5 additional men, volunteers, and has produced hepatitis in all of them, with overt jaundice in 4. Plasma was obtained from 1 of these 5 men at or near the start of his hepatitis at twenty-three days from the time that he had been inoculated with the original pool of plasma, and this plasma was injected into 2 additional volunteers. Both of these volunteers also developed hepatitis. In 2 other volunteers we injected subcutaneously yellow fever vaccine which had been produced for the Army in November 1942. It was kept in the cold until January 1942 and then at room temperature, including two summers in Washington, from June 1942 to November 1943. The yellow fever virus by this time was shown to be inactive, but the agent causing hepatitis was demonstrated as still active, since it produced the hepatitis in both of these volunteers injected. Of the 10 men, therefore, whom I have mentioned, hepatitis was produced in all by these various materials. Approximately eighteen liver function tests were used. The most valuable tests were

the serum and the urine bilirubin, the sulfobromophthalein test, cephalin, the cholesterol flocculation test and the vitamin A level in the blood. The vitamin A level is not specific but when correlated with the other tests was of considerable assistance. The incubation period in this group was from twelve to thirty-five days. Acute symptoms of gastrointestinal disturbance appeared first. At that time the liver function tests were abnormal. There was then usually a period free of symptoms in which the liver function test still indicated hepatitis. Finally, in most instances in between 75 and 110 days overt jaundice appeared. One of the men has been reinoculated with the same pool of plasma obtained from the army post one month after his liver function tests were normal and it is now well over a hundred days and he has not shown any evidence of hepatitis by the liver function studies or any jaundice. Laparotomy was performed in 1 of the cases during the height of the intestinal symptoms, and in that instance enlarged mesenteric glands were found with a regional or localized ileitis which is evidence of the generalized infection. Whether serum jaundice and infective hepatitis or infectious hepatitis of an epidemic nature are similar or different is still a question for discussion. The fact that we found early evidence of hepatitis by liver function studies thirty days after inoculation suggests that there may be greater similarity than at first had been supposed.

LIEUTENANT COLONEL JOSEPH BANK, El Paso, Texas: Colonel Benjamin and Colonel Turner and other investigators who have studied jaundice following yellow fever vaccine have caused us to scrutinize postvaccinal convalescents for residual or recurring symptoms. As a result we discovered many patients in whom symptoms recurred after return to duty following recovery. In addition we found other cases of hepatitis not associated with yellow fever vaccine but with similar findings. The latter patients can be divided into two groups. The first and larger consisted of those with deep jaundice, whose condition was diagnosed immediately and who were hospitalized. The second, smaller, group includes those with slight or unrecognized jaundice and with fatigue and vague gastrointestinal symptoms. A typical case may be a soldier who may or may not be aware of a mild attack of jaundice a long time before. Some months later he may complain of gastrointestinal symptoms and fatigue. Examination reveals little jaundice or an icterus index within the upper limits of normal, enlarged tender liver and particularly decreased sulfobromophthalein excretion by the liver. The test we used was the 5 milligram dose with determinations at thirty and forty-five minutes. One other point I should like to make about the acute cases: We have seen to date about 6 patients who were operated on for suspected abdominal emergencies but with negative findings. Several days later they developed jaundice and the usual picture of acute hepatitis.

COLONEL JULIEN E. BENJAMIN, M. C., A. U. S.: The groundwork for the recognition of this syndrome really started with the air forces when a large number of these cases were received. I should like to emphasize the fact that there were these fairly large numbers of troops who were invalided with a vague syndrome; that the only proof that we have of any organ that might be responsible is that of the liver, and we haven't really abundant proof because of the notorious fallibility of liver tests. Still it seems inescapable in the light of the clinical picture of these individuals that residuals of hepatitis were present.

Sleep During Middle Period of Life.—The interruption of rest by local disease, occurring to persons in the middle period of life, does not cause the same degree of exhaustion and wasting as in the young. They bear the loss of sleep better, because their constitution has to sustain the stress of repair only—not of both development and repair, as in the child. Their recovery is slower; their subsequent sleep is not so profound nor so prolonged, nor their rest so complete. The defective sleep and slow repair which manifest themselves in the old after injury of any kind are familiar to us all.—Hilton, John: Rest and Pain, London, George Bell & Sons, 1857.

INCIDENCE OF RAT BITES AND RAT BITE FEVER IN BALTIMORE

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Wild rats, even more than any domesticated animals, enjoy very intimate living arrangements with man. They can live in the same house, share the same beds, eat the same foods, carry the same internal and external parasites, suffer from the same diseases and plagues. Man has made numerous unsuccessful efforts to terminate this close relationship and has at all times manifested a great distaste for any physical contact with these companions, either dead or alive. Rats on the other hand are less discriminating, even seeking contact with man and treating him much as they do the dying or dead members of their own species—running over him, licking him, biting him and finally trying to eat him.

The latter aspect of the rat's relationship to man has not received much serious attention. This paper, therefore, deals with the frequency with which rats bite man, the circumstances under which they bite him, their motive in biting him, and finally the results produced in man by their bites.

Parts of Body Bitten by Rats

	Number of Persons with Bites
Arms	
Hands and fingers	41
Forearm	5
Shoulder	2
Head	
Cheek, lips	11
	5
	4
Legs	
Feet	19

The data on which the present report is based came from the Pediatric Dispensary and the Accident and Medical Departments of the Johns Hopkins Hospital, from the follow-up of these cases by several workers and from voluntary reports made by citizens to the Health Department and Rat Control Office of the city of Baltimore. In the hospital, data were available only for the four year period from 1939 to 1943. Since that time records on rat bites in the Pediatric Dispensary and the Accident Departments have been discontinued because of the war.

During this four year period 87 persons were treated for rat bites or the results of rat bites in the Johns Hopkins Hospital. Sixty-five of these persons, or 75 per cent, came from an area of less than 2 square miles surrounding the hospital. The follow-up of 43 of the cases in this area yielded records of 12 more persons having been bitten by rats. Sixteen of 51 bitten persons who during this period were voluntarily reported to the health department came from this same area. Thus a minimum of 93 persons were bitten during

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The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Johns Hopkins University.

Dr. Mary Goodwin, who was in charge of the Harriet Lane Dispensary, provided the names of patients treated in the dispensary; Dr. Huntington Williams, Commissioner of Health, gave us the names of citizens who had voluntarily reported rat bites to the health department. The follow-up work was done by Mrs. Joseph Leach of the Woman's Civic League and Mr. N. Wolbarsht.

a four year period, or 23.2 per year, in an area of this than 2 square miles. A house to house canvass of this area would undoubtedly have provided many more instances, since in these heavily rat infested districts most people apparently accepted rat bites as being inevitable. They came to the hospital for treatment only when the bites had become infected or the skin had actually been torn or chewed away. The fact that rat bites are not reportable to the health department also means that many persons may have been treated by their family physicians and so would not have been included in the records either of the hospital or of the health department.

Most of the rat bites occurred in a part of the Eastern Health District which has very poor housing and living conditions and is inhabited largely by colored people. In the block map of the Eastern Health District shown in figure 1 it can be seen that almost all of the rat bites (solid dots) were located in blocks with a high percentage of colored people (indicated by cross hatching). In the eastern part of the Eastern Health District, which has good housing and living conditions and is inhabited largely by white people, only a few persons were bitten. It does not follow that the rats bite only colored people. Actually only 58 of 93 bitten persons, or 62 per cent, were colored.

Of the 65 persons from the 2 square mile area that were treated in the Johns Hopkins Hospital and on whom we have full records 7, or 10.7 per cent, developed rat bite fever. None died and none developed any other rat borne disease.

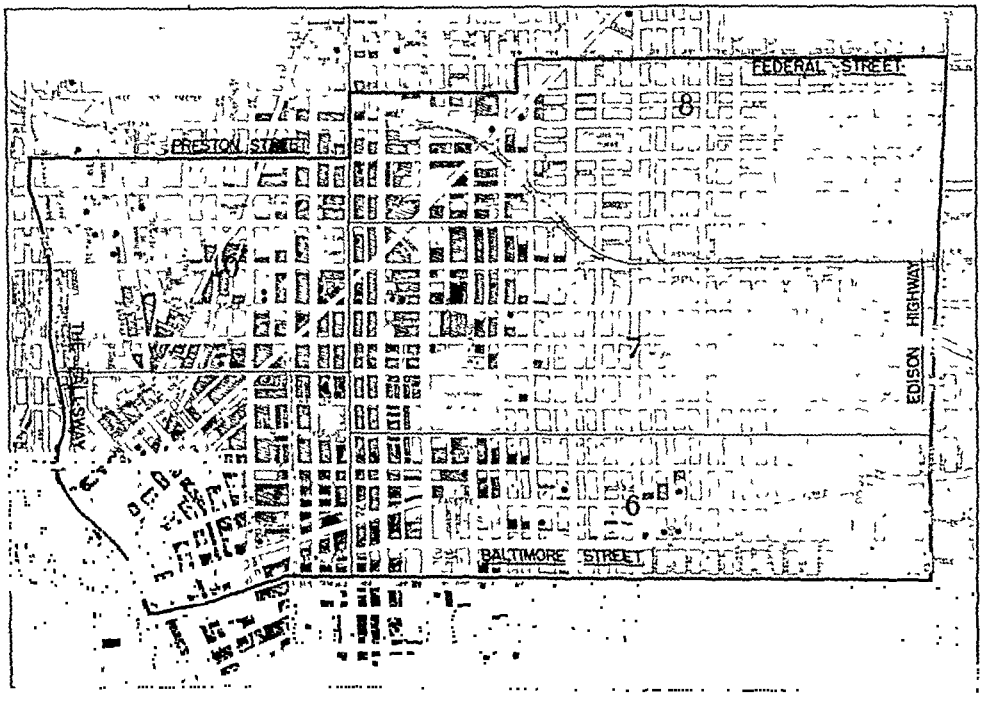


Fig. 1.—Map of Eastern Health District (heavy black line) showing colored population (cross hatching) and location of persons who were bitten by rats (black dots). The Johns Hopkins Hospital is located almost in the center of this district.

The study of these data gives other information of general and medical interest. It was found that although the ages of the bitten persons ranged from 2 months to 65 years, the great majority were infants under 1 year of age. Figure 2 shows the age incidence curve for the 87 persons treated in the hospital. Especially noteworthy is the fact that without exception all of the persons on whom we have records were bitten at night, presumably while asleep. There were no records of persons having been attacked by rats while awake.

In the 87 hospital treated patients the parts of the body most favored by the rats were the fingers and hands, as may be seen in the accompanying table.

Thus, as would be expected since the rats did the biting only while the victims were asleep, the uncovered parts of the body, namely the hands and the face, were bitten most frequently.

Twenty-five persons received multiple bites on the same or different occasions. One child was bitten on eleven different nights. Thirty-nine of the 93 patients came from one house or the immediately adjoining houses. Since these houses were not more heavily infested than many others, we may draw the conclusion that once a rat has bitten one human being it is apt to return again. In one house 4 children and 2 adults were bitten within a short time.

A strong craving for blood might explain why once having bitten a person the rats apparently are apt to bite another person. In order to determine whether rats like fresh blood, we offered them human blood obtained from the hospital operating room. The 8 rats used for these observations had recently been trapped in the city alleys and yards. At 11 a. m. each of 5 rats were given 50 cc. of fresh blood mixed with 8 per cent citrate and were given free access to dog chow and water. By 9 o'clock on the following morning 2 rats had eaten 50 cc., while 3 had eaten 20, 10 and 8 cc. respectively. At 11 a. m. each of the 3 other rats were given 139 Gm. of fresh blood and serum with access to water but not to any other food. By 9 o'clock on the following morning 2 of the rats had eaten all of the blood and 1 had eaten 47 Gm. When one considers that the average normal food intake of full grown wild rats does not usually exceed 35 to 40 Gm., the large intake of 139 Gm. indicates that the rats had a real craving for this fresh human blood.

COMMENT

The results of this sampling study indicate that a large number of persons are bitten by rats each year. It is probable that if so many are actually bitten a far larger number must have direct physical contact with rats, that is, rats run over them, lick them, and so on. In densely populated and rat infested areas the rat bites and this direct physical contact may thus constitute a hitherto overlooked means of transmission of such diseases as poliomyelitis and rabies.

It was reported that in all instances the persons were bitten at night while asleep, not while they were defending themselves. It may be asked then why the rats

bite the sleeping persons. Observations which we have made on the behavior of wild rats may answer this question. We have observed repeatedly that wild rats eat dying or dead rats with great relish. They start at the head and work down and often devour the entire body, hair, bones and even teeth. They often prefer dead rats to other foods. It is likely therefore that the rat regards the human being, particularly the blood, also as food. After exploring the quiet sleeping person the rat probably starts to eat and if not stopped at once continues to eat. Rats have been known to eat most of the cheeks and noses of babies before being driven off. Brehm [1] reports that in zoos they have been known to eat and gnaw away at the feet of elephants, in 3 instances in the Hagenbeck Zoo near Hamburg causing the death of the animals. He reports further that on farms rats have been known to eat the webs between the toes of ducks, to eat holes in the bellies of fat pigs, and near a slaughterhouse to devour 35 dead horses in one night.

It is very likely that the rats involved in the present observations belong exclusively to the common Norway species (Rattus norvegicus), which has omnivorus food habits. This statement is based on the finding that except along the water front only Norway rats were caught or recovered in an extensive trapping and

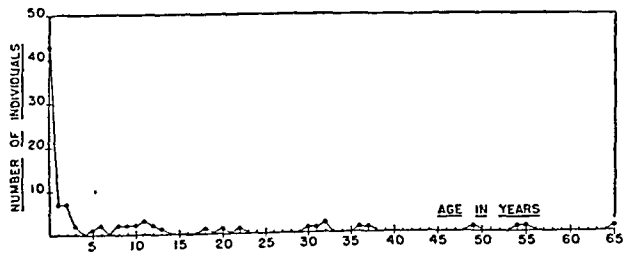


Fig. 2.—Age incidence curve for the 87 persons who were treated at the Johns Hopkins Hospital for rat bites.

poisoning campaign. It is possible that the herbivorus Alexandrine (Rattus alexandrinus) may not bite human beings with the same frequency if at all. Further observations in cities inhabited largely by the Alexandrine rats should answer this question.

SUMMARY

1. Within an area of less than 2 square miles in the city of Baltimore a minimum of 93 persons were bitten by rats during the four year period from 1939 to 1943.

2. Of these persons 65 received treatment at the Johns Hopkins Hospital, which is located within the 2 square mile area.

3. Of this number 7, or 10.7 per cent, developed rat bite fever. None died.

4. The age of the patients ranged from 2 months to 65 years. Sixty per cent were babies under 1 year of age.

5. The patients were bitten while asleep. The hands and face, which are exposed during sleep, were most frequently bitten. In many instances the bites did little more than puncture the skin and draw blood before the patients were awakened; in some cases, however, part of the face was chewed away.

6. The evidence indicates that once having bitten a human being the rats are apt to bite other human beings.

7. It was concluded that the rat regards the sleeping infant or adult as a source of food. In most instances the first bite awakens the victim, frightens the rat away and thus interrupts the meal.

8. Persons are much more apt to be bitten in heavily infested districts with poor housing and living conditions.

9. The high incidences of rat bites and the probably much higher incidence of actual physical contact between the rats and human beings may indicate that physical contact constitutes an overlooked channel for the transmission of diseases from rats to human beings.

1. Brehm, A. E.: Brehms Tierleben, vol. 2, p. 344, Die Säugetiere, Leipzig and Vienna, Bibliographisches Institut, 1921.

ABDOMINAL PAIN DUE TO UROLOGIC DISEASE IN CHILDREN

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In patients with symptoms of intra-abdominal disease the difficulties of precise anatomic diagnosis are often greatly increased by clinical manifestations due to a wide variety of extra-abdominal lesions. Hematologic, allergic, orthopedic, respiratory, endocrinologic, infectious or urologic disease frequently leads to erroneous diagnosis and mistaken surgical intervention. The diagnostic problem is usually difficult enough in adults but is notoriously more difficult in children, and in the very young the clinical approach must be largely objective. It is recognized that in infants and children with symptoms of acute abdominal surgical disease laparotomy is often the urgent indication even though the differential diagnosis may be in doubt. Only by this method will the mortality of acute appendicitis, for example, be reduced.

Abdominal pain commonly results from a localized intraperitoneal disease, as appendicitis, cholecystitis or diverticulitis, or is widespread, as in general peritonitis. The abdominal projection of pain through the vagus from an acute infection of the upper respiratory tract is well known. The sudden distention of a hollow viscus is one of the most frequent causes of abdominal pain and may vary from the intestinal gas bubble, which produces colic in the infant, to severe intestinal obstruction and distention by angulation, bands or intussusception. Except for the colic of infancy, children rarely suffer pain, nor is indigestion or constipation likely to cause it in the young. Most acute abdominal pains in children demand surgical consideration and frequently laparotomy. Moreover, it is recognized that abdominal exploration had best be performed in many children presenting this clinical picture than that a fatality should result from failure to recognize the emergency condition. Rather we are chiefly concerned here with the persistent or recurrent abdominal pain in children whose condition does not demand emergency surgical treatment and in whom a comprehensive examination, including urologic investigation, should be car-

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Read in a symposium on "Abdominal Pain in Children" before the Section on Pediatrics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

ried out before subjecting the patient to exploratory laparotomy. In many children of this group the abdominal pain will be demonstrated to have resulted from either gradual or rapid distention of the collecting part of the urinary tract above an obstruction, which in turn may be located at any point from the external urethral meatus to the renal calix. The advent of infection usually intensifies the clinical manifestations including pain and materially adds to the gravity of the prognosis and therapeutic problem.

As an unfortunate corollary, clinicians commonly fail to recognize that in half of all patients with advanced obstructive uropathy, and particularly with complicating infection, symptoms of chronic gastrointestinal disease are prominent and may overshadow other subjective symptoms of urinary tract disease. As a result the erroneous diagnosis of biliousness, intestinal indigestion, dyspepsia, chronic appendicitis, gallbladder disease and so forth is too often made. This is true in patients of all ages but is particularly notable in the young. The success of the indicated urologic treatment, often surgical, attests the fundamental correctness of the diagnosis.

With ureteral obstruction the pain of the resulting pelvorenal distention is likely to be most pronounced in the lateral and posterior loin. Yet commonly this pain is referred to the isolateral lower abdominal quadrant or even to the midabdomen. The chief potential causes of urologic abdominal pain are the obstructive lesions of the urinary tract; the large variety are indicated in the accompanying table, in which hydronephrosis, ureteral stricture, ureteral obstruction by aberrant vascular compression and obstructions at the bladder outlet or in the deep urethra are of highest incidence.

Persistent pain or swelling along the course of the urinary tract urgently demands a complete urologic examination. Urinalysis is a diagnostic requisite and, in the female, the specimen should always be collected by catheterization. Urinalysis, thorough physical examination and a satisfactory excretory urographic study represent the minimum of urologic investigation and will often leave the diagnosis in doubt. When the excretory urogram does not readily suggest the anatomic diagnosis, cystoscopy, ureteral catheterization and retrograde pyelography are necessary. When obstruction, usually stricture, involves the body of the right ureter the clinical diagnosis is usually chronic appendicitis, as I have now observed in 29 children. In 15 instances the appendix had previously been removed and in some was frankly reported as normal. In the others it was identified as "chronic," which may or may not have been a gratuity of the pathologist. The important consideration in these cases is that the original pain persisted and again brought the child to the hospital. It is now recognized in most teaching hospitals in this country that laparotomy for so-called chronic appendicitis should be delayed until disease of the urinary tract has been excluded. In short, one should perform adequate urologic investigation on any patient before subjecting him to an abdominal operation for "chronic appendicitis" or "abdominal adhesions."

An acutely inflamed appendix overlying the ureter may cause the appearance of red blood cells and leukocytes in the urine, but even here, and especially if there is question as to the diagnosis, one should perform an excretory urographic study, which will not consume more than twenty minutes and may be expected to be of diagnostic clarity in at least half of the children for whom it is employed. In 3 young patients the "acute appendicitis" proved to be right ureteral stone.

Lower abdominal pain commonly results from vesical urinary retention; an estimation of the residual urine should be made.

It cannot be overemphasized that a normal urine does not rule out grave urologic disease.

Approximately 1 in 8 of all children are born with some type of urogenital tract anomaly, and urinary obstruction can be demonstrated in about a fourth of these. Stricture of the ureter is one of the commonest congenital obstructive lesions, and in a series of 12,080 autopsies on children that I reported, congenital ureteral obstruction, chiefly stricture, existed in 95 (1:138). Yet all urinary tract anomalies are potential causes of urinary stasis. The blockage may be (1) intrinsic, as in stricture of the ureter, congenital contracture of the bladder outlet or stenosis of the external urethral meatus, or (2) extrinsic, as by extraureteral compression by an aberrant vessel, or (3) an abnormality in the course of the ureter may interfere with urinary drainage, as in horseshoe kidney disease or other forms of renal fusion or ectopia

Chief Potential Causes of Urologic Abdominal Pain

KIDNEY	URETER
Abnormally mobile	Stricture
Ectopic	Stone
Horseshoe	Kink
Fused	Diverticulum
Hydronephrosis	Compression by
Calculus	(*a*) Aberrant vessel
Tumor	(*b*) Fibrous bands
Pyelonephritis	
Pyonephrosis	BLADDER
Solitary abscess	Stone
Perirenal	Retention
Tumor	(*a*) Neuromuscular
Cyst	(*b*) Contracted outlet
Abscess	(*c*) Prostatic obstruction
URETHRA	ADRENAL
Stricture	Tumor
Meatus stenosis	Abscess
Stone	
Valves	
Hypertrophied verumontanum	

The clinical background of this discussion is the personal complete examination of 319 children admitted to the hospital and in whom abdominal pain was the chief complaint or was an outstanding symptom. Acute or subacute urinary infection was suspected from the first in half of these or was discovered after an early examination of the child. Yet in 26 instances appendicitis was the original diagnosis, usually designated as "chronic," and in 17 other children of this series appendectomy had been previously performed for symptoms which, persisting after operation, again brought the child to the hospital. In some children the cause of the pain continued to remain obscure despite extensive laboratory, gastrointestinal, surgical and urologic examinations.

In the following paragraphs the more important urologic lesions which may cause abdominal pain are briefly discussed and illustrative cases are cited.

RENAL LESIONS

Congenital Unilateral Aplasia of the Kidney.—This has occasionally been disclosed as the cause of abdominal pain in adults. In these cases distressing symptoms have promptly disappeared following removal of the diseased maldeveloped organ. I have encountered this condition but once in the young. This 7 year old child suffered mild abdominal pain but was examined primarily because of hypertension (240/140 mm. of mercury) and was known to have persistent pyuria. Removal of the diseased aplastic kidney reduced the pressure to 130/105, and the abdominal pain disappeared.

Abnormal Renal Mobility. — This seldom produces acute ureteropelvic angulation in children and the clinical picture of Dietl's crisis so often seen in adults. Nevertheless we have observed this syndrome in the young in whom the clinical picture was that of ureteral colic. The diagnosis is readily established by ureterography with the patient in the flat, Trendelenburg and upright positions and, as a rule, a renal supporting belt is adequate therapy. When this conservative measure fails, relief of the peripheral or local obstruction and nephropexy are demanded.

A 6 year old girl was admitted to the hospital with a diagnosis of abdominal tumor; this moderate size mass could be pushed into all quadrants of the abdomen except the left upper, was slightly tender and, at first, was thought to be a mesenteric cyst. Urologic examination disclosed it to be a congenital solitary right freely movable kidney on a long pedicle; a mild ureterovesical junction stricture of this ureter existed. A belt for renal support was adequate treatment.

Anomalies of Renal Fusion.—These are often manifested by pain, which may be due to urinary obstruction consequent to an irregular course of the ureter, unusual traction on the anomalous renal blood supply or complicating surgical disease, notably stone. A 12 year old girl was admitted to the hospital because of pain and tumor in the lower part of the abdomen. As she lay flat on her back a suprapubic protuberance simulating a distended bladder was readily visible and was proved to be a bilateral renal fusion in which both kidneys were joined in a gnarled mass overlying the sacrum and caused compression of the bladder. A lower abdominal supporting belt sufficiently elevated the fused organs to relieve the drag on the renal pedicle and thus relieve the pain of which this child complained. An 8 year old girl whose left kidney lay fused with the right in the right lumbar gutter had been subjected to appendectomy a month previously because of sharp pain in the right side; a normal appendix was removed. Subsequent urologic examination revealed a stricture at the vesical junction of the ureter which drained the right lower renal pelvis; instrumental dilation of this stricture cured the "appendicitis."

Horseshoe Kidney Disease.—Abdominal pain is a common symptom of this, particularly about the umbilicus. A 9 year old boy was operated on for acute appendicitis because of acute pain in the right loin and a temperature of 104.5 F. On entering the locale of the acute disease the operating surgeon penetrated a large cavity filled with purulent urine, inserted drains and backed out. The temperature rapidly returned to normal but the urine continued to drain from the wound for several weeks. The patient then came into my hands, and urologic examination revealed a pelvic horseshoe kidney the left half of which was located over the sacrum while the other half extended high into the right lower abdominal quadrant. A stricture at the right ureteropelvic junction produced hydronephrosis and, with acute ureteral obstruction and exacerbation of smoldering infection in the hydronephrotic kidney, fever and pain simulating appendicitis resulted. The diseased right half of the horseshoe kidney was resected, and the remaining half now excretes 70 per cent phenolsulfonphthalein in two hours and the urine is sterile.

Another clinical picture in horseshoe kidney disease is illustrated by the case of an 8 year old girl who for several months had suffered sharp pains in the right upper quadrant, leading her pediatrician to be sure she had gallbladder disease. In fact this fruitlessly had led to eight complete cholecystographic studies and three complete gastrointestinal roentgenographic investigations. An excretory urographic study was suggested, and this disclosed right hydronephrosis; completion of the urologic investigation with ureteral catheters and retrograde pyelography revealed a horseshoe kidney with congenital stricture of the right ureteropelvic junction and massive infected hydronephrosis. A less severe congenital stricture at the level of the fifth lumbar vertebra on the left side produced left hydronephrosis graded 1 plus. Resection of the horseshoe kidney with removal of the right half was highly successful; digestion at once improved, she gained weight rapidly and all abdominal symptoms disappeared. Subsequent periodic dilation of the left ureteral stricture completed the therapy.

URETERAL OBSTRUCTION

Stricture.—The frequency and potential gravity of congenital ureteral stricture has been indicated in preceding paragraphs. The surgical diagnostic difficulties this lesion may engender are illustrated by 2 cases: A 5 year old girl was admitted to the hospital with a diagnosis of recurrent subacute appendicitis during the past three years. The urine was normal, but an excretory urographic study fortunately was made before contemplated laparotomy. This revealed a stricture at the junction of the lower and middle third of the ureter on the right side, in other words just behind the appendix. Following periodic progressive dilation of the stricture with ureteral bougies, all symptoms of the "appendicitis" have now been absent for more than five years. In a 4 year old girl with the same symptoms on the left side and thought to have a left sided appendicitis, the clinical and therapeutic sequence has been the same. In both instances the child was spared laparotomy.

Vascular.—Obstruction of the upper ureter by aberrant renal vessels which pass from the lower pole of the kidney mesially to the aorta, to the vena cava or to the renal pedicle produce variable and often intermittent hydronephrosis, the pain of which is usually in the loin but is sometimes referred to the lower abdominal quadrant or to the umbilical area. Here urologic investigation is apt to be neglected unless there is persistent pyuria. Rarely aberrant uterine vessels block the lower end of the ureter. I have now seen 26 children with upper ureteral blockage by anomalous renal vessels and in whom persistent or intermittent abdominal pain was a prominent symptom. In some there was complicating persistent pyuria; in 7 appendectomy had previously, but fruitlessly, been performed to relieve pain. In

13 cases obstruction was eradicated by dividing the obstructing vessel, and in the other cases nephrectomy was required because of advanced renal injury.

Ureteral Kinks and Angulations.—These are seldom clinically important in children. I have encountered but 1 case in which operation seemed indicated. This 5 year old girl was admitted to the hospital because of persistent pain in her left loin and was thought to have surgical disease of the descending colon. Urologic examination revealed a fixed kink, probably congenital, in the upper third of the ureter; the kink persisted in urograms taken in the flat, upright and Trendelenburg positions. Surgical mobilization of the kink with nephropexy and subsequent periodic dilation of the ureteral stricture at the site of the kink were curative.

Diverticula.—A diverticulum of the lower left ureter in a 4 year old girl produced pain which caused the diagnosis of left sided "chronic appendicitis" to be made. The urogram readily suggested the anatomic diagnosis, and excision of the sac stopped the pain, which was due to ureteral compression by the distended diverticulum.

Calculus.—Because of improved dietetics in infancy and childhood, urinary calculus is seldom seen in the young in this country today. In most children with ureteral calculus the initial diagnosis of appendicitis or other intra-abdominal disease is usually made, but I have seen several in whom fortunate early urologic investigation averted needless laparotomy. Among these patients was a 4 year old boy admitted to the hospital with acute pain in the left loin radiating toward the testicle, with increased frequency of urination. Urography revealed a triangular calculus, approximately 7 mm. in diameter, in the upper third of the ureter. Therapeutic ureteral dilation was carried out, following which the stone was passed into the juxtavesical segment, where it was held up at the point of crossing of the vas deferens. Since it moved no farther downward during three weeks of observation, it was removed by ureterotomy. The stone was found firmly ennested and could progress no more, and the wisdom of open operation was confirmed. A 12 year old boy who ten days previously had undergone appendectomy for acute gangrenous appendicitis suddenly developed acute left abdominal pain with nausea and vomiting; there was considerable intestinal distention with shock, and it seemed likely that acute intestinal obstruction had developed. On one occasion during this postoperative complication pain had been referred to the left testicle, and there was some frequency of urination. An excretory urographic study was advised and performed. This disclosed a small shadow about the size of a grain of rice (8 by 3 mm.) in the midportion of the left ureter and two hours later this stone spontaneously passed, with prompt relief of all symptoms. Here the early employment of excretory urography caused the diagnosis of probable intraperitoneal disease to be ruled out and spared the boy the hazard and morbidity of laparotomy at a critical moment.

Vesical Distention.—Too often in children this condition, unrecognized, is the cause of low abdominal pain. Neuromuscular disease, congenital contracture of the vesical outlet, congenital hypertrophy of the verumontanum, congenital valvular obstruction of the prostatic urethra, congenital stricture of the urethra and congenital stenosis of the external urethral meatus are the commonest causes. In 2 instances hypertrophy of the verumontanum and congenital valvular obstruction coexisted. Yet in such cases the history of dysuria with frequency of urination should suggest a clue, particularly as so often there is complicating urinary infection with persistent pyuria. The diagnosis is readily made by cystourethroscopy and the obstruction removed by transurethral electroresection with miniature instruments. In some cases of chronic hypotonic vesical urinary retention I have found the administration of acetylcholine salts effective in stimulating bladder emptying.

Congenital Stricture of the Urethra.—This is frequently observed in children, while the traumatic and postgonorrheal varieties are rare. These lesions are apt to cause abdominal pain only when vesical overdistention results. In nearly every instance progressive periodic dilation with steel sounds is therapeutically effective. Of the lower urinary tract obstructions stricture at the external meatus is by far the commonest and may be of grave clinical importance. In a recent study of 152 cases of this variety, abdominal pain was found to be an outstanding symptom in 9 and was due to vesical distention. The diagnosis is made by inspection; wide meatotomy and the maintenance of a normal urethral caliber constitute the treatment.

Miscellaneous Conditions.—Palpation of the testicles is a most important part of the physical examination in males and particularly in those with symptoms of acute intra-abdominal disease. Torsion of an intra-abdominal testicle may suggest acute appendicitis or other serious lower abdominal surgical lesions. I have observed this in 1 boy with torsion of a right intra-abdominal testicle and in 3 others in whom the strangulated organ was at the internal inguinal ring. Moreover, torsion of the testicular appendix may cause differential diagnostic difficulties.

In rare instances malignant tumor of the kidney (embryonal adenomyosarcoma or Wilms tumor), new growths of the adrenal or of the lumbar sympathetic chain, and notably the neuroblastomas may cause abdominal pain in the young and remain unrecognized until the tumor mass is sufficiently well developed to be readily palpable.

COMMENT

The relatively high incidence of urologic conditions which may produce abdominal pain in infants and children has been indicated. Congenital ureteral obstructive lesions are common and, when right sided, are likely to cause the erroneous diagnosis of appendicitis to be made. No patient should be operated on for "chronic appendicitis" or "abdominal adhesions" until adequate investigation has ruled out urinary tract disease as a possible cause of the clinical manifestations. Because of the high mortality engendered by delay and neglect, most children with symptoms of acute intra-abdominal disease should be given the benefit of early laparotomy; but except in these cases urologic investigation and the correction of associated urologic disease may advisedly precede exploratory laparotomy, since the first procedure may render the second unnecessary. The urinalysis is usually abnormal in serious urinary tract disease, but the urine may be normal even though advanced obstructive uropathy exists.

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ABDOMINAL PAIN IN CHILDREN FROM A SURGICAL STANDPOINT

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There is probably nothing more perplexing or difficult to evaluate than abdominal pain in children, or to estimate the pathologic condition in the abdominal cavity in these cases. The young child himself is not old enough to talk, or, if he is, it is difficult to determine from his description how much pain he really has. In children up to 5 or 6 years of age it is hard at times to make out local tenderness or the local areas that are affected in the abdomen by percussion or palpation. Again, the physician or the surgeon is dependent on the intelligence of the mother, who has been with the child, for an accurate history of the course of the disease and the duration of the symptoms. In view of these two factors it is often difficult for the surgeon to decide whether he is dealing with a surgical condition in the abdomen.

Another factor is the many medical conditions that occur in children such as enteritis, enterocolitis, the eruptive exanthema and the cases of infantile paralysis which occur during the periodic epidemics. During the epidemic in Chicago in 1943 my associates and I were called on to operate in 4 cases of so-called acute appendicitis, but operation was not performed in these cases as the condition proved to be infantile paralysis.

CONDITIONS TO BE DIFFERENTIATED

Of the many conditions that can produce acute abdominal pain in children, the following are the most important to be considered in making a differential diagnosis:

Acute Enterocolitis.—Probably the most difficult differentiation is between acute suppurative appendicitis and acute enterocolitis with diarrhea in a child from 1 to 3 years of age. Many times the appendix is allowed to rupture because the child had diarrhea, and for this reason the pediatrician or the internist decided that the condition could not be appendicitis. From our past years of experience we feel that if there is the slightest doubt or question in cases of abdominal pain in children, operation should be performed. With careful induction of anesthesia and operative procedure we have never seen any bad results from such surgical intervention, even though operation may not reveal acute appendicitis or an acute condition in the abdomen. On the other hand, we have seen too many cases of critically ill children in whom, when operation was finally performed, a peritonitis was encountered from an overlooked gangrenous appendix which had ruptured. The mortality rate in neglected cases is much higher, and the children are many times critically ill from one to two weeks, while if operation had been carried out earlier they could be making a rapid recovery. Often the pediatrician or the internist hesitates to make a diagnosis of appendicitis if the patient's pain and tenderness is high up on the right side, in the region of the liver; but the pain is localized there owing to the fact that the cecum and appendix are still high up in the right side and have not yet rotated completely into the lower right side of the abdomen.

Intussusception.—This condition, which occurs usually in the first year of life, is characterized by symptoms of acute agonizing pain, which can subside; then complete relaxation of the abdomen followed by bloody mucous stools. However, intussusception is often overlooked because of an inaccurate history of the symptoms of the child from the mother, from poor observation or from the presence or absence of blood in the stools, which is dependent on the amount of strangulation of the mesentery. Many times the diagnosis is not made until the abdomen becomes distended and tense from a gangrenous intussuscepted bowel. There are many intussusceptions which are mild in character and in which there are no bloody stools present, and there are also recurrent intussusceptions that occur later in life, which are mild in character and do not produce bloody stools. These intussusceptions can exist for several days or weeks without damaging the colon, and they may be felt as a soft tumor in the abdomen, as I will describe later.

There is always a question between the surgeon and the pediatrician whether the intussusception is still present or whether it has released itself spontaneously. This, of course, can be determined with a roentgenographic examination with barium, for if the intussusception has reduced itself the barium passes readily into the ileum. This is true in about 95 per cent of the cases since the ileocecal valve is incompetent in infants and young children, and the barium will pass into the ileum readily. I have seen a number of definite intussusceptions shown by x-rays and, after opening the abdomen, we could see the small markings on the ileum and the damaged bowel where the intussusception had been before it had released itself. However, I again take the position that it is much better to operate in such a case and find that the intussusception has reduced itself than to delay surgery and discover a badly damaged or gangrenous bowel from an intussusception which has been left too long without surgical intervention. I want to emphasize that if there is the slightest doubt one never makes a mistake in operating in such a case.

I have observed 3 cases in boys between the ages of 6 and 10 years in whom there was a chronic intussusception without strangulation of the bowel, which produced only mild symptoms of obstruction. A tumor could be felt in the abdomen of these patients, and there was a history of mild cramps for several weeks and in 1 instance for several months. One of these patients had been operated on three times previously for recurrent intussusception. Not one of these intussusceptions had produced a complete obstruction, and the intussusception was from 2 to 4 inches in length, where the ileum had intussuscepted through the ileocecal valve into the colon. To prevent a recurrent intussusception, I have found that the best surgical procedure is to divide the parietal peritoneum, suture it over the ileum with strips of parietal peritoneum, which hold the ileum in one direction, and then suture the parietal peritoneum in the opposite direction over the cecum. This makes the ileum retroperitoneal more or less for several inches and prevents recurrence of the intussusception. In all cases of intussusception in which the ileum and cecum have extremely loose mesenteries, I find it advisable to do this simple procedure to prevent recurrence.

Mesenteric Adenitis.—This condition is commonly mistaken for appendicitis, since the children have all the classic symptoms which would seem to indicate an

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acutely inflamed appendix: pain, local tenderness, with varying elevations of temperature, and a high white blood cell count. However, the pain in these cases can be differentiated from appendicitis, as the attacks are intermittent and usually last only from a few minutes to half an hour with the pain confined to the area around the umbilicus. Many of these patients are operated on with a diagnosis of subacute appendicitis or periodic attacks of appendicitis.

Many times I have operated for supposedly acute or subacute appendicitis and found a mesenteric adenitis of tremendous extent, with hundreds of glands which vary from pea to walnut size but with the appendix unaffected. I have never seen any harm from such surgery and I have always removed the appendix in such cases. On the other hand, there is a more severe type of mesenteric adenitis in which the glands are extremely reddened; the patient has a high temperature and a rigid abdomen, such as one would find in a case of acute suppurative appendicitis. I have operated in

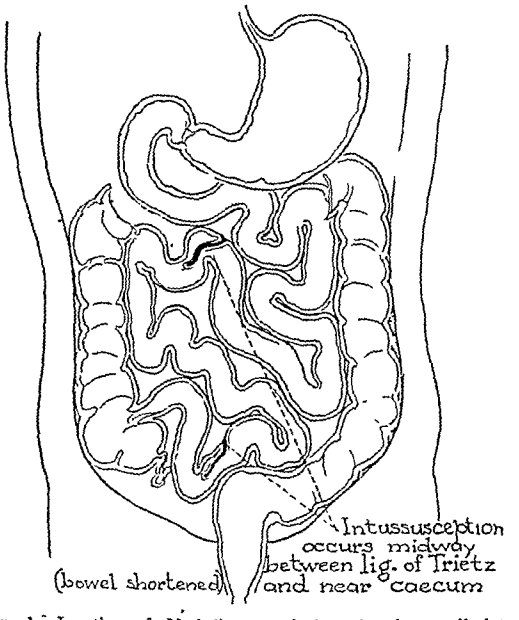


Fig. 1.—Location of Meckel's diverticulum in the small intestine, midway between the ligament of Treitz and the ileocecal valve, which can produce intussusception.

cases in which one large gland in the mesentery near the ileocecal valve was suppurating and had broken down; and, in 4 cases, several of these glands had broken down, suppurated and produced a peritonitis of quite a virulent type. In all these cases recovery followed operation, with simple drainage of the peritoneum.

Acute Inflammation or Rupture of Meckel's Diverticulum.—Probably the next most common condition to be differentiated from acute appendicitis is acute inflammation or rupture of Meckel's diverticulum. While, in a large number of cases, the Meckel's diverticulum is located on the ileum within 4 to 12 inches from the ileocecal valve, I have seen a number of cases of perforating Meckel's diverticulum located midway between the ligament of Treitz and the ileocecal valve (fig. 1). In 2 cases the Meckel's diverticulum inverted itself into the lumen and then, acting as a tumor in the lumen of the bowel, produced a double intussusception of the small intestine and in another case produced a triple intussusception (fig. 2). In all these cases acute pain and typical symptoms of acute appendicitis were present. The acute inverted diverticulum was excised by an elliptic incision made in the longitudinal axis of the bowel after the intussusception had been released and then sutured transversely with two layers of silk suture (fig. 3). The intussusception in these cases is very easily released by the usual method of forcing

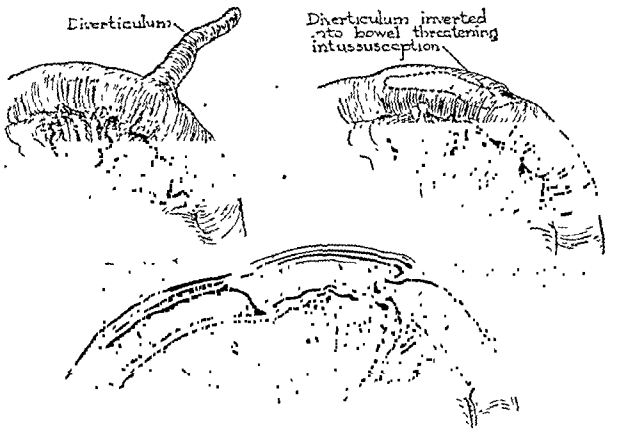


Fig. 2.—Meckel's diverticulum, the diverticulum inverted into the bowel threatening intussusception; and diverticulum with intussusception.

the bowel out as we do with a typical ileocecal intussusception, and I have never seen any serious damage to the bowel result from these small bowel intussusceptions in comparison to the serious damage which can result from an ileocecal intussusception. I have noted a number of cases in which the Meckel's diverticulum was acutely inflamed and, in addition, there had been much bleeding and a very pronounced anemia.[1] The blood in these stools was uniformly mixed, whereas, if the patient had bled from the large bowel, the blood would have been on the outside of the stool. This condition can be diagnosed if there is a history of constant presence of blood in the stool and the patients have pronounced anemia and local tenderness. Usually, in these cases of bleeding Meckel's diverticulum, duodenal or gastric mucosa is present, and the lesion is

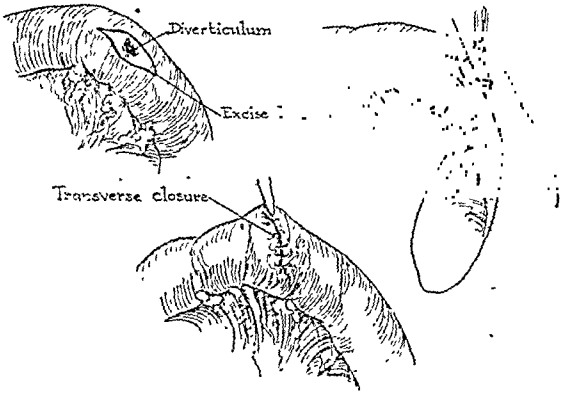


Fig. 3.—Diverticulum excised in the longitudinal axis of the bowel, and the defect in the bowel closed transversely to the longitudinal axis of the bowel.

similar to the gastric or duodenal ulcer infiltration that is seen in the stomach or duodenum. It is important that these patients have repeated blood transfusions, especially before operation, as these cases are not as acute as cases of appendicitis, and supportive measures can be taken before surgery.

1. Strauss, A. A., and Abt, I. A.: Meckel's Diverticulum as a Cause of Intestinal Hemorrhage, J. A. M. A. 87:99 (Sept. 25) 1926.

Intestinal Congenital Anomalies.—It is also difficult to differentiate the intestinal congenital anomalies that occur in young children shortly after birth and in the first year of life, such as lack of rotation and fixation of the mesenteries of the cecum, colon and intestine to the parietal peritoneum.

The anomalies that occur in the upper intestinal tract, such as atresia of the pylorus or congenital pyloric stenosis, play no particular role in this paper, as these conditions do not produce pain, and their main symptoms are regurgitation and vomiting. However, the atresia and strictures of the lower portion of the small bowel, colon and rectum play an important role in producing pain, abdominal distention and vomiting; and in many instances if they are not immediately relieved they can produce death, because they damage the bowel and the intestine. This condition is not compatible with life and must be immediately relieved. I have recently had 2 cases of complete intestinal atresia in which about 4 inches of the small bowel was atresic. A resection was done with a side to side anastomosis, and both patients made excellent recoveries.

This is, however, one anomaly that I should like to call attention to, namely, lack of rotation of the colon



Fig. 4.—Parietal peritoneum sutured on in strips to prevent intussusception of the ileum and cecum.

and absence of fixation of the mesenteries of the cecum, colon and intestine to the parietal peritoneum. The symptoms from this anomaly can occur any time during childhood, and even later in life. I have operated in 5 cases of acute conditions of the abdomen in which there was no fixation of the mesenteries of the small intestine and colon to the parietal peritoneum, and the only attachment of the intestine was where the large blood vessels normally enter the mesentery at the celiac axis. There was longitudinal rotation or volvulus, with from five to six complete twists in both the small and the large bowel. The intestine appeared blue and cyanotic but not strangulated. The small intestine, as well as the large bowel, was easily untangled and was then attached in normal position by dissecting free small areas of the parietal peritoneum and suturing them to the colon and its mesentery to hold them in correct position. Similar attachments were also made to the small intestine in a half dozen areas. All of these patients made uneventful recoveries, and 1 whom I have been able to follow for seventeen years is in perfect health and an athlete at one of our universities. This shows that if the attachment of the organs is carefully made there is not likely to be a recurrence of the condition.

There are many other anomalies in children, aside from those due to lack of rotation of the cecum, such as atresias of the ileum near the ileocecal valve or congenital absence of the rectum or sigmoid, and it is important to keep all these factors in mind when one examines a child for an acute condition in the abdomen. Therefore I believe that, in consideration of these factors, if there is the slightest doubt regarding the diagnosis, operation should be performed on children much more readily than on adults, for whom such conditions can be ruled out.

Infections.—Pneumococcic peritonitis and other types of infections from the vagina, uterus and oviducts must be kept in mind in cases in young girls. The symptoms of pneumococcic peritonitis are sometimes more insidious, as the mother will state that the child had a mild stomach ache for a few days, which became more severe, until the abdomen was rigid and boardlike. The presence of a characteristic mucous type of secretion when the abdomen is opened, and a smear, often will diagnose the condition as pneumococcic peritonitis. If it is not of pneumococcic origin, gonococci or other organisms will be found. Before the use of the sulfonamide drugs, pneumococcic peritonitis had a high mortality, from 50 to 90 per cent, but this has been remarkably reduced with the use of sulfonamide compounds. In spite of chemotherapy, the treatment in these cases, in my opinion, is drainage of the peritoneum to relieve the intra-abdominal tension. I do not believe in closing the abdomen without drainage because the sulfonamide drugs are now available.

It is difficult to differentiate between pneumonia and infections of the pleura, which often can produce rigidity and pain in the right side of the abdomen. It is only with a very careful examination of the chest and roentgenograms that a correct diagnosis can be made to determine whether the pain is produced from a chest condition or from an abdominal process.

Ovarian Cyst.—Ovarian cyst of the right and the left side is much more common in young girls than has been realized. It is not unusual for a surgeon to operate for subacute appendicitis through a gridiron incision, remove a mildly inflamed appendix and close the abdomen, leaving an ovarian cyst. I therefore have made it a routine procedure in all cases of appendicitis in females to palpate the right ovary and tube, the uterus and the left ovary and tube, except in the presence of an acute suppurative appendix. In a large number of cases in which I was not satisfied that the appearance of the appendix was sufficient to explain the symptoms of the patient I have found a small twisted ovarian cyst on the right or left side. I usually operate through a gridiron incision in all cases of appendicitis, and I have had no difficulty in palpating both tubes, ovaries and the uterus through this incision. If a routine examination of these organs is made when a subacutely inflamed appendix is removed, the mistake of overlooking an ovarian cyst is not apt to be made. The symptoms of a twisted ovarian cyst, as a rule, are not as severe as those of acute appendicitis; but I have seen cases in which the pain, white blood cell count and temperature were as high and the symptoms were as severe as those in acute suppurative appendicitis. The surgical procedure in these cases is to extend the gridiron incision into a right rectus incision by splitting the rectus sheath downward. In the case of a simple ovarian cyst I prefer to leave the base of the ovary and merely resect the cyst, but if the ovarian cyst

is badly twisted it is best to remove the ovary, and in most instances, the tube.

Rupture of Graafian Follicle.—Another condition of the ovaries that must be taken into consideration is the rupture of a graafian follicle, with severe hemorrhage. I have seen 27 cases in young girls of bleeding ovaries due to rupture of a graafian follicle. The abdomen was full of blood and there was a mild anemia, and all the typical symptoms of acute appendicitis were present, such as localized pain, high temperature and rigidity of the abdomen, which was often very evident. In many instances it is almost impossible to differentiate between these two conditions until the abdomen is opened. Usually the procedure in these cases is careful suture of the bleeding ovary so that it is absolutely dry. I believe that the patient will have less reaction if all the blood is aspirated from the abdomen by suction apparatus. In these cases transfusion is usually indicated after operation. If the patient's condition is quite good, I remove the appendix so as to spare the patient this procedure at any future time.

Gallbladder Disease.—Gallbladder disease, gallstones and obstruction of the common duct are much more common in young children than was thought at one time. It is extremely difficult at times to differentiate between an acute cholecystitis and a high lying appendix with a nonrotated cecum. If gallbladder disease is suspected and the condition persists, exploration is indicated. If stones are present it is best to do a cholecystectomy; but, if the condition is very serious, removal of the stones and drainage will probably have the lowest mortality. Obstruction of the common duct may be due to lymph glands obstructing the common duct or to stones. In a boy aged 11 a stone was located in the ampulla of Vater. The common duct was large and there were no stones in the gallbladder. The boy had repeated attacks of pain and a severe diabetes mellitus. The stone was removed, and the diabetes completely disappeared. I also found that, as a result of these previous attacks, a small amount of fat necrosis had formed in the abdomen. It is well, therefore, to consider gallbladder disease and pathologic change in the common duct in the presence of acute abdominal pain in children.

Congenital Megacolon or Hirschsprung's Disease.—While this anomaly is not common it must be considered in cases of acute abdominal pain, as many times there is an acute dilatation of the sigmoid portion of the megacolon, or a volvulus, with strangulation of its blood vessels. Usually the diagnosis can be made from a previous history of megacolon or from the pendulous distended abdomen produced by the large colon. In these cases I have always preferred to do an immediate simple loop ileostomy. I make the ileostomy opening immediately at operation and pass a rectal tube through the ileocecal valve into the colon, using a suction apparatus to decompress the colon. I prefer ileostomy to cecostomy because it avoids handling of the tremendously large colon. After the decompression has been effected by ileostomy, a left rectus incision is made and the rotated megacolon corrected and left alone if the blood supply has not been strangulated. However, if the blood supply has been cut off and the bowel damaged beyond repair, a local resection may have to be done by the obstructive clamp method. I prefer this operative procedure because I believe that the fundamental factor for the immediate relief of the patient's condition is the decompression of the colon.

Subacute and Chronic Ulcerative Colitis.—While this condition is comparatively rare in infants and children, the possibility of its presence must be considered in the case of an acute condition in the abdomen. In fact, some of the most severe forms of the disease have occurred in young children and infants. A history of cramps and pain and the presence of mucus, pus and blood in the stools is quite characteristic, and a careful proctoscopy usually makes the diagnosis comparatively simple. In my judgment, if the disease does not subside within a few weeks an immediate simple loop ileostomy is indicated. I know of no other condition of the colon which will show more decided improvement from immediate ileostomy. I believe that an immediate ileostomy is the only means by which the progressive pathologic course of the disease can be arrested and the destruction of the colon prevented. If the disease subsides, which it has a greater tendency to do in children and infants than in older persons, the ileostomy can easily be closed. By this procedure not only the patient's colon but his life can be saved. Medical treatment in these cases has little to offer and has been overdone by being continued until the colon is completely destroyed. In 4 of 5 cases in young children the ileostomy was closed within four years and the patients have remained perfectly well. In the fifth case the ileostomy is still present, as the colon contracted and strictures formed to such an extent that closure was impossible.

Strangulated Hernias.—In the diagnosis of an acute condition in the abdomen, this condition is sometimes overlooked, especially the incarcerated or strangulated femoral hernia in infants, because of the fatty condition of the abdomen in the inguinal and pubic regions.

INDICATIONS FOR OPERATION

Acute appendicitis is quite rare in children under 2 years of age, although I have seen 2 cases in infants aged 6 weeks and a fairly larger number in children between 6 and 12 years than in those between the ages of 1 and 6. It is sometimes extremely difficult to make an early diagnosis of this condition in children between 1 and 6 years of age, first, because of the fat abdomen and, second, because of the difficulty in differentiation from other conditions such as enterocolitis, peritonitis of primary type, acute mesenteric adenitis and the exanthemous fevers. I have seen a number of cases of appendicitis in which measles and severe scarlet fever were complicating conditions. It is important to make an early diagnosis of acute appendicitis in young children because the condition takes an entirely different course than that in an adult. I have often called attention to the fact that the appendix ruptures much earlier in children than in adults and is more likely to produce a general peritonitis. This is because the wall of the appendix in children consists chiefly of elastic tissue and has less connective tissue than that of adults, and, if the lumen becomes obstructed by a fecalith or inspissated material, the appendix will rupture much sooner. I have also noticed many more fecaliths and inspissated material in the lumen of the appendix in children than in adults. The peritoneum in children has less resistance to a peritonitis and there is little omentum in the region of the appendix to serve as protection. Then too the mother is more likely to give the child castor oil or another purgative for a so-called stomach ache and this, of course, is an additional factor which may endanger rupture and general peritonitis in cases of acute appendicitis. Needless to say, in children

in the first years of life appendicitis must be differentiated from the respiratory infections which are common at that age. The direct symptoms of appendicitis, such as pain, localized tenderness and rise of temperature, vary little from those in adults except that the temperature is usually higher and the vomiting more pronounced. A rectal examination should be made in addition to examination of the abdomen. It is common to obtain a leukocyte count of 12,000 to 20,000 with 85 to 90 per cent polymorphonuclears. A urinalysis should be done, although red blood cells in the urine do not always rule out appendicitis. In fact, gross blood appeared in the urine in 3 cases in which the appendix was retrocecal and was localized over the ureter, and the inflammatory process had infiltrated into the ureter.

In the surgical treatment of appendicitis in young children, immediate and early operation is the most important factor in securing good results and a low mortality rate. I do not believe in delay of operation or use of the so-called Ochsner method of treatment, except for a few hours in which the patient should be given intravenous injections of glucose and blood transfusions to get him in good condition. I prefer the McBurney gridiron incision to any other method; and if there is any difficulty the incision can always be extended above or below into a right rectus incision. I do not believe in draining abscesses without removal of the appendix and inversion of the stump with a wax silk purse string. I think it is a great mistake to drain the abscess and leave an infected appendix with enteroliths and a sloughing appendix within the peritoneal cavity. Young children do not stand well absorption from such a source, and it takes little time to peel off the appendix in almost any position. It adds little to the operation and rids the patient of the infectious process. I have never drained an appendical abscess in a child without also removing the appendix, and after a rather extensive experience I still believe that this is the best method of treatment. I also think it is a mistake merely to remove the appendix and ligate with chromic catgut or silk without also inverting the stump, especially in the case of an infected appendix, as fecal fistulas are bound to develop at the stump where the appendix was ligated when drainage is established. I have never seen a fecal fistula develop since I have adopted the procedure of ligating the stump and inverting it with a purse string of wax silk. I do not believe in closing the abdomen without drainage in cases of very severe suppurative appendicitis, especially if the appendix has ruptured or there is a severe local peritonitis. Since sulfanilamide has come into use, many surgeons have closed the abdomen in such cases and depended on the drug. I use sulfanilamide but in addition employ drainage, especially in cases in which the appendix has ruptured. Also in occasional cases of severe localized peritonitis in which the bowel shows a great deal of grayish exudate and inflammation I believe it is safer to establish drainage than to close the abdomen. I prefer to give glucose and blood intravenously in cases of peritonitis and administer nothing by mouth until the abdomen has become soft. I use the Wangensteen method only when I feel that it is indicated; that is, when the peritonitis is severe and there is a good deal of intestinal distention. I have also used a rectal tube with a Wangensteen suction apparatus to keep the colon collapsed in cases where there was much abdominal distention. In 4 cases of severe appendicitis with rupture and pronounced peritonitis, in which the bowels and the stomach were tremendously distended, I did an immediate loop ileostomy to collapse the ileum, in addition to removing the appendix. I reduced the colon by passing a rectal tube through the ileocecal valve. Four patients with severe appendicitis which had ruptured and produced peritonitis had been critically ill from five to eight days; the bowel and stomach were tremendously distended and they were in a moribund condition. I did an immediate loop ileostomy and the patients recovered. Large amounts of glucose intravenously and repeated blood transfusions are important supportive measures for a critically ill child with peritonitis following rupture of the appendix. Young children have elastic vascular systems and stand intravenous fluids well, and they show the good effects of this treatment much more quickly than do adults.

CONCLUSIONS

The difficulty in making an accurate diagnosis of an acute condition of the abdomen in infants and children is due to the following factors:

1. The differentiation between the exanthematous diseases of early childhood.
2. The anomalies that occur in infancy in the intestinal tract and the abdomen.
3. The fatty condition of the abdomen in infants and children in the inguinal and pubic regions, which makes palpation and percussion difficult.

Early diagnosis and operation are the important factors for lowering the mortality rate of appendicitis in children, and more harm can result from the delay of operations than from operations performed on an erroneous diagnosis.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CAMPBELL AND STRAUSS

DR. HERBERT E. COE, Seattle: For several years Dr. Campbell has been making valuable contributions to the care of children by pointing out repeatedly the signs and symptoms of uropathy. I confess to surprise at his statement that one eighth of all children have some type of urogenital anomaly. He also says "Most acute abdominal pains demand surgical consideration." Sylvester several years ago, in reporting 1,000 cases of acute abdominal pain, found 80 per cent nonsurgical. I wonder if Dr. Campbell's statement should not read "Most acute abdominal pains which reach the surgeon demand surgical consideration." Especially deserving of emphasis is his insistence that children with nonemergency pain or with continued or recurring pain of obscure origin be given the benefit of a comprehensive urologic examination. Acute appendicitis is too often a lazy diagnosis and chronic appendicitis a wastebasket diagnosis, to be condoned. His recitation of the case of "left sided chronic appendicitis" illustrates the extent to which some may go to make the appendix the culprit. It is poor policy to hurry the examination. Ten minutes spent in gaining the confidence of the child will insure the acquisition of all necessary information in the succeeding three minutes, whereas a fifteen minute struggle results only in physical and mental exhaustion for all concerned. An attractive toy, apparently carelessly dropped on the floor, will demonstrate characteristic pain reactions in muscles or abdomen and avoid a negativistic response to a question or a command. A suspected point of abdominal tenderness should be approached from a known nontender area, and the rigidity due to a cold hand, too vigorous prodding or fear of the examiner should be avoided. When the rectal examination is necessary, it should be conducted with utmost gentleness and plenty of lubrication if the results are to be of any significance. Abdominal tenderness in an infant may often be differentiated from peristaltic pain by requesting the mother to hold the patient firmly against her shoulder. Posture and actions are often presumptive diagnostic points in estimating

abdominal tenderness, as the child with a tender appendix will lie quietly whereas one with colic or early obstruction usually tosses about. The periodicity of the pain of peristaltic rushes suggests the obstructive type of lesion or the functional condition rather than the inflammatory one, but in the presence of definitely localized tenderness such periodic pain directs attention to an acutely inflamed appendix without protective adhesions. Moderate, persistent pain over a period of hours or days suggests the pressure of a tumor, a mesenteric drag or slow distention of the peritoneal covering of a viscus. Severe periodic right sided pains with relatively normal intervening periods require careful palpation along the course of the ureter, palpation over the bladder and the gonads and all laboratory aids to diagnosis. Much as I dislike the term, exploratory laparotomy must occasionally be performed, and the surgeon must have well in mind the various conditions that he may encounter. Dr. Strauss's principle that delay while attempting fine points of diagnosis is far more dangerous than opening a normal abdomen is vitally important and should be a fundamental concept with all who treat abdominal pain in children.

DR. ERNST WOLFF, San Francisco: Many children are seen as suspects for so-called subacute appendicitis, who complain about abdominal pain, mostly in the afternoon, but have no fever nor abdominal rigidity but irregular bowel movements. These children lose their symptoms on a good regimen of adequate diet and regular elimination early in the day. Nobody up to now has mentioned the psychosomatic angle of abdominal pain as a leading symptom. We have learned from psychologists and psychiatrists that the gastrointestinal tract is the shock receiving organ, which is frequently hit by emotional upsets in childhood. It is an everyday experience in pediatric practice that emotional stresses within the family, as between parents and children, and emotional upheavals in the lives of children provoke abdominal pain and require psychotherapy.

NODULAR VASCULAR DISEASES OF THE LEGS

ERYTHEMA INDURATUM AND ALLIED CONDITIONS

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There is a group of diseases which involve primarily the legs, characterized by the presence of nodules and sometimes by ulceration and which are associated with varying degrees of involvement of the blood vessels and fibrosis. These diseases, which have many features in common, are nodular vasculitis, erythema induratum, erythrocyanosis and pernio, erythema nodosum, panniculitis, recurrent idiopathic thrombophlebitis, and indurated cellulitis and ulceration secondary to chronic venous stasis.

Our especial interest in these diseases was aroused because they have certain clinical features in common which often make a differential diagnosis difficult or impossible on clinical grounds alone. Likewise it is difficult to correlate the vascular involvement, which may be of varying degree and sometimes of different types in each disease with the clinical findings. Furthermore, histopathologic studies of tissue excised from the nodules and ulcers have not simplified the problem, especially as to the etiologic relationship of tuberculosis in some of them. If typical tubercle formation with varying amounts of central caseation and zones of epithelioid cells, lymphocytes, plasma cells and Langhans' type of giant cells was demonstrable in all cases and if the diagnosis of tuberculosis could be substantiated by the demonstration of Mycobacterium tuberculosis in sections of tissue or by animal inoculation, the etiologic problem would be simplified considerably. It is generally recognized that the presence of collections of epithelioid cells and only a few giant cells is not diagnostic of cutaneous tuberculosis; such histologic changes occur in many nontuberculous conditions such as tuberculoid syphiloderm and tuberculoid forms of leprosy. Conversely, in typical cases of tuberculous erythema induratum pathologic examination may fail to reveal evidence of tuberculosis but simply reveal a nonspecific granulomatous lesion with varying degrees of fatty atrophy, fibrosis, vasculitis and foreign body giant cell reaction. We have observed a case in which such a histopathologic picture was present. Notwithstanding the absence of a true tuberculous structure, the disease was proved to be tuberculous by inoculation of guinea pigs. Accordingly, we are in accord with Kyrle [1] in believing that Mycobacterium tuberculosis may produce a banal nonspecific inflammatory reaction in some cases while in others the classic tubercle formation may be present. When the histopathologic findings are presumptive, concomitant evidence of the existence of tuberculosis as revealed by inoculation of guinea pigs, tuberculin tests and roentgenologic examination is essential for diagnosis. In cases in which the diagnosis is doubtful, we have found that observation of the patients for a long time is advisable because, although evidence of the existence of tuberculosis may be lacking when the patient is first seen, repeated examination may subsequently show the presence of tuberculosis in the cervical lymph nodes, peritoneum or elsewhere. Two of us and Brunsting [2] recently observed a woman aged 54 with nodular vasculitis in whom clinical, pathologic and bacteriologic examination had failed to disclose any evidence of tuberculosis. When the patient was seen six months later she had tuberculous cervical adenitis (proved histologically) and a strongly positive tuberculin reaction.

The ideal procedure for an investigation of this type would consist, as Sulzberger [3] suggested, in the removal of many large specimens of the cutaneous lesions in different stages of development. These specimens should be examined microscopically and a portion of each specimen should be used to inoculate as many as 10 guinea pigs. We have adopted the following criteria as evidence of the tuberculous origin of these diseases: (1) a positive reaction of guinea pigs to inoculation; (2) the presence of accepted histopathologic changes of tuberculosis including the presence of typical tubercles, with or without demonstration of Mycobacterium tuberculosis, and not merely collections of epithelioid cells and foreign body giant cells or the presence of caseation necrosis without the formation of tubercles; (3) contributory evidence such as proof of active tuberculosis elsewhere in the body or a history of previously recognized tuberculosis, positive roentgenologic findings or strongly positive tuberculin reactions, and (4) the clinical appearance and typical course of accepted types of cutaneous tuberculosis. These criteria

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Read before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Kyrle, Josef: Vorlesungen über Histobiologie der menschlichen Haut und ihrer Erkrankungen, Berlin, Julius Springer, 1925, pp. 181-186.
2. O'Leary, P. A.; Montgomery, Hamilton, and Brunsting, L. A.: A Case for Diagnosis, Arch. Dermat. & Syph. 50: 212-213 (Sept.) 1944.
3. Sulzberger, M. B., in discussion on Bechet,[12] pp. 59-60.

have been listed in the order of their diagnostic significance.

Although it is rare that all of these criteria can be demonstrated in the same case, they should be sought for.



Fig. 1.—*a*, nodular vasculitis in the leg of a woman aged 59; lesion of six months' duration; *b*, thickened walls of arterioles and venules at *X*; fibrosis and foreign body giant cell reaction in subcutaneous tissue (× 50).

This report is based on a study of the clinical, histopathologic and other laboratory data in 175 cases of nodular, and in some cases ulcerative, lesions of the legs and in 40 cases of recurrent idiopathic thrombophlebitis previously reported by one of us.[4] All of the 175 patients in the present series were white adults. In some cases the disease had been present for a long time, that is, it first had appeared at the age of puberty or when the patients were in the early teens. Negroes for whom a diagnosis of sarcoid or sarcoidosis was entertained and Negroes with cutaneous tuberculosis of the extremities were excluded from this study, as we believe they represent a distinct problem in themselves. In practically all of the cases a complete physical examination including roentgenologic examination of the thorax was performed in an effort to disclose evidence of tuberculosis. In many cases tuberculin tests were done by the intracutaneous method, by using purified protein derivative. A weak dilution of 0.00002 mg. was used, but in some cases a second injection of 0.005 mg. also was given. Animals were inoculated and cultures were made in a search for Mycobacterium tuberculosis in some of the recently observed cases, especially those in which a diagnosis of erythema induratum was considered.

NODULAR VASCULITIS

The nontuberculous origin of erythema induratum, especially the nodose nonulcerative form, as first exemplified by the case reported by Audry,[5] was further considered in the cases reported by Galloway[6] and Whitfield[7] at the beginning of this century. Our concept of nodular vasculitis corresponds well with the description given by Galloway and Whitfield in several articles. The nodose lesions are painful and occur chiefly on the calves of the legs of women 30 to 40 years old. They are seen only rarely among men or younger women and tend to clear up with rest in bed and elevation of the legs. Ulceration seldom occurs, but recurrence is common and a history of a previous or long-standing phlebitis is sometimes obtained. The lesions (fig. 1 *a*) have the same distribution as those of erythema induratum but are more painful and usually are of shorter duration. Histopathologically the nodules showed evidence of vasculitis with varying degrees of thickening and obliterative changes in both veins and arteries and a varying degree of fibrosis of the subcutaneous tissue, with collections of foreign body giant cells and atrophy of the fat but without definite tubercle formation (fig. 1 *b*). Audry, Galloway and Whitfield and other authors[8] were unable to demonstrate any clinical evidence of tuberculosis elsewhere in their patients, and animal inoculation failed to disclose Mycobacterium tuberculosis. In the cases reported by Whitfield there was failure to react systemically to doses of old tuberculin which caused febrile reactions in control cases of proved tuberculosis. Some of their patients



Fig. 2.—*a*, erythema induratum of fifteen years' duration on the legs of a woman aged 30; *b*, typical tubercle with central caseation about a small vein in subcutaneous tissue (× 90).

4. Barker, N. W.: Primary Idiopathic Thrombophlebitis, Arch. Int. Med. **58**: 147-159 (July) 1936.

5. Audry, C.: Etude de la lésion de l'érythème induré (de Bazin) sur la notion du lymphatisme, Ann. de dermat. et syph. **29**: 209-214, 1898.

6. Galloway, in discussion, Brit. J. Dermat. **11**: 206-207 (May) 1899. Galloway, James: Case of Erythema Induratum Giving No Evidence of Tuberculosis, ibid. **25**: 217-225 (July) 1913.

7. Whitfield, Arthur: On the Nature of the Disease Known as Erythema Induratum Scrofulosorum, Am. J. M. Sc. **122**: 828-834 (Dec.) 1901; abstr., Brit. J. Dermat. **13**: 386-387 (Oct.) 1901: A Further Contribution to Our Knowledge of Erythema Induratum, ibid. **17**: 241-247 (July) 1905; On Multiple Inflammatory Nodules of the Hypoderm, ibid. **21**: 1-12 (Jan.) 1909.

8. Pick, Walther: Erythema nodosum perstans, Arch. f. Dermat. u. Syph. **82**: 271, 1906; Ueber die persistierende Form des Erythema nodosum, ibid. **72**: 361-372, 1904.

were observed for many years. Whitfield stressed the absence of systemic disease and the onset after 30 years of age, whereas Galloway emphasized the vascular changes. The nontuberculous origin of erythema induratum in some cases has been emphasized more recently by Ormsby [9] and Michelson.[10] Cases which we have regarded as cases of nodular vasculitis also have been reported at recent meetings of dermatologic societies.[11]

We would abandon the term "periphlebitis" or "phlebitis nodularis necrotisans" as suggested by Philippson,[12] because it has been used to represent both tuberculous [13] and nontuberculous [14] conditions. Furthermore, in many of the reported cases of periphlebitis nodularis necrotisans the arteries as well as the veins apparently have been involved.[15] We believe that some of these cases could more properly be grouped with cases of nodular vasculitis, whereas some of the other cases would fit in with cases of primary recurrent thrombophlebitis.

ERYTHEMA INDURATUM

We employ the term "erythema induratum" (Bazin) in the specific sense to designate a tuberculous process either of an ulcerative or of a nodose form. The disease usually is described as beginning with involvement of the calves of the legs of girls during adolescence, but it also may occur among boys and men and may start at any age in life (figs. 2 and 3). Erythema induratum also may be associated with other forms of hematogenous tuberculosis and has been grouped by one of us [16] under the heading of tuberculosis cutis indurativa, which includes papulonecrotic tuberculids.

The 175 cases in this series included 72 which, after correlation of clinical and pathologic findings, were classified as cases of erythema induratum. The age at the onset of the disease varied from the early teens to 65 years. Eleven patients were men. In 2 of the 11 cases the lesions were classic examples of the usual ulcerative form of erythema induratum occurring on the leg; in 5 of the cases there were nodose lesions without ulceration. In the remaining 4 cases cutaneous tuberculosis was present elsewhere; the tuberculous lesions included papulonecrotic tuberculids and scrofuloderma. Two of the women had lesions of erythema induratum on their legs and similar lesions on the arms and breast. A history of recurrent nodules and ulcers which occurred every winter and disappeared in the summer was obtained in several of the cases (fig. 3). In a few cases the involvement was unilateral; in 2 cases there were superficial lesions which simulated ecthymatous ulcers and were comparable to tuberculides ulcereuses des membres inférieurs as described by Pautrier.[17]

In 21 of 25 cases of erythema induratum the intracutaneous tuberculin test (purified protein derivative) with a weak first dilution was positive. Mycobacterium tuberculosis was searched for in the examination of specimens of the skin in all of the cases of erythema induratum but was found in only 2. Inoculation of guinea pigs with portions of these specimens disclosed Mycobacterium in only 2 of 10 cases in which this test was performed. A negative result, however, would not rule out the presence of this organism, as such a negative report is of no significance.

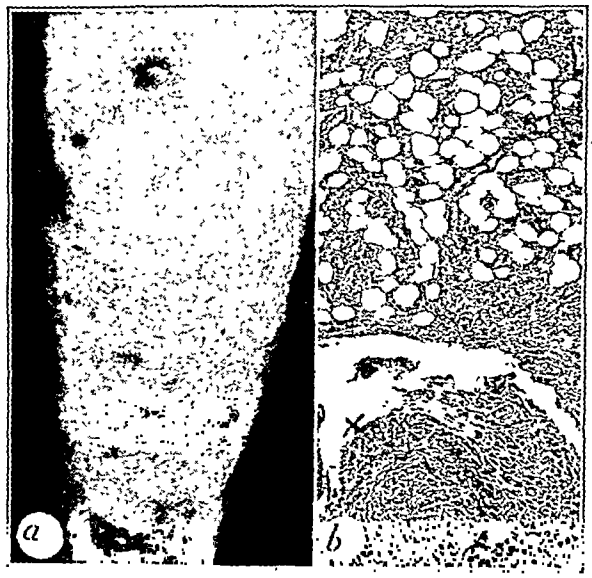


Fig. 3.—*a*, erythema induratum on leg of a woman aged 31; recurrent nodules, ulcers and livedo had occurred each winter for eighteen years; *b*, large occluded vein in subcutaneous tissue at *X*; fibrosis and fatty atrophy (× 30).

It is generally recognized that in cases of erythema induratum the histopathologic changes are not always classic. In our experience a nonspecific granuloma with varying degrees of vasculitis has been present in somewhat more than 30 per cent of cases. Writers, including Volk,[18] Gans,[19] Kyrle [1] and Pautrier,[20] all have emphasized that the histopathologic changes are not always characteristic, and they have spoken essentially of the following three types of histologic reactions seen in cases of erythema induratum: (1) formation of typical tubercles with caseation in the center of the tubercles (fig. 2), (2) a severe degree of necrosis of the fat, both acute and chronic in type, with varying degrees of vasculitis and foreign body giant cell reaction and (3) a process similar to the second but with extensive fibrosis rather than necrosis of the fat pre-

9. Ormsby, O. S.: Erythema Induratum, in A Practical Treatise on Diseases of the Skin, for the Use of Students and Practitioners, Philadelphia, Lea & Febiger, 1915, pp. 712-715; in Ormsby, O. S., and Montgomery, Hamilton: Diseases of the Skin, ed. 6, Philadelphia, Lea & Febiger, 1943, pp. 858-861.

10. Michelson, Henry: Unpublished data.

11. Ebert, M. H., and Otsuka, M.: A Case for Diagnosis (Erythema Induratum?), Arch. Dermat. & Syph. **48**: 212 (Aug.) 1943; **48**: 343 (Sept.) 1943. Mitchell, J. H., and Kesler, R. L.: A Case for Diagnosis (Erythema Nodosum? Erythema Induratum?), ibid. **48**: 445 (Oct.) 1943. O'Leary, Montgomery and Brunsting.[2]

12. Philippson, L.: Ueber Phlebitis nodularis necrotisans (Beitrag zu dem Studium der Tuberculides von Darier), Arch. f. Dermat. u. Syph. **55**: 215-228, 1901.

13. Bechet, P. E.: Periphlebitis Nodularis Necrotisans: An Attempt at Definition and Classification, Arch. Dermat. & Syph. **41**: 55-59 (Jan.) 1940.

14. Gans, Oscar: Erythema nodosum (s. contusiforme), in Histologie der Hautkrankheiten; die Gewebsveränderungen in der kranken Haut unter Berücksichtigung ihrer Entstehung und ihres Ablaufs, Berlin, Julius Springer, 1925, pp. 373-376.

15. Highman, W. J., in discussion on Eller, J. J.: Periphlebitis Nodularis Necroticans, Arch. Dermat. & Syph. **22**: 722 (Oct.) 1930.

16. Montgomery, Hamilton: Histopathology of Various Types of Cutaneous Tuberculosis, Arch. Dermat. & Syph. **35**: 698-715 (April) 1937.

17. Pautrier, L. M.: Tuberculose nodulaire dermique à petits nodules; les tuberculides ulcéreuses, in Darier, J., and others: Nouvelle pratique dermatologique, Paris, Masson & Cie, 1936, vol. 3, chapter 2, pp. 643-652.

18. Volk, Richard: Tuberkulose der Haut, in Jadassohn, J.: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1931, p. 368.

19. Gans, Oscar: Tuberculosis cutis indurativa, in Histologie der Hautkrankheiten; die Gewebsveranderungen in der Kranken Haut unter Berücksichtigung ihrer Entstehung und ihres Ablaufs, Berlin, Julius Springer, 1925, pp. 463-478.

20. Pautrier, L. M.: Tuberculose nodulaire hypodermique; érythème induré de Bazin, in Darier, J., and others: Nouvelle pratique dermatologique, Paris, Masson & Cie, 1936, vol. 3, chapter 3, pp. 655-669.

dominating. Gans [19] regarded fibrosis as a late stage in the disease. Multiple sections of wide deep specimens which include subcutaneous tissue may be necessary before typical tubercles can be demonstrated. More than one specimen often is necessary for diagnosis.

A review of the literature of recent years indicates that little attention has been paid to the vasculitis present in erythema induratum, which formerly was described as affecting chiefly the veins and to a lesser degree the arteries. We observed some involvement of the veins and arteries in all of our cases (figs. 3 and 4). Varying degrees of periarteritis, endarteritis, panarteritis and phlebitis of the same types can be seen in erythema induratum involving not only the arterioles and venules but also at times involving the larger vessels in the subcutaneous tissues. As a result of necrosis of the fat (panniculitis) or extensive fibrosis secondary to the vasculitis, vascular changes may predominate to the exclusion of any formation of tubercles. At times there may be a necrotizing arteritis or a hyaline or fibrinoid necrosis of the arterial walls involving the media and intima which is suggestive histologically of periarteritis nodosa but is not associated with evidence of systemic disease. Varices that may be associated with lesions of erythema induratum are usually readily distinguished from the vasculitis seen in erythema induratum by the microscopic appearance, including the wavy walls and irregular pattern of the fibrosis that is present.

ERYTHROCYANOSIS AND PERNIO

Telford [21] defined erythrocyanosis as a reddish blue discoloration of the skin seen on the lower half of the legs of girls and young women, which is associated with indurative nodules which may break down to form small ulcers and undergo involution with residual scarring. Most of the affected women are stout and have a florid appearance and large legs. He compared the process



Fig. 4.—Typical examples of erythema induratum with vasculitis in subcutaneous tissue: *a*, obliterative changes in vein and artery (× 75); *b*, thickening of wall of vein, proliferation of endothelium but preservation of elastic tissue; arterioles also thickened at *X* (× 50).

to vascular disturbances in the leg in anterior poliomyelitis in which nodules develop in the winter time but later persist the year round with subsequent development of ulcers. Telford expressed the opinion that Bazin's disease (erythema induratum) is not of tuberculous origin and is in no way different from the condition he called "erythrocyanosis." He was unable in his cases to demonstrate a tuberculous origin either clinically, pathologically or by animal inoculation. In



Fig. 5.—*a*, pernio or erythema induratum (?) on the legs of a woman aged 29; painful nodules had recurred each winter for thirteen years; the ulcers, which had been present for one year, are deeper than those observed in most cases of pernio; *b*, obliterative vasculitis, fibrosis and caseation and fatty atrophy in subcutaneous tissue (× 35).

describing the microscopic appearance of erythrocyanosis he mentioned foreign body giant cells, obliterative vascular changes including thickening of all the coats of the arteries, necrosis of the fat and finally formation of fibroblasts and granulation tissue. He said that unlabeled sections of tissue of patients who have erythrocyanosis, Bazin's disease, anterior poliomyelitis and necrosis of the fat of the breast cannot be separated into their respective groups by histopathologic examination alone. He also said that tissues have a limited method of response and one should depend essentially on the clinical course and appearance of the disease for diagnosis. Seventeen of his 19 patients with erythrocyanosis remained well after sympathectomy.

Telford [21] apparently opposed the concept that erythema induratum is due to tuberculosis. Certainly, many of his illustrations, especially his figures 3, 4 and 5, would be acceptable as representing early but definite formation of tubercles, while other photomicrographs he included do not differ from those showing the nonspecific changes frequently seen in erythema induratum.

21. Telford, E. D.: Lesions of the Skin and Subcutaneous Tissue in Diseases of the Peripheral Circulation, Arch. Dermat. & Syph. **36**: 952-963 (Nov.) 1937.

McGovern and Wright,[22] under the title Pernio:[23] a vascular disease, reported cases which they regarded as similar to those reported by Telford. They pointed out that in Bazin's original monograph there were reports of several cases in which the description fitted that of pernio rather than that of erythema induratum but that, when Bazin originally described the condition, Mycobacterium tuberculosis had not been discovered. McGovern and Wright said that the onset of the disease was associated with painful nodules and indurated lesions on the legs of girls in adolescence, that it was precipitated by exposure to cold and that it tended to persist throughout the winter and disappear in the summer. A serosanguineous to purulent exudate is frequently followed by the appearance of superficial ulcers which may not clear up in the summer in cases in which the disease has been present for a long time (fig. 5). The internal malleolus and the calf are sites of predilection; however, the feet and toes, which rarely are involved in cases of erythema induratum and nodular vasculitis, may be involved by erythrocyanosis or pernio. McGovern and Wright compared their cases to the cases of frostbite reported by Perutz,[24] whose patients were women. In the cases reported by Perutz the inner aspects of the knee joints were involved and the condition was designated as "erythrocyanosis crurum puellaris." McGovern and Wright regarded pernio as a vascular disease affecting the smaller vessels of the skin and associated with terminal sclerodermatous changes. They described angiitis of the smaller veins, necrosis of fat and giant cells which were not associated with evidence of tuberculosis.

In both erythrocyanosis and pernio there are recurrent attacks which occur in the winter and disappear in the summer, which also is true in some cases of the tuberculous type of erythema induratum; however, it is true that the ulcers of pernio are usually more superficial than are the ulcers of erythema induratum and that the degree of inflammatory reaction is not as great in pernio as it is in erythema induratum

ERYTHEMA NODOSUM

Erythema nodosum is a much more acute process than any of the conditions that we have considered so far. The term is usually applied in this country to an acute disease associated with fever, malaise and arthralgia and characterized by relatively superficial tender nodules and plaques which occur on the legs but at times occur elsewhere on the body. The lesions last a few days to several weeks. They undergo involution without ulceration and leave a residual discoloration. There is a tendency for attacks to occur in the spring and autumn, and the disease has been associated with streptococcic infection, including foci of infection in the teeth and the tonsils. A chronic lesion resembling erythema nodosum may occur in association with other conditions such as syphilis and coccidioidal granuloma or as the result of administration of various drugs such as the bromides and sulfonamides. We are not concerned with these conditions in the present paper. In acute erythema nodosum,[25] microscopic examination reveals infiltration about the vascular network in the upper and middle portions of the cutis. The infiltrate consists chiefly of lymphocytes and polymorphonuclear leukocytes. The walls of the vessels are edematous, and at times there is an inflammatory hemorrhagic infiltration of the walls. There may be a relatively acute infiltration with atrophy and necrosis of the fat in the subcutaneous tissue. Secondary thrombophlebitis may supervene. According to Gans, when lesions persist for several weeks there may be atrophy of fat and a tuberculoid reaction without definite relation to tuberculosis.

We believe that the chronic forms of erythema nodosum which have been attributed to tuberculosis are actually examples of nonulcerative types of erythema induratum or types of nodular vasculitis.

PANNICULITIS

Like erythema induratum, relapsing, febrile, nodular, nonsuppurative panniculitis (Weber-Christian disease[26]) is often associated with bouts of fever. There are large subcutaneous plaques and nodules predominating on the trunk and thighs rather than on the legs, and subsequent subcutaneous atrophy results in depression of the skin at the site of involution. The condition is uncommon and occurs chiefly among women. The histopathologic changes are characterized by edema and necrosis of the subcutaneous fat with phagocytic cells of different types, which engulf the fat; there are a few multinucleated cells and an inflammatory reaction consisting of lymphocytes and polymorphonuclear leukocytes. As a rule there is little evidence of fibroblastic proliferation or of vasculitis; however, in recent articles the authors[27] have mentioned both of these conditions as well as edema of the walls of the arterioles, endothelial proliferation and even thrombosis. There apparently is no definite relationship between this disease and tuberculosis, although Tilden, Gotshalk and Avakian[28] and Shaffer[29] have reported atypical forms of the disease which are difficult to classify. Panniculitis of Weber-Christian disease is quite distinct from nodular vasculitis, erythema induratum, erythema nodosum, erythrocyanosis, pernio and thrombophlebitis, all of which, however, excepting primary thrombophlebitis, are associated with a varying degree of acute or chronic panniculitis in the subcutaneous tissues.

RECURRENT IDIOPATHIC THROMBOPHLEBITIS

Comment has been made that in many of the types of lesions just mentioned there may be an associated thrombophlebitis of the small veins and venules. In most cases in which thrombophlebitis affects medium sized and large veins the disorder is secondary to chemical or mechanical injury, local suppuration, blood dyscrasia, heart disease, carcinoma or varices, or it occurs after operations, childbirth or acute infectious disease and need not be considered in differential diag-

22 McGovern, Teresa, and Wright, I S Pernio A Vascular Disease, Am Heart J **22**: 583 605 (Nov) 1941

23 The use of the term "pernio" is somewhat confused in the literature, as the term has been applied to (1) lupus pernio (Besnier), which is a form of sarcoid, (2) lupus pernio (chilblain lupus Hutchinson), which is part of the picture of disseminated lupus erythematosus, and (3) erythema pernio (chilblains, frostbeulen, frostbites), which also has been called pernio and perniones The term "pernio" as used by McGovern and Wright apparently does not fit in with any of these uses except indirectly with the last one

24 Perutz, A , cited by McGovern and Wright [22]

25. Thibaut, D : Erythème noueux, in Darier, J , and others: Nouvelle pratique dermatologique, Paris, Masson & Cie, 1936, vol 4, pp. 543 557. Gans [21]

26 Bailey, R. J : Relapsing Febrile Nodular Nonsuppurative Panniculitis (Weber-Christian Disease), J. A. M. A. **109**: 1419 1425 (Oct. 30) 1937.

27. Cummins, Loretta J , and Lever, W F Relapsing Febrile Nodular Nonsuppurative Panniculitis (Weber Christian Disease): Report of Two Cases, Arch Dermat & Syph **38**: 415 426 (Sept) 1938.

28 Tilden, I. L., Gotshalk, H C , and Avakian, E. V : Relapsing Febrile Nonsuppurative Panniculitis: Report of Two Cases, Arch. Dermat & Syph **41**: 681 689 (April) 1940.

29 Shaffer, Bertram Liquefying Nodular Panniculitis: Report of a Case, Arch Dermat & Syph **38**: 535 544 (Oct) 1938

nosis.[30] Primary recurrent idiopathic thrombophlebitis (thrombophlebitis migrans), however, should be considered in the differential diagnosis of the conditions mentioned in this paper. Primary idiopathic thrombophlebitis, unlike conditions already described in this paper, predominantly affects men rather than women (fig. 6 *a*). It is primarily a disease of small and medium sized veins and in many cases is identical to the thrombophlebitis seen in thromboangiitis obliterans except that the arteries are not involved. It is characterized by multiple discrete tender nodules which involve the lower extremities but also are found anywhere on the body. The nodules are quite tender, persist from seven to eighteen days and tend to occur in crops and to extend by segments to the larger veins. The lesions are more linear to palpation than circular and usually are

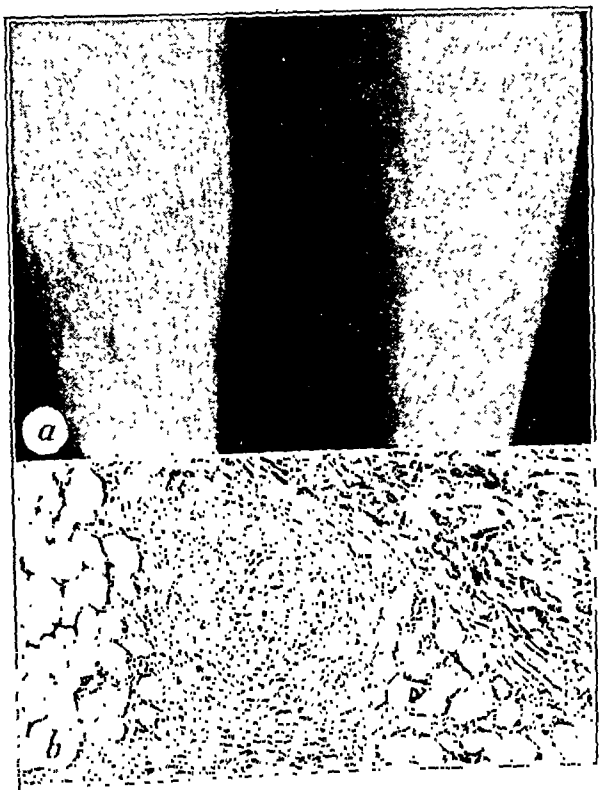


Fig. 6.—*a*, primary recurrent idiopathic thrombophlebitis of two years' duration on legs of a man aged 28; *b*, thrombosed vein in subcutaneous tissue with absence of inflammatory reaction (× 55).

smaller than are the lesions of erythema nodosum and erythema induratum. Constitutional symptoms are usually mild, and necrosis and ulceration of the nodules do not occur. The histopathologic changes in idiopathic thrombophlebitis include occlusion of the lumen by cellular thrombosis with severe infiltration of the wall of the vein, varying degrees of fibrosis of the wall and more particularly an absence of or very little inflammatory reaction of the tissue adjacent to the vein (fig. 6 *b*). The involved veins are usually larger than those affected in cases of nodular vasculitis, erythema induratum, erythema nodosum or panniculitis. Histologically, the relatively small amount of periphlebitic inflammatory reaction and the absence of necrosis of fat and fibrosis readily distinguish idiopathic thrombophlebitis from thrombophlebitis secondary to other conditions. Such sharp distinction, however, is not always possible clinically; at times, more than one condition may be present.

INDURATED CELLULITIS AND ULCERATION SECONDARY TO CHRONIC VENOUS STASIS

As a result of chronic venous stasis which follows iliofemoral thrombophlebitis or varicose veins of long standing, a subacute or chronic inflammatory reaction may occur in the lower third of the leg and produce a tender painful plaque-like induration of the skin and subcutaneous tissues. At times the entire circumference of the leg may be involved and have the appearance of a tight constricted anklet above which there is definite pitting edema. However, the most common site of involvement is just proximal to the internal malleolus. Ulceration may occur in these indurated regions. Secondary infection may occur, and considerable induration may be present in the margins of the ulcers. Ordinarily the differential diagnosis of these conditions and other nodular vascular lesions of the legs offers little difficulty, particularly if the history and findings indicative of previous iliofemoral thrombophlebitis or primary varicose veins are correctly evaluated. It is important to recognize that the primary etiologic factor in cases of cellulitis and ulceration secondary to venous stasis is the venous insufficiency.

SUMMARY

We have used the term "nodular vasculitis" to refer to relatively chronic, persistent or recurrent nodular lesions of nontuberculous origin occurring chiefly on the legs below the knees. The lesions occasionally result in ulceration and occur especially among women past 30 years of age but also affect younger persons. They infrequently affect boys and men. Histopathologically there is a definite vasculitis with varying degrees of obliterative changes in both arteries and veins together with necrosis of fat and fibrosis in the subcutaneous tissues. Cases reported by Galloway and Whitfield at the beginning of the century would belong in this group, as do other reported cases in which no evidence of tuberculosis has been demonstrable even when observations have been continued for a long period. We believe that nodular vasculitis represents an entity which is not due to tuberculosis although observation of affected patients for several years is necessary before conclusive deductions in regard to the cause of the disease will be possible.

A varying degree of vasculitis is a prominent feature of both the ulcerative and the nodular form of erythema induratum, and a specific histopathologic picture of tuberculosis is seen in about 70 per cent of the cases in which a clinical diagnosis of erythema induratum is made. The absence histopathologically of a tuberculous structure does not eliminate the possibility that a patient has erythema induratum (Bazin) because the duration of the lesions and of the disease and the site from which specimens are obtained for biopsy are important factors in establishing the diagnosis. Erythrocyanosis and pernio and erythema nodosum, panniculitis and stasis induration and ulceration all are associated with varying degrees of vasculitis and fibrosis and with varying degrees of acute or chronic panniculitis. There are many similarities between the conditions considered in this paper which necessitate correlation of the clinical, histologic and other laboratory data.

30. Allen, E. V., and Barker, N. W.: Some Diseases of the Blood Vessels and Lymphatics, in Tice, Frederick: Practice of Medicine, Hagerstown, Md., W. F. Prior Company, Inc., 1940, vol. 6, pp. 36-52.

ABSTRACT OF DISCUSSION

DR. MICHAEL H. EBERT, Chicago: The classification of nodular lesions of the legs is often attended by great difficulty. There is a tendency to make the term erythema induratum a catch-all for obscure cases. In 1908 Schidachi, from Jadassohn's clinic, reemphasized the necessity of strict proof of the tuberculous origin of any given condition before it could be justly called erythema induratum. Painstaking studies by the departments of internal medicine, vascular diseases and pathology must be made to accumulate roentgenologic, pathologic, clinical, immunologic and experimental data before a decision can be arrived at. Erythema induratum, as the authors have shown, is a nodular vasculitis of tuberculous origin affecting the deeper vascular bed of the hypoderm and associated with varying degrees of panniculitis and fibrosis. They have reserved the term "nodular vasculitis" without any qualifying adjectives for the residuum of cases of similar symptomatology but of unknown or unproved etiology. The authors have emphasized the necessity for prolonged observation before passing final judgment on such cases. Generally speaking, they have pointed out that nodular vasculitis occurs in older women, is more painful, is of shorter duration, responds better to bed rest and has less tendency to ulcerate than erythema induratum. However, it has some tendency to recurrence. To say that erythema induratum is tuberculous does not completely explain its etiology. Its predilection for the legs is probably due to poor circulation and low resistance of the fatty tissue. There are still other things to explain: first, its predilection for young women and, second, its peculiar seasonal incidence. In addition to the immune state of the individual patient to the tubercle bacillus, it may be that functional vascular spasm plays a significant role. Cutis marmorata not infrequently accompanies erythema induratum, and this type of circulation is known to be the predisposing factor in livedo reticularis, a rare type of tuberculoderma. Tilford goes so far as to state that persistent functional spasm may result in organic changes in the vessels. Endocrine disturbance may be reflected through the vascular spasm. The increased evidence of erythema induratum in cold weather or cold damp climates would seem best explained on the basis of vascular spasm.

DR. JOHN H. LAMB, Oklahoma City: Stokes (*Arch. Dermat. & Syph.* **36**:412 [Aug.] 1937) presented a case of erythema induratum in which he stressed two important points: First, that some cases diagnosed as Bazin's disease often exhibit a pyogenic or allergic sensitizing factor with a possible tuberculosis which is demonstrated with difficulty. The patient he presented had many forms of therapy with no improvement. After the removal of an infected tooth, the lesions cleared for a year and a half. Second, the importance of support of the peripheral circulation with elastic bandages, rubber boots and gelatin boots. Greenbaum suggests equal parts of contractible and flexible collodion. A further report of a case of febrile nodular nonsuppurative panniculitis (*Oklahoma State M. J.* **33**:1 [Jan.] 1940) may have some bearing on the etiology of Weber-Christian's disease. A white girl, aged 11 when first seen in 1937, had panniculitis of the lower extremities. The disease was for the most part afebrile. New lesions appeared at irregular intervals until 1939. About six months after the appearance of the last lesion the patient reported to the clinic with the complaint of fever, stiffness, pain and swelling of her hands and some joint pain in the legs. The diagnosis was made of a juvenile equivalent of adult chronic infectious arthritis, Still's disease. This case aroused suspicion that there may be a possible relationship between this nodular disease of the lower extremities and rheumatoid arthritis. I agree with Drs. Montgomery, O'Leary and Barker that there is a group of nodular lesions of the lower extremity occurring in women over 30 years of age which is not Bazin's disease and can be classified under the term suggested, nodular vasculitis. Dr. Ebert's case of possible nodular vasculitis (*Arch. Dermat. & Syph.* **48**:212 [Aug.] 1943) also presented a history of rheumatic heart disease. I should like to ask the authors if there was a similar history in any of their cases. The association of rheumatism in many of these cases does not make the treatment of these conditions any easier or solve the problem of their etiology, since the causes of arthritis are many and varied, but it may give us a new approach to therapy in nodular lesions of the lower extremity.

DR. HENRY E. MICHELSON, Minneapolis: When discussing the various diseases that may occur on the lower part of the leg one must realize that the majority of such conditions are due either to stasis or to spasm of the blood vessels, with the resulting physiologic and pathologic changes. Most chronic conditions of the lower part of the leg are characterized by indurated plaques, and the more one studies the microscopic appearance of these plaques the more is one impressed with the fact that a pathognomonic microscopic picture is rarely present. The classic picture of erythema induratum is quite carefully simulated by other conditions. Therefore it is not easy to ascertain the etiology from the resulting pathologic condition. I am particularly concerned with the promiscuous injection of dilated veins. I have seen many examples of irreparable damage and persistent edema following the indiscriminate use of that method of treatment. Erythema induratum is part of a constitutional tuberculosis, and it may flare at the same time at which there is an exacerbation in the lung.

DR. FRED D. WEIDMAN, Philadelphia: I take it that "nodular vasculitis" is presented as a new clinical entity. It will receive much attention, whether one thinks of the quarters from which it comes in their physical or in their professional sense. That being the case, I beg to add another possible item that should not be overlooked as dermatologists come to evaluate this condition and determine its scope. I refer to the role of dermatophytosis. Thompson in New Haven and Naide in Philadelphia are experts in the field of peripheral vascular disease. They claim that dermatophytosis is the cause (or at least they go as far as they can without contending that they have positive proof on this point) that dermatophytosis produces an allergic mechanism which is responsible for spasms and thromboses of the blood vessels of the lower extremities. They intimate that this is the cause of Buerger's disease. Or, in other words, Buerger's disease is an allergic expression of dermatophytosis. I hold no brief for this thesis. I doubt that any of us would feel convinced until the matter has been yet more thoroughly studied, but at any rate it is worth remembering. In future studies of nodular vasculitis one should check for the presence of dermatophytosis. The microscopic changes are indeed similar.

DR. HAMILTON MONTGOMERY, Rochester, Minn.: None of our cases of nodular vasculitis presented any evidence or history of rheumatism or rheumatic cardiovascular disease. We do not know what nodular vasculitis is. It resembles erythema induratum but is apparently on a nontuberculous basis. The lesions are more acute and painful than those of tuberculous erythema induratum, but the lesions of nodular vasculitis are much more chronic in character than those in the common nontuberculous type of erythema nodosum. Primary idiopathic thrombophlebitis is to be distinguished from thrombophlebitis secondary to venous insufficiency and other conditions mentioned in the paper. We frequently see cellulitis and lymphedema in association with trichophytosis of the feet, but this is a distinct picture from the conditions which we grouped together in this presentation. Some authors, for example Telford, would regard all cases of erythema induratum as nontuberculous in origin and explainable on a vasospastic basis. We believe, however, that there is a tuberculous erythema induratum which should be distinguished from allied conditions which may simulate it.

Number of Practitioners in Ceylon.—A total of 928 physicians are in practice in Ceylon. About 405 of them are in government service. Private practitioners seem to be limited to towns. Medical missionaries are to be found in some sections. In 1938 the ratio of physicians to population was 1 per 6,500. In the same year there were about 3,500 registered native physicians who practiced medicine according to the precepts of the Ayur-Veda, the Hindu book of the science of health and medicine.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

TREATMENT OF AMBULATORY PATIENTS WITH PENICILLIN SODIUM

PRELIMINARY STUDIES OF FUSOSPIROCHETOSIS

LIEUTENANT WILLIAM F. PEARCE
AND
CAPTAIN JOHN B. McDONALD
MEDICAL CORPS, ARMY OF THE UNITED STATES

The treatment of fusospirochetosis with penicillin sodium became apparent after the preliminary report by Mahoney and his co-workers [1] in 1943 noting the influence of penicillin therapy on the clinical manifestations and serologic reactions of patients with early syphilis. Also in 1943 Heilman and Herrell [2] found penicillin to be effective in experimental animals against other spirochetal infections, namely Leptospira icterohemorrhagiae of Weil's disease, Spirillum minus of rat bite fever and Spirillum recurrentis of relapsing fever. Following the confirmation [3] of these studies the use of penicillin against Spirillum vincenti became a reasonable sequence. With the more general use of this chemotherapeutic agent in various bacteriologic infections an apparent relationship between the condition of the gingivae and pharynx with the administration of penicillin was observed by Strock [4] and others in 1944. In such cases ulceration and bleeding of the gingivae disappeared after penicillin therapy was instituted, leaving the gums and pharynx free from inflammation; similar observations no doubt are being made by many users of penicillin today. Penicillin is an extremely powerful bacteriostatic and probably bactericidal agent that has the advantage of acting on most secondary invading organisms in the mouth and throat. A series of cases of fusospirochetal infection of the gingivae and pharynx was studied and is reported here using penicillin sodium as the paramount therapeutic agent.

Although this infection was treated systemically with penicillin sodium, the amount of active penicillin in the blood, measured by the power of the blood serum to effect bacteriostasis either by Fleming's [5] or Rammelkamp's [6] methods, was not computed; therefore clinical and bacteriologic response had to be utilized as the guide in therapy.

PROCEDURE

In this series 50 patients with fusospirochetosis were studied; these included 29 patients with Vincent's angina, 16 patients with Vincent's stomatitis and 5 patients having both conditions. Before penicillin therapy was instituted, the diagnosis was definitely established in each instance on the basis of the following criteria:

1. There was a history of sore throat (usually unilateral), dysphagia, fever, malaise and/or sore and bleeding gums, foul breath.

2. Examination revealed turgid papillae, bleeding easily, with ulceration and exudate. Usually one tonsil bore a grayish membrane which was readily detached, leaving a necrotic, foul smelling ulcer. The glands on the affected side were swollen and tender.

3. Smears from the gums or tonsil revealed innumerable spirochetes and fusiform bacilli. All smears were prepared according to the following routine: [7]

(*a*) The patient washed his mouth and gargled with a sodium bicarbonate solution.

(*b*) A cotton swab was applied to the infected area, removing the membrane and then discarded.

(*c*) A fresh swab was used to take the smear from the desired area.

(*d*) This swab was then rolled, not rubbed, over a crayon encircled area on a clean glass slide and stained with 2 per cent gentian violet solution.

4. Diphtheria bacilli were not identified on any smears. Leukemia and agranulocytic angina were excluded by blood examinations. Syphilis was ruled out by negative serologic reactions and also by the fact that Treponema pallidum is very fine and shaped like a corkscrew, while Spirillum vincenti is much coarser and has long undulating curves.

PLAN OF TREATMENT

All patients were treated with intramuscular injections of penicillin sodium in doses of either 10,000 or 20,000 units every two or three hours night and day until a total of 100,000 to 200,000 units had been given. Some patients were treated with penicillin only, some were given hydrogen peroxide mouth washes following penicillin, and still another group was observed in the dental clinic,[8] where tartar, caries and other pockets of infection were treated to establish proper drainage. All patients remained ambulatory during the therapy.

CRITERIA OF CURE

Patients in this study were retained under observation until smears on three successive days did not reveal the presence of spirochetes. They were then advised to return in seven days and again in fourteen days for clinical observation and bacterial studies. For academic purposes in several cases smears were taken night and day before each succeeding injection of penicillin. In many cases all spirochetes had disappeared from the slide after 70,000 units had been given and in no instance were spirochetes found after 100,000 units of sodium penicillin had been administered. All patients were symptom free within twenty-four hours after the first injection; that is, they were afebrile, were free from malaise and had no pain on swallowing. Usually the ulcerated area appeared much cleaner, and signs of epithelization were present. In the vast majority of cases the gums and tonsils became clinically well in forty-eight to ninety-six hours. Patients were judged as cured after becoming symptom free, after demonstrable clinical healing of ulcerations and after

From the Station Hospital, Camp San Luis Obispo, Calif

1. Mahoney, J. F.; Arnold, R. C., and Harris, A.: Penicillin Treatment of Early Syphilis. A Preliminary Report, Ven. Dis. Inform. **24**: 355-357 (Dec.) 1943.

2. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Relapsing Fever, Proc. Staff Meet., Mayo Clin. **18**: 457-467 (Dec. 1) 1943; Penicillin in the Treatment of Experimental Leptospirosis Icterohemorrhagica (Weil's Disease), ibid. **19**: 88-99 (Feb. 23) 1944; Penicillin in the Treatment of Experimental Infections with Spirillum Minus and Streptobacillus Moniliformis (Rat Bite Fever), ibid. **19**: 257-264 (May 17) 1944.

3. Lourie, E. M., and Collier, H. O. J.: The Therapeutic Action of Penicillin Spirochaeta Recurrentis and Spirillum Minus in Mice, Ann. Trop. Med. **37**: 200-205 (Dec. 31) 1943. Augustine, D. L.; Weinman, D., and McAllister, Joan: Rapid and Sterilizing Effect of Penicillin Sodium in Experimental Relapsing Fever Infections and Its Ineffectiveness in the Treatment of Trypanosomiasis and Toxoplasmosis, Science **99**: 19-20 (Jan. 7) 1944.

4. Strock, A. C.: Relationship Between Gingivitis and Penicillin Administration: Preliminary Report, J. A. D. A. **31**: 1235-1236 (Sept.) 1944. Herrell, W. E.; Nichols, D. R., and Hellman, D. H.: Penicillin: Its Usefulness, Limitations, Diffusion and Detection, with Analysis of 150 Cases in Which It was Employed, J. A. M. A. **125**: 1008 (Aug. 12) 1943.

5. Fleming, A., in Discussion on Penicillin, Proc. Roy. Soc. Med. **37**: 101-104 (Jan.) 1944.

6. Rammelkamp, C. H.: A Method for Determining the Concentration of Penicillin in Body Fluids and Exudates, Proc. Soc. Exper. Biol. & Med. **51**: 95-97 (Oct.) 1942.

7. Corporal Milbert W. Terry rendered valuable technical assistance.

8. Col. Vivian Z. Brown and Lieut. Numa C. Johnson, the dental clinic officers, cooperated in the study.

three negative smears were obtained, provided smears remained negative in the follow-up period of two weeks. Several patients whose smears were negative within the first twenty-four hours suffered relapses, and spirochetes were demonstrable in small numbers after forty-eight hours. All of these, however, responded to further penicillin administration. Patients who still had ulcerations but no demonstrable spirochetes after forty-eight hours were not given additional penicillin; but in these instances healing was complete in another twenty-four to forty-eight hours.

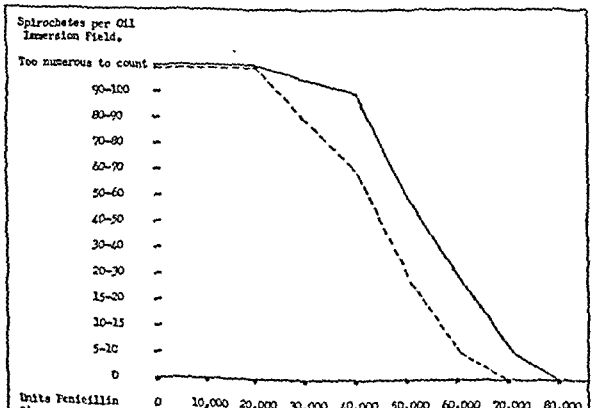
MATERIAL STUDIED

A total of 50 patients suffering from Vincent's angina or Vincent's stomatitis or both is included in this study. All were men between the ages of 18 and 35. The average duration of infection before the patient reported for treatment was five days. Only 3 of the patients had received any treatment prior to administration of penicillin sodium, and this without clinical or bacteriologic improvement. All patients studied fulfilled the diagnostic criteria previously enumerated.

RESULTS OF TREATMENT

The accompanying chart demonstrates the rate of disappearance of spirochetes from Vincent's ulcerations as penicillin was administered. Smears were taken in the manner described before each succeeding injection of the drug, and an effort was made to count the number of spirochetes per average oil immersion field. Owing to inability to spread the material evenly over all parts of the slide, many inaccuracies in the actual count have no doubt occurred; however, as the chart shows, the number of organisms diminished rapidly and in all instances spirochetes could not be demonstrated in any part of the slide after the eighth injection or 80,000 units of penicillin sodium. It was also demonstrated that the fusiform bacilli decreased in number in similar proportion, though not as rapidly.

In the table are shown the results of treatment in respect to the size of individual doses and the length



Rate of disappearance of spirochetes in Vincent's stomatitis (solid line) and Vincent's angina (broken line) after administration of penicillin.

of therapy and also in respect to use of penicillin alone as compared with the use of penicillin in conjunction with other procedures. The most satisfactory results were obtained as shown in column A. In this series 10,000 units was administered every two hours until 100,000 units had been given; this was followed by the use of 3 per cent hydrogen peroxide as a gargle four times daily for seventy-two hours in the cases of Vincent's angina, while in the cases of stomatitis the patients were referred to the dental clinic for correction of possible causative factors such as fillings, caries, malocclusions or gingival flaps. Ninety-five per cent of these patients in the first twenty-four hours obtained

Fusospirochetosis

	Individual Dose	Treatment, Hrs.	Number Treated	Negative Smears 24 Hrs.	Relapses (per Smear) 48 Hrs.	Per Cent Cured 24 Hrs.	Per Cent Cured 72 Hrs.
A. Penicillin with hydrogen peroxide* or dental care†	10,000	18	19	19	1	95%‡	100%§
B. Penicillin alone¶.....	10,000	18	16	16	3	81%‡	100%§
C. Penicillin alone¶.....	20,000	12	15	14	7	53%‡	100%§

* Hydrogen peroxide gargle used for seventy-two hours in Vincent's angina after penicillin.
† Elimination of dental factors and drainage established in cases of Vincent's stomatitis.
‡ Percentage cured refers to those whose smears remained negative for three week period and were clinically well.
§ Relapsed patients given an additional 100,000 units.
¶ Includes both Vincent's angina and Vincent's stomatitis.

negative smears which remained negative during the three week follow-up period. The remaining 5 per cent obtained a similar result when an additional hundred thousand units of penicillin was administered in the next twenty-four hours. All patients were symptom free after ten injections and remained ambulatory during treatment. Beginning epithelization could be observed of the ulcerations in gums and tonsils the first day, and the tissues appeared completely healed in all cases after ninety-six hours had elapsed. Column B reveals the results of treatment with penicillin alone; 81 per cent were cured in twenty-four hours and the remaining 19 per cent in seventy-two hours after an additional hundred thousand units. Column C demonstrates that 100,000 units given in divided doses of 20,000 units each with a three hour interval was much less satisfactory, with only 53 per cent obtaining a twenty-four hour cure. The remaining cases did, however, become negative when the therapy was repeated. The natural conclusion from these studies is that 10,000 units of penicillin, given every two hours up to a total of 100,000 units and followed by prompt elimination of adverse dental factors plus the use of an oxygenating gargle or mouth wash, will eliminate Vincent's spirochete from the mouth and pharynx and result in rapid healing of ulcerations and dramatic relief of symptoms occurring in this infection. However, this report is merely preliminary and it is obvious that more cases must be observed and over a longer period of time before the results may be regarded as conclusive.

COMMENT

From the foregoing results it is evident, or at least suggestive, that penicillin sodium is an effective agent in the treatment of fusospirochetal disease. Since we felt that the causative agent in this condition is the symbiotic action of the spirochete and the fusiform bacillus, which probably become pathogenic when the vitality of the tissues is impaired, it was believed that elimination of one of these organisms, namely Vincent's spirillum, was sufficient to produce favorable therapeutic results. For this reason studies were confined to the spirochete, and it was discovered that the destruction of this invader by penicillin sodium effected cures in all

cases studied even though a few fusiform bacilli persisted in the mouth or throat.

From the point of view of the time required for cure, penicillin sodium was distinctly superior to all other forms of therapy in fusospirochetosis. It has been our experience that older methods required daily care and observation for a minimum of ten days and usually much longer; with penicillin this was reduced to three days, the necessity of isolation was promptly eliminated, the relief of constitutional symptoms enabled the patient to resume his normal activities quickly and further observation was required only once a week for two or three weeks. The reduction of treatment time and the diminishing cost of penicillin indicate that this method of therapy is both practical and economical for general office use. The time of therapy and the cost involved will be no doubt even further curtailed when the use of penicillin in beeswax-peanut oil mixture or the like has been established and only one injection is required for a complete treatment.[9]

In this series 2 patients developed a generalized maculopapular erythematous eruption which subsided in twenty-four hours. No other toxic reactions to the drug were observed.

It has been well established that fusospirochetosis may involve the larynx, the eustachian tubes, the middle ear and the genitalia and may even result in pulmonary complications with bronchopneumonia or lung abscess. In this series of cases no involvement of these sites was observed, and it was felt that the absence of these complications was probably the result of the early institution of penicillin sodium as the therapeutic agent. In the vast majority of cases fusospirochetosis is not fatal or even serious, but the length of disability makes it an important factor in the health of an army or community and therefore its prompt eradication is highly desirous.

As a final comment, it cannot be emphasized too strenuously that satisfactory results in ulcerative stomatitis are dependent on adequate elimination of any significant dental pathologic condition. This is unnecessary in Vincent's angina.

CONCLUSION AND SUMMARY

1. Penicillin sodium was used in the treatment of a series of ambulatory patients with fusospirochetal infections.

2. The optimal total dosage in this type of infection was 100,000 Oxford units of penicillin administered intramuscularly.

3. Fusospirochetosis responded promptly to divided doses of 10,000 units each given at two hour intervals.

4. Complete alleviation of symptoms and eradication of the causative organisms were effected in twenty-four hours after the institution of therapy, thus reducing the infectious period and the total time of treatment to about one fourth of that formerly required.

5. Follow-up studies were accomplished at weekly intervals without clinical or bacteriologic evidence of recurrence.

6. The study reveals that this infection may be treated while the patients are ambulatory, with a material reduction of the time and cost involved, and without complications arising.

7. Masking of the development of early syphilis in fusospirochetal disease when treated with penicillin necessitates interval serologic studies.

8. Untoward reactions of any consequence to penicillin sodium were not encountered in this series.

9. It is apparent that the primary treatment of fusospirochetosis belongs within the realm of chemotherapy, and with the more general supply and distribution of penicillin these treatments may be utilized in office practice and in clinics.

9. Romansky, M. J., and Rittman, G. E.: Penicillin, Bull. U. S. Army M. Dept. **81**: 43-49 (Oct.) 1944

NUTRITION IN PREGNANCY

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Few fields of medicine are moving forward as rapidly as the field of nutrition. Certainly few offer greater opportunity for scientific research and its application to the problems of nutrition and health. On the other hand, some aspects of this problem, like the death of Mark Twain, have been greatly exaggerated. Much of the exaggeration has come from those exploiting the vitamins, some from pseudoscientific food faddists and some from studies inadequately controlled with unwarranted emphasis placed on single case reports. These unfortunate exaggerations have stimulated the enthusiast and have provoked distrust in the conservative. These and other reasons make it fitting to review discriminately some of the facts and fallacies of nutrition as it concerns the pregnant woman.

Nutrition as a whole or in any of its parts cannot exceed the optimum, which was Pirquet's term for "the amount desirable under given circumstances." "Super adequacy" cannot exist, but superabundance does and it is useless, wasteful in times of want and sometimes harmful. Obesity is a manifestation of a harmful superabundance, usually of carbohydrates and fats. Excessive administration of iron is an example of waste, for it is not absorbed from the gastrointestinal tract and is directly eliminated in the feces.[1]

Our present standards for dietary essentials are those of the Food and Nutrition Board of the National Research Council.[2] They are our best available yardstick of nutrition. Roberts,[3] in a critical discussion of the accuracy of these standards [4] for normal nonpregnant women, considered the allowances as fairly satisfactory but noted that actual experimental evidence was far from complete. This criticism holds to an even greater extent for the pregnant woman.

Some substances, such as the mineral elements and nitrogen, have been studied quite carefully by determinations of metabolic balances. These are the accurate determinations of intake and output of a substance during a given period of time. Such studies cannot be directly extended to all dietary essentials because not all are excreted unchanged. At present the newer methods of assay for vitamins in the blood, urine, tissues and body fluids are crystallizing our knowledge concerning this phase of human nutrition. These methods have not been widely applied to the pregnant woman

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1. Heath, C. W.: Iron in Nutrition, J. A. M. A. **120**: 366-370 (Oct. 3) 1942.
2. [illegible] Recommended Dietary Allowances, Reprint and Circular Series, [illegible] Council, January 1943. Recommended Daily [illegible] Nutrients.
3. [illegible] Scientific Basis for Recommended Dietary Allowances, New York State J. Med. **44**: 59-66 (Jan. 1) 1944.
4. Recommended Daily Allowances for Specific Nutrients, Committee on Food and Nutrition, National Research Council, Washington, D. C., Government Printing Office, 1941.

except possibly for vitamin C and recently to a limited extent for vitamin A. Even less has been done with the vitamin B complex, vitamin D and vitamin E.

One sweeping criticism can be applied to all studies attempting to determine the dietary requirements during pregnancy. They fail to take into account the problem of storage. It is clear that the pregnant woman stores many substances to a degree beyond the requirements of herself and her fetus. This capacity for storage, possibly of phylogenic origin, creates a reserve for emergencies. If these emergencies fail to develop the excess is excreted during the puerperium. Water is an excellent example, as is nitrogen [5] and probably iron,[6] calcium,[5] vitamin A and others. For this and other reasons we must be very cautious in classifying the diet of any pregnant woman within narrow limits and hesitant to make dogmatic statements concerning minor deviations. Certainly pregnancy produces a nutritional strain and certainly the dietary needs of the expectant mother are more than those of any similarly healthy but nonpregnant woman. However, this yet unmeasured increased demand has given food faddists, entrepreneurs and others opportunity for unwarranted advice and advertising.

TABLE 1.—*Sources and Requirements of Various Food Essentials*

Type of Food	Amount	Calories	Proteins, Gm.	Calcium, Gm.	Iron, Mg.	Vitamin A, I. U.	Thiamine, Mg.	Riboflavin, Mg.	Niacin, Mg.	Ascorbic Acid, Mg.
Meat	Pork or beef daily, liver weekly	200 to 400	25 to 35	...	4	1,000	0.2	0.8	10	..
Milk	1 quart	680	32	1.2	..	1,000	0.6	2.0	0.6	±
Butter	1 ounce	350	..	...	..	600	...	...	..	..
Vegetable, green, leafy	1 time daily	50 to 75	..	0.2	3	5,000 (carotene)	0.2	0.1	1.5	25
Vegetable, others	2 times daily	200	20	...	3	.....	0.2	0.2	3	30
Fruit, citrus	Generous daily	75 to 100	..	...	..	.....	...	...	..	100
Bread, enriched	4 slices	200	10	...	1.2	.....	0.4	0.2	0.2	..
Egg	One	75	7	...	1.6	500	0.1	0.2	..	..
Total		2,000±	100±	1.4	13	3,100±	1.7	3.5	15±	155
Estimated requirement		2,500	85	1.5	15	.....	1.8	2.5	18	150 to 200

THE DIETARY REQUIREMENTS OF NORMAL PREGNANCY

It is not my purpose in this paper to discuss the frequency of dietary deficiencies or the various social, economic and educational factors involved. For a practicing physician the problem is the dietary needs of each patient. She is not to be treated according to the nutritional standards of any other person or groups of persons. She is an individual problem and it is the physician's duty to take a short, accurate dietary history and to see that he or some other qualified person explains to her the dietary problems of pregnancy. Table 1 lists most of the basic foods and the approximate amounts of dietary essentials supplied by each.

Calories.—The average pregnant woman requires about 2,500 calories per day during pregnancy.[4] Those doing heavy work require more, the sedentary and the obese require less. The foods listed in table 1 provide most of the essentials with the caloric content limited to approximately 2,000. Additional calories are readily obtained by increasing carbohydrates and fats. If for purposes of weight reduction the calories are limited to less than 2,000, dietary supplements of minerals and vitamins may become necessary depending on the foods deleted.

Protein.—There is no unanimity of opinion as to the needs for protein. All agree that needs are increased. To provide for a positive nitrogen balance Coons [7] advised 70 Gm. daily, Dieckmann and Swanson [8] 75 Gm., the National Research Council 85 Gm. and others as high as 100 to 120 Gm.[5] Whatever the exact figure may be does not alter the importance of providing an ample supply—at least one moderately large serving of meat daily and liver once each week. The type of protein must also be considered and half or more should be grade A, which is that of animal origin, such as meat, milk and eggs.[9] There is no place for restriction of proteins in pregnancy whether normal or complicated. Few physicians still advise such restriction, but many patients unless warned to the contrary will voluntarily do so, apparently because of the old popular notion that high protein diets favor development of eclampsia.

Calcium and Phosphorus.—The metabolism of calcium, phosphorus and vitamin D is so intimately linked as to require joint discussion. In spite of the extensive work of such investigators as Macy,[5] Coons,[7] Dieckmann,[10] Oberst and Plass [11] and others, we know, as Macy recently said,[12] "neither the most satisfactory level of calcium intake nor the optimal retention of calcium at any physiologic age or stage of man's development." Most of the workers mentioned agree that a negative calcium balance does not ordinarily occur if 1.5 Gm. of native calcium is ingested each day. This amount of calcium not only supplies fetal needs but also permits the mother to gain calcium during the entire gestation.

One quart of milk daily supplies 1.2 Gm., nearly the normal requirement; the slight remainder is readily available in other foods. There is no need for supplements of calcium. Many physicians also forget the well known fact that calcium salts differ in the amount of calcium yielded. To equal the calcium obtained from a quart of milk it would be necessary to take 8 Gm. of dicalcium phosphate or calcium lactate or about 12 Gm. of the gluconate salt.

5. Macy, Icie G., and Hunscher, Helen A.: An Evaluation of Maternal Nitrogen and Mineral Needs During Embryonic and Infant Development, Am. J. Obst. & Gynec. **27**: 878-888 (June) 1934.
6. Coons, Callie M.: Iron Retention by Women During Pregnancy, J. Biol. Chem. **97**: 215-226 (July) 1932.
7. Coons, Callie M.; Schiefylbusch, A. T.; Marshall, G. B., and Coons, R. R.: Studies in Metabolism During Pregnancy, Bulletin 223, Oklahoma Agricultural and Mechanical College Experiment Station, Stillwater, Okla., 1935.
8. Dieckmann, W. J., and Swanson, W. W.: Dietary Requirements in Pregnancy, Am. J. Obst. & Gynec. **38**: 523-533 (Sept.) 1939.
9. Arnell, R. E.: Protein Malnutrition in Pregnancy, New Orleans M. & S. J. **95**: 114-127 (Sept.) 1942. Ebbs.[13]
10. Adair and others.[15] Dieckmann and others.[15]
11. Oberst, F. W., and Plass, E. D.: Calcium, Phosphorus and Nitrogen Metabolism in Women During the Second Half of Pregnancy, Am. J. Obst. & Gynec. **40**: 399-413 (Sept.) 1940.
12. Macy, Icie G.: Principal Mineral Elements in Nutrition, J. A. M. A. **120**: 34-42 (Sept. 5) 1942.

Phosphorus need not concern us. It is a well known fact that the American diet is high in phosphorus, and sufficient amounts are obtained if calcium intake is adequate.

The amount of vitamin D necessary for adult mineral metabolism is not known.[13] The Nutrition Council[14] has empirically advised 500 to 800 units daily for pregnancy. Conclusive experimental evidence is not available at this time.

Iron.—A daily intake of 15 mg. of iron will produce a positive balance in most women.[14] Again it is possible to supply these needs by diet alone if the woman does not enter pregnancy with a deficiency. This is of considerable importance, for not a few women begin with an iron deficiency due to chronic blood loss in the presence of a low intake. Determination of hemoglobin level during early pregnancy is essential and gives a very rough estimate of the dietary state as concerns this element. Iron is a "one way substance"; after ingestion it will be absorbed and held or will be rejected and eliminated in the feces.[12] It is not excreted in appreciable amounts.[1] The pregnant woman absorbs iron in greater amounts than the nonpregnant one and builds up stores in hypertrophied muscles and other tissues which Coons[6] calls "rest iron." Fetal demands are insignificant until the last three months, and even during the last month of gestation the fetus takes but 6.6 mg. per day.[6] It is interesting to note that many iron deficiencies appear before the last trimester, which indicates that the deficiency has not been due to the parasitic action of the fetus.[15] It has been suggested[16] that the diminished or absent gastric hydrochloric acid commonly found in pregnancy may be a factor in the failure of absorption of iron even in the presence of adequate supplies. Further investigation of this problem is indicated.

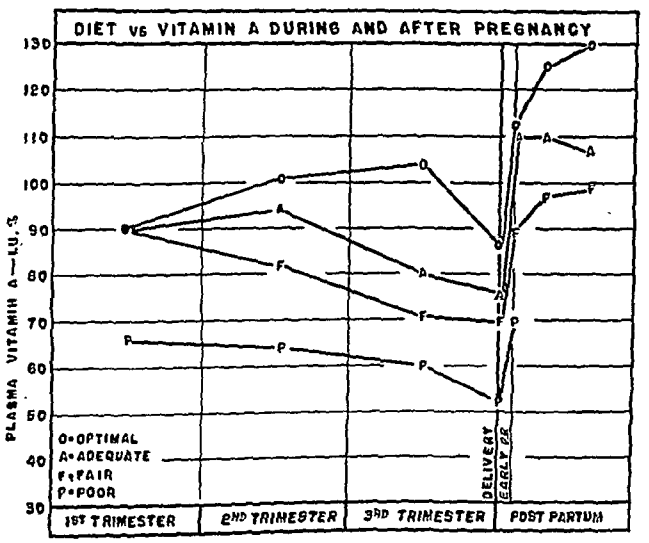


Chart 1.—Mean plasma vitamin A values of patients grouped according to diet. Note that the gestational decrease occurs in all, but the degree varies in regard to time and diet. All show the striking mobilization of vitamin A into the blood post partum.

Vitamin A.—Until recently little was known about the increased need for vitamin A during pregnancy. Within the past year several reports have appeared.[17] All have utilized the photocolorimetric methods of determination and all have recorded somewhat similar results. Interpretations of these data have been at some variance. Our study[18] of 212 women during pregnancy showed that plasma vitamin A values reflected in general the dietary intake of the vitamin. The difference between extremes of diet was great, but no patient with a poor diet had plasma values within the fully normal range for nonpregnant women. Seasonal changes in plasma vitamin A could not be demonstrated. The most definite changes occurred during the course of pregnancy and immediately after delivery. Our results showed, as did those of others,[19] that plasma levels tend to decrease during the course of pregnancy. We noted this in nearly every patient. However, the decrease was not always progressive nor did it appear at the same time in pregnancy. The time of appearance depended, at least in part, on the intake of the vitamin, coming early when the diet was poor and later when the diet was good. Chart 1 shows the relations of diet, vitamin A values and stage of pregnancy. Most striking of all was the immediate and unfailing postpartum elevation of plasma vitamin A. Within twelve to twenty-four hours after delivery every patient showed elevation of values. The average increase was roughly 33 per cent. The significance of these unusual changes is not known but affords interesting speculation. It appears to be another manifestation of maternal storage during pregnancy and release post partum for lactation or such emergencies as might arise. The gestational decrease cannot be due to fetal demands alone, for it occurred when 25,000 international units of vitamin A was taken daily, an obviously excessive amount. It was not due to hydremia of pregnancy, for the decrease was sometimes most pronounced during the last few weeks of pregnancy, when hydremia normally diminishes. Also concomitant determination of plasma carotene failed to show similar changes. Once elevated, plasma values were readily maintained at adequate levels during lactation. This suggests that vitamin A requirements are not greater during lactation, as has been previously believed.

Various estimates have placed requirements during pregnancy at from 6,000 to 8,000 international units daily. Until the problem of maternal storage is solved no one can say definitely what the needs of pregnancy are: a problem particularly significant as regards vitamin A, because it is fat soluble and readily stored. Our studies suggest that diet alone may not be sufficient during the last half of pregnancy; at least diet alone did not always maintain optimal plasma values. The addition of 5,000 international units of vitamin A during the second trimester and 10,000 international units during the third trimester provided ample amounts for the maintenance of best possible plasma levels.

Vitamin B Complex.—The importance of this group of water soluble substances cannot be denied. They are poorly stored, usually rapidly excreted and consequently

13. Ebbs, J. H.: Nutritive Requirements in Pregnancy and Lactation, J. A. M. A. **121**: 339-345 (Jan. 30) 1943.
14. Coons.[6] Coons and others.[4]
15. Dieckmann, W. D.; Adair, F. L.; Michel, H.; Kramer, S.; Dunkle, F.; Arthur, B.; Costin, M.; Campbell, A.; Wensley, A. C., and Lorang, E.: Calcium, Phosphorus, Iron and Nitrogen Balance in Pregnant Women, Am. J. Obst. & Gynec. **47**: 357-368 (March) 1944.
16. Neale, A. V., and Hawksley, J. C.: Studies in Anemias of Infancy and Early Childhood: Nutritional Anemia in Mother and Child, Arch. Dis. Childhood **8**: 227-240 (Aug.) 1933.
17. Byrn, J. N., and Eastman, N. J.: Vitamin A Levels in Maternal and Fetal Blood Plasma, Bull. Johns Hopkins Hosp. **73**: 132-137 (Aug.) 1943. Abt and others.[18] Bodansky and others.[19] Lund and Kimble, footnotes 18 and 28.
18. Lund, C. J., and Kimble, Marian S.: Vitamin A During Pregnancy, Labor and the Puerperium, Am. J. Obst. & Gynec. **46**: 486-501 (Oct.) 1943.
19. Bodansky, O.; Lewis, J. M., and Lillienfeld, M. C.: The Concentration of Vitamin A in the Blood Plasma During Pregnancy, J. Clin. Investigation **22**: 643-647 (Sept.) 1943. Abt and others.[18]

must be continually replaced. At least a dozen separate factors of the B complex have been described. Adult human requirements have been recently reviewed by Elvehjem,[20] but needs for pregnancy have not been established. The recent report of Lockhart [21] summarizes the literature as regards thiamine. She believes

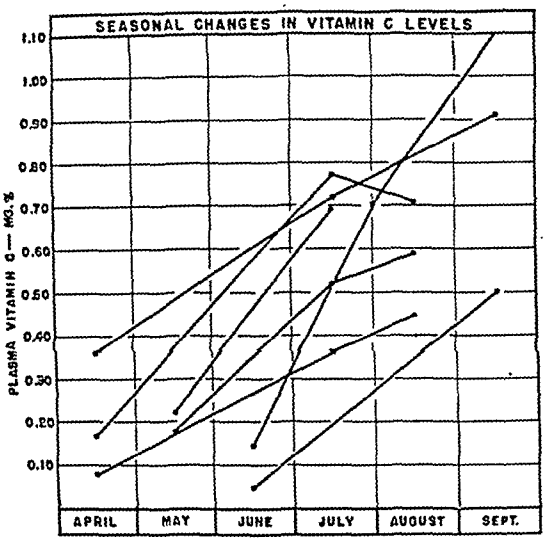


Chart 2.—Importance of season in relation to plasma vitamin C. For various reasons the diet of these women was poor in vitamin C during the winter but quickly improved when fresh fruits and vegetables were abundant.

that requirements may be three times those of nonpregnant women. A daily intake of 1.8 mg. is thought to be enough. Most of the natural supply comes from whole wheat cereals, enriched bread, pork and liver.

Need for riboflavin has been estimated to be 2.5 mg. daily, an amount not difficult to obtain from the diet alone. In fact, a quart of milk provides 2 mg., or nearly the minimal requirement. Liver, eggs and vegetables are the other reliable sources.

Niacin requirements are estimated at 18 mg. Liver, other meats and vegetables are the common sources.

The significance in human nutrition of the other members of the complex such as pantothenic acid, pyridoxine, biotin, choline, para-aminobenzoic acid, folic acid and others cannot be told. Undoubtedly each has its place in human economy. These and probably many as yet unrecognized factors occur for the most part in foodstuffs such as liver, meat, cereal grains, eggs and milk. In any event, adequate amounts of all can be supplied by diet alone and should be supplied in that manner if possible.

Vitamin C.—This too is a water soluble substance which is poorly stored and readily excreted. Daily requirements are constantly being revised upward for normal adults as well as for pregnant women. Earlier estimates for pregnancy of 75 to 100 mg. daily are probably too low. More recent ones range from 150 [4] to 200 [22] mg. daily. In a recent study [23] of 197 pregnant women we found a wide variation in plasma vitamin C levels, but in general the dietary intake was reflected in plasma values. The mean plasma value for 152 patients with an adequate diet was 0.95 mg. per hundred cubic centimeters, for 103 patients with a fair diet 0.52 mg. per hundred cubic centimeters and for 45 patients with a poor diet 0.18 mg. per hundred cubic centimeters. This study, which covered a two year period, showed that one of the greatest influences on the dietary intake of vitamin C was season. During the summer only 7 per cent of all our patients had a poor intake, while 63 per cent of the diets were completely adequate; during the remainder of the year 20 per cent were definitely inadequate and 43 per cent completely adequate. Chart 2 illustrates the ease with which a poor diet improves during the summer. This does not mean that adequate diets are not possible during the winter even in northern latitudes. Table 2 shows the plasma values for a group of 6 women who conceived in late summer and delivered in late spring. These women were intelligent and cooperative but had limited finances. Yet by the use of generous amounts of citrus fruits and at least one fresh vegetable each day they maintained excellent values for ascorbic acid through the entire winter.

While we made no attempt to study extensively the effects of supplements of ascorbic acid we did observe 24 women at delivery who, in addition to an "adequate" diet, had received 25 mg. of ascorbic acid daily for several months. The mean plasma value for these patients was 0.94 mg. per hundred cubic centimeters, while the value for 128 patients with adequate diet but without such supplements was 0.95 mg. per hundred cubic centimeters. Small doses of vitamin C are of little benefit to the person with a good diet and may lead the physician into a false sense of security concerning patients with low intakes unless he realizes that daily requirements are six to eight times greater than 25 mg.

Vitamin E.—The ubiquitous distribution of vitamin E, alpha-tochopherol, makes deficiency unlikely. It is found in grains, vegetables, eggs and meat. Requirements in pregnancy are unknown.

Vitamin K.—The pregnant woman rarely exhibits a deficiency of vitamin K, as it is freely synthesized in the gastrointestinal tract. It is common practice to administer 1 to 2 mg. of vitamin K during labor, not for maternal needs, but to build up fetal values for the critical early neonatal period. This is probably a justifiable practice but may not be necessary.[24]

TABLE 2.—*Individual Values of Six Patients Who Became Pregnant During Late Summer and Who Were Delivered in Late Spring*

Patient	Plasma Vitamin C in Milligrams per Hundred Cubic Centimeters			
	August, September	October, November, December	January, February, March	Delivery April, May
Mrs. Be.	1.01	0.77	1.00	1.10
Mrs. Ba.	....	0.99	1.05	0.99
Mrs. Jo.	....	1.22	1.15	1.23
Mrs. Ke.	1.01	1.22	1.23	1.36
Mrs. Ku.	0.85	1.05	0.81	0.73
Mrs. M.	....	1.30	1.00	1.36
Average	0.93	1.09	1.04	1.12

These excellent vitamin C levels were maintained through the winter by diet alone.

20. Elvehjem, C. A.: The Water Soluble Vitamins, J. A. M. A. **120**: 1388-1397 (Dec. 26) 1942.

21. Lockhart, Helen S.; Kirkwood, S., and Harris, R. S.: The Effect of Pregnancy and Puerperium on the Thiamine Status of Women, Am. J. Obst. & Gynec. **46**: 358-365 (Sept.) 1943.

22. Javert, C. T., and Stander, H. J.: Plasma Vitamin C and Prothrombin Concentration in Pregnancy and in Threatened, Spontaneous and Habitual Abortion, Surg., Gynec. & Obst. **76**: 115-122 (Jan.) 1943.

23. Lund, C. J., and Kimble, Marian S.: Some Determinants of Maternal and Fetal Plasma Vitamin C Levels, Am. J. Obst. & Gynec. **46**: 635-647 (Nov.) 1943.

24. Parks, John, and Sweet, L. K.: Does the Antenatal Use of Vitamin K Prevent Hemorrhage in the Newborn Infant? Am. J. Obst. & Gynec. **44**: 432-442 (Sept.) 1942.

THE FETUS

Recent studies have not materially altered the older concept that the fetus is more or less a parasite and takes what nutriments it needs, sometimes at its mother's expense. This is well illustrated by weight, which cannot be influenced by maternal dietary restriction short of starvation. The general literature of fetal nutrition was summarized by Huggett [25] in 1941.

While it is true that the fetus obtains materials at maternal expense, it cannot obtain something that the mother does not have. Burke and her associates [26] have recently reported a high incidence of physically unfit infants born of mothers with poor and very poor food intake. Specific maternal deficiencies when severe may be exhibited by the newborn infant. For example, maternal deficiency of iron may lead to poor fetal storage and though the infant at birth has normal hemoglobin values it may develop an anemia during the first year of life.[27]

The placental transfer of vitamins is not completely understood, although evidence suggests that the fat soluble vitamin A differs greatly from the water soluble ascorbic acid. Our experimental findings, as well as a review of the recent literature,[28] indicate that plasma vitamin A values of the newborn infant are low, the range being about one-half those of the adult. Furthermore, we found that fetal values are completely independent of maternal values and could not be elevated even when the mother was given enormous doses (330,000 international units) of vitamin A daily before delivery. By contrast, carotene, the precursor of vitamin A, apparently passes the placenta regularly since fetal values, though only one-tenth as high, were usually directly related to those of the mother. From a prepared curve fetal values can be predicted with reasonable accuracy from known maternal values. Evidence that carotene was synthesized to vitamin A by the fetus was not apparent, for there was no correlation between fetal plasma carotene and vitamin A. This lack of correlation does not necessarily exclude the possibility for a similar situation exists in the adult.

Vitamin C behaved differently. Fetal values were always higher than maternal ones and in general the two were roughly correlated. It was most unusual to find values of the newborn infant in the deficiency range. The lowest value recorded by us was 0.10 mg. per hundred cubic centimeters (maternal value 0.0). Of the others 5 were between 0.25 and 0.60 mg. per hundred cubic centimeters, 17 were between 0.61 and 1.00 mg. per hundred cubic centimeters and the remaining 71 were all higher.

COMPLICATIONS OF PREGNANCY AND NUTRITIONAL DEFICIENCIES

It is becoming increasingly apparent that too much attention has been focused on the deficient diet as a cause of complications while too little attention has been given the nutritional deficiencies produced by the complications of pregnancy. As regards the former the problem may be considered in terms of general or specific dietary failure. Numerous reports have attempted to link diet with success or failure of gestation.[29] The recent report of Burke and her associates [26] suggests that complications of pregnancy and labor, the toxemias in particular, are common when diet is poor or very poor, and rare when diet is good or excellent. Ebbs, Tisdall and Scott [30] and the Interim Health Report of the British Isles [31] reported more toxemias, anemias and premature labors when the diet was deficient. Addition of certain food essentials decreased the incidence of these complications. More recently Dieckmann and his associates [15] found that the addition of calcium, phosphorus, iron and vitamins A and D to the diet did not change the course of pregnancy and labor. The reasons for such discrepancies are not clear now. Deficiency of a single food factor is rare; nevertheless we sometimes find certain characteristic clinical conditions associated with specific deficiencies.

Protein deficiencies are manifested in several ways. The two most common are nutritional edema and anemia.[32] Nutritional edema must be clearly differentiated from that of toxemia, and the anemia from that of iron deficiency or the primary anemia of pregnancy. It is also said [33] that ample dietary protein favors lactation. Therapy is simple: the ingestion of large amounts of meat.

Many reports have stressed the increased need for calcium during pregnancy and have reported relief of many symptoms from such therapy. It has been said [34] that administration of calcium and vitamin D reduced the incidence of toxemia, relieved muscular cramps, reduced blood loss and helped preserve the teeth. Dieckmann and his associates,[35] in a critical review of some of these claims, presented evidence that administration of calcium was without significant effect on blood loss, duration of labor, incidence of toxemia or premature labor. It is exceedingly difficult to reconcile some of the glowing clinical reports with physiologic facts, and until additional evidence appears we must assume that the pregnant woman in this country very rarely exhibits calcium deficiency. Certainly it has been definitely proved that pregnancy cannot withdraw calcium once laid down in tooth enamel.

A deficiency of iron leads directly to anemia, which is easily recognized and treated. Administration of 15 grains (1 Gm.) of ferrous iron daily will suffice in most instances.

Complications of pregnancy due to deficiency of the fat soluble vitamins A and D are difficult to prove. Because of storage, depletion develops slowly. Very little is known of vitamin D in the adult or in the pregnant woman. In our study of vitamin A we found no specific complications associated with low plasma values. In fact, very low plasma values were not

25. Huggett, A. St G.: The Nutrition of the Fetus, Physiol. Rev. **21**: 438-463 (July) 1941.

26. Burke, Bertha S.; Beal, Virginia A.; Kirkwood, S. B., and Stuart, H. C.: Nutrition Studies During Pregnancy, Am. J. Obst. & Gynec. **46**: 38-52 (July) 1943.

27. Parsons, L. G., and Hawksley, J. C.: Studies in Anemias of Infancy and Early Childhood: Anhematopoietic Anemias, Arch. Dis. Childhood **8**: 117-144 (April) 1933. Strauss, M. B.: Anemia of Infancy from Maternal Iron Deficiency in Pregnancy, J. Clin. Investigation **12**: 345-353 (March) 1933.

28. Lund, C. J., and Kimble, Marian S.: Plasma Vitamin A and Carotene of the Newborn Infant, Am. J. Obst. & Gynec. **46**: 207-221 (Aug.) 1943.

29. Burke and others.[26] Ebbs and others.[30] Nutrition of Expectant and Nursing Mothers.[31] Dieckmann and others.[15]

30. Ebbs, J. H.; Tisdall, F. F., and Scott, W. A.: The Influence of Prenatal Diet on Mother and Child, J. Nutrition **22**: 515-526 (Nov.) 1941.

31. Nutrition of Expectant and Nursing Mothers, Interim Report of People's League of Health, Lancet **2**: 10-12 (July 4) 1942. Williams, P. I., and Fralin, T. G.: Nutrition Study in Pregnancy, Am. J. Obst. & Gynec. **43**: 1-20 (Jan.) 1942.

32. Williams, P. I.: Nutrition in Pregnancy, Am. J. Surg. **48**: 118-124 (April) 1940. Arnell, R. E., and Guerriero, W. F.: Nutritional Edema in Pregnancy, Am. J. Obst. & Gynec. **43**: 467-483 (March) 1942. Arnell.[9]

33. Coons, C. M., and Blunt, K.: Retention of Nitrogen, Calcium, Phosphorus, and Magnesium by Pregnant Women, J. Biol. Chem. **86**: 116 (March) 1930.

34. Mendenhall, A. M., and Drake, J. C.: Calcium Deficiency in Pregnancy and Lactation, Am. J. Obst. & Gynec. **27**: 800-814 (June) 1934.

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common. There was no correlation between low values and the toxemia of pregnancy, as might be expected on the basis of liver damage. There was no correlation with anemia of pregnancy, although this has been described.[36] We did note slightly less puerperal morbidity in mothers with highest values While this could be a specific effect, it is unlikely and probably reflects the salubrious effect of a generally good diet, good antepartum care and a cooperative patient

The water soluble vitamins B and C are probably of greater importance to the health of the pregnant woman than any of the others, but it is difficult to avoid the familiar fallacy of *post hoc ergo propter hoc* in dealing with these vitamins For that reason I shall review briefly some of the complications of pregnancy associated with deficiencies of the water soluble vitamins

Regardless of cause, prolonged and severe vomiting of pregnancy produces starvation. Aside from fluids and electrolytes, one of the earliest deficiencies is in vitamins B and C. A vicious cycle may be set up by the administration of glucose parenterally, for the metab-

TABLE 3—*Plasma Vitamin C Values in 241 Women with No Acute Infections During Pregnancy in 24 Women Before Onset of Acute Infection and in 35 Women After Acute Infection*

Plasma Vitamin C in Milligrams per Hundred Cubic Centimeters	Number	Mean	Standard Deviation	Standard Error	P*
Controls, no infection	241	0 73	±0 242	0 00414	0 61
Before acute infection	24	0 66	±0 364	0 0552	
After acute infection .	35	0 40	±0 286	0 0234	0 015

Note the significant lowering of values after infection
* P indicates the probability of the magnitude of difference of means being exceeded solely through errors of random sampling

olism of glucose requires thiamine hydrochloride. The sudden exhibition of ample amounts of glucose quickly uses any remaining thiamine, thus precipitating an even greater deficiency. The grade of the deficiency depends on the duration and severity of the emesis. All grades occur. Occasionally we have seen such severe manifestations as polyneuritis, Korsakoff's psychosis, beriberi heart disease, severe glossitis and even pharyngitis. We have also observed plasma vitamin C depleted to zero with clinical manifestations of scurvy.

In 3 cases of severe hyperemesis gravidarum, retinal hemorrhages were noted. Administration of large doses of vitamin C parenterally (1,000 to 15,000 mg.) prevented formation of new hemorrhages For this reason I believe that at least some, if not all, of the retinal hemorrhages seen in this disease may be due to increased capillary fragility induced by the lack of ascorbic acid. In none of these 3 patients was the pregnancy interrupted, and all recovered.

The therapeutic requirements of these vitamins depend on the severity of the disease. As a general rule the daily dosages range as follows thiamine 5-10 mg., riboflavin 5-10 mg., niacinamide 50-200 mg., pantothenic acid 5-25 (?) mg., pyridoxine 5-25 (?) mg. and ascorbic acid 500-1,000 mg. It must be clearly understood that such vitamin therapy is but a part of the usual regimen of therapy commonly employed.

36 Abt, A. F.; Aron, C. S.; Bimmerle, J. F., Bundesen, H. N.; Delaney, M. A.; Fagen, H. J.; Farmer, C. J.; Wegner, O. C., and White, J. L., Studies on Plasma Vitamin A, Quart. Bull., Northwestern Univ. M. School 16: 241-245, 1942

Infections may quickly deplete the water soluble vitamins. Chart 3 illustrates plasma vitamin C in pyelitis of pregnancy and chart 4 the effect of a breast abscess. These reactions are typical of any acute infection. The physician must be on guard at these times and supply supplements, particularly if the dietary intake is poor.

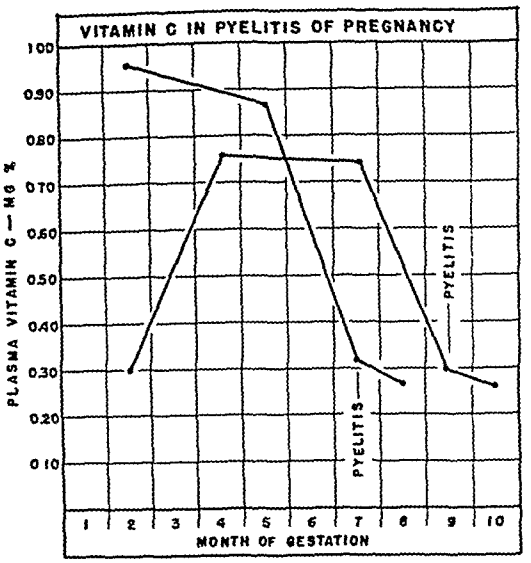


Chart 3.—Pyelitis of pregnancy, like any acute infection, may quickly deplete vitamin C, as these 2 cases illustrate.

While vitamin C diminished after infections, we could not demonstrate that low plasma values influenced the development of infection (table 3).

Certain other complications may occasionally arise from vitamin deficiencies. For example, we observed a peculiar type of postpartum hemorrhage (bleeding in

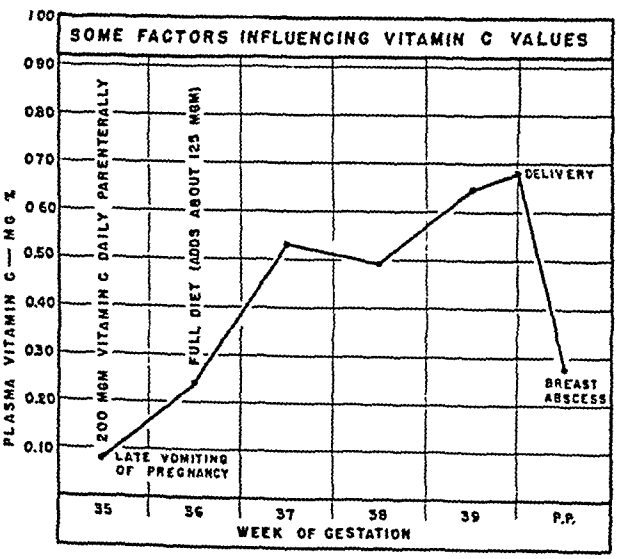


Chart 4.—Because of late vomiting of pregnancy this woman had a low plasma vitamin C. Fairly large amounts (325 mg. daily) slowly elevated her plasma level but failed completely to maintain that level after acute infection

small but constant amounts from the uterus for twenty-four hours ater delivery). This woman's plasma vitamin C was zero, and no other cause for the bleeding was found after a careful search. Administration of 1,000 mg. of ascorbic acid was followed by cessation of the bleeding.

These and many other unusual and fascinating stories of isolated instances of vitamin deficiencies are of minor clinical importance by virtue of their rarity and should not be stressed, for they no doubt contribute to some of the unjustified publicity of nutritional deficiencies.

SUMMARY

It is clear that the normally healthy, pregnant woman requires more dietary essentials than the similar nonpregnant woman. The exact extent of this increase is not known for any substance, but approximate values have been reasonably well established. Under ordinary conditions these needs can and should be met by diet alone. For optimal supply the daily diet should consist of one generous serving of meat, including liver weekly, a quart of milk, an ounce of butter, one fresh vegetable, one green leafy vegetable and one other cooked vegetable, generous amounts of citrus fruits or their equivalent, an egg and whole grain cereal or enriched bread. Beyond this, supplements are unnecessary except possibly 5,000 international units of vitamin A during the second trimester and 10,000 international units during the last trimester. Administration of vitamin K to the mother in labor or to the newly born infant is probably justified.

Gross deficiencies of diet undoubtedly influence unfavorably the course of pregnancy and the health of the newborn infant. An excellent diet favors a successful course and termination of pregnancy for mother and infant. Lesser degrees of deficiency are not easily diagnosed, nor is their significance understood.

Complications of pregnancy probably exert a greater influence on nutrition than does nutrition on them. Such conditions as hyperemesis gravidarum, pyelitis of pregnancy and puerperal infection and other acute and chronic infections may produce nutritional deficiencies. These are conditions which frequently require dietary supplements, sometimes in large amounts.

ABSTRACT OF DISCUSSION

DR. FRED L. ADAIR, Chicago: We must recognize that physicians are really the health educators of the community and we should be certain that when we educate our patients they are being educated soundly; otherwise we may have to uneducate them later. We have to recognize certain facts about foods: First, that there are no standards which apply to all foods; second, that there are no standards which apply to all individuals. Consequently we have to adapt the food to the individual. Foods are both quantitative and qualitative, and no food could be produced which contains anything which is not present in the environment in which it is grown. Individuals also are creatures of their environment. Not only the quantity of food but also its quality is subject to variation and there are environmental and seasonal variations of food. Our civilization has had foisted on us a lot of artificial foods. Fresh and natural foods are altered by the various processes which have adapted them to our civilization. The effort to enrich flour and bread is a result of a deprivation of our flour and bread of certain essential things which are in the whole grains. This is particularly noticeable, I think, with reference to flour and corn meal. The efforts at the enrichment of corn meal have not as yet been successful. The effort is necessary on account of the mores of the people. People like white bread. Most of them prefer white bread to whole grain bread. Proteins are closely "tied in" not only with nutrition but also with immunity. Proteins not only have certain nutritive values but also have very definite protective values in the resistance to infection. The proteins of highest quality, from the standpoint both of nutritive value and of their protective qualities, seem to occur in meat, in milk and in eggs. They have certain superiorities over proteins which are derived from grains. The minerals, of course, vary in importance, but there are special reasons for the addition of these to the diet. The pregnant woman has to store not only for herself but also for the growing fetus. Added to her actual maintenance needs are the requirements which are immediate for the fetus and also the storage needs of the mother, to supply her in the period subsequent to delivery and the period of lactation. Certain elements in her diet are required for storage for the fetus, which is another problem about which we have even less information than we have on the storage for the individual. The first trimester of pregnancy often presents great difficulty not only to meet the maintenance requirements of the individual but to provide for storage of the essential things which the fetus needs mostly in its later period of development. Probably most of these requirements have to be met in the second trimester of pregnancy after some of the anorexia, nausea and vomiting of the early period of pregnancy disappears.

THE PROBLEM OF NONFLUORESCENT RINGWORM OF THE SCALP

A WARNING

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AND
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The presence of an epidemic of ringworm of the scalp in New York has been known for several years. During this period new cases have appeared sporadically throughout the United States and have produced minor epidemics in various cities. In a previous publication we [1] discussed the routine diagnosis and treatment of epidemic tinea capitis. In the majority of instances the infection is due to either "animal" (Microsporum lanosum) or "human" (Microsporum audouini) types of fungi. While these agents are responsible for different clinical and laboratory findings, they have one important property in common. This peculiarity is disclosed by examination of the infected hairs by means of Wood's light or filter. This light or filter is composed of glass containing sodium barium silicate and nickel oxide. When placed over a source of ultraviolet radiation it screens out all wavelengths except those in the near portion of the ultraviolet part of the spectrum (3,600 angstroms). These rays impart a fluorescence to hairs infected with members of the microsporum group and, to a lesser degree, to hairs infected with Achorion schoenleini (favus). The infected hairs appear as short, luminous, bright yellowish green stubs. As a result of this observation, filtered ultraviolet rays have been employed in various institutions such as hospitals, schools and orphan asylums for the purpose of case finding. These "screening" procedures have been and will continue to be of great value in the detection of both early and advanced cases as well as in the determination of cure. Unfortunately, this device has occasionally been employed by those not thoroughly acquainted with the mycologic background of tinea capitis. In several instances these individuals have informed the patient or the family that there is no evidence of ringworm of the scalp because Wood's light failed to disclose fluorescence. This may be true in proved cases of treated Microsporum infection, in which two negative examinations at intervals of three weeks suffice for discharge of the patient. However, it is of the utmost importance that information be dis-

From the Department of Dermatology of the Mount Sinai Hospital.

1. Levin, O. L., and Behrman, H. T.: Diagnosis and Treatment of Epidemic Ringworm of the Scalp, J. Mount Sinai Hosp. 10: 455 (Nov.) 1943.

seminated to the effect that a small percentage of other fungous infections of the scalp do not produce fluorescence under the filtered ultraviolet rays. It is fortunate, indeed, that this proportion is usually less than 10 per cent during an epidemic, but it may increase considerably if the infected child is allowed to remain in school because of an incorrect diagnosis. In addition, the organisms producing these nonfluorescent infections are vastly more recalcitrant to therapy. The following case is illustrative of the entire problem, as this child was permitted to attend school for several months after the development of the fungous infection of the scalp.

REPORT OF CASE

History.—D. Z., a white boy aged 7 years, first seen on Nov. 6, 1943 in the Dermatologic Clinic of the Mount Sinai Hospital, was said by his mother to have had "sores" in his head for a number of months. The school authorities had been uneasy about the condition, but repeated examinations under the Wood's light failed to disclose the classic greenish fluorescence of Microsporum infections. Accordingly the child continued to attend school during this entire period. The first examination of the scalp in the clinic showed several crusted, follicular papules irregularly disseminated throughout the hair. A few pea to dime size (18 mm.) erythematous, eczematoid patches were also in evidence on the scalp and the back of the neck.

Laboratory Examinations.—The child was first examined under the Wood's filter. At the time of this examination the scalp was completely covered with an ointment, so that proper study was impossible. The mother was advised to shampoo the scalp daily and to return for further examination. At the subsequent examination, rapid perusal of the scalp during a busy clinical session with numerous classic cases of Microsporum infection failed to disclose any abnormalities under Wood's light. Routine examination of several extracted hairs showed no trace of fungous infection. Cultures were performed with other hairs as a routine measure. Within a short time one of the culture plates began to show an unusual type of fungous growth. The child was recalled for further study. At this time careful examination of the scalp under Wood's filter brought to light a dull white fluorescence of a number of scattered hairs, especially over the occipital and temporal regions. These hairs were extracted and examined microscopically. They exhibited large spores in chains in the shaft of the infected hairs.

Cultures were made of the abnormal material. Within ten to fourteen days they began to show a velvety tan surface. The central portion of the colony was lower than the rest of the surface. The margin of this central area fell away sharply to form a crater-like border. Culture mounts showed numerous microconidia occurring *en grappes* and as thyrsi sporiferi.

The diagnosis of Trichophyton crateriforme infection of the scalp was made and confirmed on numerous occasions subsequently. Roentgen epilation was advised as the only possible method of cure of the fungous infection of the scalp.

COMMENT

There are various types of fungi responsible for infection of the scalp. The offending agents responsible for the widespread epidemic of ringworm of the scalp in the United States fall into two main groups for the purpose of classification.

The first group, and the less important of the two, is that due to the so-called "animal" type of fungus. In this group, the causative organism is Microsporum lanosum. This organism is usually transmitted to children by infected cats or dogs. Clinically the disease appears as one or several scaling, inflammatory patches in the scalp. In this scaly patch there are found pustules, or groups of pustules, around the hair follicles, as well as broken-off hairs. Similar lesions may be present elsewhere on the body. The hairs can be removed with ease from the infected sites. Microscopic examination of these hairs furnishes a rapid diagnosis, as evidenced by the presence of a mosaic sheath of spores around the hair shaft. Further confirmatory aids in establishing a diagnosis include trichophytin tests and cultural studies. Trichophytin is an extract of fungi isolated from patients with ringworm. Owing to the inflammatory reaction produced by the "animal" ringworm, immunologic phenomena are elicited as evidenced by a positive trichophytin reaction. Cultural studies on special mediums (Sabouraud) show dull tan colonies with a lemon yellow substratum within five to seven days. Examination of the infected hairs or scalp by means of Wood's light is corroborative of the diagnosis. These rays impart a fluorescence to hairs infected with the Microsporum group. The infected hairs appear as short luminous, yellowish green stubs.

The second group of fungi etiologically responsible for tinea capitis is composed of the so-called "human" type of organism. The present epidemic is composed mainly of cases due to this organism, namely Microsporum audouini. The disease is spread from one child to another by means of direct contact. It may also be communicated by means of intermediate agents such as incompletely sterilized barbers' instruments, combs and brushes, hats, towels and the backs of chairs, especially theater seats. The lack of conscious effort on the part of parents of infected children to warn neighbors of the presence of the disease plays an important part in transmission of the infection. The clinical picture of the disease consists in the appearance of one or several small scaling patches on the scalp. These patches are composed of fine scales covered with brittle and broken hair stubs. The inflammatory reaction is slight, and pustulation is infrequently observed. The hairs are not easily extracted, owing to the ease with which they break following slight trauma. The unfortunate feature of this disease is the fact that the scalp may appear to be entirely normal from a clinical standpoint. In all suspicious or suspected cases, recourse must be had to examination by means of Wood's light. It is amazing to the novice to see an apparently normal and healthy scalp spring into focus as islands of greenish points under the filtered ultraviolet ray. Microscopic examination of the diseased hair is also corroborative of the diagnosis and resembles that seen with M. lanosum. The trichophytin reaction is usually negative, owing to the lack of inflammatory reaction produced by this organism. Cultural studies should be performed in all cases. In about seven to ten days there usually appears a grayish white fluffy culture with a central elevation. The substratum is usually reddish brown. In the culture mount the organism may be differentiated from M. lanosum by the rarity with which fuseaux (an asexual, oat-shaped spore) are found. Cultural mounts of M. lanosum, the "animal" type of ringworm, are characterized by the presence of numerous fuseaux.

In view of the frequency of infection due to the preceding fungi, the fact that other mycologic agents may also produce ringworm of the scalp has been overlooked. The remaining groups include less important members of the Microsporum family (Microsporum fulvum), Achorion schoenleini (favus) and the Trichophyton group. Infections due to M. fulvum resemble those produced by M. lanosum.

Achorion schoenleini, the cause of favus, produces a classic picture in the scalp. The lesions are sulfur yellow, cup shaped crusts with a characteristic mouse-

like odor. Occasionally the scalp merely shows irregular crusted areas or greasy scales. If the infection has been present for any length of time, areas of alopecia and scarring may be present. Under Wood's light the infected hairs fluoresce like the Microsporum group but are not as bright green. The cultural growth has a smooth, brownish, waxy surface. Splitting of the medium is common. Microscopic study of the culture shows the so-called favic chandeliers, which are diagnostic.

The Trichophyta are less well known than the preceding fungi and are more apt to be incorrectly diagnosed when they infect the scalp. They are roughly divided into endothrix and ectothrix groups, depending on their predilection for the hair shaft itself (endothrix) or the surface sheath (ectothrix). The three most important fungi in the endothrix group are Trichophyton violaceum, Trichophyton sulfureum and Trichophyton crateriforme. Infections caused by T. violaceum are known as "black dot" ringworm. This name stems from its peculiar appearance as patches of black specks through the scalp. These black specks are, in reality, broken hairs which have split off close to the scalp. In the other two endothrix infections, as well as in some of those due to T. violaceum, follicular pustules and small, eczematous, impetiginized patches constitute the usual clinical picture. Microscopic examination of the hairs reveals large spores, usually in chains, throughout the hair shaft. Cultures distinguish the various types and their variants. Under Wood's light the infected hairs show a dull white fluorescence. Exceptionally the hairs exhibit a bright, shining white fluorescence. This unusual fluorescence is apt to be overlooked in rapid or casual examinations. To the untrained it may be dismissed as of no consequence or as a phenomenon due to an applied ointment. Various salves and ointments do produce a white or bluish white fluorescence. However, this shine is not confined to individual hairs but is widely dispersed over irregular areas. In addition, fluorescence due to an ointment may be removed by scrubbing the area with alcohol or one of the fat solvents (acetone, carbon tetrachloride or the like).

The ectothrix Trichophyta are uncommon invaders of the scalp. The two important members of this group are Trichophyton gypseum and T. purpureum. They both have several variant types which are probably derivatives or subgroups. When T. gypseum involves the scalp it usually produces an inflammatory pustular infection.[2] In some cases this may be so severe as to form a boggy, pustular, almost carbuncular mass, usually referred to as a kerion. The infected hairs exhibit chains of spores external to the hair shaft. Cultures made from this material usually show snowy white, fluffy or powdery colonies. Under Wood's light the infected hairs appear normal. This important fact must not be overlooked—the infections produced by this group of Trichophyta supposedly do not impart fluorescence to the diseased hair. The clinical appearance may resemble that of M. lanosum, but the lack of fluorescence should lead the observer to further investigation. The diagnosis is a laboratory procedure and, if correctly performed, will clarify the problem. The other ectothrix of importance, namely T. purpureum, rarely involves the scalp, although we have encountered 2 instances of tinea of the beard due to this organism. The clinical appearance of cutaneous infections due to T. purpureum is usually that of a sharply marginated, dull red, eczematous patch. The cultural features are diagnostic, owing to the development of a purplish red color in the colony. Under Wood's filter this fungus has been reported as producing no fluorescence. As we have never seen a case of T. purpureum involvement of the scalp we cannot refute this observation. However, in both cases of T. purpureum infection of the bearded region there was a distinct white fluorescence of the infected hairs. For the sake of completeness, another member of the Trichophyta should be mentioned, namely Trichophyton niveum. It is a very uncommon cause of tinea capitis and resembles T. gypseum clinically and mycologically.

2. Lewis, G. M., and Hopper, M. E.: An Introduction to Medical Mycology, Chicago, Year Book Publishers, Inc., 1939, p. 53.

CONCLUSIONS

It should be emphasized that not all fungous infections of the scalp impart a noticeable fluorescence to the diseased hairs.

All patients suspected of ringworm of the scalp should be carefully studied before the diagnosis is discarded. A negative examination under Wood's light is not sufficient to exclude these cases. In every instance of clinically suspected infection the performance of microscopic and cultural examinations is essential.

The public health aspect of this problem is of extreme importance and must not be overlooked. These children should be reported to the local health authorities in order to insure adequate case finding and supervision of therapy. They should not be permitted to attend school or enter into close contact with other children.

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GASTROINTESTINAL CONDITIONS

SIMULATING OR AGGRAVATING CARDIOVASCULAR DISEASE

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The relationship of gastrointestinal disorders to cardiovascular disease is an old problem, and much has been written in regard to the confusion of symptoms. Dr. Paul White in the Alvarez Lecture before the Gastro-Enterological Association in 1937 spoke of "the differential diagnosis being of never ceasing importance and interest." He in turn quoted from Liddell and Scott's Greek Lexicon, giving the following definitions: "Kardia, heart, stomach" and "Kardiakos, of the heart or stomach, dyspepsia." He goes on to say "It is no wonder we have been confused ever since."

I have reviewed a great many cases from my practice in the last ten years and have endeavored to develop if possible some practical plan to separate those with some abnormality of the digestive system from those with actual cardiovascular disease. In many cases this can be done with a careful history and physical examination. In other cases it seems plain that the digestive difficulty and cardiovascular disease have occurred in the same individual, and the digestive difficulty is aggravating the cardiovascular disease. In a few cases even with the most careful history, physical examination, and with the aid of laboratory studies, including x-ray and electrocardiogram, it is impossible to be absolutely certain of the actual diagnosis.

Read before the Section on Miscellaneous Topics, Sessions for the General Practitioner, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

Pressure, burning or actual pain in the chest is a relatively common symptom, and it causes a patient to think of the possibility of heart disease. Since starting this paper I have read a most interesting article by Tinsley Harrison[1] on chest pain. When substernal pain occurs, especially pain related to effort or emotion, and lasts about sixty seconds, the great probability is that it is angina. Numerous observers have proved, however, that cardiospasm or irritability of the lower esophagus can give pain in the same location as actual angina pectoris. Chester Jones in his essay "Pain from the Digestive Tract" feels that pain impulses are associated with pressure or spasm of the musculature of the esophagus or cardia, and this pain may be referred over the same nerve pathway as angina. This is also true if a patient is having a gallstone attack. Some one said years ago that some of the most severe pain a human being can experience in this life is due to violent contractions of unstriped muscle.

Now the first group of cases that may be confused with cardiovascular disease are those of diaphragmatic or hiatus hernia. In the last fifteen years there have been an increasing number of diaphragmatic or hiatus hernia cases reported. Probably a large percentage of these cases may be without symptoms, but there are a certain number of these hernias that give symptoms that are quite suggestive of coronary disease. The fact too that hiatus hernia and coronary disease occur so often in the same age group tends to add to the confusion. In fact it is not unusual for the two conditions to occur together in the same individual. They also occur in the period of life when we so frequently encounter gallbladder disease, and it is well known how often cholecystitis and coronary disease occur in the same patient.

The most striking case I have found in the literature in which hiatus hernia resembled coronary disease is a case reported by William D. Reid in July 1940. A physician aged 52 complained of pain over the sternum and down the left arm, waking him at 3 a. m. He was seen by a cardiologist a few hours later. The pain was persistent and not completely abolished by two ¼ grain (16 mg.) doses of morphine. There was some referred pain noted over the inner aspect of both elbows and the little finger of each hand. It was worse on the left side, and the arm pain would last from one to three minutes at a time. The patient recognized little if any pressure symptoms and did not feel particularly ill. Gastric symptoms were entirely absent. During the subsequent four days he remained in bed. The white cell count remained normal, fever was absent and the electrocardiograms were normal. Examination of the heart itself gave normal findings. This substernal discomfort was located under the lower third of the sternum, where it persisted in a mild form. The patient was discharged at the end of four days as not having a cardiac infarction but with the suspicion that "something was wrong in the mechanics of the chest."

The patient did not feel well during the subsequent weeks. The aforementioned symptoms persisted in a mild form and occasionally in association with nervous tension. The patient reported a sensation similar to that felt when one has swallowed something too hot. Roentgen examination, which unfortunately did not include a search for hiatus hernia, disclosed nothing abnormal in the esophagus or gastrointestinal tract. A vacation of six weeks in Florida was prescribed. The patient was able to play golf, but there was only slight lessening of the thoracic and arm pain. Later he consulted an orthopedic surgeon who previously had successfully treated him for certain postural defects. The orthopedist thought that if the substernal pain was not due to heart disease it could be explained on the basis of muscular strain from faulty posture. Exercises were prescribed. These were faithfully followed from April until September without relief of the symptoms.

During this period that he was under the care of the orthopedist he had another rather severe attack of substernal pain, and a different cardiologist was called. After two days' study as a bed case again it was decided that cardiac infarction was not present. The symptoms at that time were believed to be partly orthopedic, partly cardiac and partly gastric in origin.

During the summer the patient resumed active exercise without untoward symptoms. The substernal and arm pains were present with increasing frequency. Finally it was noted that the pain was tending to center under the lower third of the sternum and that the feeling of discomfort after meals was becoming more frequent. He would get some relief by belching. A gastroenterologist was then consulted and he suggested hiatus hernia, and the hernia was demonstrated both fluoroscopically and on the x-ray plate. The establishment of the diagnosis was of decided value to the morale of the patient. Medical treatment for some months was of uncertain benefit. Finally the following year this patient consulted a surgeon. Radical cure by surgery was deemed unwarranted, and dilation of the esophagus was performed. There was a gradual abatement of symptoms to the date of writing, January 1940. Whatever symptoms occurred were minor and readily ignored.

A prominent physician in Washington has had a hiatus hernia for several years. When I questioned him as to why so many hernias were symptom free he ventured the following opinion, which I think is excellent: First there is a group with a short esophagus, where the cardiac end of the stomach is up in the chest and probably has always been up in the chest. These patients are very apt to be symptom free. In the second group the hiatus is large enough and free enough so that part of the stomach can herniate into the chest and return to below the diaphragm without getting caught. These too are apt to be symptom free. The cases that really give symptoms are the ones with a rather small hiatus so that when a portion of the stomach, even a small portion, herniates through the diaphragm it is more apt to get caught or even become incarcerated. In discussing his own case he states that if he had not known that he had hiatus hernia he would have thought he had angina, although in his case the pain does not come after exercise. In fact, exercise as a rule gives him some relief. Anything that upsets him emotionally, however, always brings on an attack of substernal pain. He has recently gone to the Mayo Clinic, where he had the phrenic nerves crushed, with complete relief of his symptoms although of course this has not cured the hernia.

Dr. Chester Jones has collected 128 cases of hiatus hernia from his own practice and from his service at the Massachusetts General Hospital. He found that the

1. Harrison, T. R.: Clinical Aspects of Pain in the Chest, Am. J. M. Sc. 207: 501 (May) 1944.

intake of food, especially a large meal, initiated substernal pain in 15 out of 25 cases, and half of these were shoulder and arm pain. Rather less frequently the act of lying down initiated symptoms of substernal pressure. He found that glyceryl trinitrate gave some relief, but it was not the prompt and characteristic relief that is obtained in angina. Belladonna or other antispasmodics gave relief to the pressure in the chest in 17 out of 18 cases. Belching gave temporary relief. In these 128 cases collected by Dr. Jones, 11 were heart disease and in 9 of these there was substernal pain with or without radiation. In all the latter there were small hernias, and Jones stresses that it was the patients with small hernias that had symptoms most nearly mimicking angina pectoris. Although exertion frequently precipitated substernal pain in patients with hernia, it was not as consistently so as in patients with real coronary disease. Dietary indiscretions and nervous tension were the most frequent precipitating causes of an attack of chest pain.

There is 1 remarkable case in my own practice that I have been looking after for the last two years. Mrs. L. M. C., aged 50, was referred by Dr. Howard Smith of Washington. Her past history was negative. She had been an unusually healthy, vigorous woman. Nine years ago she sustained a fall down ten steps, resulting in concussion. This fall occurred in June, and as near as she can remember around October of that year she began to have pain in the chest, referred to her shoulder and back and down her left arm. The pain was usually related to eating and she described it as being sharp, cutting off her breath. It was accompanied by heart consciousness and palpitation. She would get relief by the application of heat and by massaging between her shoulders. After a time she would explosively belch and be relieved. She was seen by a number of physicians, who diagnosed nervous indigestion following the shock from the fall. She was x-rayed on several occasions with negative findings. As the months passed, her symptoms increased in severity. Frequently if she was out socially to dinner she would have to excuse herself from the table and go somewhere to loosen her girdle, for she was "in agony" because of the pain in her chest referred to her back and arm. The pain never was referred into the forearm or fingers. Even though she had been x-rayed repeatedly, Dr. Smith had her x-rayed again and for the first time a diaphragmatic hernia was demonstrated.

She was treated palliatively for several months, but she grew worse. About Christmas 1939 apparently the hernia became incarcerated and she had to be taken to the hospital for observation and treatment. She developed a secondary anemia, requiring repeated transfusions. Finally she was operated on by Dr. Gwathmey and Dr. Rodman in Norfolk, Va. The opening into the diaphragm was so large that Dr. Gwathmey could put his hand up into the chest and hold up the heart while Dr. Rodman with difficulty pulled down the herniated stomach into its proper position. The large aperture of the diaphragm, which had evidently been caused at the time of the fall, was closed down to normal size. The stomach was very much congested and inflamed from the constriction and partial strangulation. Her convalescence was uneventful.

In 1940 she could eat anything, she regained her weight, and she was absolutely symptom free. In 1942 she developed a hernia in the operative wound. Dr. Smith operated and repaired this, and soon after she developed symptoms that suggested a recurrence of the hiatus hernia. This was verified with the x-ray, and it is interesting that when they put her in the Trendelenburg position to demonstrate the hernia there was such embarrassment of the heart that it caused her to lose consciousness. Whether from increased abdominal pressure from repair of the ventral hernia or whether the postoperative retching and vomiting caused a recurrence of the diaphragmatic hernia one cannot be sure. At any rate the stomach had again herniated through the diaphragm and the patient was desperately ill. She not only had substernal pressure and discomfort but became cyanosed if she made the least motion. On auscultation one could hear peristaltic gurgling over the precordia, just as one would elicit over the epigastrium.

I was called in on the case about this time and we did everything possible to give her relief by conservative medical management. We kept a Wangensteen tube in for days but apparently the hernia again was incarcerated, for the material drained away was brown coffee ground material, apparently from the ooze of the mucosa due to the constriction of the diaphragm. Again operation was decided on and she was got ready with transfusions, plasma and glucose. Dr. Howard Smith and Dr. Charles Stanley White operated and found almost the whole stomach, including the pylorus, up in the thoracic cavity. With considerable difficulty the stomach was pulled down, and as the patient was in such a weakened condition and bordering on shock no attempt was made to repair the hernia, but the stomach was stitched fast to the peritoneum of the anterior abdominal wall and the wound closed. By early afternoon the patient was better and she made steady improvement.

This past year they had to operate again and do an anastomosis between the duodenum and the upper jejunum, as there were adhesions around the ligament of Treitz that were causing obstruction, but since that time she has been relatively well, although she still has to avoid getting overtired and she follows a diet of the low residue type.

I do believe, especially in older patients, if they are somewhat obese, and if they have any atypical cardiac, respiratory or pressure symptoms under the lower sternum, that hiatus hernia should be thought of and an effort made to demonstrate or exclude such a condition. In general, patients with hiatus hernia associate the pain with eating, and too they are not apt to have symptoms when they are in the recumbent position at night. They may have symptoms after effort, as in true angina, but this is rare. Although our patient got relief by belching, in many of the patients with true hiatus hernia the gas and contents are incarcerated in the hernial sac and they cannot get relief by belching.

I would like to mention briefly a woman from Eastport, Me., who came to Washington to look after the home of her son and his two daughters of high school age. She was 73 years of age, and when we took her history we elicited substernal pain occurring after effort, referred down her arm. She also was able to differentiate another group of symptoms referred to the lower esophagus or cardiac end of the stomach which she related to eating. There was no question about her having coronary sclerosis with angina, her symptoms were so typical, and the electrocardiographic changes fitted in with that diagnosis. At the same time

she had distress high in the epigastrium and under the lower third of her sternum that was at times related to eating. X-ray examination showed the presence of a small hiatus hernia, so that this case illustrates the combination of coronary sclerosis, angina pectoris and hiatus hernia, with the aggravating influence of the hernia.

PATIENTS WITH CHEST PAIN

The next group of cases I want to mention is illustrated by a man of 69 who has been the chief in one of our government departments for years. He has been a sound, practical, effective administrator of his department. Gradually as he has grown older and as new conditions have come up, especially since the war, there has been a reorganization of his department. He does not seem to have the elasticity to meet the change. He comes into conflict with what he terms theoretical, unpractical and visionary younger men in his department. After a varying number of conflicts he goes to pieces nervously and develops a queer pressure in the upper left quadrant, referred into his left chest and into his neck. He does not relate the attacks to anything he has eaten and they are not related to effort, although they often waken him at 2 or 3 a. m. He thinks the symptoms are due to gas that traps or pockets under the diaphragm, causing the chest and neck pain. Naturally, like any one with chest symptoms he fears that his heart may be involved. To make the case a bit more confused, in the course of giving his history he described two attacks that sounded very much like real angina pectoris. These two attacks were associated with effort, and effort rather soon after meals.

His first electrocardiogram showed flattening of the T waves, enough to suggest a certain amount of coronary disease. I feel, however, that it is this emotional stress due to his inability to cope with changing conditions in his office, or, if I must be plain, it is the New Deal that seemed to be causing most of his symptoms. As he is almost 70 and eligible for retirement, I encouraged him to retire. He has enough normal interests to entertain him and he gladly accepted this advice. I put him on a program of lessened activity without stressing his possible coronary disease, and the relief from conflict and peace in his heart have allayed most of his symptoms. A second electrocardiogram was essentially normal.

There are many patients of highly nervous organization that may mention chest pain as one of their chief symptoms. They do not as a rule describe the pain as substernal pressure but more often at the outer border of the heart or in the chest wall. They will speak of it as a burning or pinching or they will have difficulty in describing it at all, like most patients with somatic sensations. Of course nervous or psychoneurotic patients also are more subject to irregularities, cardiac palpitation and so on; but usually by taking a careful history and doing a physical examination, with possibly an electrocardiogram, one can rule out cardiovascular disease. I was interested in talking recently with a friend who had returned from the meeting of the College of Physicians in Boston. He said he heard Dr. Paul White make the statement that cardiology had got top heavy and that the best trained men were getting back to the good old principles of a careful painstaking history and physical examination, and they put laboratory tests and electrocardiograms well down on the list in importance.

PATIENTS WITH CHOLECYSTITIS

Another group of cases I would like to mention that may simulate or aggravate cardiovascular disease are those in which there is cholecystitis or cholelithiasis. Over and over again the association of gallbladder disease and coronary sclerosis has been demonstrated. It is almost equally well known that a diseased gallbladder will often have what has been termed a trigger mechanism, initiating attacks of angina. I am not suggesting a cholecystectomy on every patient who has angina and cholecystitis, but if the patient is in relatively good condition and has gallstones, cholecystectomy will not only relieve the gallbladder symptoms but often will have a most favorable effect on the heart symptoms. I think that in the past we have been too prone to allow a patient to continue with what have been called silent or innocent gallstones. Dr. Lahey, Dr. Jordan and many other authorities have shown with what frequency these patients who were relatively good risks in their late forties or early fifties develop very definite symptoms related to their gallbladder when they are in their sixties and when they have become very questionable surgical risks. All of us have a certain number of such patients under our care. I know one in particular that I wish could have had cholecystectomy years ago, for the diseased gallbladder is now having an almost constantly aggravating effect on her cardiovascular disease.

NERVOUS EXECUTIVES

There is still another group of patients that I feel should be mentioned in this discussion of indigestion simulating cardiovascular disease. We are seeing a great many executives that are driving hard in their work, with too little recreation and rest. In many instances they are overweight and they are nervously smoking twenty, thirty or even forty cigarets a day. They begin to complain of gaseous indigestion and discomfort in the epigastrium, frequently referred into the chest. Often because they have got so little exercise and are overweight and tired they will be rather short of breath on exertion. In my experience most of these patients fail to have pressure or pain after exertion but may complain of atypical sensations like dragging or pulling in the left chest anteriorly, and they are always worse when under increased emotional strain. The Graham test may be negative, and the gastrointestinal x-ray examination will be negative except for irritability or spasticity. As some one describing this group of cases says, they have mild traffic jams along their gastrointestinal tract, especially at the cardia or pylorus, from spasm of the sphincters in these areas. Many of them will describe a burning in the epigastrium and over the course of the esophagus. Cutting out or drastically reducing their tobacco, and cutting down their schedule, usually brings about relief. I cannot sufficiently emphasize the relief there is to the mind of such patients if they can be reassured and given a sense of security that their heart is intact and that their symptoms are due to the strain they are under plus the tobacco.

SUMMARY

1. Diaphragmatic or hiatus hernia may present a clinical picture that resembles heart disease, especially coronary sclerosis with angina. And too it is the smaller hernias that are often overlooked that are most apt to give symptoms like those of cardiovascular disease.

2. The symptoms in hiatus hernia are much more apt to be associated with eating rather than with effort.

The pain is less promptly relieved with glyceryl trinitrate. Belladonna and phenobarbital, "Trasentin" or other antispasmodics usually relieve or modify the pain.

3. Gallbladder disease, especially cholecystitis with stones, is not only frequently found associated with coronary disease but may reflexly initiate attacks of angina. In properly selected cases cholecystectomy may lessen or even clear up the attacks of angina for a time at least.

4. Functional derangement of digestion and irritable colon syndrome may also mimic or accent cardiovascular symptoms.

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ABSTRACT OF DISCUSSION

DR. SARA M. JORDAN, Boston: I have found in many cases that even the large, long esophagus type of hernia, the hernia in which the stomach is almost completely upside down in the thorax, can be controlled by a careful regimen. On the question of other causes, perhaps less frequently encountered but still occasionally found in the gastrointestinal tract, which might confuse the picture and make one think of heart disease, it must be remembered that spasm at the cardia is sometimes initiated by pain only. Not only is there dysphagia from cardiac spasm but there may be simple, severe pain with the onset of the attack, which makes one think of coronary disease. A rapid fluoroscopy of the esophagus will settle the diagnosis there. Spasm in the pylorus may produce chest pain which radiates to the neck, the teeth and even down in the arms. Spasm in the sphincter of Oddi after cholecystectomy may also produce this type of pain. The diaphragmatic flexure, in my experience, more than any other condition has been a source of confusion in the diagnosis when patients have been sent with a question of coronary or gastrointestinal disease. Pocketing of gas in the high splenic flexure in an atonic colon directly under the diaphragm certainly may be the cause of substernal pain which radiates to the neck and arms and can be alleviated and prevented, of course, by gastrointestinal management. I have often had patients who come with high upper gastric or chest pain which is due entirely to a habit of belching. They don't always swallow air, so it really isn't aerophagia. Fluoroscopy of their stomachs does not reveal air. But watch the patient who has that type of pain and ask him if he has the habit of belching. Put him on a careful regimen, a little antispasmodic treatment, and ask him to be careful not to belch, and sometimes cure will ensue within a few days. A digestive tract upset in a cardiac condition is certainly not helpful; it is harmful. The attention to food, prescription of an easily digestible diet (it doesn't have to be too restricted, but the notoriously indigestible foods should be removed), attention to smoking and to the abuse of laxatives—all those things should be watched carefully in a cardiac patient in order to have the digestive tract help rather than hinder the condition.

DR. WILLIAM EARL CLARK, Washington, D. C.: I stated that as a rule large hernias are less apt to get caught, but Dr. Jordan brings out the fact that they sometimes do get caught, and 1 of the cases on numerous occasions became incarcerated. I agree also that some patients with a congenital short esophagus do have symptoms.

Public Acceptance of Medical Science.—Men who saw malaria driven out of Guadalcanal, and typhus beaten at Naples, will be very willing to accept the guidance of a profession that uses both stethoscope and microscope, combining sound practice with sound theory based on experiment. There need be no fear, in our time, of any danger from outside to public acceptance of medical art and science.—Corner, George W.: The Gifts of the Good Physician, University of Rochester, N. Y., 1944.

Clinical Notes, Suggestions and New Instruments

MULTIPLE CARCINOMAS

A CASE OF FOUR CONSECUTIVE PRIMARY CARCINOMAS WITH APPARENT CURE

C. A HOLLAND, M.D., PHILADELPHIA

Since first reported by Billroth in 1860, multiple primary carcinoma has been found with relative frequency. No longer can multiple primary malignant growths be considered pathologic curiosities and "remarkably rare." [1]

The incidence has been estimated at from 0.3 to 4.33 per cent. Warren and Gates [2] in their statistical survey of recorded cases report an incidence of 3.7 per cent. Hurt and Broders [3] found 3.34 per cent in 2,124 cases of cancer, while Hellendall [4] reports an incidence of 4.33 per cent in 685 autopsies



Fig. 1.—Section of breast removed in 1933 showing microscopic appearance typical of adenocarcinoma.

Primary carcinomas may be multiple in one organ or in various structures of the body. They may be synchronous or metachronous: synchronous when of simultaneous occurrence and metachronous when they develop at different times. Criteria have been suggested to establish the independence of multiple growths. Billroth postulated that each neoplasm must show independent histologic characteristics, that each neoplasm must arise from its parent epithelium and that each neoplasm must produce its own metastatic lesions. These criteria, however, are too limited, since it is well known that many carcinomas are slow to metastasize (e. g. the failure of metastasis in 40 per cent of carcinomas of the cervix uteri) and it is conceivable that multiple cancers in one organ, as in the colon,

From the Surgical Department of Temple University Hospital.

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3. Hurt, H. H., and Broders, A. C.: J. Lab. & Clin. Med. **18**: 765-777 (May) 1933.
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may have the same microscopic appearance. Therefore the broader standards of Warren and Gates are more logical; namely, that each tumor must present a definite picture of malignancy, that each must be distinct and that the probability of metastasis one from another must be excluded.

These authors report, in a survey of 277 cases of multiple cancer, 111 cases in which three or more primary malignant



Fig. 2.—Appearance in June 1939 showing irregularity of the posterior wall of the esophagus at the level of the aortic arch.

growths were found. Hellendall reports a case in which four primary carcinomas of the anus occurred within a period of ten years, and a carcinoma of the cervix uteri which occurred in the eleventh year was healed locally by x-rays but the patient died one year later from carcinomatous involvement of the thoracic duct. The following is the report of a case in which four primary carcinomas occurred in different organs in the same individual. Two were treated by radical surgery and two by roentgen therapy, apparently with complete cure.

Mrs. S. K., aged 55, was admitted to a Philadelphia hospital in March 1928 and exploratory laparotomy was performed. As the head of the pancreas was firm, thickened and palpable, a diagnosis of carcinoma was returned. No biopsy was done, and as the patient received no special therapy for this condition the error in diagnosis was proved by the subsequent clinical course. The changes felt in the pancreas may have been due to a chronic interstitial pancreatitis.

The patient was readmitted to the hospital in August 1933 for a subradical resection of the right breast. The axillary glands and fat were removed but the pectoral muscles were left intact. Examination of the removed specimen revealed a hard nodule 1.5 cm. in diameter, which cut with increased resistance and proved on microscopic examination to be an adenocarcinoma (fig. 1). No involvement of the axillary lymph nodes could be determined.

In January 1934 she again entered the hospital because of the recurrence of a nodule on the chest wall at the site of the previous mastectomy. This was excised, but microscopic examination failed to show evidence of tumor. Following operation the patient received a series of roentgen treatments to the right side of the chest.

The patient was first admitted to Temple University Hospital in June 1939, to the bronchoscopic and radiologic services, complaining of pain and difficulty in swallowing solid and semisolid foods for a period of five weeks and a loss of 5 to 6 pounds (2.3 to 2.7 Kg.) in weight. Substernal pain appeared immediately after the taking of food, while liquids caused less discomfort. X-ray examination of the esophagus, two weeks before admission, showed an irregularity of the posterior wall of the esophagus at the level of the arch of the aorta involving approximately 3 cm. of the esophagus (fig. 2). The lumen of the esophagus was slightly narrowed at this point, but there was no appreciable delay in the passage of the barium mixture. A diagnosis of carcinoma of the thoracic esophagus was made.

Endoscopy, performed by Dr. Chevalier L. Jackson on June 8, revealed a narrowing of the upper thoracic esophagus with ulceration of the mucous membrane at and just below the point of constriction. Tissue removed at biopsy was typical on microscopic examination of squamous cell carcinoma (fig. 3). The diagnosis returned by Dr. Lawrence Smith of the pathologic department was "squamous cell carcinoma, grade 3."

Irradiation was administered by Dr. Edward Chamberlain between June 10 and July 18, five days a week in daily dosages of 100 roentgens (one fourth in each of four positions: anteroposterior, posteroanterior, left posterior oblique and right posterior oblique) *to a total of 3,000 roentgens. This heavy dosage* was well tolerated, with a minimum of skin reaction and discomfort. Roentgenograms of the chest in October showed extensive changes in both lungs thought to be the result of the intensive irradiation. The patient having no dysphagia, the esophagus was not examined until March 1940, when fluoroscopic and roentgen studies of the esophagus by Dr. Edward Chamberlain

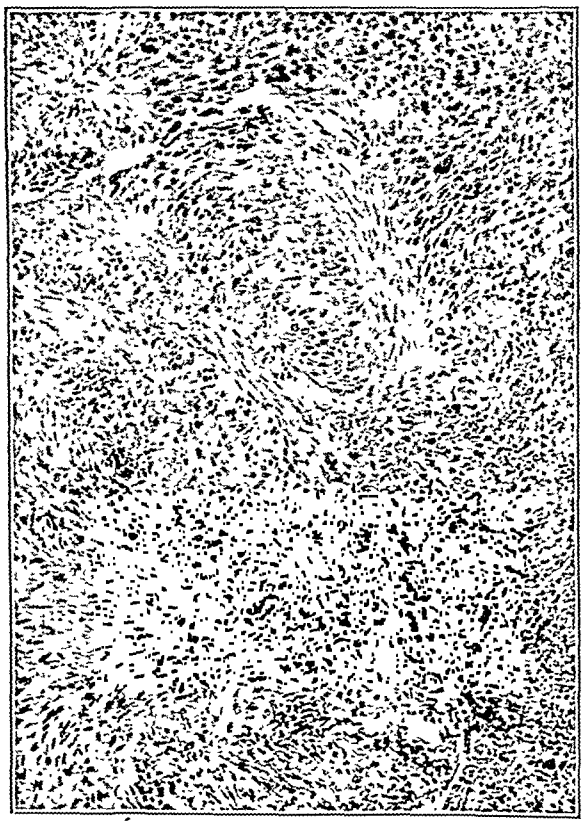


Fig. 3.—Section of biopsy specimen from esophagus showing whorls of pleomorphic cells characteristic of squamous cell carcinoma.

showed no evidence of ulceration or neoplasm (fig. 4). The lumen of the esophagus was ample throughout, and there was no delay in passage of the barium, with no residual barium at the previous site of the neoplasm. Frequent subsequent roentgenograms have shown the esophagus to be apparently normal.

During treatment for the esophageal carcinoma a small basal cell carcinoma of the left cheek was discovered, and one dose of

3,030 roentgens was administered. The growth promptly disappeared and has not recurred.

On July 14, 1942 the patient was again admitted to Temple University Hospital under the care of Dr. W. Wayne Babcock, complaining of intermittent cramplike abdominal pain of two months' duration, with no relationship to time or food. Blood streaked stools were passed on two occasions, but there was no change in bowel habit, the patient having required daily cathartics for years. Barium enema showed an annular carcinoma of the transverse colon near the hepatic flexure (fig. 5) Laboratory findings were within normal limits, with the exception of a moderate anemia.



Fig. 4.—Appearance of esophagus after roentgen therapy, showing no evidence of ulceration or neoplasm.



Fig 5.—Annular carcinoma of proximal transverse colon.

On July 17 resection of part of the transverse and ascending colon was performed by Dr. Babcock with an end to end anastomosis and complemental appendicostomy, and, after a prolonged convalescence resulting from infection and fecal leakage into the obese abdominal wall surrounding the appendix, the patient was discharged August 29 in good condition except for a small draining sinus at the site of the appendicostomy. This necessitated later readmission to the hospital for removal of the infected appendical stump, after which the wound promptly healed.

Examination of the resected portion of the colon showed an annular constricting growth just distal to the hepatic flexure, completely encircling the bowel for a distance of 4 cm, with typical raised, scalloped, firm borders and central ulceration. The neighboring lymph nodes were not enlarged Histologically the growth showed all the features of malignancy, including loss of polarity, pleomorphism, hyperchromatism and infrequent unbalanced mitoses (fig. 6). The diagnosis was adenocarcinoma of the colon, grade 2.



Fig. 6.—Section from ulcerative neoplasm of transverse colon showing loss of polarity, pleomorphism and infrequent unbalanced mitoses

In 1943 the patient, in addition to having developed a mild diabetes which was controlled by diet, had recurrent attacks of upper right quadrant pain accompanied by chill and fever. The last attack was followed by jaundice and resembled the disturbance produced by a stone in the common bile duct. During the resection of the colon the gallbladder was found to be thickened and to contain many stones. A cholecystectomy was performed in November 1943 by Dr. Babcock. Satisfactory exploration of the common bile duct was not accomplished and the cystic duct was anastomosed to the duodenum.

At the present writing, twenty-eight months after removal of the fourth carcinoma, the patient is without physical or roentgen evidence of any malignant disease. She has completely recovered from cholecystectomy and no further symptoms have developed.

SUMMARY

Four metachronous primary cancers occurred in different organs of the body in the same patient within a period of ten years. All apparently have been cured, two by radical surgery and two by roentgen therapy.

This is one of the first recorded cases of carcinoma of the esophagus treated, with five year cure following roentgen irradiation.

3401 Broad Street, Philadelphia 40.

POSITIVE PRESSURE RESPIRATION IN THE TREATMENT OF IRRITANT PULMONARY EDEMA DUE TO CHLORINE GAS POISONING

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The development of positive pressure respiration by Barach and Eckman [1] in the United States and by Poulton [2] in England made possible a specialized form of inhalational therapy for bronchial asthma, laryngotracheal obstruction and acute pulmonary edema. The physiologic effects of pressure breathing, the results of its continuous application clinically and various methods of administration have been described previously.[3]

In cases of irritant pulmonary edema in which a continued exudation of serum from the capillaries into the alveoli takes place, despite rest and oxygen therapy, drainage through the respiratory passageway is impeded and bronchopneumonia and death may result. The administration of positive pressure to combat edema of the lungs produced by gas poisoning was suggested by Barach, Martin and Eckman [4] in 1938 in a paper dealing with the therapeutic advantages of positive pressure in the treatment of clinical pulmonary edema. Mention was there made of a case of edema of the lungs described by Norton [5] in 1897 in which a rapid clearance of the edema took place with the use of the Fell-O'Dwyer forced respiration apparatus. Although a theoretical discussion of the mechanism was not given in Norton's report, the recovery of the patient appeared to be due to the introduction of a laryngeal tube and the application of forced respiration under positive pressure.[6]

Carlisle [7] reported that the administration of oxygen with the mask which provided positive pressure in expiration [8] was a most effective method of treating and preventing pulmonary edema due to irritant gases. Rovenstein [9] described a case of irritant gas poisoning in which acute pulmonary edema was successfully treated by the Meter mask, which provided positive pressure in expiration.[10] Segal [11] has also reported the favorable effects of positive pressure respiration in acute pulmonary edema.

The physiologic basis for employing positive pressure in the treatment of irritant gas poisoning is in the main the application of a direct physical pressure on the external surface of the pulmonary capillaries. Approximately 50 per cent of the applied intrapulmonary pressure is lodged on the capillary wall, the remainder being taken up by the elasticity of the expanded lung.[4] Although positive pressure in both cycles of respiration is a more effective method, the application of positive pressure during expiration alone is simpler. In this case the Meter mask with the pressure regulated in expiration by a disk with varying sized outlets was used.[10] When a flow of 8 liters of oxygen per minute is administered with the Meter mask at an oxygen concentration of 50 per cent the incoming air through the injector distends the collecting bag so that a very slight positive pressure is momentarily obtained at the start of inspiration in addition to pressure during expiration.

Other significant physiologic effects of positive pressure respiration are (1) the maintenance of a more patent bronchial passageway, since pressure breathing has been shown to increase the diameter of bronchi in spasm during the expiratory cycle [12] and (2) a variable retarding effect on the entrance of blood into the right side of the heart, this factor being especially manifest in circulatory failure.[4]

The patient who is the subject of this report demonstrates the specific value of positive pressure respiration, since inhalation of 40 per cent oxygen had been continuously used prior to the employment of pressure.

REPORT OF CASE

H. K., a boy aged 11 years, inhaled at a single inspiration some freshly prepared chlorine gas while visiting in a friend's play laboratory. Painful, persistent coughing ensued for two hours, then codeine ½ grain (0.032 Gm.) hypodermically resulted in comparative temporary relief. After one hour the persistent cough returned with labored rapid breathing, exhaustion, vomiting and rapid thin pulse. At this time auscultation revealed loud rhonchi throughout the chest bilaterally. These sounds simulated the creaking of leather, and no moisture appeared to be present. Five hours after the accident he was put in a tent which provided an atmosphere of 40 per cent oxygen and the cough was somewhat relieved. The pulse, however, maintained its poor quality and increased in rate; rapid respirations continued with infrasternal retraction. After four hours in the tent fine moist rales were present in the left lower lobe laterally and at the left border of the heart. Severe headache developed and nausea continued. Fifteen hours later the pulse was feeble, rapid and at times irregular; cyanosis was recognizable; the respiratory rate was 44 per minute. At this time, thirty hours after the accident, the Meter mask was applied with 4 cm. pressure and 50 per cent oxygen. Fine moist rales were now present at both lung bases and over the left lung laterally and posteriorly. Half an hour after positive pressure was applied the cyanosis and headache disappeared and the boy was cheerful and comfortable. Three and a half hours later the moist rales had disappeared from the lung bases but remained in the left lateral area. During the night, while asleep, the patient pulled off the mask and in the morning the general appearance of illness, headache and moist rales at the bases reappeared. After reapplication of the mask with the original pressure adjustment for four hours the rales again diminished and in the next twelve hours the pressure was gradually lowered to zero and the lungs were clear. Oxygen was discontinued. A few rhonchi and wheezing sounds returned for a day but the child was clinically well. The degree of circulatory failure which developed rapidly seems worthy of note. After the lungs were clear, the pulse did not return to normal for three days; weakness and listlessness continued for a week. The patient then recovered completely.

SUMMARY

A patient with irritant pulmonary edema due to inhalation of chlorine gas showed prompt improvement after breathing under a positive pressure of approximately 4 cm. of water during expiration. In spite of previous inhalation of 40 per cent oxygen in a tent, cyanosis, pulmonary edema and obstructive dyspnea had developed and progressed. The favorable clinical response demonstrated that positive pressure respiration was the specific therapeutic agent in the recovery of this patient.

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Council on Foods and Nutrition

SPECIAL ARTICLE

This is the sixth of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication.

GEORGE K. ANDERSON, M.D., *Secretary.*

THE IMPORTANCE OF PROTEINS IN RESISTANCE TO INFECTION

PAUL R. CANNON, M.D.
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Interest in the problem of undernutrition has developed increasingly in recent years, largely because of the relationship of food shortages to rising death rates from disease. Moreover, the great amount of undernutrition brought about by the war has reemphasized in particular the nutritional importance of proteins with respect to the normal processes of growth, lactation, fluid balance, bone marrow functioning, recovery from shock, wound healing and immunity. In this brief review especial emphasis will be placed on the influence of protein metabolism on resistance to infection.

In approaching the problem of infection and resistance as a whole it is important to bear in mind that all pathogenic micro-organisms are foreign proteins; therefore, from the standpoint of the host, resistance to them is basically a protein problem, i. e. a problem of protein digestion. When resistance is of a high degree either the invading micro-organisms are destroyed quickly by the phagocytes or their intercellular growth is stopped. When phagocytosis functions speedily and directly, as it usually does in natural resistance, the infectious agents are unable to establish themselves in the tissues of the host; when, on the other hand, phagocytosis is less effective, antibodies may appear, thereby reenforcing the phagocytic mechanism and setting in motion the processes of acquired resistance. In either type of immunity the outcome of an infection depends primarily on the efficiency with which the combined cellular and humoral defense mechanisms cooperate to inhibit microbic growth. Bacterial growth tends to terminate whenever the micro-organisms are engulfed by phagocytes, depending, however, on the digestive capacity of the phagocytes in relation to the particular bacterium engulfed. With virus infections the process is somewhat different in that intracellular parasitism may at times protect the viruses from phagocytes; hence antiviral immune mechanisms may differ in some respects from antibacterial ones. With most types of bacterial infection the outcome depends on the shifting balance between the potentiality of the invading micro-organisms to multiply and disseminate and the efficiency with which the phagocytes ingest and destroy them. If phagocytic action is sluggish, the infection may progress and even become lethal. For example, Lushbaugh [1] has demonstrated that, if rabbits immune to a virulent pneumococcus are intoxicated by alcohol and then infected intradermally with the same strain of pneumococcus, the sluggish inflammatory response caused by the paralyzing action of alcohol on the blood vessels in the area of inoculation may lead to a delayed mobilization of phagocytes and a consequently severe and often fatal bacteremia. Under normal conditions, however, effective phagocytosis tends to favor the speedy localization and destruction of the infective agents. To the extent, therefore, that phagocytosis restricts bacterial growth and thus ensures an adequate resistance, a continual supply of phagocytes is necessary, which requires, in turn, an abundant reserve of phagocytes and their precursors in the mesenchymal tissues (spleen, bone marrow, lymph nodes and lymphoid tissues, liver). These cellular reserves are usually abundant, but when their continuous replacement is hampered by atrophy induced by old age or by prolonged undernutrition or malnutrition the numbers of potential phagocytes from these mesenchymal tissues may become correspondingly diminished. Under such circumstances an infection which might ordinarily be of minor significance may now become menacing, in view of the reduced numbers of phagocytic cells available at the time of need. Furthermore, in the course of progressive undernutrition the total amount of protein nutriment which can be withdrawn from the reserve protein stores will eventually become so depleted that nourishment of the mesenchymal tissues will be seriously impaired, with a resulting tissue atrophy. Under such conditions any opportunistic type of intercurrent infection which would ordinarily be of minor import may now become progressively more severe because of the inability of the mesenchymal reserves to supply phagocytes at a rate commensurate with demands.

Besides these quantitative requirements for a large reserve of phagocytic cells, qualitative adequacy of the phagocytes is also essential. For example, it has been demonstrated by Strumia and Boerner [2] that immature leukocytes, such as myeloblasts and myelocytes, when tested under comparable conditions, manifest less phagocytic ability than do mature polymorphonuclear leukocytes and that phagocytic ability in general varies directly with the degree of functional maturity of the phagocytes. Recent evidence suggests that phagocytic potentialities of polymorphonuclear leukocytes may be impaired by various nutritional deficiencies. Cottingham and Mills [3] report that dietary deficiencies of protein and of certain vitamins, viz. thiamine, pyridoxine, riboflavin, ascorbic acid, choline and pantothenic acid in young white male mice may all depress phagocytic activity in vitro. With respect to protein intake they found a direct relationship between the amount consumed and the degree of phagocytic activity. These investigations should be pursued further in the living animal in order to ascertain more precisely how these dietary deficiencies may modify natural resistance.

Of particular importance in antimicrobic defense, however, is acquired resistance; all pathogenic micro-organisms, because they are foreign proteins, are capable within the tissues of activating the antibody mechanism. Antibodies so engendered may or may not be cast into the circulating fluids in large amounts, depending on the intensity of the antigenic stimulus, the quantity and character of the antigen reaching the antibody producing tissues, and other factors. But, regardless of the antibody content of the circulating plasma the antigen activates the mechanisms of acquired resistance, and

From the Department of Pathology, the University of Chicago.

1. Lushbaugh, C. C.: The Effect of Alcoholic Intoxication on Acquired Resistance to Pneumococcal Infection in Rabbits, J. Immunol. **46**: 151-159 (March) 1943.

2. Strumia, M. M., and Boerner, F.: Phagocytic Activity of Circulating Cells in the Various Types of Leukemia, Am. J. Path. **13**: 335-350 (May) 1937.

3. Cottingham, E., and Mills, C. A.: Influence of Environmental Temperature and Vitamin Deficiency on Phagocytic Function, J. Immunol. **47**: 493-502 (Dec.) 1943. Mills, C. A., and Cottingham, E.: Phagocytic Activity as Affected by Protein Intake in Heat and Cold, ibid. **47**: 503-507 (Dec.) 1943.

these mechanisms may persist, to be reactivated later by specific or nonspecific antigenic stimulation. This specifically acquired resistance to a wide variety of potentially pathogenic micro-organisms represents a type of biologic adaptation which conditions a child in the early years to many clinical and subclinical infectious experiences. After the micro-organisms have been effectively resisted, the resultant immunity tends to persist, to be reawakened or restimulated in the course of later infections. This ability to respond with an accelerated reactivity to later antigenic stimulations is referred to as the anamnestic response; elsewhere I[4] have discussed the nature of this phenomenon and its relationship to antibody production and resistance.

Evidence that the antibody mechanism may remain quiescent for a long time is seen in the fact that, after infection or vaccination, specific antibodies may tend to persist in low concentration or even to disappear from the blood serum, only to reappear in greater immediate concentration after antigenic stimulation, as following a so-called "booster" injection.[5] It is evident, therefore, that it is not the fact of antibody concentration in the blood serum at any particular moment that is so significant in resistance as that there has been a retention of the capacity of the antibody producing tissues to become reactivated and thereby enabled to resist bacterial agents against which they have once been immunized. The persistence of this antibody producing capacity may be explained by the supposition that a protein matrix exists within the tissues from which antibodies arise, and in the course of their fabrication the antigen unites in some way with this matrix to form a common union, which may then persist, regardless of the amount of antibody originally liberated into the circulating fluids.[6] The supposition is, moreover, that this matrix is composed of globulin from which is derived the antibody globulin of the immune serum. According to current views concerning the nature of antibody synthesis, it is assumed that antibody globulin in the blood serum is actually normal serum globulin which has been specifically altered during intracellular synthesis in the antibody producing cells because of its configurational relationship to antigen. In accordance with this view, therefore, antibody production should be influenced by the same conditions which determine globulin production; moreover, as globulin production is dependent on the intake of amino acids and is impaired by an inadequate intake of dietary proteins, antibody production must similarly depend on protein intake.

The earlier hopes of some nutritionists that specific food constituents might be discovered which could enhance natural resistance have not been realized; indeed, evidence justifying such hopes has been disappointingly meager. Moreover, the probability that some type of vitamin may be found which can elevate resistance has not been strengthened by the facts at hand. At the present time there is little reason to hope, furthermore, that optimal nutrition, whatever that may prove to be, will be likely to activate some kind of bacteriostatic agent, which in turn will act prophylactically to inhibit infection. On the other hand there is abundant evidence that the absence of good nutrition may induce a decreased resistance to bacterial infection, as is seen, for example, in the development of various types of infection accompanying prolonged periods of starvation. The important question remains, however, What resistive mechanisms are most deleteriously affected in the course of undernutrition?

The influence of malnutrition and undernutrition on susceptibility to infection is indicated especially by the long known tendency of undernourished persons to acquire severe tuberculosis, rheumatic disease and respiratory and enteric infections. Moreover, in malnourished persons with debilitating diseases, such as cirrhosis of the liver, nephritis or nephrosis, gastrointestinal cancer or ulcerative colitis, there is often a well defined tendency to develop intercurrent infections. Many of these diseases also exhibit the consequences of starvation, as evidenced by a severe loss of weight.

One important effect of prolonged starvation is hypoproteinemia. In an earlier study of this problem[7] it was stated that, in a series of patients dying from various types of chronic disease, hypoproteinemia was one of the outstanding clinical findings. Among these hypoproteinemic patients, moreover, the high incidence and severity of terminal infections was noteworthy. For example, in those with total serum protein values of approximately 5 Gm. or less per hundred cubic centimeters a serious infection in most instances dominated the terminal days of life. The simultaneous occurrence of hypoproteinemia and increased susceptibility to infection suggests the possibility of a mutual relationship.

Much recent evidence indicates that a pronounced reduction in the concentration of serum proteins signifies a reduction also in the tissue protein reserves. Thus it has been shown that there is a dynamic relationship between the serum and tissue proteins, so that the loss of one or the inadequate formation of the other may lead to a reduced protein concentration in both the blood and the tissues.[8] Inanition, wasting disease or protein loss (proteinuria) may all lead in varying degrees to hypoproteinemia, and when depletion of the protein reserves falls below a certain critical level further processes of protein metabolism, whether evidenced as tissue growth or as serum protein fabrication, are thereby also reduced. Although the first effect of hypoproteinemia is manifested as a hypoalbuminemia, it may later be manifested also as a hypoglobulinemia. As both serum albumin and serum globulin are complex proteins fabricated in the tissues and contributed to the blood, impaired production of one or both will seriously hamper their functional utilization, as exemplified by the development of nutritional edema in relation to hypoalbuminuria and by the loss of resistance to bacterial infection in relation to hypoglobulinemia.

Because of the more general interest in albumin synthesis and function, less attention has been given to the effects of undernourishment on the synthesis of serum globulin, although globulin synthesis is fundamental to the problem of antibody formation.[9] The importance of globulin metabolism has not been fully appreciated because of the inadequate understanding of the significance of serum globulin as it is usually evaluated in the albumin-globulin ratio. Because of the fact, moreover, that at times in cirrhosis of the liver or in nephritis or nephrosis there may be a reversal of the albumin-globulin ratio, some workers have concluded that hypoglobulinemia rarely occurs. This may be true in a general sense, but one important fact has

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been overlooked, viz. that from the standpoint of antibody globulin and the antibody globulin reserves only a portion of the serum globulin, that is, the gamma fraction, is significant. This gamma fraction is not even demonstrated by ordinary chemical methods of fractionation. Furthermore, in some conditions, as nephrosis, elevation of the alpha and beta fractions of globulin may give the false impression of an increase in total serum globulin, whereas the antibody containing gamma portion may actually be considerably reduced.[10]

In the process of synthesis of gamma globulin in human tissues the important fact should be kept in mind that the body must fabricate a complex serum protein fraction composed of several of the amino acids essential for man. Thus amino acid analysis has shown that human gamma globulin contains appreciable amounts of lysine, methionine, tryptophan, threonine and leucine.[11] Any protein which contains at least five of the eight amino acids considered essential for maintenance of nitrogen equilibrium or of the two additional amino acids which appear necessary for normal human function can assuredly be synthesized only if these amino acids are available either in the protein reserves or in the dietary protein. Obviously such a synthesis cannot readily occur in the face of prolonged protein deficiency and resulting depletion of the tissue protein reserves. Under such conditions, indeed, one would expect definite impairment of the capacity of the depleted tissues to fabricate antibody gamma globulin and thus to contribute antibodies in the course of a developing or impending infection. This has been shown experimentally to be the case.[12] For example, animals (rabbits and rats) subjected to prolonged protein undernutrition exhibit a pronounced loss of capacity to fabricate antibodies and to resist infection. Their antibody producing ability can be quickly restored, however, by ingestion of adequate amounts of high quality protein.

These facts suggest the need, therefore, of an abundant supply of high quality dietary proteins in all persons who have developed a severe protein deficiency in order to bring about repletion of their depleted tissue protein stores. This replenishment of the protein reserves becomes especially important in surgical patients, particularly in those who have lost much weight. Thus, Studley[13] has shown that the incidence of postoperative complications (wound disruption, infection, death) is considerably higher in patients who, before operation, have lost more than 20 per cent of their normal weight. Such patients are also frequently hypoproteinemic. If, after rehydration, the concentration of total serum protein in these patients is low, for example, under 5 Gm. per hundred cubic centimeters of serum, it may be possible to restore their protein reserves preoperatively by blood and plasma transfusions, intravenous or oral administration of protein hydrolysates and/or by more intensive dietary attention to caloric, vitamin and protein intakes. It is recognized, of course, that at times this does not seem to be possible, as in severe liver disease or in nephrosis, but the further loss of blood and tissue proteins may be at least reduced. Furthermore, even here protein repletion may occur in the globulin forming tissues, although the production of albumin is seriously impaired.

In summary it may be said that in the past few years much evidence has accumulated indicating the basic importance of protein metabolism in relation to the processes of natural and acquired resistance. This evidence points more and more to the conclusion also that many important aspects of the problem of infection and resistance are essentially nutritional.

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Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following report. HOWARD A. CARTER, *Secretary.*

DIATHERMY AND RADIO INTERFERENCE

The Federal Communications Commission has just completed a most extensive survey of the communication services of the radio spectrum. In a news release May 17, 1945 the commission announced its final frequency allocations to the nongovernmental radio services in the portion of the spectrum between 25 and 30,000 megacycles with the exception of the region left unassigned for frequency modulation pending the outcome of certain tests now under way. The frequency allocations for scientific, industrial and medical devices including diathermy apparatus are as follows:

Wavelength (Meters)	Dominant Frequency (Megacycles)	Frequency Band (Megacycles)	Band width in per Cent, Approximately
21.95	13.660*	13.653 13.667	±0.05
10.98	27.320	27.185 27.455	±0.5
7.32	40.980	40.960 41.000	±0.05

* The 13.660 megacycle band was assigned previously.

In its proposed report on Jan. 15, 1945 the commission recommended a 30 kilocycle channel (0.05 per cent) for the 27 megacycle region, but in the final report on the recommendation of the manufacturers of diathermy apparatus the commission assigned a 270 kilocycle band, which corresponds to 0.5 per cent channel width approximately. The other allocations for scientific, industrial and medical devices were left unchanged. The commission requested that all equipment be adjusted and maintained as closely as possible to the dominant or middle frequency in each band.

The high frequency energy generated by diathermy equipment has been known to interfere with radio communications. For this reason the commission was obliged to allocate frequencies for medical and surgical applications and for industrial heating. The high frequency electrical energy generated by short wave and long wave diathermy is much the same electrically as that generated by radio broadcasting apparatus. Although the diathermic energy is supposed to be absorbed by the tissues, unfortunately some of it is not and is radiated into space. This energy, if on the same wavelength as established communications, may cause interference.

It is generally agreed among the manufacturers of diathermy machines that band widths of 0.5 and 0.05 per cent will increase the cost of equipment and the service expense. Apparatus made to operate on the narrower channel (0.05 per cent) will cost much more, according to the estimates of the manufacturers.

The Council has given most careful consideration to the entire problem of radio interference by diathermy equipment. In view of the general interest which has been displayed, the Council desires to discuss the matter.

At its recent annual meeting (Feb. 12, 1945) the Council on Physical Medicine of the American Medical Association voted that in the interest of public relations it desires to support the stand of the Federal Communications Commission and that it does not care to be in opposition to the federal agency which is responsible for this important decision.

Furthermore, the Council voted that the suggestion by some of the manufacturers to confine diathermy to one single frequency was unwise. The Council believed that three frequency channels might well be allocated for diathermy, the width of these channels to be decided by the commission.

The Council's decision was based on consideration of the relative importance of serious communication requirements and those of diathermy and the fact that the cost of meeting the situation on the part of the profession is an insignificant part of the whole cost of medical care.

The following facts entered into the Council's deliberations:

1. That diathermy is a useful therapeutic procedure for applying heat to the tissues of the body.

2. That diathermy is not the only method of applying heat for therapeutic purposes, though it is the most effective method known for administration of deep heat.

3. That medical diathermy has interfered with radio communications.

4. That successful operation of medical diathermy does not necessitate radiating high frequency electrical energy into space. In other words, the radio energy dispersed is a by-product and the diathermy equipment would be much more efficient electrically if this energy did not escape but was absorbed by the tissue.

5. That controlled diathermy apparatus designed to operate on a narrower tolerance will cost more per unit than previous equipment.

6. That the therapeutic efficacy of the frequency controlled diathermy apparatus is the same as that of prewar uncontrolled apparatus.

7. That screening the diathermy equipment is one solution of the problem though not practical in many instances. Screening is expensive if the decorations (papering and plastering) of the treatment room are taken into consideration and, furthermore, the mobility of the equipment is limited.

8. That the problem is one of sound medical services and questions pertaining to public relations.

The Council studied two points of view which were raised by the specialists in this field:

1. That there are a number of physicians specializing in physical medicine who are responsible for the operation of physical therapeutic departments in hospitals and in private offices and that these physicians are mindful of budgets and expense of equipment. These specialists, and likewise the Council, are not pleased with the prospects of paying higher prices for diathermy apparatus which are no better therapeutically than uncontrolled devices.

2. That a larger group of physicians do not employ diathermy to any great extent, if at all, in their practice and are not greatly interested.

For several years the medical profession has been accused by various radio interests of interfering with radio communication and of usurping too much of the radio spectrum. This is not good public relations. Those radio interests are of considerable importance, as, for example, the police, Coast Guard, Army, Navy, television, frequency modulation, and other services. In spite of the fact that some physicians might be called on in the future to pay a higher price per unit for diathermy apparatus, the Council chose the approach which in its opinion will benefit the greater number of the profession, e. g. maintaining cordial public relations, and decided to accede to the recommendations of the Federal Communications Commission.

The Council has filed a request with the Federal Communications Commission to allow at least five years for physicians to liquidate their investment in existing diathermy apparatus before being asked to screen them, dispose of them, change them or purchase apparatus which will be frequency controlled.

Some diathermic equipment, especially in hospitals and office buildings of steel construction, may be screened sufficiently so that it may cause little or no interference with radio communications. In these few instances the commission may not insist on any change. The extent of interference will be determined by measuring devices manned and operated by the Federal Communications Commission. If the commission accedes to the Council's request to provide a period of several years for the physicians to make the change, it is unreasonable to think that a physician practicing physical medicine and using diathermy extensively will find his hospital department broken up or his practice ruined.

Surgical diathermy is not regarded as a source of serious interference to communications, and hence the Federal Communications Commission does not contemplate the regulation of this service.

The Council believes that the commission is serving the best interests of the public at large and of the majority of the medical profession in the United States. These public relations are not confined to this nation alone but to Canada, Mexico and other countries. Hence another agency, namely the International Radio Advisory Committee, a subcommittee of the Department of State, is authorized to make necessary preparations for treaties with other nations of the world. The aforementioned allocations the commission states are subject to change necessitated by international agreements.

Advances in technology often create sociological problems which have to be settled by compromises. This is another manifestation of sacrifices by a smaller group made necessary or advisable in the interest of tranquil and cordial relations for the benefit of the public at large.

The Council on Physical Medicine believes that the Federal Communications Commission has studied the problem very carefully and that the commission is fully informed about the questions pertaining to medical service and public relations. The Council hopes that the decisions reached by the commission will be satisfactory to all concerned.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional article has been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its actions will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

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SATURDAY, JUNE 2, 1945

THE WAGNER-MURRAY-DINGELL BILL (S. 1050 OF 1945)

On May 24 Senator Wagner introduced into the Senate of the United States the bill about which there have been so many conjectures and preliminary announcements during the last few months. The text contains 185 pages. The measure was referred to the Senate Committee on Finance, of which Senator George of Georgia is chairman. The measure was introduced into the House of Representatives by Representative Dingell of Michigan and is there known as H. R. 3293. In the House it was referred to the House Committee on Ways and Means, of which Representative Doughton of North Carolina is chairman. These are the committees to which the previous version was referred.

Elsewhere in this issue appears the first of a series of analyses of this measure, prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association. The present analysis is confined to the section of the bill that proposes a system of compulsory sickness insurance. In subsequent issues of THE JOURNAL attention will be paid to some of the other phases of social security covered by the proposed act. These include grants and loans for construction of health facilities, grants to states for public health services and for maternal and child health and welfare services, also a comprehensive public assistance program and a national system of public employment offices.

The Wagner-Murray-Dingell measure—1945 version—would take over the proposals of the Hill-Burton bill for hospital and health center construction and make of it a ten year program at ten times the cost. This is long term planning with a vengeance, in view of the experimental character of the proposal, at best. Instead of the advisory board with authority proposed by the Hill-Burton measure, the 1945 Wagner-Murray-Dingell bill would substitute a National Advisory Hospital Construction Council, appointed by the Surgeon General and without authority, except to review applications and make recommendations. The new Wagner-Murray-Dingell bill also proposes to extend the grants for venereal disease and for the tuberculosis program. The section on public health service would change the present authorization of $20,000,000 a year for grants to the states with an authorization to appropriate a sum sufficient to carry out the purposes. The annual amount available to the Surgeon General of the Public Health Service for demonstrations, training of personnel and administrative expenses is increased from $3,000,000 to $5,000,000 a year. A formula is established designed to give more aid to the poor states and relatively less to the richer states.

Another section of the 1945 version relates to federal cooperation with the states in providing health and welfare services for mothers and children. The states are to develop their own plans, which are to be approved by the chief of the Children's Bureau. Here also a formula is established for aiding the poorer states to a greater extent than the larger ones.

Section 6 of the measure is devoted to the public assistance program, authorizing federal matching for money payments to the aged, dependent children, the blind and other needy individuals. The seventh and eighth sections provide for an expanded and strengthened national system of public employment offices. Under this section a National Advisory Employment Policy Council is set up to formulate policies and to advise in the administration of the service.

The section of greatest interest to the medical profession at this time is section 9, which would establish a national sickness insurance system. The proponents of the measure minimize its compulsory aspect in every way they possibly can. Nowhere is the word "compulsory" used. In both the abstract of the measure and in Senator Wagner's presentation all the emphasis is placed on the benefits which presumably every one in the United States would receive from this measure; Senator Wagner reaffirms that complete freedom is offered to every one with regard to such medical services as he may give or receive. Indeed, Senator Wagner went so far as to say that "health insurance is not socialized medicine; it is not state medicine." With this pronouncement most people with any understanding of the situation will differ. They will insist that compulsory sickness insurance with federal control is both socialized medicine and state medicine. Health insurance, or actually sickness insurance, is a method of paying medical costs in advance and of distributing such costs. There are differences between various forms of sickness insurance. Senator Wagner emphasizes freedom of medical practice, which he says is carefully safeguarded because each insured person is entitled to choose his own doctor. But he must choose his own doctor from among the physicians or groups of physicians in the community who agree to go into the insurance system. Certainly the insured person cannot

secure the application of any of the funds that he has paid for the payment of a physician who is outside the system. The statement is made that "the participating doctors are likewise free to choose the method through which they are to be paid from the insurance fund." As a rule, they must choose as a group either a fee-for-service plan with a fee table, a capitation fee or a salary. In the summary of the bill released by Senator Wagner the statement is made that "the Surgeon General of the U. S. Public Health Service—a doctor—would administer the technical and professional aspects of the program." This version of the Wagner-Murray-Dingell bill places tremendous authority in the hands of the Surgeon General, as was placed by previous versions. This time there is to be a National Advisory Medical Policy Council, to be appointed from panels of names submitted by professional and other organizations concerned with medical services, education and hospitals and to include also a representative of the public. This council is wholly advisory and without authority. Incidentally, there is nothing in previous law that says the Surgeon General of the U. S. Public Health Service must be a physician. The President can appoint the Surgeon General by selecting any of the members of the regular corps, which includes physicians, sanitarians, economists, doctors of public health and a wide variety of other personnel in the field of medicine.

Among the first of the editorial comments to appear relative to the program for expanded social security was that of the New York *Times*, published on May 26. The *Times* says that certain questions are to be asked of any proposal like the Wagner-Murray-Dingell bill, namely "Will it provide relief where it is needed without producing it where it is not needed? Will it mitigate the penalties for failure or misfortune without weakening the incentives to production and success? Will it provide aid to individuals without making them politically dependent and without dangerously extending the power of the central government?" To these questions the *Times* replies that under the bill as it stands it is more than doubtful whether these questions can be answered satisfactorily. The *Times* points out that vast new programs would be undertaken under the new bill, and existing programs would be tremendously liberalized. The unemployment benefits place a premium on not working. The old age benefits in some instances would pay a man more for retiring than for continuing at his job. The differential treatment would make the states competitors for especially favorable formulas. The total costs of the bill, involving an 8 per cent tax on the payroll, would be a direct tax on employment and would tend to discourage employment at a time when it is our chief problem. Moreover, the *Times* feels that the sponsors have greatly underestimated the actual cost of their measure.

Physicians should obtain copies of this proposed act and study carefully all of its provisions, so that they may see for themselves the extent to which this act would revolutionize medical care in the United States. Senator Wagner points out that he has consulted this time with the American Federation of Labor, the Congress of Industrial Organizations, the Physicians Forum, the Committee of Physicians for the Improvement of Medical Care and the National Lawyers Guild, among other organizations, in obtaining suggestions for modification of his previous version. He has not consulted with the American Medical Association or, as far as is known, with any of the members of its representative bodies or councils. The so-called Physicians Forum is a group of several hundred physicians, mostly inclined toward communism and practically all living in New York City. The Committee of Physicians for the Improvement of Medical Care, once known as the Committee of 400, now maintains a mailing list of around 1,000 physicians and is actually controlled by an inner group of a few physicians who do not in any way represent a majority of medical opinion. Thus the bill completely disregards the majority opinion of the 125,000 physicians who constitute the American Medical Association and who provide the major portion of medical practice for the people of the United States. The bill also disregards the 60,000 physicians now in the armed forces who have sacrificed as much as any other group in the country in the great war in which our nation is now engaged. This obstinacy is typical of the manner in which Senators Wagner and Murray and Representative Dingell have from the first endeavored to impose their notions regarding the care of the public health and of the sick on the people of the United States.

THE HYALURONIC ACID-HYALURONIDASE SYSTEM

Recent work of American and English investigators has extended our knowledge of the hyaluronic acid-hyaluronidase system in several interesting directions of important physiologic, pathologic and therapeutic implications. Hyaluronic acid, previously shown to occur in the vitreous humor, synovial fluid, skin and umbilical cord of various mammals,[1] was found also in the lung[2] and in tumor tissue of various types.[3] Probably hyaluronic acid, free or bound, is a constituent of other cement substances and mucoid matter of mesodermal structures in the body. Its presence may be related to the metachromatic properties of some of these substances, especially such as occur in increasing amounts with progressive age in the walls of large and small arteries. A study of the role of increased capil-

1. Meyer, K., and Chaffee, E.: The Mucopolysaccharides of Skin, J. Biol. Chem. **138**: 491, 1940.
2. Humphrey, J. H.: Antigenic Properties of Hyaluronic Acid, Biochem. J. **37**: 460, 1943.
3. Pirie, A.: A Hyaluronidase and a Polysaccharide from Tumors, Brit. J. Exper. Path. **23**: 277, 1942. Meyer and Chaffee.[1]

lary permeability to the hyaluronic acid content of capillary structures may yield interesting results.

Recent experiments of Meyer, Hahnel and Feiner [4] have shown that solutions of this macromolecular polysaccharide introduced intravenously into rabbits and guinea pigs accelerates the erythrocytic sedimentation, as do other macromolecular colloidal solutions.[5] Studies by Humphrey [2] on rabbits demonstrated that hyaluronic acid bound to horse serum albumin is not antigenic and therefore differs in this respect from the polysaccharides and mucoproteins from pneumococci and other microorganisms. McClean,[6] on the other hand, found that the capsules sometimes formed by streptococci of groups A and C, which contain a polysaccharide, are destroyed by hyaluronidase from various soures, while it does not attack the specific capsular matter of pneumococci, indicating fundamental chemical differences between the capsules of various micro-organisms.

Hyaluronidase, which is one of the "spreading factors," has been isolated from avian and mammalian testicular and cancerous tissues, from filtrates and extracts of staphylococci, streptococci, virulent pneumococci and members of the gas gangrene group, from snake and spider venoms and from leeches. When injected into arthritic joints this enzyme temporarily lowered the viscosity of the synovial fluid without changing the course of the disease and without altering erythrocytic sedimentation.[7] It causes a depolymerization of hyaluronic acid. Capsule formation in young cultures of streptococci of the A and C strains never develops if hyaluronidase is active in such cultures.[6] Meyer and Chaffee [1] consider capsule formation a protective measure against attack from the host on the infecting organisms, thus permitting them to proliferate and increase their virulence, while the production of hyaluronidase by streptococci facilitates their invasion of tissues and their distribution throughout the body. Meyer and Chaffee suggest that similar conditions and interrelations might exist in the case of the hyaluronic acid-hyaluronidase system of cancer.

McClean and Rowlands,[8] and Fekete and Duran-Reynals [9] have shown that hyaluronidase in the spermatic fluid plays an important role in fertilization by dissolving the liquor folliculi and dispersing the cells around the ovum, thus permitting the spermatozoa to reach the ovum. It may be of physiologic importance not only that depolymerization of hyaluronic acid is produced by hyaluronidase but that it proceeds slowly and progressively in the presence of ascorbic acid and oxygen, but without the development of reducing substances.[10]

4. Meyer, K. E.; Hahnel, E., and Feiner, R. F.: Experiments on Erythrocyte Sedimentation Rate, Proc. Soc. Exper. Biol. & Med. **38**: 36, 1945.
5. Hueper, W. C.: Macromolecular Substances as Pathogenic Agents, Arch. Path. **33**: 267 (Feb.) 1942.
6. McClean, D.: The Capsulation of Streptococci and Its Relation to Diffusion Factor (Hyaluronidase), *J. Path. & Bact.* **53**: 13, 1941; Action of Diffusion Factors on Tissue Permeability, Lancet **1**: 797, 1941.
7. Ragan, C., and DeLamater, A.: Hydrolysis of Hyaluronic Acid of Human Joint Fluid in Vivo, Proc. Soc. Exper. Biol. & Med. **50**: 349, 1942.
8. McClean, D., and Rowlands, I. W.: Role of Hyaluronidase in Fertilization, Nature **150**: 627, 1942.
9. Fekete, Elizabeth, and Duran-Reynals, F.: Hyaluronidase in the Fertilization of Mammalian Ova, *Proc. Soc. Exper. Biol. & Med.* **52**: 119, 1943.
10. Hale, C. W.: Studies on Diffusing Factors, *Biochem. J.* **38**: 262, 1944.

Current Comment

RANKIN BILL TO ESTABLISH BUREAU OF MEDICINE AND SURGERY IN VETERANS ADMINISTRATION

Representative Rankin, chairman of the House Committee on World War Veterans' Legislation, introduced in the House on May 25 a bill to establish a Department or Bureau of Medicine and Surgery in the Veterans Administration, H. R. 3310. Representative Rogers, Massachusetts, also a member of the committee, introduced a similar bill in the House on the same day, H. R. 3317. Immediately the Committee on World War Veterans' Legislation, to which the bills were referred, scheduled hearings for May 29. This legislation, besides establishing a Bureau or Department of Medicine and Surgery in the Veterans Administration, proposes that commissioned officers and noncommissioned personnel of the department or bureau may be detailed for service with the medical services of the Army and Navy and that commissioned, appointed or enlisted medical personnel of the Army and Navy may be detailed for service with the Veterans Administration when such detail, in the judgment of the heads of the agencies concerned, or of the president, will promote the public interests without impairing the efficiency of the service or services involved. Nowhere is any consideration given to the rights of the men involved. It is further provided that members of the newly to be created Department or Bureau of Medicine and Surgery will be exempt from selection or draft for service with any other component of the armed forces but that any personnel needs of the bureau or department may be filled by assignment of selected or drafted persons. Under this broad authority it would be possible for physicians to be drafted for assignment to the Veterans Administration. Here is more compulsion! Instead of attempting to attract more and better physicians to the Veterans Administration by improving the quality of the service and by making positions sufficiently attractive to well qualified men, these measures propose—at least during wartime—to force physicians who enlisted voluntarily with the armed forces into assignments with the Veterans Administration. The damage that has been wrought to medicine by the destruction of premedical classes, by the threat of state medicine and by the compulsion which has already forced hundreds of physicians into the Veterans Administration is incalculable. The nation will reap this sad harvest for generations to come.

RATS AND RAT BITES

"Man and rat will always be pitted against each other as implacable enemies," Hans Zinsser[1] said. Rats harbor and transmit the infectious organisms responsible for a number of serious diseases of man including bubonic plague, typhus and rat bite fever. They eat the same food as man, they are destructive to the habitations and storehouses of man, and they do not have any compensating beneficial effects on human life whatever. They are an unmitigated pest and nuisance. Rats bite human beings. Elsewhere in this issue (page 324) appears an account of rat biting which will shock even those who had only vague ideas on the subject. Richter reports that almost 25 per cent of the people in a 2 square mile area of Baltimore were bitten by rats over a four year period! Most of the bites were unimportant clinically, but hospital treatment was sought by nearly 100 persons "when the bites had become infected or the skin had actually been torn or chewed away." No doubt a much larger number were treated by physicians in their offices and were not even reported to the health department. About a tenth of those who received hospital treatment for their rat bites developed rat bite fever. From experimental observations it is deduced that rats bite people because they are hungry and will continue to chew unless frightened away. The situation in Baltimore presumably is not any worse than that in most other cities; rats on farms have always been numerous, infesting grain bins, barns and houses. This menace needs to be brought forcefully to the attention of the appropriate civic authorities again and again. Continuous active steps must be taken to control the pest of rats with every means available.

1. Zinsser, Hans: Rats, Lice and History, Blue Ribbon Books, Inc., 1934.

SURGICAL TREATMENT OF PARKINSONISM

In recent articles addressed to the public much has been said about a new surgical attack on paralysis agitans, or Parkinson's disease; indeed, cure of 70 to 80 per cent of patients operated on has been claimed in some of these statements. Recent years have seen much investigation into the cause and treatment of paralysis agitans. One method of approach has been surgical. At present, operations for the relief of paralysis agitans must still be regarded as experimental. Klemme of St. Louis[1] and Bucy of Chicago[2] have both relieved the tremor of paralysis agitans by removal of part of the cerebral cortex, although not the same part. Bucy has removed part of the motor cortex, and in each instance the abolition of the tremor has been followed by a certain measure of paralysis of the extremities. Klemme reports that removal of a portion which he terms the "premotor cortex" has not been followed by paralysis, at least not in all cases. As yet the details of Klemme's operations in the cases studied have not been published. Putnam of New York[3] has relieved the tremor by dividing the pyramidal tract in the spinal cord. Meyers and Browder of Brooklyn[4] have relieved the tremor in some cases by removal of part of the basal ganglions. As yet it has not been possible to assess the relative value of these different operative procedures. None of them can, however, be regarded as a cure. All of them benefit the patient only by alleviating the tremor characteristic of the disease. The other manifestations of the disease remain unaltered. All the operations are followed, at least in some instances, by a variable degree of weakness or paralysis of the arm and leg and at times by other undesirable sequelae. Certainly the surgical treatment of this condition has not yet reached the stage where it can be routinely recommended. The method is worthy of consideration as an experiment in selected and carefully studied instances.

1. Klemme, R. M.: Surgical Treatment of Dystonia, Paralysis Agitans and Athetosis, Arch. Neurol. & Psychiat. 44: 926 (Oct.) 1940; Surgical Treatment of Dystonia, A. Research Nerv. & Ment. Dis. Proc. (1940) 21: 596, 1942.

2. Bucy, P. C.: Cortical Extirpation in the Treatment of Involuntary Movements, A. Research Nerv. & Ment. Dis., Proc. (1940) 21: 551, 1942; Neural Mechanism of Athetosis and Tremor, J. Neuropath & Exper. Neurol. 1: 224 (April) 1942; The Precentral Motor Cortex, edited by Paul C. Bucy, Urbana, Ill., University of Illinois Press, 1944.

3. Putnam, T. J.: Treatment of Unilateral Paralysis Agitans by Section of the Lateral Pyramidal Tract, Arch. Neurol. & Psychiat. 44: 950 (Nov.) 1940.

4. Meyers, Russell, and Browder, Jefferson: The Modification of Alternating Tremors, Rigidity and Festination by Surgery of the Basal Ganglia, A. Research Nerv. & Ment. Dis., Proc. (1940) 21: 602, 1942.

CRYING BABIES

The crying of the newborn baby is a universal negatively directed reaction—a reflex act to unpleasant stimuli. Aldrich and his associates,[1] who studied the crying of newborn infants in a maternity ward nursery, say that good management reduces this crying to a minimum. Evaluation of the pediatric and nursing routines in answering the needs of the newborn infants is a realistic approach to determining causes and means of reducing the amount of crying. The average baby cries one hundred and thirteen minutes a day in the nursery. This is more than should be necessary for the normal use of the cry as a signal of need. The peaks of crying during a twenty-four hour period were found to correspond exactly to the periods when nursing care was at its lowest. The calmest hour of the nursery day occurred at 10 a. m., when the nursery was fully staffed, all babies had been fed and the smaller needs of the infants were more completely satisfied. The hours of most crying were from 10 p. m. on through 2 a. m., at which time there were only two student nurses in the nursery, with thirty babies to care for. Other peaks of crying are explained by adjusting feeding schedules in the nursery to routines of the obstetric ward—visiting hours and supper hours. Crying does not appear to be contagious from one baby to another. The chances are less than 0.14 per cent that more than half of the babies in the nursery will be crying simultaneously. The study indicates that pediatric and obstetric routines, the distribution of nurses through day and night in the nursery, should be adjusted to the community needs of the infants. Other factors, such as the color and lighting in the nursery, the type and nature of babies' clothes and the positions of the babies, may be investigated as contributing to the babies' comfort.

1. Aldrich, C. Anderson, and others: The Crying of Newly Born Babies, J. Pediat. 26: 313 (April) 1945.

MEDICINE AND THE WAR

ARMY

FIRST MERCY SHIP AFTER VE DAY REACHES AMERICAN SHORES

The first mercy ship to reach American shores after VE day arrived at Charleston, S. C., Port of Embarkation May 10 with 707 wounded men from the European theater of operations. The ship, newest of the Transportation Corps' fleet of twenty mercy liners in the Atlantic, is the Army Hospital Ship *Ernestine Koranda*, named after Army Nurse Lieut. Ernestine Koranda, who was killed in a plane crash in the southwest Pacific during December 1943. The Army Hospital Ship *Ernestine Koranda* formerly was known as the *Dorothy Luckenbach*, an intercoastal freighter, which was later converted into a 750 bed hospital ship in Brooklyn.

SUBCOMMITTEE ON ACCELERATION

The Subcommittee on Acceleration of the National Research Council's Aviation Committee met recently at Wright Field, Ohio, headquarters of Air Technical Service Command to coordinate army, navy and civilian research on flight acceleration conditions. The subcommittee studied the effectiveness of antigravity devices in fighter aircraft and shock forces precipitated by parachutes. The intensive conference program included a demonstration of helicopter flight, a discussion of the pneumatic fever unit and reports from allied air forces representatives.

1386TH SERVICE COMMAND UNIT HONORED

The Meritorious Service Unit Plaque was recently awarded to the 1386th Service Command Unit, Deshon General Hospital, Butler, Pa., "for superior performance of duty by the Headquarters Detachment in the performance of exceptionally difficult tasks, achievement and maintenance of a high standard of discipline during the period of July 1 through Nov. 30, 1944."

NEW COMMANDING OFFICERS IN ARMY HOSPITALS

Col. Harry A. Bishop, who recently returned from the European theater of operations, has been assigned to the post of commanding officer of Welch Convalescent Hospital, Daytona Beach, Fla. Col. Phillip L. Cook, formerly commanding officer of that hospital, has been assigned to Thomas M. England General Hospital, Atlantic City, N. J.

APPOINTED CONSULTING VASCULAR SURGEON

Dr. Charles Goodman, New York, was recently appointed consulting vascular surgeon to the U. S. Veteran's Facilities in the Second Corps Area, which includes U. S. Veterans Hospital 81, New York.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Illinois

Gardiner General Hospital, Chicago: Peptic Ulcer, Gallbladder and Liver Diseases, Drs. Andrew C. Ivy and Warren Cole, June 6; Thrombosis, Thrombophlebitis and Anticoagulants in Less Common Peripheral Vascular Diseases, Dr. Armand J. Quick, June 13; Chest Diseases and Diseases of the Larynx, Drs. Paul H. Holinger and William E. Adams, June 20; Low Back Pain, Drs. Edward L. Compere and Paul B. Magnuson, June 27.

Station Hospital, Fort Sheridan: Diseases of the Kidneys, Dr. Francis D. Murphy, June 6; Low Back Pain, Drs. Fremont Chandler and Harry E. Mock, June 13; Heart Disease and Allied Conditions, Drs. Newell C. Gilbert and George K. Fenn, June 20; Bone and Joint Infections, Dr. C. H. Hatcher and Lieut. Col. Ralph Soto-Hall, June 27.

Vaughan General Hospital, Hines: Exfoliative Dermatitis Capt. W. W. Tobin and Capt. N. L. Baker, June 1; Arterial Vascular Disease—Traumatic Lesions, Dr. Geza de Takats, June 7; Presentation of Cases, Major S. B. Grimes, June 8; Repair of Bone in Fractures and Diseases, Drs. Edwin Ryerson and Herman C. Schumm, June 13; Palindromic Rheumatism and Rheumatoid Arthritis, Capt. L. M. Schweiger, June 15; Diseases of the Kidneys—Urogenital Tract, Drs. LeRoy H. Sloan and Norris J. Heckel, June 20; Presentation of Allergy Cases, Capt. W. H. Horwitz, June 22; Blood Dyscrasias—Malaria—Filariasis, Dr. Raphael Isaacs and Col. Alexander Marble, June 27; Presentation of Cases, Capt. C. H. Ewing, June 29.

Mayo General Hospital, Galesburg: Heart Disease and Allied Conditions, Dr. Louis N. Katz, June 6; Bone and Joint Infections, Drs. Arthur Steindler and David Markson, June 13; Arterial Vascular Disease—Traumatic Lesions, Drs. Max Peet and Geza de Takats, June 20; Repair of Bone in Fractures and diseases, Dr. J. Albert Key, June 27.

Regional Hospital, Chanute Field: Malignancies in the Army Age Group—Medical X-Ray and Surgical Diagnosis and Treatment, Drs. Alexander Brunschwig and George J. Rukstinat, June 6; Endocrinology, Dr. Willard O. Thompson, June 13; Virus and Rickettsial Diseases—Medical and Neurologic Diseases and Treatment, Dr. Howard Shaughnessy, June 20; Psychosomatic Medicine, Drs. David Slight and Sidney A. Portis, June 27.

Michigan

Percy Jones General Hospital, Battle Creek: Cardiovascular Dynamics, Dr. Richard H. Lyons, June 4; Backache and Vertebral Lesions, Dr. Ralph Ghormley, June 11; Discussion of Testicular Tumors, Major H. Chapnick and staff, June 18; The Post-Scrub Typhus Syndrome, Capt. Mark Dale and staff, June 18; Cast Presentation, Capt. W. E. Peltzer and staff, June 18; Statistical Report of the Work of the Neurosurgical Section Since April 1, 1943, Lieut. Col. Frank H. Mayfield, June 25; Lesions of the Posterior Interosseous Branch of the Radial Nerve, Lieut. John H. Mayer, June 25; Repair of Cranial Defects with Tantalum (Analysis of Cases Done), Lieut. J. J. Byrne, June 25; Causalgia (Analysis of 75 Cases), Lieut. Jack L. Ulmer, June 25.

Virginia

A. A. F. Regional Hospital, Langley Field: Gastroenterology, Dr. Lay Martin, June 29; Traumatic Surgery of the Abdomen, Capt. John B. McKittrick, June 29.

Wisconsin

Station Hospital, Camp McCoy: High Blood Pressure, Dr. John B. Ludden, June 6; Laboratory Diagnosis and Its Relationship to Medical and Surgical Treatment, Dr. Philip F. Cohen, June 13; Conditions Affecting Glucose Metabolism, Dr. Elwood W. Mason, June 20; Brain and Spinal Cord Injuries, Dr. Theodore C. Erickson, June 27.

Station Hospital, Truax Field: Diseases of the Intestinal Tract—Medical and Surgical Diagnosis and Care, Drs. Karver L. Puestow and Erwin R. Schmidt, June 6; Plexus and Peripheral Nerve Injuries, Dr. Theodore C. Erickson, June 13; Dermatologic Diseases, Dr. G. A. Cooper, June 20; Burns and Plastic Surgery, Dr. Anthony R. Curreri, June 27.

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THE WAGNER-MURRAY-DINGELL BILL—S. 1050 OF 1945

An Analysis by the Bureau of Legal Medicine and Legislation, American Medical Association, May 26, 1945

IN GENERAL

The Wagner-Murray-Dingell bill differs in many respects from the previous one, some of which differences will be italicized or otherwise referred to in this and succeeding analyses. For one thing, it contains ninety-five more pages. Briefly and in broad outline, here is what the bill contains: It adds a new title to the Social Security Act for grants and loans for hospitals and health center construction. This title corresponds closely with the provisions of the Hill-Burton hospital construction bill, with significant exceptions. It provides for grants and services to develop more effective measures for the prevention, treatment and control of venereal diseases and tuberculosis and to extend and improve public health work. It proposes grants to states for maternal and child health services, for services for crippled children and for child welfare services. It would make available grants to states for public assistance to needy individuals, including medical care for such individuals. Section 9 proposes to amend title II of the Social Security Act to provide a national social insurance system. The amended title would provide for (*a*) prepaid personal health service, (*b*) a national system of unemployment and temporary disability insurance (including cash benefits for disability from sickness which causes unemployment), (*c*) retirement, survivor and extended disability benefits, (*d*) a national social insurance trust fund, (*e*) credit for military service, (*f*) extended coverage to include an estimated additional 15,000,000 persons, (*g*) contributions or taxes by employers, employees and the self employed and (*h*) certain general provisions to apply to the operation of the title.

Division of Contributions

Program	Employer	Employee	Total
1. Retirement, survivors and extended disability insurance	1.0%	1.0%	2.0%
2. Medical care and hospitalization insurance	1.5%	1.5%	3.0%
3. Unemployment insurance	1.0%	1.0%	2.0%
4. Temporary disability insurance	0.5%	0.5%	1.0%
Total contributions	4.0%	4.0%	8.0%

Some of the foregoing parts of the bill will be dealt with in subsequent analyses. The present analysis will be confined to that section of the bill proposing a system of compulsory health insurance to be "made available to 135,000,000 persons," in the words of Senator Wagner. In passing, it is perhaps significant to note that the term "compulsory" appears in no place in the releases made available by Senator Wagner to explain the contents of his bill and to construe its provisions. Rather the emphasis has been placed in such releases on the contention that the legislation will not interfere with the normal relationship between the patient and his physician and on the point of view that the health insurance provisions will not be mandatory on the medical profession.

The national social insurance system will be financed in general from a trust fund established by a 4 per cent employer and a 4 per cent employee contribution on wages and salaries up to the first $3,600 a year paid or received after Dec. 31, 1945. The first bill placed the ceiling at $3,000 a year and the employer-employee contribution at 6 per cent each. The contribution to be made by the self employed will be 5 per cent of the market value of services subject to the same ceiling limitation. The contribution by states and localities and by their employees will be 2.5 per cent of the first $3,600. The contributions that employers and employees will make to finance the system will be distributed as shown in the table.

MEDICAL, HOSPITALIZATION, DENTAL, NURSING AND RELATED BENEFITS IN GENERAL

Part A of the amended title II proposes a system of compulsory prepaid personal health service insurance to covered employees and certain specified dependents. As used in this part, the term "personal health service benefits" is defined to include general medical benefits, special medical benefits, general dental benefits, special dental benefits, home nursing benefits, laboratory benefits and hospitalization benefits. There was no provision in the first bill for dental or home nursing benefits. When the term "general medical benefit" is used, it means services furnished by a legally qualified physician or by a group of such physicians, including all necessary services such as can be furnished by a physician engaged in a general or family practice of medicine, at the office, home, hospital or elsewhere, including preventive, diagnostic and therapeutic treatment and care, and periodic examination. The definition in the earlier bill did not refer to services rendered "by a group of such physicians."

The term "special medical benefit" is defined as necessary services requiring special skill or experience, furnished at the office, home, hospital or elsewhere by a legally qualified physician who is a specialist *or consultant* with respect to the class of service furnished, *or by a group of such physicians, or by a group of physicians including such specialists or consultants.*

The term "general dental benefit" is defined to mean services furnished by a legally qualified dentist or by a group of such dentists, including all necessary dental services such as can be furnished by dentists engaged in the general practice of dentistry, with or without the aid of an assistant or hygienist under his direction, and including preventive, diagnostic and therapeutic treatment, care and advice, and periodic examinations. Similarly, the term "special dental benefit" is defined to mean necessary services requiring special skill or experience, furnished at the office, hospital or elsewhere by legally qualified dentists (with or without the aid of an assistant, hygienist or anesthetist under his direction) who is a specialist or consultant with respect to the class of service "furnished by a group of such dentists, or by a group of dentists, including such specialists or consultants."

"Home nursing benefit" means nursing care of the sick furnished in the home by (1) a registered professional nurse or (2) a practical nurse who is legally qualified by a state or, in the absence of state standards or requirements, who is qualified with respect to standards established by the Surgeon General after consultation with the Advisory Council and with competent professional nursing agencies and who furnishes nursing care under the direction or supervision of the state health agency, the health agency of a political subdivision of a state or an organization supplying and supervising the services of registered professional nurses.

A beneficiary entitled to laboratory benefits will receive such necessary laboratory or related services, supplies or commodities as the Surgeon General may determine, including chemical, bacteriologic, pathologic, diagnostic and therapeutic x-ray and related laboratory services, *refractions and other ophthalmic services furnished by a legally qualified practitioner other than a physician,* physical therapy, special appliances prescribed by a physician, and eyeglasses prescribed by a physician or other legalized practitioner. If any of the services, supplies or commodities covered by this definition are provided a hospitalized patient, or by a physician or dentist incidental to services rendered, payment therefor will be included in payments for hospitalization or for services furnished, respectively.

"Hospital benefit" is defined to mean an amount, as determined by the Surgeon General after consultation with the

Advisory Council created by the bill (S. 1161 required the determination to be made "after approval by Social Security Board"): not less than $3 and not more than $7 ($6 in the first bill) for each day of hospitalization not in excess of thirty days in a period of hospitalization, not less than $1.50 and not more than $4.50 ($4 in the first bill) for each day of hospitalization in excess of thirty in a period of hospitalization, and not less than $1.50 and not more than $3.50 ($3 in the first bill) for each day of care in an institution for the care of the "chronic sick." In lieu of such compensation, the Surgeon General may enter into contracts with participating hospitals for the payment of the reasonable cost of hospital service at rates for each day of hospitalization neither less than the minimum nor more than the maximum applicable rates previously mentioned. In S. 1161 such contracts were conditioned on the approval of the Social Security Board.

A new provision relating to these contracts with participating hospitals provides that payment may be included in a contract for inclusive services of a participating hospital and its staff or attending staff and that such payment will not affect the right of participating hospitals to require payments from patients with respect to the additional cost of more expensive facilities furnished for lack of ward facilities or occupied at the request of the patient, or with respect to services not included within a contract.

A hospital may become a "participating hospital" if it is an institution which provides all necessary and customary hospital services and is found by the Surgeon General to afford professional service, personnel and equipment adequate to promote the health and safety of individuals customarily hospitalized in such institutions. The Surgeon General may accredit a hospital for a limited variety of cases and may accredit an institution for the care of the "chronic sick," taking into account, for the purpose of such limited accrediting, the type and size of the community which the institution serves, the availability of other hospital facilities and such other matters as the Surgeon General may deem relevant.

NATIONAL ADVISORY MEDICAL POLICY COUNCIL

The pending bill contemplates the creation of a National Advisory Medical Policy Council. This Council will consist of the Surgeon General as chairman and sixteen members appointed by him without regard to the Civil Service laws and subject to the approval of the Federal Security Administrator. The appointed members will be selected from panels of names submitted by professional and other agencies and organizations concerned with medical, dental and nursing services and education and with the operation of hospitals and laboratories and from among other persons, agencies or organizations informed on the need for or provision of medical, dental, nursing, hospital, laboratory or related services and benefits. A new provision in the bill requires the membership of the Advisory Council to include (1) medical and professional representatives and (2) public representatives, in such proportions as are likely to provide fair representation to the principal interested groups that furnish and receive personal health services, having regard for the functions of the Advisory Council.

Appointed members will hold office for four years, with terms of office staggered, and will receive compensation at the rate of $25 a day for the time spent on official business with the Council plus actual and necessary traveling expenses. The Council will be required to meet not less frequently than twice a year and whenever at least four of the members request a meeting. The Advisory Council will advise the Surgeon General with reference to questions of general policy and administration in carrying out the provisions of this particular section of the bill, including (1) professional standards of quality to apply to personal health service benefits; (2) designation of specialists and consultants; (3) methods and arrangements to stimulate and encourage the attainment of high standards through the services of general or family practitioners, specialists and consultants, laboratories and other auxiliary services, and through the coordination of the services of physicians and dentists with those of educational and research institutions, hospitals and public health centers, and through other means; (4) standards to apply to participating hospitals, to the relations or coordination among hospitals and to the establishment and maintenance of the list of participating hospitals; (5) adequate and suitable methods and arrangements of paying for personal health service benefits; (6) studies and surveys of personal health services and of the quality and adequacy of such services; (7) policies and procedures for determinations of disability; and (8) grants-in-aid for professional education and research projects. Under the first bill the Advisory Council was also directed to advise the Surgeon General with respect to the establishment of special advisory, technical, local or regional boards, committees or commissions. Under the pending bill the Advisory Council is authorized to establish such groups, whose membership may include members of the Council or other persons or both, to advise on general or special questions, professional and technical subjects, questions concerning administration, problems affecting regions or localities, and related matters.

SELECTION OF PHYSICIANS; ACCEPTANCE OF PATIENTS; PANELS

The Surgeon General will be required to publish and otherwise make known in each local area to individuals entitled to benefits the names of medical and dental practitioners and groups of practitioners who agree to furnish services as benefits and to make such lists of names readily available to individuals entitled to benefits. A new provision in the pending bill provides that such lists must include general or family practitioners and qualified specialists and consultants. With respect to qualified specialists and consultants the lists must indicate the class or classes of specialist or consultant services for which each has been qualified. Any physician, dentist or nurse legally qualified by a state to furnish any services included as personal health service benefits will be legally qualified to furnish such benefits, including any group of physicians, dentists or nurses or combinations thereof whose members are similarly qualified. A limitation contained in the first bill conditioning the participation by a physician on rules and regulations prescribed by the Surgeon General has been eliminated.

Likewise a beneficiary may select any practitioner appearing on a panel to treat him subject to the consent of the practitioner or the group of practitioners, as the case may be. This freedom of choice of practitioner is conditioned, however, on the right of the Surgeon General to prescribe maximum limits to the number of potential beneficiaries for whom a practitioner or group of practitioners may undertake to furnish services, and such limits may be nationally uniform or may be adapted to take account of "relevant factors." A restriction in the old bill that the freedom of choice of physician must be exercised in accordance with such rules and regulations as the Surgeon General may prescribe has been eliminated. A new provision, however, has been added to the effect that every beneficiary and every group of beneficiaries will be permitted to make selection of a practitioner through a representative of his own choosing.

As in the bill introduced in the Seventy-Eighth Congress, the services of specialists, or consultants as added by the pending bill, will ordinarily be available only on the advice of the general practitioner. This is modified in the new bill so that such services may be made available on the advice of a specialist or consultant attending the individual or "when requested by an individual entitled to specialist and consultant services as benefits and approved by a medical administrative officer appointed by the Surgeon General."

The Surgeon General will designate what shall constitute specialist or consultant services. He will likewise determine who are qualified to render such services, in accordance with general standards prescribed by him after consultation with the Advisory Council. In establishing standards and in designating specialists and consultants, the Surgeon General will be required to "utilize standards and certifications developed by competent professional agencies" and must "take into account the personal resources and needs of regions and local areas."

PAYMENTS FOR THE SERVICES OF PRACTITIONERS

Payments to general medical and family practitioners or to general dental practitioners may be made (1) on the basis of fees for services rendered, according to a fee schedule, (2) on a per capita basis, the amount being according to the number of individuals entitled to benefits who are on the practitioner's list,

(3) on a salary basis, full time or part time or (4) on a combination or modification of these bases, as the Surgeon General may approve. The method of payment will apparently be determined in each local area as the majority of the general medical and family practitioners or of the general dental practitioners, respectively, may elect. A new proviso authorizes the Surgeon General to make payments by another method from the one selected in a local area to those general medical and family practitioners or general dental practitioners who do not elect the method designated by the majority. Any of the methods of making payments indicated in the foregoing may be used, as the Surgeon General may approve, in making payment to groups of practitioners that contain designated specialists or consultants as well as general or family practitioners. The Surgeon General may negotiate agreements or cooperative working arrangements to utilize inclusive services of hospitals and their staffs or attending staffs and may enter into contracts for such inclusive services.

Payments to designated specialists and consultants may be made on the basis of salary (whole time or part time), "per session," fee for service, per capita or other basis or combination, as the Surgeon General and the specialists and consultants may agree.

Rates or amounts of payment for particular services or classes of services may be nationally uniform or may be adapted to take account of relevant regional or local conditions and other factors. The bill contains a new provision that payments shall be adequate, "especially in terms of annual income or its equivalent and by reference to annual income customarily received among physicians, dentists and nurses, having regard for age, specialization and type of community." Payment will be commensurate with skill, experience and responsibility involved in furnishing service. In any local area where payment for services of a general or family practitioner is only on a per capita basis, the Surgeon General, the bill proposes, shall make per capita payments on a pro rata basis among the practitioners and groups of practitioners of the local area on the panel with respect to those individuals who after due notice have failed to select a general or family practitioner or who, having made one or more successive selections, have been refused by the practitioner or practitioners selected.

In each local area the provision of general medical or dental benefits will be a collective responsibility of all qualified general medical or family practitioners or of all qualified general dental practitioners, respectively, in the area who have undertaken to furnish such benefits.

HOME NURSING BENEFITS

The bill provides that home nursing benefits shall ordinarily be available only on advice of a legally qualified attending physician but may be made available also when requested by an individual entitled to the benefits and when approved by a medical officer designated by the Surgeon General. The method to be used in paying for home nursing services is not clear.

LIST OF PARTICIPATING HOSPITALS

The Surgeon General is directed to publish a list of institutions which he finds to be participating hospitals in accordance with general standards prescribed by him after consultation with the Advisory Council. Any institution which is not included in the list, or any institution having been removed from the list, may petition the Surgeon General for a hearing. The bill provides that the Surgeon General shall exercise no supervision or control over a participating hospital unless it is owned or leased and operated by the United States. No requirement for participation by a hospital may prescribe its administration, personnel or operation.

LIMITATIONS ON GENERAL MEDICAL, GENERAL DENTAL, HOME NURSING AND LABORATORY BENEFITS

The Surgeon General, after consultation with the Advisory Council and subject to the approval of the Administrator of the Federal Security Agency, may determine that every individual entitled to general medical, general dental or home nursing benefits may be required by the physician, dentist or nurse attending him to pay a fee with respect to the first service or with respect to each service in a period of sickness or course of treatment if he believes that such a limitation is necessary and desirable to prevent or reduce abuses of entitlement to the benefits. The maximum amount of such fee may be fixed by the Surgeon General after consultation with the Advisory Council and with the approval of the Administrator of the Federal Security Agency. He may also limit the application of such fees to home calls, to office visits or to both.

A new provision in the bill would authorize the Surgeon General, after consultation with the Advisory Council and with the approval of the Administrator of the Federal Security Agency, to restrict the content of the general dental, special dental or home nursing benefit. On and after Jan. 1, 1947, however, the restricted content of the general dental or special dental benefit must include at least (1) examination (including x-rays) and diagnosis, (2) prophylaxis, (3) extraction of teeth which are considered by the dentist and an attending physician to be or likely to be injurious to the general health of the individual and (4) treatment of acute diseases of the teeth, their supporting structures and adjacent parts, including fractures of the teeth or jaw. He may also fix an age above which the restrictions on content shall apply.

As to the home nursing benefits, restriction of content may limit the service to part time care on an hourly or visit basis or may limit the types of cases for which such benefits shall be available, or the maximum amount of service per case, or otherwise.

The maximum number of days in any benefit year for which an individual may be entitled to hospitalization will be sixty (thirty in the bill introduced in the Seventy-Eighth Congress). This maximum may be increased to not more than one hundred and twenty days in a calendar year if funds are adequate.

No application for hospitalization benefits will be valid with respect to any day of hospitalization if filed more than ninety days after such day, or with respect to any day of hospitalization more than thirty days following the diagnosis of tuberculosis or psychosis, or with respect to any day in a hospital or other institution for mental or nervous disease or tuberculosis.

Likewise the Surgeon General, after consultation with the Advisory Council and with the approval of the Federal Security Administrator, may limit for any calendar year or part thereof the cost of laboratory benefits. Such limitation may relate to a class of services, supplies or commodities, to maximum payments per beneficiary in a benefit year, to a specified fraction of the cost or to combinations thereof.

PROPOSED METHOD OF ADMINISTRATION

The bill provides that the Surgeon General shall perform the duties imposed on him under the supervision and direction of the Federal Security Administrator and after consultation with the Advisory Council *as to questions of general policy and administration.* He will be authorized to take all necessary steps to arrange for the availability of the benefits provided. He will be authorized, after consultation with the Advisory Council *as to questions of general policy and administration* and with the approval of the Administrator to negotiate and periodically to renegotiate agreements or cooperative working arrangements with appropriate agencies of the United States, or of any state or political subdivision, and with other appropriate public agencies. He may, too, make such agreements or arrangements with private persons or groups of persons to utilize their services and facilities and to pay fair reasonable and equitable compensation therefor. He may negotiate and periodically renegotiate agreements or cooperative working arrangements for the purchase or availability of supplies and commodities necessary for the benefits provided in the bill and to enter into contracts for such services, facilities, supplies and commodities.

Except with respect to state or local areas for which other arrangements have been made, the Surgeon General will be directed to appoint local area committees to aid in the administration of the part of the bill relating to compulsory health

insurance. These committees will include representatives of persons entitled to receive services and benefits, the practitioners, the groups of practitioners, institutions and agencies furnishing services as benefits, and other persons informed on the need for, or provision of, personal health services. Such committees, the bill provides, must be consulted at frequent intervals and must be kept informed by the local area officers of the Public Health Service with respect to arrangements for the availability of benefits and policies to be followed.

The Surgeon General will be directed to give priority and preference to utilizing the facilities of state and local departments or agencies on the basis of mutual agreements with such departments or agencies. He may delegate to any officer or employee of the United States Public Health Service or of any federal, state or local cooperating department or agency such of his powers and duties, except the prescribing of rules and regulations, as he may consider necessary and proper. He may, after consultation with the Social Security Board, after consultation with the Advisory Council *as to questions of general policy and administration,* and with the approval of the Federal Security Administrator, prescribe and publish such rules and regulations and require such records and reports, not consistent with other provisions of the bill, as may be necessary.

The Surgeon General will be required to make a full report to Congress, at the beginning of each regular session, of the administration of the functions devolved on him by the bill, and such reports must include "a record of consultation with the Advisory Council, recommendations of the Advisory Council, and comments thereon."

RELATION TO WORKMEN'S COMPENSATION BENEFITS

No individual will be entitled to any personal health service benefits with respect to any injury, disease or disability on account of which any medical, dental, home nursing, laboratory or hospitalization service is being received, or on application would be received, under a workmen's compensation plan for the United States or of any state.

BENEFITS FOR NONINSURED PERSONS

Benefits may be extended to noninsured persons on behalf of whom equitable payments are made or assured by public agencies of the United States, the several states, or any of them or of their political subdivisions. The bill specifically extends this provision to groups of persons for whom the Congress makes provision under the Social Security Act and other acts of Congress.

ADDITIONAL BENEFITS IN CONTEMPLATION

The Surgeon General and the Social Security Board will be jointly given the duty of studying and making recommendations as to the most effective method of providing dental, nursing and other benefits not already provided for and of reporting their recommendations as to legislation from time to time but not later than two years after the enactment of this bill. The studies and recommendations will relate to expected costs for the additional benefits and a desirable division of the costs between (1) financial resources of the social security system or other public fund and (2) payments to be required of beneficiaries receiving such benefits. Specifically, the Surgeon General and the Social Security Board are mandated to study and make recommendations as to needed services and facilities for the care of the "chronic sick" afflicted with physical ailments and for the care of individuals affected with mental or nervous diseases, recommendations as to legislation to be submitted from time to time but not later than three years after the enactment of this bill.

GRANTS-IN-AID FOR MEDICAL EDUCATION, RESEARCH AND PREVENTION OF DISEASE AND DISABILITY

With the exceptions noted, the provisions in the pending bill authorizing grants for medical education, research and prevention of disease and disability are identical with those that were contained in the original Wagner-Murray-Dingell bill. Under these provisions the Surgeon General will be authorized to administer grants-in-aid to nonprofit institutions and agencies engaging in research or in undergraduate or postgraduate professional education. Such grants will be made with respect to each project (1) for which application has been received from a nonprofit institution or agency, stating the nature or the project and giving the reasons for the need of financial assistance in carrying it out, and (2) for which the Surgeon General finds, with the advice of the Council and *after consultation with other federal departments and agencies concerned with research or professional education* that the project shows a promise of making valuable contributions to the education or training of persons useful to or needed in the furnishing of medical, *dental, nursing* hospital, *laboratory,* disability, rehabilitation and related benefits, or to human knowledge with respect to the cause, prevention, mitigation or method of diagnosis or treatment of disease and disability.

Another new provision would make it mandatory that the Surgeon General and the Advisory Council give preference and priority, during the five year period beginning Jan. 1, 1946, to grants-in-aid with respect to projects to aid servicemen seeking postgraduate education as medical or dental practitioners or training for administration of personal health services, disability benefits, rehabilitation services and related services.

To finance this part of the program a certain percentage of amounts expended for benefits from the social security trust fund will be set aside. The amount to be set aside, the bill provides, will equal 1 per cent of the total amount expended for benefits from the trust fund, exclusive of unemployment insurance benefits, or 2 per cent of the amount expended for personal health service benefits after the latter benefits have been payable for not less than twelve months, whichever is the lesser, in the last preceding fiscal year.

EXISTING PREPAYMENT PLANS

Senator Wagner believes that the enactment of S. 1050 will not necessarily result in the displacement of existing prepayment medical service and hospitalization plans. In the statement that he made to the Senate when the bill was introduced, he said:

> There has been much misunderstanding about the part that voluntary hospitals, group service organizations, existing voluntary insurance or prepayment plans and similar agencies may play in the social insurance system. Let me emphasize that our bill makes a place for them, so that they can continue their good work. All qualified hospitals, all qualified medical groups or organizations, will be able to participate in the program as organizations that will furnish services to the insured persons who choose them, they will receive fair payments for the services they furnish as insurance benefits and they will have enlarged opportunities to be service agencies for particular groups or for their communities. This applies to service organizations created by trade unions, consumer groups, employers, nonprofit community groups, churches, fraternal associations, groups of doctors or individual doctors, medical societies or many other kinds of sponsors or combinations of sponsors The bill not only provides for utilizing existing service organizations but it also encourages the creation of new ones
>
> The Blue Cross hospital insurance plans will be able to continue to act as representatives of the participating hospitals and the community groups that own or manage the hospitals, and they will have large opportunities to be important public organizations that facilitate the administration of vital parts of the insurance system The same will be true for many other community and public organizations
>
> Medical service groups (private clinics, salaried staffs of hospitals, group service plans such as the Kaiser or the Ross-Loos plan) furnishing service under the social insurance system would be as free as they are today to select their own staffs and their own method of paying physicians and others on their staffs, irrespective of the method of payment which prevailed among the individually practicing physicians or dentists of the local area.

The bill itself, however, does not specifically mention existing prepayment medical service and hospitalization plans. It does direct the Surgeon General, after consultation with the Advisory Council as to questions of general policy and administration, and with the approval of the Federal Security Administrator, to make agreements or arrangements with private agencies or institutions, or with private persons or groups of persons, to utilize their services and facilities. To what extent the importance and effectiveness of existing plans could be preserved under such agreements or arrangements is a matter about which many will entertain serious doubts.

Council on Medical Service and Public Relations

MEETING OF MAY 10 AND 11, 1945

The meeting of the Council on Medical Service and Public Relations was called to order by the Chairman, Dr. John H. Fitzgibbon, Portland, Ore., in the Council offices, American Medical Association, Chicago.

Council members present were Dr. Edward J. McCormick, Toledo, Ohio, Vice Chairman; Dr. H. L. Kretschmer, Chicago; Dr. Louis H. Bauer, Hempstead, N. Y.; Dr. A. W. Adson, Rochester, Minn.; Dr. James R. McVay, Kansas City, Mo.; Dr. James E. Paullin, Atlanta, Ga.; Dr. Thomas A. McGoldrick, Brooklyn; Dr. Olin West, Chicago; Mr. Thomas A. Hendricks, Chicago, Secretary, and Dr. Joseph S. Lawrence, Director of the Washington Office of the Council.

Other A. M. A. and state society officials present were Dr. R. L. Sensenich, South Bend, Ind., Trustee, A. M. A.; Dr. Charles Fidler, Milwaukee, president, State Medical Society of Wisconsin; Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL; Dr. Edwin P. Jordan, Chicago, Associate Editor of THE JOURNAL; Dr. Carl M. Peterson, Chicago, Secretary, Council on Industrial Health; Mr. J. W. Holloway Jr., Chicago, Director of the Bureau of Legal Medicine and Legislation; Dr. Thomas G. Hull, Chicago, Director, Scientific Exhibits; Dr. Austin Smith, Chicago, Secretary of the Council on Pharmacy and Chemistry; Dr. Victor Johnson, Chicago, Secretary of the Council on Medical Education and Hospitals; Mr. John L. Bach, Director, Press Relations; Mr. T. V. McDavitt, Chicago, Bureau of Legal Medicine and Legislation; Col. Robert D. Bickel, Liaison Officer to the American Medical Association from the Office of the Surgeon General.

Approval of the Minutes of the Meeting of Feb. 13 and 14, 1945.—On the motion of Dr. McVay, seconded by Dr. Bauer, the minutes were approved.

Suggestion for the Formation of Indemnity Insurance Corporation.—Dr. Bauer introduced Mr. Rowland George, president of the United Medical Service of New York, who presented to the members of the Council a plan for the formation of a stock corporation providing prepayment medical expense indemnity on a nonprofit basis. This corporation, according to the plan, was to be formed and operated under the insurance laws of the state of New York. In regard to Mr. George's suggestion, Dr. McCormick moved that the chairman appoint the General Manager and two members of the Board of Trustees and two members from the Council to convey to Mr. George the reactions to his proposal.

The motion was seconded by Dr. Adson and carried.

The following committee was appointed: Chairman, Dr. Edward J. McCormick; members, Drs. West, Bauer, Sensenich and Adson.

The following letter was prepared and sent to Mr. George:

Dear Mr George,

The Council on Medical Service and Public Relations of the American Medical Association appreciates your coming to Chicago to discuss the proposed plan of establishing a national indemnity corporation and placing the matter before it.

The Council is desirous of doing all in its power to carry out the mandates of the House of Delegates of the A. M. A. to stimulate the development of medical society plans and extend the area of coverage so that the whole United States may be covered by such plans.

The Council has considered the statements made by you yesterday, the memorandum on the formation of a national surgical corporation to cooperate with the Blue Cross and medical plans which you left with the Council and also a letter from Mr. William C. Breed Jr. addressed to Dr. Bauer.

It would appear to the Council that your plan is not yet wholly definite as to the following points.

1. You do not yet have a license to operate either in New York or in any other state.
2. You are not yet certain that you will be allowed to use the funds of the Associated Hospital Service and the United Medical Service.
3. It is not yet definite as to the makeup of the board of directors, although at present the idea is to have them all from New York.
4. The holding corporation, while it is to be composed of at least 51 per cent from the medical profession, at present is to be drawn entirely from the United Medical Service of New York or those they may select. It was stated, however, that this might be changed, but how changed has not yet been determined.
5. It was stated that there would be no competition with existing medical society plans and that, as soon as such plans were available, or if they were already available, the national organization would then withdraw from that local field. However, there is no definite statement in either written memorandum that such would be the case.

For these reasons we believe you will understand that the Council cannot approve what is not yet in effect and the details of which have not yet been wholly worked out.

The House of Delegates of the A. M. A. has set up certain minimum standards on both indemnity and service plans and it is the opinion of the Council that any company operating in the field of medical care insurance would have to set up the following minimum specifications in order to meet with the approval and cooperation of the medical profession.

1. Any plan developed must deliver medical control of all medical policies and medical service into the hands of the medical profession.
2. The final approval of the selection of any medical control board set up under 1 should in the last analysis be by a responsible group of the organized medical profession.
3. The plan must not interfere with [illegible] her cash indemnity or service plans developed b[illegible]
4. The practice of hospitals selling [illegible]pproved, and the special services of anesthesiology, pathology, radiology, physical therapy in any other medical service should be covered in the medical contract and not in the hospital contract.

The House of Delegates of the A. M. A. has approved both cash indemnity and service plans with the proviso that these plans are so constituted that (1) they give good medical care, (2) they are approved by the local medical societies involved (although not necessarily actually developed by the medical society), (3) the part played by the A. M. A. is restricted to the adoption of broad general principles and to acting as a clearing house and, (4) since conditions vary in different localities, plans should be largely local in character so far as details are concerned, and national only so far as broad general principles are concerned.

In the development of any cash indemnity national plan, therefore, it would appear that the four items listed in the second preceding paragraph are those that are most pertinent.

Again, permit us to thank you for your courtesy and cooperation.

Sincerely yours,

JOHN H. FITZGIBBON, M.D.
Chairman, Council on Medical Service and Public Relations

Dr. McCormick moved the adoption of the report.

Request for Consulting Committee by Insurance Companies.—Dr. Harry E. Ungerleider and Mr. Wendell Milliman of the Equitable Life Insurance Company, representing a group of large insurance companies, requested that a consulting committee be appointed by the Council to rate various surgical procedures on a unit system for the purpose of insurance reimbursement. Dr. Bauer moved that the Council appoint a consulting committee, including the various surgical specialties, to consider the feasibility of the assessment of the various surgical procedures on a unit system for purposes of insurance reimbursement. The motion was carried.

Dr. Jordan said that the American Medical Association had published a Standard Nomenclature of Operations which would be useful to the committee. Dr. Hull suggested that each member of the committee be supplied with a copy of the book on nomenclature.

Suggestions for Medical Care.—Dr. Lawrence presented suggestions in regard to the medical care problem which were considered by the Council but not approved.

Legislation.—Dr. Lawrence, Mr. Holloway and Dr. Victor Johnson discussed pending national legislation.

Supply of Medical Students.—Dr. Johnson will make a statement in regard to the situation for a Council News Letter.

Commercial Health Insurance Meeting.—It was decided that there should be a joint meeting of the members of the Council on Medical Service and Public Relations and the Council on Industrial Health, or possibly the executive committee of both Councils, depending on the agenda planned by Dr. Peterson and Mr. Hendricks. If insurance men are invited, the full Councils should meet.

Employment of Insurance Study Director.—Dr. McCormick moved that the Council should recommend to the Board of Trustees the selection of the best available talent to institute an insurance study bureau in the American Medical Association headquarters under the direction of this Council, and that the study be under way prior to the meeting of the House of Delegates.

Dr. McGoldrick suggested the following modification: "The Council requests and urges the Board of Trustees to lend every assistance to Dr. West and this Council for the speedy selection of a qualified director of insurance."

The motion as amended was carried.

Insurance Company Programs.—The Liberty Mutual Company program was presented by Dr. Peterson.

Comment on prospectus of G. H. Poulsen & Co., through the underwriting facilities of the Metropolitan Casualty Insurance Company of New York, was made by Dr. McCormick.

An indemnity plan underwritten by a nationally recognized insurance carrier is being prepared by Don Hawkins, insurance executive.

In each case enough copies of these proposed plans were to be obtained for each member of the Council.

Listing and Fellowships for Men in Service.—It was moved by Dr. McCormick and seconded by Dr. Adson and carried "that the Council recommend to the Board of Trustees and officers of the American Medical Association that all members in the military service who have been Fellows of the American Medical Association be carried in the directory as Fellows whether they take THE JOURNAL or not until the cessation, and men entering service if they are Fellows be listed as Fellows in the directory until the end of the war, or until six months thereafter, or the termination of their service."

The motion was amended by Dr. McCormick to read that "they retain their membership."

Committee on Chronic Diseases.—Dr. McCormick moved that "this Council recommend the appointment of a committee on chronic diseases." The motion was carried after amendment to read that "the Council recommend that the Board of Trustees appoint such a committee."

Preparation of Annual Report.—Dr. McCormick moved that the annual report of the Council be sent to state associations for publication in their journals and to THE A. M. A. JOURNAL if a meeting of the House of Delegates is not held. The motion was carried.

Interim Body with Power to Act.—Dr. Adson moved that a committee be appointed which will consist of the executive Committees of the Board of Trustees and the Council which is to implement the activities of the House of Delegates during the interim between their meetings on subjects of public policy. The motion was carried.

American Cancer Society Clinics.—Mr. Louis Neff, director, American Cancer Society, discussed the program of the establishment of clinics by the society.

Dr. McCormick made the following motion after discussion: "The work of the American Cancer Society be supported by this Council with the understanding that all work done in the various counties be done under the supervision of the county medical society and that a committee be appointed by the chairman of this Council to act as an advisory committee of the Council cooperating with the American Cancer Society until such time as the committee on chronic diseases is appointed, when it might seem feasible for this committee to take over the work." The motion was seconded by Dr. McGoldrick.

The committee appointed by the chairman has the following membership: Chairman, Dr. McGoldrick; members, Drs. Bauer and McCormick.

Suggestion for State Society Information Service.—Suggestion that an information service to coordinate the work of the state medical society and the state health department in anticipation of the Hill-Burton bill set up under the direction of the American Medical Association in each state medical society was presented to the Council by Miss Virginia Shuler of the Bureau of Information.

Dr. Paullin suggested "I think it would be fine if this Council endorse the plans as set forth here by Miss Shuler and that such plans be transmitted to the Committee on Postwar Medical Service." It was decided to follow this suggestion.

Material for Journal A. M. A.—Mr. Hendricks stressed the desire of the Council to obtain information from Council members as to public appearances, speeches given and so on for use in the News Letter and also publication in THE JOURNAL.

News Letter.—It was agreed that the names of those doctors who desire the News Letter be added to the mailing list. Also that once or twice a year a questionnaire be included in the issues to find whether or not doctors want to continue receiving the News Letter.

The Council approved having reprints made of the following, and distributed through the News Letter:

1. "Do Not Socialize Your Medical Care," by Dr. John H. Fitzgibbon, from April 1945 issue of The Republican.
2. "Should we have Government Health Insurance?" a debate between Hon. Andrew J. Biemiller and Dr. Louis H. Bauer.
3. Copy of "Status of the English Doctor," copied from the Jackson County Medical Society Bulletin and brought to the attention of the Council by Dr. Lawrence.

Conference of Seventeen Presidents.—Dr. McCormick reported on the conference of seventeen presidents held at Detroit, April 27-28, under the auspices of the Michigan State Medical Society. He reported that this conference passed the following resolution:

Be It Resolved,

1. That this group expresses its continued loyalty to the American Medical Association;
2. That it is the duty of the various state medical societies to advise the American Medical Association, through its Council on Medical Service and Public Relations, of their wishes in regard to national health legislation;
3. That the presidents of the several states and District of Columbia medical societies, or their representatives, act as a permanent committee immediately to set up Drafting Panels in each state for this purpose;
4. That states not represented here today be invited and encouraged to join in this work;
5. That the president of the Michigan State Medical Society be designated as temporary chairman of this committee to facilitate its activities.

Suggestions for Council Work.—Copies of the letters from Charles Crownhart, executive secretary of the State Medical Society of Wisconsin, and John Farrell, executive secretary of the Rhode Island Medical Society, in regard to suggestions, sent to members of the Council.

Letter of Appreciation to Dr. W. S. Leathers.—The Secretary of the Council was instructed to write Dr. Leathers expressing regret because of his resignation.

Regional Meeting in West.—There should be an announcement from the Council that it is planning a meeting in the West and will hold it as soon as possible, when travel conditions improve.

Executive Meeting of the Council.—An executive committee meeting will be held before a full Council meeting is held.

Public Relations Organization Plan.—The suggestion that an organization chart be prepared for the next meeting of the Council indicating its relationship and functions was given approval by the Council. The Council recommended that the Secretary study the public relations plans of large organizations.

Very respectfully submitted,

JOHN H. FITZGIBBON, M.D., Chairman.
THOMAS A. HENDRICKS, Secretary.

Official Notes

DOCTORS LOOK AHEAD

Broadcast on the network of the National Broadcasting Company will include the following programs in the next four weeks:

June 9. They Shall Hear Again: A program devoted to the needs of the hard of hearing and indicating new opportunities for them through the use of hearing aids, lip reading, medical treatment and occasionally surgery. Guest speaker Howard A. Carter, B.S. in M.E., Secretary of the American Medical Association Council on Physical Medicine.

June 16. Home Was Never Like This: A program devoted to the possibilities of the American health resort or spa in the treatment of disease. Guest speaker Dr. Walter S. McClellan, Chairman of the American Medical Association Committee on Health Resorts, speaking from New York.

June 23. Postwar Doctor: Problems in medical education and their influence on the public health. Guest speaker Dr. Victor Johnson, Secretary of the American Medical Association Council on Medical Education and Hospitals.

June 30. Health in Schools: A program devoted to health education and related topics in our schools, in which doctors look ahead to greater progress in the next decade. Speaker Dr. Charles C. Wilson, Teachers College, Columbia University, speaking from New York.

Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting Company network each Saturday at 4:30 p. m. Eastern War Time (3:30 p. m. Central War Time, 2:30 p. m. Mountain War Time and 1:30 p. m. Pacific War Time).

Owing to conflicts in schedule, Doctors Look Ahead, which was not heard in Chicago on May 26, will continue to be heard

in Chicago at 3 p. m. Central War Time, but each program as scheduled on the preceding page will be heard in Chicago one week later. Doctors Look Ahead will close with the program of June 30; this will be heard in Chicago on July 7.

BUREAU OF PUBLIC RELATIONS CHANGES STAFF

Mr. Lawrence C. Salter, associate in public relations in the Bureau of Public Relations of the American Medical Association, has resigned, effective June 1. Mr. Salter is establishing a private agency in the field of public relations, particularly as related to medicine and science. Mr. Salter is succeeded by Mr. John L. Bach, who from June 1 will be responsible largely for the preparation of the *American Medical Association News* and for the publicity releases made by the headquarters office of the American Medical Association.

Washington Letter

(From a Special Correspondent)

May 28, 1945.

Surgeon General for Veterans Administration Proposed

Creation of the office of Surgeon General for the Veterans Administration, establishing a setup comparable to the medical corps of the Army and Navy, is proposed in a bill introduced by Representative Rankin, Democrat of Mississippi, after he and Veterans Administrator Frank T. Hines had conferred with President Truman. Rankin said the President had approved the bill "in principle." To give the administrator free reign in selecting personnel, the measure would take veterans' hospital medical personnel out of Civil Service. It would also call for a wartime draft of nurse and other medical personnel for the agency to help get "the best available" medical care for veterans.

Latest development in the probe of charges against the agency of inefficiency in the operation of veterans' hospitals is a move in Congress to have the inquiry taken away from Representative Rankin and his Veterans Committee. It is proposed that Representative Philbin, who has criticized Rankin's conduct of the hearing, head a new investigation. Meantime the Veterans Administration has endeavored to counteract charges against what Brigadier General Hines calls an effort to "destroy confidence" in the agency by launching a publicity campaign through its field offices.

Hearings on Physically Handicapped Continue

Wendell Burge, assistant United States attorney general, supplemented his charges of monopoly in the production, distribution and sale of certain drugs and appliances when he continued testimony before the subcommittee on aid to the physically handicapped. Hearings continued later in the week on the causes, prevention and treatment of epilepsy and general problems of the epileptic. Among witnesses were Dr. William G. Lennox, Harvard Medical School, Boston; Dr. A. L. Van Horn, director of health service, Children's Bureau, U. S. Department of Labor; Frank D. Ashburn, headmaster, Brooks School, North Andover, Mass.; Wilfred B. Johnston, safety engineering instructor, Northeastern University, Boston; Ralph J. Crosby, insurance executive, Marsh and McLennan, New York City; Dr. Jerry Price, Tiffin State Institute, Tiffin, Ohio, and Mrs. Brooks Potter, president, American Epilepsy League, Inc., Boston.

Veterinarians Accused of Fostering Rabies Scares

Dr. Millicent Morden, Brooklyn physician, told a House District subcommittee considering compulsory antirabies vaccinations that many veterinarians deliberately agitate rabies scares to sell serums and charge vaccination fees. Other opposing witnesses said that vaccination spreads rabies instead of preventing it, and James P. Briggs, president of the Humane Educational Society, said no vaccine yet developed justified compulsory use on dogs. Despite these adverse witnesses, District and Federal health department officials backed up the District commissioners in their demands for authority to order vaccinations of dogs during rabies scares. A supporting witness, Dr. William D. Claudy, member of the National Capital Kennel Club, said he had served on a committee to investigate the rabies situation here and quoted American Medical Association reports to back his conclusion that vaccination is "not 100 per cent perfect" but does increase resistance of dogs to rabies infections. Favoring the measure were Dr. Ruhland; Dr. H. C. Schoening, chief of the pathologic division, Bureau of Animal Husbandry; Dr. James G. Cummings, director of communicable disease bureau, District Health Department; Dr. Reed R. Ashworth, and Dr. Claudy. Opposing the measure were Mrs. H. D. Albin, secretary, Animal Protective Association, and others.

Another Hearing on Capital Hospital Center Planned

Another hearing is to be held on the proposed 1,500 bed hospital center for the District, says Representative Murphy, Democrat of Pennsylvania, chairman of the Fiscal Affairs Subcommittee of the House District Committee. At the hearing last week conflicting testimony was given on Washington's need for the proposed center. Henry J. Sullivan, division engineer of the Federal Works Agency, told the subcommittee he believed the Capital should meet its need for hospital facilities by replacing existing obsolete institutions rather than through creation of the new medical center. He submitted survey figures to show that the District now has four hospital beds per thousand of population, and he declared that when new hospitals for Georgetown and George Washington universities are completed there will be 5 beds per thousand persons. He said that authorities agreed the latter figure should be the standard. Wherever the center might be erected, he warned that "in ten or fifteen years you might wish you hadn't." Health Officer George Ruhland, however, supported the center, declaring that recent population growth of the metropolitan area more than justified the 1,500 bed center. His figures submitted at the hearings on the Tydings-Bilbo measure estimated the population of the District at 950,000, with about 1,268,000 concentrated within the metropolitan area. He estimated hospital beds here at 3.7 per thousand of population and declared that the District requires an additional 1,468 beds to assure medical treatment for all needing it. Charles D. Drayton, president of Children's Hospital and chairman of the Hospital President's Association, urged House approval. Representative Bates, Republican of Massachusetts, said he had an "open mind" on the question, but he pointed out that the bill involves a new policy for Congress in providing funds for an enterprise which after establishment would be conducted by private interests.

Capital Notes

Two temporary buildings at St. Elizabeths Hospital, described as "firetraps" and a grave menace to 300 aged or insane inmates, will be replaced by a modern 500 bed structure under a bill approved by the House, which provides over $2,500,000 building funds for the hospital in a Labor Department and Federal Security Agency appropriation.

Present easing of War Production Board controls will not greatly improve meeting drug and pharmaceutical industry requirements for materials and supplies currently on short supply, says John T. Batson, chief of the Drugs and Cosmetics Branch of the Chemicals Bureau, WPB.

Medical supplies for army installations in Florida, Georgia, South Carolina, North Carolina and Virginia, formerly handled at Savannah Medical Depot, will be taken over by the Atlanta Army Service Forces depot, the War Department states.

The Red Cross reports that a million dollars' worth of food and medical supplies for American prisoners of war held by the Japanese have been shipped from a West Coast port to the Russian far eastern port of Vladivostok.

District of Columbia coffers will be swelled by an estimated $500,000 through a drive to collect hospital fees from financially solvent "indigent" patients in St. Elizabeths and other local institutions.

A Negro woman who carried typhoid germs which caused death of another Negro has been warned to stay away from food handling on the threat that if she is caught at such work a third time she will be arrested.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

State Medical Election and Meeting.—Dr. *Philip K. Gilman*, San Francisco, was inducted into the presidency of the *California* Medical Association during its seventy-fourth annual session in *Los Angeles* May 6. Dr. *Samuel J. McClendon*, San *Diego*, was named president-elect. Delegates to the American Medical Association include Dr. *Robertson Ward*, San Francisco, Dr. McClendon, Dr. *Lowell S. Goin*, Los Angeles and Dr. *Dwight H. Murray*, *Napa*. The house of delegates adopted two amendments to the constitution, the first of which made a slight change in the personnel of the state council by abolishing the office of past president, and the second of which removed certain technical difficulties affecting the obtaining of retired membership. A resolution was adopted providing for the establishment of an advisory planning committee to be composed of lay employees of various medical bodies including the executive secretaries of the Los Angeles County Medical Association, the Alameda County Medical Association, the Public Health League of California and the California Medical Association, the associate counsel of the state medical association, the lay representative of the council and such other lay employees as the council of the state association may designate. As constituted at present, the members of the committee will consist of Stanley K. Cochems, Rollen Waterson, John Hunton, Howard Hassard, W. Glenn Ebersole and Ben H. Read. The committee was instructed to study the economic and health factors involved in medical and hospital care problems as at present under consideration or as may hereafter be brought to the committee, to act in other matters as the council of the California Medical Association may from time to time direct and to make reports to the council of the California Medical Association in respect to all of these matters, outlining actions to be taken with reasons therefor. The meeting was held under the presidency of Dr. Goin. The scientific session, which was prepared under the auspices of the Los Angeles County Medical Association, included panel discussions on diseases of the liver and on vascular diseases and symposiums on wartime medicine and psychogenic factors in obstetrics and gynecology. Among the speakers were:

Dr. Harry L. Arnold Jr., Honolulu, The Diagnosis of Early Leprosy.
Lieut. Col. Ralph Soto-Hall, M. C., and Lieut. Col. Morris Thomas [illegible] M. C. An Evaluation of Methods of Treatment of Comminuted Shaft of the Femur.
Ca [illegible] (MC), Modernization of Quarantine Regulations to Prevent the Transmission of Tropical Diseases to the United States.

The symposium on wartime medicine included the following speakers:

Comdr. Richard B. Schutz (MC), Filariasis.
Capt. Louis E. Mueller (MC), Aviation Medicine.
Lieut. Comdr. Milton B. Filberbaum (MC), Cardiac Murmurs and Pain.
Comdr. Walter Rapaport (MC), War Neuroses.

CONNECTICUT

Dr. Peter Goes to Washington.—Dr. William W. Peter, New Haven, has resigned as associate professor of public health and chief of sanitary inspection in the department of health, Yale University School of Medicine, to become director of the training division of the Institute of Inter-American Affairs, Washington, D. C., according to the New York *Times*.

ILLINOIS

Graduate Conferences.—The Illinois State Medical Society will sponsor a postgraduate conference at the Emmerson Hotel, Mount Vernon, June 7, with Dr. Andy Hall, Mount Vernon, presiding, who will speak on "Reminiscences of Fifty-Four Years in the Practice of Medicine." Among speakers will be:

Lieut. Col. Earl R. Denny, M. C., Penicillin.
Dr. Willard C. Scrivner, East St. Louis, Sterility.
Dr. Edward W. Cannady, East St. Louis, Recent Advances in Treatment of Essential Hypertension.
Dr. Frank E. Maple, Chicago, Treatment of Abortion.
Dr. G. Henry Mundt, Chicago, Management of Sinus Disease.
Dr. Edward L. Compere, Chicago, Treatment of Compound Fractures.
Dr. William O. Thompson, Chicago, Recent Advances in Endocrinology.
Dr. H. William Elghammer, Chicago, Rheumatic Fever in Children.
Dr. Edwin S. Hamilton, Kankakee, Future of Medicine.

A similar conference with the staff of the Mayo General Hospital, Galesburg, cooperating was held for western Illinois in Galesburg, May 17. The speakers included:

Capt. Leo A. Kaplan, M. C., Psychiatric Factors Delaying Recovery.
Capt. David I. Abrahamson, M. C., Thrombophlebitis.
Major Harris B. Shumacker Jr., M. C., Traumatic Aneurysms.
Lieut. Col. Philip Lewin, M. C., Fractures of the Upper Shaft of Femur.

Capt. Charles M. Schroeder, M. C., and Capt. Norman T. Welford, M. C., Mayo General Hospital, conducted discussions on the "Use of Penicillin" and Major Richard E. Kinzer, M. C., and Capt. Irving Joshua Speigel, M. C., a symposium on "Ruptured Intervertebral Disks."

Chicago

Committeè on Tuberculous Veterans.—A committee on tuberculous veterans of the Tuberculosis Institute of Chicago and Cook County will hold its first annual meeting June 29 at the central Y. M. C. A. auditorium, 19 South La Salle Street. Dr. William F. Petersen will discuss "Practical Problems in Tuberculosis."

Personal.—Dr. *Norman C. Parfit* on his return to Oxford, England, after spending some years as associate professor of public health in the West China Union University School of Medicine, Chengtu, China, visited the headquarters of the American Medical Association, May 17. Dr. Parfit's wife, Edith Jesse, is also a physician.

Ear, Nose and Throat Refresher Course.—The University of Illinois College of Medicine will hold its sixth semiannual refresher course in laryngology, rhinology and otology, September 24-29. Additional information may be obtained from Dr. Abraham R. Hollender, chairman, refresher course committee, department of otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.

Beauty Products Company Ordered to Halt False Advertising.—The Federal Trade Commission on May 21 ordered the American Beauty Products Company to halt false advertising about the cure-all properties of certain vitamin preparations it sells in interstate commerce, according to the Chicago *Sun*. The company also was told to stop representing that any article is "free" when the recipient is required as a condition "to obtain the same to purchase some other article or render some service."

Course in Electroencephalography.—A two weeks course in electroencephalography is offered by the department of psychiatry of the University of Illinois College of Medicine under the supervision of Dr. and Mrs. Frederic A. Gibbs. It is intended primarily for medical officers in the armed forces, but applications will be accepted from others who have qualifications for undertaking such work. The course will begin June 11. Persons interested may address Dr. Gibbs at the University of Illinois, 912 South Wood Street, Chicago 12.

Alumni Dinner.—The Medical Division of Northwestern University Alumni Association will entertain the members of the graduating class, and faculty, at dinner to be given at the Furniture Club of America, 666 Lake Shore Drive, Chicago, June 11, at 6:30 o'clock. Guests of honor will include Franklyn B. Snyder, LL.D., president of the college; Fred D. Fagg Jr., LL.D., dean of the faculties; Dr. George H. Gardner, assistant dean of the medical school; Comdr. Walter G. Reddick (MC); Lieut. Col. Harold C. Lueth, M. C., and the members of the class of 1895. Commander Reddick will speak on "The Young Medical Officer in the Navy" and Colonel Lueth, "The Young Medical Officer Looks to the Future." A special invitation is extended to all Northwestern Medical Alumni. Because of existing food conditions, reservations for this dinner must be made at the Medical Alumni Office, Room 796, 303 East Chicago Avenue, Chicago, by June 8.

INDIANA

Dr. Judd Gives Commencement Address.—Dr. Walter H. Judd, congressman from the Fifth Minnesota District, gave the commencement address of Franklin College, Franklin, May 6, on "Building Tomorrow's World." A feature of the commencement was the presentation of the honorary degree of doctor of laws to Dr. Judd and that of doctor of science to Dr. Herbert F. Thurston, Indianapolis.

Membership of State Board of Health.—The membership of the Indiana State Board of Health now includes nine persons in accordance with a recently enacted bill. Members designated by Governor Ralph E. Gates are Dr. James L. Wyatt, Fort Wayne; Dr. Jacob T. Oliphant, Farmersburg, Dr. David R. Johns, East Chicago, and Howard Johnson, orchardist and businessman, Mooresville, who will serve four

year terms; Glenn L. Jenkins, Ph.D., dean of the School of Pharmacy, Purdue University, Lafayette, and R. E. Julian, veterinarian and serum producer, three year terms; Miss Mary Heckard, superintendent of nurses, James Whitcomb Riley Hospital for Children, Indianapolis, and W. B. Currie, Indianapolis, dentist, two year terms, and Don E. Bloodgood, head of the department of civil engineering, Purdue University, one year. On May 11 Dr. Johns was elected chairman of the board. Dr. Leroy E. Burney, regional director for the U. S. Public Health Service, New Orleans, was named state health commissioner and secretary of the board. Dr. Thurman B. Rice, Indianapolis, was reelected acting secretary and commissioner until July 1, when Dr. Burney will take over the office.

LOUISIANA

University News.—Dr. Peyton Rous, member, Rockefeller Institute for Medical Research, New York, addressed the students and faculty of the Louisiana State University School of Medicine, New Orleans, on "Present State of the Cancer Problem." Dr. Arild E. Hansen, professor of pediatrics, University of Texas Medical Branch, Galveston, spoke April 13 on "Some Phases of Lipid Metabolism" and the "Evaluation of the Nutritional State of the Child."

The Circle Chooses New Members.—Norman F. Conant, Ph.D., associate professor of bacteriology and mycology, Duke University School of Medicine, Durham, N. C., was the principal speaker at a recent meeting of the Circle, undergraduate honor scholastic society at Louisiana State University School of Medicine, New Orleans. Dr. Pierre Jorda Kahle, professor and director of the department of urology at the medical school, was elected an honorary member and Donald Duncan, Ph.D., professor of anatomy, was elected to membership on the faculty advisory committee of the Circle. New members from the junior class are David W. Aiken, Joe F. Simpson and Dorothy R. York, and those from the senior class include Walter J. Hollis, Edwin Byer, Harold J. Jacobs, William R. Scarborough and James C. Burns.

MASSACHUSETTS

Occupational Therapy Affiliation.—The affiliation of the Boston School of Occupational Therapy with Tufts College in the fall of 1945 completes total affiliation of the sixteen schools for occupational therapy in the United States with approved schools. There are seventeen approved occupational therapy schools, one of which is in Toronto.

Licenses Revoked.—The Massachusetts Board of Registration in Medicine announced the revocation of the license to practice medicine February 21 of Dr. Nathan Gaber, Boston, because of gross misconduct in the practice of his profession, as shown by collusion. At a meeting, March 16, the license of Capt. George J. J. Orlansky, M. C., was revoked on a similar charge.

Alumni Election.—Dr. Leon W. Crockett, Boston, was chosen president of the Alumni Association of Boston University School of Medicine May 11, succeeding Dr. Eleanor B. Ferguson-Howard, the first woman physician ever to head the association. Other officers include Drs. Roger M. Burgoyne, Winchester, and James E. Vance, Natick, vice presidents; Frank E. Barton, Boston, secretary, and Kenneth Christophe, Boston, treasurer. A feature of the reunion was the special meeting of the class of 1895, of which ten members are living.

Personal.—Dr. Derek E. Denny-Brown, professor of neurology, Harvard Medical School, Boston, has been granted a leave of absence to return to active military duty as a brigadier general with the British forces in India and Southeast Asia. In 1941, after two years of service in the field, he was temporarily released by the British army to carry on research and teaching in the United States, according to *Science*.——Alice M. Boring, Ph.D., associate in anatomy at Columbia University College of Physicians and Surgeons, has been appointed visiting professor of zoology at Mount Holyoke College, South Hadley. For many years professor of biology at the Chinese University of Yenching, Dr. Boring returned to this country last year after being interned seven months by the Japanese. ——Irwin W. Sizer, Ph.D., associate professor of physiology at the Massachusetts Institute of Technology, Cambridge, has been awarded a grant of $5,000 by the Eli Lilly pharmaceutical company for the continuation of his studies on the action of enzymes on the irritant principles of poison ivy and related plants.

Practice of Anesthesiology.—The hospital section of the postwar planning committee of the New England Society of Anesthesiology would like to hear from physicians who are interested in the peacetime practice of anesthesiology in New England. This information will be made available to persons interested in obtaining the services of an anesthesiologist in their individual surgical practice, group or hospital in New England. It is felt that the collection and dissemination of this information may facilitate the proper relocation of anesthesiologists now in the service when they return to civilian practice. The following information is desired from those interested: age, medical school, year of graduation, internship (year and hospital), training in anesthesiology (in detail), give length and type of training, chief of service, activity and specialty after completion of training, military experience in anesthesia, publications, membership in medical societies, present address and a permanent address. The information should be addressed to Dr. Morris J. Nicholson, chairman of the postwar planning committee, 605 Commonwealth Avenue, Boston 15. Other members of the committee are Drs. Jacob Fine and Signey C. Wiggin, Boston.

MICHIGAN

Status of Hospital Commission Changed.—The state hospital commission will be known as the department of mental health, in accordance with a recently enacted law which becomes effective September 7. The act further sets up a five member, policy determining commission by appointment of the governor to make policies and adopt rules and regulations governing the operation of the department. Under the law a director of mental health will be selected by the commission and the governor for a six year term, the director to be a physician legally registered in the state of Michigan with at least ten years' experience as a psychiatrist in the treatment of mental diseases and the administration of mental hospitals and mental health programs. The administration of the department is to be divided into three divisions: business administration, hospitals and mental hygiene. The head of one of the three divisions will be designated as deputy director. The director of the department of health will appoint, subject to approval of the commission, a head for each division, a medical superintendent for each state hospital and state home and training school, who is to be a physician legally registered in the state with at least three years of experience in the treatment of the mentally afflicted, and a director for each child guidance clinic. The department is to be housed in suitable offices in Lansing. With the creation of the new department of health the old state hospital commission will be abolished.

MISSOURI

Joseph Erlanger Honored.—Dr. Joseph Erlanger, professor of physiology, Washington University School of Medicine, St. Louis, and 1944 joint winner of the Nobel Prize, has been awarded the certificate of merit and medal for distinguished service of the St. Louis Medical Society because "his contributions to fundamental knowledge of the cardiovascular and nervous system and to methods of physiological investigation, his excellence as a teacher and his devotion to the furtherance of medical research have strengthened the hand and augmented the skill and discernment of present and future practitioners of medicine."

NEW YORK

Licenses Reinstated.—The licenses to practice medicine of Drs. Michael James Pietaro, Brooklyn, and August C. Schwenk, New York, have been reinstated.

Basil MacLean Named Professor of Hospital Administration.—As a step toward eventual organization of a department of hospital administration in the University of Rochester School of Medicine and Dentistry, Dr. Basil C. MacLean, director of Strong Memorial Hospital, has been appointed professor of hospital administration, a newly created position. Dr. MacLean has been director of the Strong Memorial Hospital since 1935, returning to the position last September after an absence of more than a year while he served in Washington as a lieutenant colonel in the medical corps of the army as consultant in the surgeon general's office. Dr. MacLean is also in charge of a ten member commission appointed by Governor Dewey to draft a program providing medical care for the state's needy to make recommendations for action by the state legislature.

Alleged Abortion Mill.—On April 27 three alleged operators of an Irondequoit (Rochester) abortion mill were being held in Monroe County jail pending grand jury action. All three were charged with abortion and remanded to jail in lieu of $25,000 bail each. Newspapers reported that the police estimated more than $100,000 had been collected from more than 700 young women patients. The abortion ring was said to be operating at 3731 St. Paul Boulevard, Irondequoit, for more than a year and a half, where investigators found a completely equipped clinical room with operating table. Investigation of the alleged abortion ring began after several reports from a hospital of patients admitted suffering from after-effects of illegal operations. Fees generally ranged from $75 to $150, while some ranged as high as $500. One of the so-called operators, Bennett Mistrator, who was said to have performed the operations, is said to be listed in the suburban directory as a salesman.

New York City

Proposed Addition to St. Vincent's Hospital.—Plans for a sixteen story addition to St. Vincent's Hospital as a memorial to Alfred E. Smith were announced May 13. The addition will replace an old five story unit of the hospital. The estimated cost is three million dollars, to be raised by public subscriptions soon to be sought by the hospital's advisory board, according to the New York *Times*. The memorial wing will give the hospital 250 beds and provide other accommodations.

Blue Cross Extends Benefits.—In a statement May 8, Louis H. Pink, president of the Associated Hospital Service, announced that an extended program of benefits of hospitalization would be made available to members of the Blue Cross Plan. The added services would double the number of days during which members would receive hospitalization at reduced costs. At present the plan offers twenty-one days of semiprivate hospitalization without cost and ninety days of such care at half cost discount rates each time subscribers are hospitalized for a different ailment. Under the new setup the discount coverage is increased to one hundred and eighty days, according to the New York *Times*.

Postgraduate Medical School and Hospital Seek Funds.—A campaign with an immediate goal of five million dollars and an eventual goal of fifteen million dollars for an expansion program at the New York Post-Graduate Medical School and Hospital, Columbia University, was announced at the seventieth anniversary dinner of the school, May 9. The expansion program contemplates a new clinic, classroom and laboratory building, to be erected on the land adjacent to the present plant at an estimated cost of $1,500,000 and holding an endowment of $3,500,000 for staff and research expense. Other projects include a private pavilion of 200 beds, a new medical school building and a new hospital unit for ward beds to replace Roosa Building, opened for service in 1894. The entire project was suggested as a memorial to members of the profession who have performed in the current conflict.

Committee of Teachers Sues School and Health Boards.—Challenging the right of the board of education to compel teachers to undergo x-ray examinations of the chest for tuberculosis, the Joint Committee of Teachers Organizations, representing New York City's 30,000 school employees, started a law suit May 7 against the school board and the board of health to force a reprisal of the regulation, according to the New York *Times*. The complaint declares that the board of health does not have the authority to adopt the policy requiring all teachers and school employees who come in contact with pupils to take a chest examination every two years. If found to be infected with "active tuberculosis" the teachers are to be excluded from the school, although the board of education permits these teachers to take a leave of absence with part pay while recuperating. It was stated that the school staff resents the board's action and feels that it is an unjust attack on the teaching profession. It was contended that a present law giving to principals the right to require teachers to appear before the medical department for a physical examination if there is any suspicion of ill health should be sufficient to cover teachers who may have tuberculosis. Mrs. May Andres Healy, chairman of the joint committee, in a statement to the press said "We have not heard that tuberculosis is prevalent among teachers. This regulation will frighten the public and regiment the teachers. No other group in the city has this type of examination. Certainly our teachers are intelligent enough to go to a doctor when they are ill; they do not need to have this embarrassing situation inflicted upon them."

OKLAHOMA

Activities on Medical Faculty.—Dr. Hubert Eugene Doudna, professor of clinical anesthesiology, University of Oklahoma School of Medicine, Oklahoma City, has been granted a leave of absence for active duty in the Navy. Dr. Charles R. Rayburn, Norman, on leave with the Army since June 15, 1942, has returned to his position as professor of mental diseases.

State Medical Election.—Dr. Louis C. Kuyrkendall, McAlester, is the new president-elect of the Oklahoma State Medical Association. Dr. Victor C. Tisdal, Elk City, assumed the office of president at a meeting of the house of delegates on April 22. Dr. Ralph A. McGill, Tulsa, is vice president and Dr. Lewis J. Moorman, Oklahoma City, continues as secretary-treasurer and editor of the *Journal*.

Endowment for Ophthalmology.—Dr. and Mrs. Samuel J. Bradfield have established an endowment fund for the library of the Tulsa County Medical Society to be known as the Dr. Albert W. Roth Endowment for Ophthalmology and which honors the physician who was an honorary member of the Tulsa County Medical Society and served in 1917 as its president. Dr. Roth was also a founder and president of the Tulsa Public Health Association. He died March 17.

PENNSYLVANIA

Society News.—Dr. Herbert T. Kelly, Philadelphia, addressed the Centre County Medical Society at Nittany Lion, State College, May 10, on "Convalescent Care and Postoperative Management."

Philadelphia

Christian Febiger Dies.—Christian Febiger, a member of the firm of Lea & Febiger, medical publishers, died May 12.

Course on Venereal Diseases.—The department of public health and preventive medicine, University of Pennsylvania School of Medicine, opened a course May 22 on the control of venereal diseases under the direction of Dr. John H. Stokes. The course will continue until June 30 and carries two units of credit for those working for a graduate academic or public health degree.

Personal.—Dr. Francis D. Patterson has been appointed to the advisory health board of the state of Pennsylvania. Dr. Alexander H. Stewart, Harrisburg, secretary of the state department of health, is chairman of the board, and other members consist of Dr. Thomas Palmer Tredway, Erie, Pa.; Dr. James D. Lewis, Scranton, Pa.; Dr. Joseph Scattergood Jr., West Chester, Pa.; Mr. Arch W. Nance, C.E., Pittsburgh, and Dr. David W. Thomas, Lock Haven, Pa.—Dr. and Mrs. Thomas Ellison recently celebrated their fiftieth wedding anniversary.

Dr. Cantarow Named Professor of Physiological Chemistry.—Dr. Abraham Cantarow, associate professor of medicine at the Jefferson Medical College of Philadelphia and chemist to the Jefferson Medical College Hospital, has been appointed professor of physiologic chemistry, succeeding George R. Bancroft, Ph.D., who will retire at the end of the school term in June. Dr. Cantarow graduated at Jefferson in 1924 and became the first resident chemist at the hospital, where he subsequently served his internship and as assistant demonstrator in medicine and research fellow in the department of diseases of the chest.

Pittsburgh

Special Society Election.—At a recent meeting of the Pittsburgh Roentgen Society the following officers were elected for the following year: Drs. Reuben G. Alley, president; Robert Meader, vice president, and Lester M. J. Freedman, secretary-treasurer.

Hospital Changes Name.—The name of the Western State Psychiatric Hospital has been changed by action of the legislature to Western State Psychiatric Institute and Clinic. The change, long under consideration, was brought about to emphasize the important functions of training, teaching and research and the operation of the mental health clinic. In cooperation with the University of Pittsburgh, instruction is given to students in medicine, nursing, psychology, social service and dentistry. Six junior and six senior residencies in psychiatry are available. Junior positions offer opportunities in clinical work and teaching. Senior positions require previous experience in psychiatry; this work is largely confined to the care and treatment of outpatients. Additional information may be obtained from Dr. Grosvenor B. Pearson, director of the Western State Psychiatric Institute and Clinic, O'Hara and Desoto streets.

TENNESSEE

The Haggard Lecture.—Dr. Rustin McIntosh, professor of pediatrics, Columbia University College of Physicians and Surgeons, New York, delivered the annual Haggard Memorial Lecture at the Vanderbilt University School of Medicine, Nashville, April 27, on "Congenital Malformation Causing Obstructive Phenomena." The lecture is sponsored by the student chapter of Alpha Kappa Kappa.

Chapter Meeting of International College of Surgeons.—The Tennessee Guild of the U. S. Chapter of the International College of Surgeons and the Knox County Medical Society, Knoxville, will cooperate in a meeting June 8 at the Andrew Johnson Hotel for the following program:

Dr. Custis Lee Hall, Washington, D. C., Stenosing Tenosynovitis of the Wrist.
Dr. Robert L. Sanders, Memphis, Surgical Complications of Duodenal Ulcer.
Dr. Albert A. Berg, New York, Prevention of Recurrent Ulcers After Subtotal Gastrectomy by Vagus Section.
Dr. William Milton Adams, Memphis, Early Treatment of Extensive Facial Injuries.
Dr. William Seaman Bainbridge, New York, Surgical Emergencies.
Dr. Desiderio Roman, Philadelphia, Lingual Goiter.
Dr. Max Thorek, Chicago, Surgical Plagiarism: Its Etiology, Manifestations and Cure.
Dr. Moses Behrend, Philadelphia, Surgery of the Common Bile Duct.
Dr. Gilbert F. Douglas, Birmingham, Conditions and Diseases Incident to the Menopause.
Dr. Lloyd F. Craver, New York, Hodgkin's Disease.
Dr. Watson B. Morris, Springfield, N. J., Office Gynecology.

WEST VIRGINIA

Health Department Activities.—The Public Health Council has entered an order separating the bureau of industrial hygiene from the division of sanitary engineering. Similar action has separated the bureau of dental hygiene of the state health department from the division of maternal and child hygiene, setting it up as a separate unit. The new dental bureau will be under the direct supervision of Dr. John E. Offner, Weston, state health commissioner; two dental counselors will carry out the work now done by a dental consultant.

State Medical Election.—Dr. Andrew E. Amick, Charleston, was elected president of the West Virginia State Medical Association at a meeting of the house of delegates in Clarksburg, May 14. Dr. Blonda S. Brake, Clarksburg, and Dr. James B. Thompson, Oak Hill, were named as vice presidents, and Dr. Thomas M. Barber, Charleston, was reelected treasurer. Dr. Ivan Fawcett, Wheeling, and Dr. James L. Wade, Parkersburg, were reelected as American Medical Association delegate and alternate, respectively. At this meeting, which was held in lieu of the 78th annual meeting, the president was authorized to appoint a standing committee on tuberculosis and a special committee on relocation and reestablishment of doctors returning from military service. The house also adopted an amendment to the constitution increasing annual dues from $10 to $15, effective Jan. 1, 1946. An amendment to the constitution was proposed which provides for the election, with the approval of the council, of affiliate members of component societies who, although doctors of medicine, cannot qualify for licensure in West Virginia. The amendment will be acted on at the annual meeting, which will be held at Huntington in 1946.

ALASKA

Department of Health Created.—On March 21 the legislature of the Territory of Alaska approved an act providing for the establishment of a department of health, charged with the duty of administering laws and regulations relating to the promotion and protection of the public health, control of communicable diseases, programs for the improvement of maternal and child health, care of crippled children, hospitalization of the tuberculous, and such other duties as may be conferred on it by law. The act provides for a board of health within the department of health consisting of the governor and four members, one from each judicial division of the Territory of Alaska appointed by the governor, one of whom shall be a member of the Alaska Territorial Medical Association. All will be subject to approval of the senate and house, and each is to serve for four years. The board will appoint a commissioner of health who will be chief executive of the health department, appointed on a full time status for a term of five years and eligible for license under the medical practice laws of Alaska. Members of the new board appointed by the governor are Dr. Dwight L. Cramer, Ketchikan; Mrs. Katherine Kehoe, Nome; Rev. R. Rolland Armstrong, Anchorage, and Mr. George Preston Sr., Fairbanks. Previously the legislature had been willing only to create the office of commissioner of health. On May 17 the board had not yet met or organized, nor had it selected the new commissioner of health.

GENERAL

Health Council Reelects Officers.—The National Health Council has reelected Mrs. Eleanor Brown Merrill, executive director of the National Society for the Prevention of Blindness, New York, as president. Other officers who were reelected include Dr. Charles Walter Clarke, executive director of the American Social Hygiene Association, New York, vice president; Maurice A. Bigelow, Sc.D., New York, former president of the American Eugenics Society, secretary, and Dr. William F. Snow, general director of the American Social Hygiene Association, treasurer. The National Health Council, with headquarters at 1790 Broadway, New York 19, is a clearing house of twenty-one voluntary health organizations.

Grant for Cancer Research.—The Rockefeller Foundation through its Division of Medical Sciences has given $282,000 to the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, for the study of "the genetic factors in intelligence and emotion in mammals" in the hope of learning more about human beings as they are born and the way they grow up. According to an announcement in *Science News Letter* the main reason for using dogs in the early part of the project is that genetic experiments require pure strains differing as much as possible in the characteristics it is proposed to study. The *News Letter* states that Hamilton Farm, consisting of a 58 acre estate, recently given to the laboratory and located just outside of Bar Harbor, will be used for the study.

The Doctor Fights.—A radio series of coast broadcasts over the Columbia Broadcasting System entitled "The Doctor Fights" will begin Tuesday, June 5. Motion picture stars will participate in the dramatization of such events as the devotion to duty of Major Livingston Pope Noell Jr., M. C., the physician who elected to stay with the litter cases on Bataan when the hospital unit and all the nurses were evacuated to Corregidor, the heroic three days in July last year, when Capt. James E. T. Hopkins, M. C., treated 80 casualties during the battle for the Munda air strip on the Solomon Islands, and other similar case histories from actual service files. The broadcasts are being presented by Schenley Laboratories, Inc., and will consist of thirteen dramatizations. Whenever possible the programs will be cut in from Washington and other points to introduce the doctors of medicine whose stories are being dramatized.

Aid to China.—Thirty medical and health experts will go to China to train personnel in medical centers to be established by the Chinese government, Herbert H. Lehman, director general of the United Nations Relief and Rehabilitation Administration, announced May 10. Essential supplies will also be furnished by UNRRA to equip centers in Chungking and Chengtu, and later in Kweiyang, Nanking and Peiping. It was said that in the coming months 90,000 pounds of medical supplies would be shipped for the project. According to the New York *Times*, one of China's most serious needs is said to be skilled medical and technical personnel, estimates showing that there is only 1 doctor in China for every 40,000 persons and 1 hospital bed for every 10,000. Experts of the UNRRA mission, which forms part of the general program of rehabilitation for China, will be recruited from the United States, Great Britain, Australia and Canada.

Maternity Leaves Recommended.—Recommendations for maternity clauses in union contracts were issued April 30 by the Women's Bureau of the U. S. Department of Labor in the first of a series of leaflets resulting from a survey of ninety-two midwestern war plants in Illinois, Indiana and Wisconsin. The survey showed that only five plants had union contracts carrying maternity leave provisions. More than two thirds of the contracts had provisions for illness which was sometimes construed as covering maternity leave. In most local unions no attention, however, had been paid to this question and in some plants women were discharged when their pregnancy became known, according to the New York *Times*. The Women's Bureau claims that a maternity clause is needed in the union contract for the following reasons:

To protect the health of the mother and children.
To protect the expectant mother against discharge and to protect her right to return to her job.
To see that women retained their seniority rights and were not penalized when they have babies.
To see that there was a good maternity policy in every plant where women are employed.

CORRECTION

Marriages.—In the marriage announcement of Carroll R. Olson to Miss Thelma Olson, THE JOURNAL, April 28, page 1143, the bride's name should have appeared Miss Thelma Cousin.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 28, 1945.

London's Last Ordeal

With the end of the last form of "frightfulness" practiced on London—the rocket bomb, which was fired from the continent and reached us after traversing the stratosphere—the government is now able to publish details. The total number of rocket bombs which reached this country was 1,050. The total casualties were 2,754 killed and 6,523 seriously wounded. The first rocket fell on the evening of Sept. 8, 1944 at Chiswick, doing considerable damage. One of the first to fall on London was at Brentford, where eight houses were destroyed and fifty damaged by the blast. Two people were killed and ten seriously injured. The rocket attack reached its height during a week in February, when seventy-one fell on southern England. Totals of fifty or sixty rockets a week were common in February and March, many of them on London. The highest number in twenty-four hours was seventeen. Then came the Canadians' advance into the northern part of the Netherlands, the overrunning of rocket sites and the end to one of the most diabolic forms of attack on a civilian population. The last rocket fell on March 27 at Orpington, killing 1 person and injuring 23.

Among the worst incidents was the fall of a rocket on Woolworth's store in southeastern London during the lunch hour rush, when the pavements as well as the store were crowded with women and children. One hundred and sixty were killed and 108 injured. In March a rocket reduced two blocks of flats to rubble in eastern London, killing 134 and seriously injuring 49. One fell on Farringdon market in March, when the stalls were crowded with shoppers; 110 were killed and 123 seriously injured. In these raids thirty-five hospitals were hit. Seven American soldiers were killed when a rocket fell in the west end of London.

A New Insecticide

In a lecture to the Society of Chemical Industry, Dr. Roland Slade of Imperial Chemical Industries announced the discovery of a remarkable new insecticide with a wide range of uses, gammexane, which is the gamma isomer of benzene hexachloride ($C_6H_6Cl_6$). This was isolated early in 1943 and was found to be more toxic to weevils than any substance previously tested. There is every indication that it is much more toxic in locust baits than anything used heretofore. It has numerous medical, veterinary and agricultural uses. Experiments in the field against wireworm have led to the hope that we have found at last a means of fighting this pest, which causes the failure of so many farmers' crops in Britain. Gammexane has proved highly toxic to lice and fleas. Dusts, sprays and paints have been used experimentally on the surfaces of rooms and rendered them toxic to any flies that walked over them.

Surgeon Attacks Method of Cancer Research

At the Medical Society of St. Mary's Hospital a surgeon, Mr. D. C. L. Fitzwilliams, said that an outlay of $5,000,000 by the British Empire Cancer Campaign had shown only one important discovery, that of diethylstilbestrol by Professor Dodds. No one would wish to underrate this, but this, with the addition of something in trades cancer and carcinogenic agents, was hardly full value for time and money. He attributed this failure to the haphazard and uncoordinated nature of British research. He described a scheme in which five hundred research workers under ten directors and one superdirector would deal with all aspects of the problem.

Subsequent speakers unanimously disagreed with him and described his scheme by the expressions "dictatorship," "German" and hence "not British." Professor Dodds said that Pasteur, with his academic qualifications at the time, would hardly have been employed by "the director of a suppuration campaign." But he took some of the sting out of his allegory by suggesting that energy and funds should be expended not on research into a specific disease but into general biochemistry and pathology, which may confidently be expected to yield information of practical as well as theoretical value.

Norwegian Psychiatrist Murdered by the Germans

The *British Medical Journal* of April 14 contains the obituary of Dr. Haakon Saethre, who was head of the psychiatric department of Oslo City Hospital and through his excellent clinical work and administrative abilities made his clinic one of the most inspiring in Norway. His work on oxycephaly, disseminated sclerosis, dementia paralytica and other subjects is classic in neurologic literature. He was official Norwegian delegate to several international congresses and president of the Inter-Scandinavian Congress of Psychiatry held in Oslo in 1938. He devoted much energy to popularizing the general principles of mental hygiene. On February 9 he was arrested with several Norwegian patriots as hostages. They were immediately sentenced to death by a German summary court martial as a reprisal for the killing of a Quisling police chief the day before by Norwegian Home forces.

The Campaign Against Leprosy

The British Empire Leprosy Relief Association held its twenty-first anniversary meeting in London. The lord mayor said that the association had done remarkable work in combating the scourge of leprosy throughout the empire. The meeting inaugurated a campaign to raise $1,050,000, representing $50,000 for every year of the association's existence, in an intensified effort to abolish leprosy within the empire, in which there are 2,000,000 sufferers. In the absence of the secretary of state for the colonies, his representative said that the Colonial Office had benefited by the collaboration of the association, together with that of the missionary societies and Toc H, but the measures so far taken were inadequate, notwithstanding what had been done.

Marriages

PAUL ALEXANDER BENDIX, Mount Vernon, N. Y., to Lieut. Frances Nantes Briscoe, Army Nurse Corps, at Charleston, S. C., March 28.

ORVILLE JAMES LIGHTHIZER, Ashtabula, Ohio, to Miss Michaelene Bogan of Lexington, Ky., May 24.

GEORGE E. FELKNOR Jr., Meridian, Miss., to Miss Marion C. Starts of New Orleans, Dec. 29, 1944.

JOHN PATRICK MURPHY, Boston, to Miss Elizabeth Ann Lehiff of Arlington, Mass., April 7.

FORDE ANDERSON McIVER to Miss Ruth Raymond Huegel, both of Madison, Wis., April 14.

EUGENE LAWSON ARMSTRONG to Miss Bernice Ehri Collins, both of Los Angeles, February 8.

JAMES W. BARRETT to Miss Margaret Mary Williette, both of East Orange, N. J., April 12.

CHARLES D. COOK, Minneapolis, to Miss Sheila Gamble of Brookline, Mass., March 10.

JULIAN PETER KRAKOWSKI, Waterloo, Ill., to Miss Fern Zinser of El Paso, April 14.

HOWARD S. BRANIN to Mrs. Lilyan B. Murphy, both of Millville, N. J., March 18.

DAVID McCULLOUGH, Kerrville, Texas, to Miss Mary Myers of Electra, February 21.

BEN HILL CLIFTON to Miss Faye Hollis, both of Atlanta, Ga., April 7.

Deaths

Paul August Teschner ⊕ assistant director, Bureau of Health Education, American Medical Association, died at his home in Elmhurst, May 25, aged 48, of chronic valvular heart disease with acute decompensation.

Dr. Teschner received his education at the Washington High School, Milwaukee, the Milwaukee Normal School and the University of Wisconsin. He graduated in 1924 at the Marquette University School of Medicine, Milwaukee, completed his internship at the Northwestern Branch, National Home for Disabled Volunteer Soldiers, National Home, Wis., and subsequently practiced medicine in Gillette and Cecil, Wis. In 1926 he became a member of the medical staff of the Wisconsin Anti-Tuberculosis Association, serving as examiner and consulting physician. In 1939 he joined the staff of the American Medical Association as assistant director of the Bureau of Health and Public Instruction, then a newly created position. In this capacity he had lectured before various groups throughout the country and was well known to lay agencies interested in health activities, carrying practically all the question and answer correspondence with the lay public, one of the most important functions of the Bureau.

Dr. Teschner was a member of the editorial board of *Hygeia*, assistant in charge of the American Medical Association radio program on NBC network and other stations, and a member of the first aid medical advisory committee of the Chicago chapter, American Red Cross. He was the co-author of the Workbook on Health coordinated with the American Medical Association radio program Your Health and was an extensive contributor of articles on health subjects to magazines.

Abraham Rudy ⊕ Boston; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1923; instructor in medicine at Tufts College Medical School; member of the Greater Boston Medical Society, Boston Society of Biologists, New England Heart Association, Association for the Study of Internal Secretions and American Diabetes Association; fellow of the American College of Physicians; associate in medicine at the Beth Israel Hospital, where he served as chief of the diabetic clinic, which he helped to organize; from 1926 to 1928 assistant in medicine at the Mount Sinai Hospital in New York; visiting physician and consultant in diabetes at the Jewish Tuberculosis Sanatorium, Rutland, and at the Jewish Memorial Hospital; author of the "Practical Handbook for Diabetic Patients" and of the "Simplified Diabetic Manual"; his authority was recognized by the New York Diabetes Association, which invited him to write two of the Fundamental Concepts in the Treatment of Diabetes Mellitus and Its Complications; died February 19, aged 49, of pulmonary neoplasm.

Frederic Russell Calkins ⊕ Watertown, N. Y.; Bellevue Hospital Medical College, New York, 1894; fellow of the American College of Surgeons; twice president of the Jefferson County Medical Society; at one time county physician and county coroner; served on the local medical examining board during World War I; formerly affiliated with the local National Guard; vice president and director of the Y. M. C. A.; served as director of the chamber of commerce and the Jefferson National Bank; for many years chief surgeon at Mercy Hospital and the House of the Good Samaritan, where he died February 24, aged 73, of arteriosclerosis and heart failure.

Gustav Adolf Pudor, Portland, Maine; Harvard Medical School, Boston, 1892; honorary member of the Maine Medical Association and member of the American Medical Association; formerly professor of dermatology at the Bowdoin Medical School; fellow of the American College of Physicians; served as captain in the Base Hospital at Camp Devens during World War I; captain, medical reserve corps, U. S. Army, not on active duty; on the staffs of the Maine School for Deaf, Maine General Hospital and Children's Hospital; affiliated with the venereal disease clinic at Portland City Dispensary; died March 7, aged 80, of arteriosclerotic heart disease.

Rosario Gori, Brookline, Mass.; Regia Università degli Studi di Roma, Facoltà di Medicina e Chirurgia, Italy, 1925; served during World War I; at one time on the staff of the Misericordia Hospital in Ottawa, Ont.; Italian consular general in western Massachusetts until all Italian officials were returned to that country following this nation's entry into World War II; at the time of his death was serving as medical officer, under the civilian mobilizer appointed by the allied military government, in Belsito, province of Cosenza, Italy, where he died February 1, aged 47, of heart disease.

William P. E. Wyse, Pikesville, Md.; University of Maryland School of Medicine, Baltimore, 1886; member of the American Medical Association; deputy medical examiner for Baltimore County; president of the board of governors of the Rosewood State Training School, Owings Mills; consultant on the staff of the Mount Hope Retreat, Baltimore; formerly surgeon to the Maryland Line Confederate Soldiers' Home; died in the Union Memorial Hospital, Baltimore, March 12, aged 78, of injuries received in an automobile accident.

William Hunter Arnold, Thompsons Station, Tenn.; Hospital College of Medicine, Louisville, Ky., 1876; died February 10, aged 89.

Jerry Clark Bliss, Denver; Cincinnati College of Medicine and Surgery, 1875; Civil War veteran; died January 25, aged 99, of purulent cystitis and cerebral hemorrhage.

William B. Boggess, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1897; died in the Shadyside Hospital January 12, aged 71, of congestive and hypertensive heart disease.

Ralph Childs Bowen ⊕ Cumberland, Md.; University of Maryland School of Medicine, Baltimore, 1907; died February 28, aged 60, of hypertension and chronic myocarditis.

Elizabeth Annastatia Brackett, Malden, Mass.; Boston University School of Medicine, 1891; died February 16, aged 88, of generalized arteriosclerosis.

Charles Augustus Brown, Hopkinton, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1891; died February 5, aged 77, of chronic myocarditis.

Joseph Addison Buckwalter ⊕ Royersford, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1904; died January 26, aged 64, of coronary occlusion and diabetes mellitus.

H. D. Carson, Union Point, Ga.; University of the South Medical Department, Sewanee, Tenn., 1899; city health officer; local surgeon for the Georgia Railroad; died in the Athens General Hospital, Athens, March 28, aged 72, of carcinoma of the pancreas.

Frederick Henry Carter, Derby, Vt.; College of Physicians and Surgeons, Boston, 1907; member of the American Medical Association; health officer of the town of Derby; died in the Orleans County Memorial Hospital, Newport, April 3, aged 66, of gastric hemorrhages.

Clarence Marmaduke Casselberry ⊕ Newton, Mass.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; on the staff of the Boston Dispensary; died February 23, aged 69, of carcinomatosis.

Samuel M. Clark, Knoxville, Tenn.; Meharry Medical College, Nashville, 1910; on the staff of the Knoxville General Hospital; died March 11, aged 62, of coronary occlusion.

Albert Crocker Cobb ⊕ Marion, Mass.; Albany Medical College, 1892; an Affiliate Fellow of the American Medical Association; school physician for many years; died March 21, aged 76, of anemia and uremia.

Basil Loren Connelly ⊕ Detroit; Western Reserve University School of Medicine, Cleveland, 1920; fellow of the American College of Surgeons; served on the staffs of the East Side General Hospital, St. Mary's Hospital, Woman's Hospital, Florence Crittenton Hospital, Mount Carmel Mercy Hospital and Grace Hospital, where he died April 1, aged 51, of coronary thrombosis.

Howard Russell Cooder ⊕ Los Angeles; McGill University Faculty of Medicine, Montreal, Que., Canada, 1921; assistant professor of pediatrics, College of Medical Evangelists; chairman of the pediatric section, California Medical Association, and secretary-treasurer from 1934 to 1936 of the Southwestern Pediatric Society; interned at St. Louis Children's Hospital and the Children's Memorial Hospital in Chicago; on the staff of the Children's Hospital; died March 26, aged 58, of Hodgkin's disease.

Daniel Joseph Daly, New York; Baltimore Medical College, 1905; member of the American Medical Association; died in Bellevue Hospital February 10, aged 64.

James Joseph Daly, Decorah, Iowa; Northwestern University Medical School, Chicago, 1898; examiner for the local draft board; served during World War I; died February 20, aged 75, of coronary thrombosis.

Charles Frederick Daniel, Tiffin, Ohio; Starling Medical College, Columbus, 1907; member of the American Medical Association; on the staff of the Mercy Hospital, where he died March 31, aged 65, of cerebral hemorrhage.

Roy Adelbert Daniels, Melrose, Mass.; (licensed in Massachusetts in 1895); died February 3, aged 70, of heart disease.

Wilbur Fiske David, Marshalltown, Iowa; the Hahnemann Medical College and Hospital, Chicago, 1881; died March 25, aged 85, of cerebral hemorrhage.

Frederick Detlefsen ⊕ Chicago; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1890; died in the Alexian Brothers Hospital April 5, aged 83, of chronic myocarditis and prostatic hypertrophy.

James Francis Donahue, Philadelphia; Medico-Chirurgical College of Philadelphia, 1902; died January 13, aged 77, of asthma and cardiac dilatation.

Ross May Fisher ⊕ Syracuse, N. Y.; Syracuse University College of Medicine, 1906; for many years on the staff of the Crouse-Irving Hospital; died February 4, aged 63, of aplastic anemia and leukemia.

William Henry Foster, St. Louis; St. Louis University School of Medicine, 1908; died in the Missouri Baptist Hospital April 1, aged 75, of congestive heart disease and myocarditis.

Thomas B. Fowler, Springville, N. Y.; Medical College of Ohio, Cincinnati, 1880; past president of the village board of education; a founder and director of Chaffee Hospital, where he died March 31, aged 89, of uremia caused by nephritis.

William Clarkson Freeman, Waco, Texas; Trinity Medical College, Toronto, Ont., Canada, 1876; died March 3, aged 90, of senility.

William M. Gibson, Nashville, Ark.; Memphis (Tenn.) Hospital Medical College, 1904; died January 10, aged 75, of arteriosclerosis.

Albert Arthur Gorbold, Ross, Ohio; Miami Medical College, Cincinnati, 1897; died in the Fort Hamilton Hospital, Hamilton, March 1, aged 75, of pernicious anemia.

Ruth Pierce Guilder, Boston; University of Illinois College of Medicine, Chicago, 1922; served as research fellow in otology at Harvard Medical School and the Massachusetts Eye and Ear Infirmary, where she had been affiliated with the Winthrop Foundation for the Study of Deafness; died February 12, aged 56.

Clarence Evans Johnson, Philadelphia; Southern Medical College, Atlanta, 1891; for many years represented Mead Johnson & Company of Evansville, Ind.; formerly employed by the Charles H. Phillips Chemical Company of New York; died while on a vacation in St. Petersburg, Fla., March 13, aged 70, of cerebral hemorrhage.

William Franklin Keim ⊕ Newark, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the American Academy of Ophthalmology and Otolaryngology; on the staffs of the Hospital of St. Barnabas and for Women and Children, Newark Memorial and Presbyterian hospitals; died March 7, aged 76, of carcinoma of the stomach.

Hilda Kinkead, Madison, N. J.; Woman's Medical College of Pennsylvania, Philadelphia, 1935; diplomate of the National Board of Medical Examiners; member of the American Medical Association; interned at the Medical Center of Jersey City; served a residency at the Overlook Hospital in Summit and the New York Infirmary for Women and Children in New York; died in the Memorial Hospital, Morristown, March 19, aged 34, of an accidental overdose of barbituric acid.

Harry Van Kitzmiller, Wray, Colo.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905; for many years health officer of Yuma County; died March 14, aged 66, of cerebral hemorrhage.

Franz F. Lyon, Patchogue, N. Y.; Albert-Ludwigs Universität Medizinische Fakultät, Freiburg, Baden, Germany, 1912; member of the American Medical Association; died February 16, aged 57, of cerebral hemorrhage and hypertension.

Albert Sidney Maddox, Asbury Park, N. J.; Bellevue Hospital Medical College, New York, 1890; member of the American Medical Association and the Medical Society of the State of New York; died March 3, aged 78, of coronary occlusion.

Ervin McElroy, Rockaway, N. J.; Jefferson Medical College of Philadelphia, 1922; member of the American Medical Association; fellow of the American College of Surgeons; interned at the Newark City Hospital, Newark; served as school physician and as president of the board of health; member of Selective Service Board number five and of the Morris County Mosquito Commission; on the staff of the Dover (N. J.) General Hospital; died March 18, aged 47, of coronary thrombosis.

Samuel B. McMillan, Frisco City, Ala.; Atlanta College of Physicians and Surgeons, 1902; member of the American Medical Association; died January 6, aged 66, of cerebral hemorrhage.

John Henry Merrick ⊕ Glenwood, Iowa; McGill University Faculty of Medicine, Montreal, Que., Canada, 1895; since July 1944 staff physician at the Glenwood State School; died April 15, aged 72, of lung abscess following pneumonia.

Armand Normandin ⊕ Laconia, N. H.; M.B. in 1909 and M.D. in 1911, School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal; medical examiner for the draft board; died February 14, aged 57, of coronary thrombosis.

Robert Earl Patterson ⊕ New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1921; died February 11, aged 49, of coronary thrombosis.

Stanley Earl Patterson, Mandan, N. D.; University of Manitoba Faculty of Medicine, Winnipeg, Man., Canada, 1928; died February 6, aged 43, of cirrhosis of the liver.

Carlin Philips, New York; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; served during World War I and with the U. S. Veterans Bureau; died in Miami, Fla., February 8, aged 73, of coronary thrombosis and carcinoma of the lung.

Emery C. Pixley, Canisteo, N. Y.; University of Buffalo School of Medicine, 1891; at one time on the staff of the New York State Soldiers and Sailors' Hospital in Bath; died in St. James Mercy Hospital, Hornell, April 19, aged 82, of carcinoma.

John L. Powell, Aberdeen, Wash.; Medical College of Ohio, Cincinnati, 1891; at one time member of the board of regents of Washington State College, Pullman; died March 13, aged 86.

Arthur L. Pritchard, Nelsonville, Ohio; Medical College of Ohio, Cincinnati, 1886; member of the American Medical Association; past president of the Athens County Medical Society; served as a member of the city board of education; recently completed a third term as county coroner; died March 28, aged 80.

Joe M. Quinn, Bogalusa, La.; Kentucky School of Medicine, Louisville, 1892; died in New Orleans January 14, aged 78.

Morton C. Reeves, Palms, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1883; died January 23, aged 88.

Dabney Belvin Reinhart, Merrill, Wis.; Bellevue Hospital Medical College, New York, 1886; health officer; died March 13, aged 83, of myocarditis.

Isaac Reitzfeld ⊕ New York; University and Bellevue Hospital Medical College, New York, 1904; served in France during World War I; consulting orthopedist, Bronx Maternity and Woman's Hospital, New York, Long Beach Hospital, Long Beach, and Rockaway Beach (N. Y.) Hospital; director of orthopedics, St. Joseph Hospital, Far Rockaway, where he died April 8, aged 61, of uremia and hypertrophy of the prostate.

William Randolph Smith, Roselle Park, N. J.; College of Physicians and Surgeons, Baltimore, 1890; at one time president of the board of education in Little Falls; died in the New Jersey State Hospital, Marlboro, March 12, aged 83, of cerebral hemorrhage, arteriosclerotic cardiovascular disease and epithelioma of the nose.

Benjamin Franklin Vaughan, Bethany, Okla.; (licensed in Oklahoma under the Act of 1908); died in the University Hospital, Oklahoma City, February 21, aged 80, of pneumonia.

MERCHANT MARINE CASUALTY

Benjamin Andrew Price, Rigby, Idaho; Barnes Medical College, St. Louis, 1903; at one time on contract work with the Wyman Mining Company in San Javier, Sonora, Mexico, and the Vipont Silver Mining Company in Hazelton, where he was physician for the Union Pacific Railroad; served as Liberty County health officer and county physician while residing in Chester, Mont.; examiner for the Jefferson County Selective Service Board, Idaho National Guard, Civil Service, veterans insurance and many life insurance companies; health officer of Jefferson County, 1940-1941; in 1942 joined the Merchant Marine as a ship's medical officer aboard the S. S. *Delvalle,* which was attacked and sunk by an enemy submarine on April 12, 1942; aged 64; on May 23, 1944 posthumously awarded the Mariners Medal.

Correspondence

MEDICAL CARE OF VETERANS

To the Editor:—Your suggestion for a wholly independent investigation of the Veterans Bureau hospitalization seems to me sound and timely.

Regarding tuberculosis, the results might not lead promptly to a correction of the difficulty. The remedy may call for federal legislation not yet possible. If custom and regulations continue to make it too easy for patients to break treatment by leaves, passes, transfers, checking out against approval, and the like, its correction may have to wait on revised demands of veterans and their relatives and friends. This in turn has to wait on the progress of education, really health education.

Toward this educational end the American Legion and especially its Auxiliary and its Eight & Forty, aided by the voluntary tuberculosis associations, are taking definite steps. It is necessary to convince tuberculous veterans and their relatives that the treatment is medical and that it is important and that if they wish favorable results, such as are procured at similar hospitals under other auspices, it is really necessary for them to endorse and follow the prescriptions of their physicians.

In this effort all physicians and nurses and others truly desirous of aiding tuberculous veterans may assist. Then when the demand comes in volume from those whom it will most benefit it may be better understood and can be translated into favorable action by Congress and by the Veterans Bureau. This is not like the weather, because all together we can do something about it.

ARTHUR J. STRAWSON, Boston.
Executive Secretary, Massachusetts Tuberculosis League.

MARIHUANA PROBLEMS

To the Editor:—The editorial "Marihuana Problems" (THE JOURNAL, April 28, p. 1129) labels the Mayor La Guardia committee report "an unscientific, uncritical study" and, again, declares that it has "narrow and thoroughly unscientific foundation." The report in question came generally to the same conclusions that any other group of competent investigators might reach if they repeated the inquiry under the same conditions. Further, the New York report contained much new scientific information which is valuable. The editorial characterized the recent article in *War Medicine* (December 1944) as a "devastating refutation" of the La Guardia report, whereas this article simply described 35 cases of psychopathic or grossly maladjusted soldiers who used marihuana along with other manifestations of criminal behavior. The editorial primarily objected to the fact that the public may be led to mischievous results because the La Guardia report minimized the harmfulness of marihuana. A scientific study should be expected to report merely what it finds, avoid propaganda and let the public do what it will with the results. It is an old, familiar issue most sharply brought in focus by the frequent conflicts between temperance officials and those scientific workers who study the problems of alcoholism. The marihuana laws are adequate to suppress its use. (In fact they are so comprehensive as to have the indirect effect of obstructing legitimate researches with this unique drug.) Enforcement officials manifestly have a difficult job with grave responsibilities and it is unfortunate if some scientific publications might be thought to operate against their efforts. They should, however, have enough support for restraining criminal traffic in this drug, since all serious opinions, including the La Guardia report, have branded it an undoubted nuisance.

ROBERT P. WALTON, M.D., Charleston, S. C.
Professor of Pharmacology, Medical College of South Carolina.

SURVEY OF INTEREST IN PHARMACEUTICAL DEVELOPMENT

To the Editor:—In a recent survey to obtain indication of the probable postwar needs in academic and industrial organizations of those whose special interest lies in the development and use of drugs, inquiry was made of one hundred and thirty-five pharmaceutical and drug houses, seventy-seven medical schools and eighty-one foundations. Apparently all organizations plan to reemploy those on leave for service with the armed forces or on leave for other special work, although a comparatively small number will no doubt choose voluntarily to go elsewhere.

Many plans for expansion are being made and opportunities will be numerous for those qualified and willing to undertake teaching, research and administrative work. Expansion will be more extensive in industry than in academic centers, yet representatives of a number of schools anticipate enlargement of their institutions. Medical schools can provide full or part time teaching and research duties, fellowships, funds for which may be supplied by the university, foundation, drug manufacturer or other group, and merely space for study and research.

Pharmaceutical manufacturers can offer several types of work depending on the size of the organization: in the plant health department, which is responsible for the prevention and treatment of accidents and illness arising during employment; in the medical department, which is responsible for correspondence with physicians and inquirers, the accuracy of advertising claims, initiation of laboratory and clinical investigations; in the research department, in which are initiated studies of new drugs, and in the merchandising and promotion department. The men and women who will undertake work in this type of industry may have been trained as pharmacologists, bacteriologists, obstetricians, general practitioners, gynecologists, pediatricians, internists, pathologists and others. Of course, comparatively few of the latter will practice their special subjects; their work will depend on the department in which they are placed or to which they choose to apply their medical knowledge. Regardless of the specialty, however, these men have received basic medical training which, when coupled with a desire and aptitude for writing, research and executive or organizational activities, fits them for this type of work.

Foundations probably will provide fewer opportunities for full time work, but they will offer many fellowships.

Other places for specially trained medical men were not investigated, as the questionnaire was not intended to provide an exhaustive study. Otherwise, federal agencies such as the Food and Drug Administration, Federal Trade Commission and the National Institute of Health would have been included in the survey, as well as state and local health agencies, insurance companies, advertising agencies, radio broadcasting stations and other organizations.

Outstanding is the need for pharmacologists. Also in demand are individuals qualified to become toxicologists, medical writers, medical directors, bacteriologists, parasitologists, chemists and physiologists. Other specially trained personnel are also desired. The need for increased personnel in university centers is obvious. The need is equally obvious among pharmaceutical manufacturers, although the reasons for such scientific help are different. Of the three hundred institutions queried, about two hundred can probably supply well over three hundred additional positions, not including the vacancies created by men on leave for duty with the armed forces. This does not include fellowships, as the number which will be available is not possible to determine now.

AUSTIN SMITH, M.D., Chicago.
Secretary, Council on Pharmacy and Chemistry, A. M. A.

SANITARY DANGERS OF CROSS CONNECTIONS IN PLUMBING

To the Editor:—The editorial "Sanitary Dangers of Cross Connections in Plumbing" outlines a problem which is encountered in hospitals where the physical facilities are more than 15 years old. Few hospitals have an adequate water supply as judged by a study of dynamic pressures, so that sanitary plumbing is essential for safety. Administrators and hospital engineers have become calloused toward the problem, feeling that freedom from difficulty in the past indicates that sanitary plumbing is a luxury, too expensive to justify modernization of existing service. The profession has little knowledge of such matters and too often feels that 'sanitary plumbing' has esthetic implications but has little to do with good health. Local authorities are either apathetic or frustrated by the economic implications of correcting the situation. The American Medical Association can perform an outstanding service by sending trained experts into every hospital to inspect sterilizers, bath tubs, water closets, steam tables and laundry equipment as well as the general plumbing. An unbiased authoritative report to the trustees should stir most communities and even bureaucracies to corrective action.

CARL W. WALTER, M.D., Boston.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Liability of Corporate Employer for Physician-Employee's Negligence in Preemployment Physical Examination and Treatment.—Rannard and his wife instituted action for damages for malpractice against the Lockheed Aircraft Corporation and a physician in its employ. The first cause of action in the complaint alleged that the corporation employed the physician defendant in the conduct of its business; that Rannard applied to the corporation for employment and was found acceptable for employment subject to a required physical examination; that the corporation and the physician conducted the physical examination negligently, carelessly and unskilfully, and that as a direct result of such negligence the plaintiff sustained stated damages. The second cause of action incorporated the allegations of the first cause of action but elaborated on the employee relationship of the physician defendant and the corporation, alleging that the physician defendant was employed for the purpose of conducting physical examinations of applicants for employment and that the corporation in hiring and retaining the physician "negligently failed to select and employ a medical and surgical attendant physician and surgeon possessed of or capable of exercising that degree of care, skill, ability or learning possessed and exercised by medical and surgical attendants, physicians and surgeons practicing" in that locality. The third cause of action incorporated the allegations of the first cause but elaborated on the charge as to the negligent physical examination, alleging that Rannard was required to submit to such examination as a condition precedent to employment and was negligently advised by the defendants that it would be necessary for Rannard to submit to an operation to correct a purported "double hernia" and that Rannard did submit to such an operation performed by the physician, which operation was performed in a negligent, careless and unskilful manner. The final cause of action incorporated the substance of the first cause and incorporated by reference the allegations of the third cause with respect to the operation. In addition, the last cause alleged that after the operation the physician discontinued his employment with the corporation but continued to care for Rannard and that he did so negligently and that the corporation participated in and took an active part in that negligence and thereby ratified the act of the physician. There was a judgment on the pleadings in favor of the corporation, apparently on the ground that the details of the alleged negligence had not been set out. From an order of the trial court denying a new trial the plaintiffs appealed eventually to the Supreme Court of California.

The question here to be determined, said the Supreme Court, is whether the judgment on the pleadings in favor of the corporation was properly granted. In determining this question it is necessary to determine the sufficiency of the complaint on the same principle as though it had been attacked by general demurrer. In other words, only where there is an entire absence of some essential allegation may a motion for a judgment on the pleadings be properly granted. Under the applicable authorities, it is sufficient for a plaintiff to allege that an act was negligently done by the defendant and that it caused damage to the plaintiff. This rule has been applied in cases involving automobiles, in which it has been held sufficient to aver that the defendant negligently operated the vehicle without alleging how or in what respect it was done. This rule has also been applied in malpractice cases. *Dunn* v. *Duffey*, 194 Cal. 383, 228 P. 1029; *Ragin* v. *Zimmerman*, 206 Cal. 723, 276 P. 107; *McGehee* v. *Schiffman*, 4 Cal. App. 50, 87 P. 290. While, in malpractice cases, in addition to general allegations of negligence, the complaint may include a recital of certain related particulars, that fact does not deflect from the force of the general rule that it is sufficient in cases of this class to plead that the thing done was negligently done. The application of this rule is stated in *Abos* v. *Martyn*, 31 Cal. App. 2d 705, 88 P. 2d 797 as follows:

> It sufficiently appears from this complaint that what was done by this defendant was the administration of chiropractic treatments, which treatments, it was alleged, were negligently administered. Having alleged what was done and that the same was negligently done, the complaint was sufficient in the absence of a demurrer. While the defendant might have insisted upon greater certainty and particularity, he waived such defects by failure to interpose a special demurrer. As against a general demurrer, which is what an objection to the introduction of any evidence amounts to, the complaint is sufficient.

Tested by the requirements of the rule referred to, continued the court, the complaint in this case must be held sufficient. Negligence is expressly alleged with respect to three successive stages in medical services rendered Rannard: the diagnosis, the operation and the subsequent treatment. In relation to this premise of negligence, the complaint further alleges that "as a direct and proximate consequence and result" thereof various items of damage were sustained by the plaintiffs, thus satisfying the requirement of pleading "a causal connection between the act and the injury." 19 Cal. Jur. "Negligence," Sec. 101. The complaint here is couched in very general language but, as stated in *Dunn* v. *Duffey, supra:*

> All that is required of a plaintiff, as a matter of pleading, even as against a special demurrer, is that his complaint set forth the essential facts of the case with reasonable precision and with sufficient particularity to acquaint the defendant with the nature, source and extent of his cause of action.

The details of the specific act or omission on which the plaintiffs rely are matters of evidence which may be shown under the scope of the general negligence charge. The standard of pleading in negligence cases rests on consideration of fairness and convenience in view of the situation of the opposing parties, and the rule permitting the pleading of negligence in general terms as justified by the fact that the person charged with negligence may ordinarily be assumed to possess at least equal, if not superior, knowledge of the affair to that possessed by the patient.

The final question for the court's determination was with respect to the liability of the corporation for the alleged malpractice of the physician. The complaint, said the court, sets forth the relationship of principal and agent between the corporation and the physician, expressly charging not only that the physician was retained in the employ of the corporation in the conduct of and in furtherance of its business but also that the physician in rendering the specified medical treatment "at all times acted as the agent and employee" of the corporation and that the acts of the physician were done in the scope of and as a regular and routine part of his usual employment. This theory of pleading the joint responsibility of the corporation and the physician for the negligent acts of the physician was proper in view of the fact that the complaint alleged that Rannard was acceptable for employment "subject only to a physical examination" by the physician and that after submitting to such examination Rannard "as a condition precedent to the proposed employment" was required to undergo the operation in question. It is clear that the corporation employed the physician primarily to protect its own interests rather than the interests of the applicant and, under the doctrine of respondeat superior, it is liable for any injury proximately resulting from the malpractice of the physician. As is stated in 39 Corpus Juris, "Master & Servant," Sec. 356, pages 244 and 245:

> Where a physician is employed by the master but the relation of physician and patient does not exist between him and the servant, the rule of respondeat superior applies and the master may be liable for his negligence. In any event, in order to hold the employer liable for the negligent treatment of the employee, such negligence must be established, and the complaint must positively and directly allege the facts imposing liability.

A case illustrating the application of this rule is *Jones* v. *Tri-State Telephone & Telegraph Co.*, 118 Minn. 217, 136 N. W. 741, in which the plaintiff employee, who had been injured in the course of his employment, was required to submit to the taking of certain roentgenograms by a physician hired for such purpose by the employer. As a result of exposure to the roentgen rays the employee suffered injury. In sustaining the liability of the employer, the Minnesota court said:

> The relation of physician and patient did not exist between Dr. Roberts and plaintiff. The doctor was the servant of defendant. The case is the same, therefore, as if defendant's manager, or any other agent or employee, had inflicted the injury, and the rule of respondeat superior applies, rather than the law relative to the liability of a physician or surgeon to his patient, or to the liability of a master who employs a physician to treat his servant. There can be no doubt that defendant wanted the picture for its own purposes, probably as evidence in case plaintiff should bring suit against it to recover for the injury received in the accident.

The fact that here, in contrast to the situation in the Minnesota case, Rannard was a prospective rather than an actual employee would not deflect from the force of the general rule that the employer is liable for the injury sustained through the incompetence or want of skill of the physician acting as the employer's agent primarily in protecting the employer's interests. 35 Am. Jur. "Master & Servant," sec. 111, pages 539, 540. It is true that the corporation could not lawfully practice medicine, but this circumstance does not affect the application of the principle of agency. The claim that the subject of the agency—the practice of medicine—would constitute an ultra vires act by the corporation is of no avail as a premise to escape liability voluntarily assumed by the corporation in order to gain advantage or benefit for himself. *Hedlund* v. *Sutter Medical Service Co.*, 51 Cal. App. 2d 327, 124 P. 2d 878.

The court accordingly held that the pleadings in the present case sufficiently stated a cause of action against the corporation and accordingly reversed the judgment of the trial court denying the plaintiff's motion for a new trial.—*Rannard v. Lockheed Aircraft Corporation, 157 P. (2d) 1 (Calif., 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, May 26, page 308.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA: * Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * *Eclectic.* Little Rock, June 7. Sec., Dr. C. H. Young, 1415 Main St., Little Rock. *Medical.* Little Rock, June 7-8. Sec., Dr. D. L. Owens, 701 Main St., Little Rock.

CALIFORNIA: *Oral.* Los Angeles, Aug. 11. *Written.* San Francisco, July 9-12. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO: * Denver, July 3-7. Final date for filing application is June 18. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Homeopathic.* New Haven, July 10-11. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical. Examination.* New Haven, July 10-11. *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, June 11. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: * Jacksonville, June 25-26. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

IDAHO: Boise, July 10. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 26-28. Superintendent of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Kansas City, June 26-27. Sec., Board of Medical Registration & Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

KENTUCKY: Louisville, June 18-20. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville 2.

LOUISIANA: June 14-16. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MAINE: Augusta, July 10-11. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 19-22. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 19-20. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 10-13. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F. State House, Boston.

MICHIGAN: * Detroit, June 26-28. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA: * Minneapolis, June 19-21. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MISSOURI: St. Louis, June 7-9. Sec., State Board of Health, Miss Lucy Motley, State Capitol Bldg., Jefferson City.

MONTANA: Helena. Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEBRASKA: * Omaha, June 19-21. Final date for filing application is June 4. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

NEW JERSEY: Trenton, June 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July. *Examination.* Columbus, June 18-21. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, June 14-16. Sec., Dr. J. D. Osborn, Jr., Frederick.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Galveston, June 4-6. Houston, July 17-19. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: * Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: * Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

WEST VIRGINIA: Charleston, July 5-7. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Milwaukee, June 26-28. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, June 4-5. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, June 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: June 9. Address State Board of Healing Arts, 250 Church St., New Haven 10.

MINNESOTA: Minneapolis, June 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

OREGON: Portland, July 7. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

SOUTH DAKOTA: Yankton, June 19. Sec., Dr. G. M. Evans, Yankton.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

29:143-280 (Feb.) 1945

Clinical and Theoretical Considerations of Involvement of Left Side of Heart with Echinococcal Cysts: Review of Literature, with Report of 5 New Cases, Including 1 Observed by Authors. J. H. Peters, L. Dexter and S. Weiss.—p. 143.
Heart Disease in the South: I. Statistical Study of 1,045 Cardiac Deaths. Alice B. Holoubek.—p. 168.
*Incidence of Heart Disease and Rheumatic Fever in School Children in Three Climatically Different California Communities. J. J. Sampson, P. T. Hahman, W. L. Halverson and Margery C. Shearer.—p. 178.
*Coronary Occlusion After Fever Therapy for Sulfonamide Resistant Gonorrheal Urethritis. A. M. Harvey and F. T. Billings.—p. 205.
Periodic Changes in Form of P Waves in Partial Heart Block. D. Scherf.—p. 213.
Negative Displacement of RS-T Segment in Electrocardiogram and Its Relationships to Positive Displacement: Experimental Study. C. C. Wolferth, S. Bellet, Mary M. Livezey and F. D. Murphy.—p. 220.
Treatment of Orthostatic Hypotension, with Particular Reference to Use of Desoxycorticosterone. R. Gregory.—p. 246.

Heart Disease and Rheumatic Fever.—The school populations of three California communities with different climates were surveyed for the incidence of heart disease, rheumatic fever, functional heart murmurs and hypertension. Rheumatic fever and rheumatic heart disease occur in the warm dry climate of Redlands in a degree comparable to cities with mild temperate climates, such as Cincinnati and San Francisco. Susanville, a mountain community with average humidity and precipitation but with wide extremes of winter and summer temperatures, presented a high incidence of rheumatic fever and rheumatic heart disease, comparable to the incidence in the northeastern United States or Great Britain. Eureka, with a uniformly cool climate and high precipitation, presented an unusually high incidence of rheumatic disease, especially of valvulitis. Certain statistical relations seem to exist between rheumatic disease and age, sex, race and housing. Questionable relations exist to diet and to a history of scarlet fever. Definite relation of functional murmurs to any physical, symptomatic or environmental influences, such as age, shape of chest or nutritional state, was not found.

Coronary Occlusion After Fever Therapy.—Harvey and Billings used fever therapy in the treatment of 85 young men with chronic gonococcic urethritis resistant to sulfonamide therapy. Three patients aged 24, 19 and 25 respectively developed electrocardiographic changes typical of occlusion of a coronary artery after fever therapy. In 1 case there were never any symptoms referable to the heart, and in the other 2 they were relatively mild and the illness was never serious. Electrocardiograms in each case showed progressive changes similar to those which occur with occlusion of the anterior descending branch of the left coronary artery. In 2 cases definite T wave changes were still present eight and ten weeks after the onset. In the third case a record made fifteen weeks after the therapeutic hyperpyrexia revealed normal T waves. Subsequently, in 15 cases, records were made routinely before and for three days after therapeutic hyperpyrexia. In 2 of these the electrocardiograms showed a coronary type of ST segment and T wave change within twenty-four hours, which persisted for several days but then reverted to normal. Neither patient had complaints referable to the cardiovascular system. In several others a transient cardiac arrhythmia was observed in addition to minor changes in the ST segments and T waves.

American Journal of Clinical Pathology, Baltimore

14:593-626 (Dec.) 1944

Immunity in Malaria. W. H. Taliafero.—p. 593.
Studies of Urobilinogen: IV. Quantitative Determination of the Urobilinogen by Means of the Evelyn Photoelectric Colorimeter. S. Schwartz, V. Sborov and C. J. Watson.—p. 598.
Id.: V. Simple Method for Quantitative Recording of Ehrlich Reaction as Carried Out with Urine and Feces. C. J. Watson, S. Schwartz, V. Sborov and Elizabeth Bertie.—p. 605.
Isoimmunization to Factor P by Blood Transfusion. A. S. Wiener and L. J. Unger.—p. 616.

American Journal of Medical Sciences, Philadelphia

209:281-420 (March) 1945

Clinical Observations on Outbreak of Jaundice Following Yellow Fever Vaccination. J. M. Hayman and W. A. Read.—p. 281.
Anaerobic Septicemia: Report of 6 Cases with Clinical, Bacteriologic and Pathologic Studies. J. D. Reid, G. E. Snider, E. C. Toone and J. S. Howe.—p. 296.
Coincidence of Allergic Disease, Unexplained Fatigue, and Lymphadenopathy: Possible Diagnostic Confusion with Infectious Mononucleosis. T. G. Randolph and R. A. Hettig.—p. 306.
Use of Bromsalizol in Lengthening Effect of Sympathetic Nerve Block. F. C. Lee, D. I. Macht and R. Z. Pierpont.—p. 314.
Spermatogenic Activity of Various Steroids. G. Masson.—p. 324.
Meigs Syndrome in Case of Multilocular Pseudomucinous Cystadenoma of Ovary. J. Millett and J. Shell.—p. 327.
Relation Between Cell Pack (Hematocrit) Volumes and Lymphocyte Counts. F. T. Jung, O. E. Hepler and M. S. Maynard.—p. 336.
Pernicious Anemia and Carcinoma of Stomach Autopsy Studies Concerning Their Interrelationship. H. S. Kaplan and L. G. Rigler.—p 339.
Coronary Insufficiency Revealed by Ectopic Nodal and Ventricular Beats in Presence of Left Bundle Branch Block. E. Simonson, N. Enzer and J. S. Goodman.—p. 349.
Large Interauricular Septal Defect, with Particular Reference to Diagnosis and Longevity: Report of 2 New Cases. J. B. Burrett and P. D. White.—p. 355.
Developments in Arthritis. R. Pemberton.—p. 364.
*Poliomyelitis in Pregnancy. M. J. Fox and L. Sennett.—p. 382.

Poliomyelitis in Pregnancy.—During the epidemic of poliomyelitis in 1943, 6 women with poliomyelitis were admitted to the Milwaukee Isolation Hospital. The fact that 4 were pregnant seems to indicate that pregnancy increases susceptibility to poliomyelitis. Increased susceptibility to poliomyelitis in pregnancy may be due to the change in ovarian secretion at that time, although pituitary dysfunction and fetal hormones upsetting the mother's balance may also be suspected. In the 4 cases of poliomyelitis complicating pregnancy at the Milwaukee Isolation Hospital, delivery of 2 normal children and examination of 1 fetus in a dead mother confirmed the opinion that poliomyelitis in the mother has not affected the newborn child, nor does it prevent normal spontaneous delivery.

American Journal of Public Health, New York

35:191-298 (March) 1945

Changing Challenges of Public Health. C.-E. A. Winslow.—p. 191.
Bacteriologic Improvements Obtained by Practice of Break-Point Chlorination. A. E. Griffin and N. S. Chamberlain.—p. 199.
Influence of Psychologic Factors on Nutrition of Children. M. J. E. Senn.—p. 211.
Accident Prevention—An Essential Public Health Service: Program Developed by Subcommittee on Accident Prevention, Committee on Administrative Practice, American Public Health Association. D. B. Armstrong and others.—p. 216.
Nursing Records in Industry. Anna M. Fillmore.—p. 221.
Destruction of Water Borne Cysts of Entameba Histolytica by Synthetic Detergents. G. M. Fair, Shih Lu Chang, Margery P. Taylor and Margaret A. Wineman.—p. 228.
Value of Typing Meningococci. Sara E. Branham.—p. 233.
Industrial Health Program for Federal Employees. V. K. Harvey.—p. 239.
Future Implications of Nutritive Value of American Wartime Diet. F. G. Boudreau.—p. 243.
Current Tuberculosis Statistics in the United States. Mary Dempsey.—p. 248.
Engineering Technic Applied to Restaurant Sanitation. W. S. Johnson.—p. 257.
*Sanitary Aspects of Control of 1943-1944 Epidemic of Dengue Fever in Honolulu. W. E. Gilbertson.—p. 261.

Sanitary Aspect of Control of Dengue.—Gilbertson says that dengue again made its appearance in epidemic form in Honolulu, Territory of Hawaii, in 1943, after an absence of over thirty years. The supposition that the disease was imported from the Southwest Pacific is based on the knowledge of the cases of 2 airline pilots who were hospitalized with

dengue in Honolulu after arrival from Suva, Fiji Islands, where an epidemic of dengue had been reported. The Honolulu dengue epidemic is believed to be one of few outbreaks of such proportions to be suppressed largely by mosquito control. Sanitary controls used were (1) citywide premise to premise inspections to reduce incidence of the vectors, Aedes aegypti (Linneas) and Aedes albopictus (Skuse), (2) comprehensive exterior-interior spraying to eliminate foci of dengue infection and (3) public education to urge householders to prevent mosquito breeding on their premises. Aedes breeding indexes were satisfactorily reduced by these efforts, while simultaneous spray work destroyed adult mosquitoes in zones of high dengue incidence. Comprehensive spray treatment of the epidemic foci was followed by a sharp reduction in cases. A total of 1,498 civilian cases occurred from July 1943 through June 1944, less than 0.7 per cent of the population contracting the disease.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

29:141-280 (March) 1945

*Acute Syphilitic Meningitis Treated with Penicillin. R. A. Nelson and L. Duncan.—p. 141.
*Experimental Investigation of Etiology and Immunology of Granuloma Inguinale. Katherine Anderson, W. A. DeMonbreun and E. W. Goodpasture.—p. 165.
Sobismol Mass in Treatment of Syphilis. C. W. Barnett and W. M. Meininger.—p. 174.
Chemotherapy of Syphilis. J. E. Moore.—p. 185.
Effect of Sodium Hydroxide on Biologic Falsely Positive and Anticomplementary Serologic Reactions in Syphilis. H. Brown, J. A. Kolmer and Elsa R. Lynch.—p. 200.
Relative Activity of Partially Purified Penicillin and of Crystalline Penicillin G on Treponema Pallidum. W. B. Dunham and G. Rake.—p. 214.

Syphilitic Meningitis Treated with Penicillin.—Nelson and Duncan report the effects of intramuscular injections of sodium penicillin on acute syphilitic meningitis in 10 patients treated at the Johns Hopkins Hospital. The total amount of penicillin administered varied from 600,000 to 4,000,000 units; the duration of treatment varied from seven and one-half to eleven days. The treatment schedule advised for acute syphilitic meningitis is a total dosage of 2,000,000 to 3,000,000 Oxford units of penicillin administered every three to four hours day and night for from eight to sixteen days. Although penicillin does not appear in the cerebrospinal fluid even after frequent intramuscular administration, the drug is effective in acute syphilitic meningitis when given by the intramuscular route. None of the 10 patients treated have so far developed evidence of clinical relapse, though 1 has shown relapse in the spinal fluid.

Etiology and Immunology of Granuloma Inguinale.—Anderson and her associates report experiments in which a micro-organism having morphologic identity with the Donovan body and specific antigenic relationship to patients with granuloma inguinale has been isolated and serially cultivated in the yolk of developing chick embryos. The Donovan micro-organism has been isolated and cultivated from 3 cases of granuloma inguinale. From the cultured strain a bacterial antigen has been prepared that elicits an apparently specific skin reaction in patients with the disease. A so-called capsular substance, precipitable from infected embryonic yolk, fixes complement and gives a positive precipitation test in combination with patient's serum and also stimulates a skin reaction in patients with granuloma inguinale. Successful cultivation of the Donovan micro-organism depends on the isolation of uncontaminated pieces of human tissue infected with Donovan bodies. The Donovan micro-organism survives in extirpated human tissue as long as ninety-six hours at 37 C. This permits the isolation of uncontaminated bits of recently removed infected tissue on the surface of a solid medium that would indicate contaminants by the gross appearance of colonies. Ordinary blood agar plates or slants were satisfactory in this initial step of isolation. With the elimination of contaminated fragments of tissue, Donovan bodies in a pure state in human tissue can be introduced into the yolk of developing chick embryos 5 to 6 days old, where they find a favorable invironment for growth. Although multiplication proceeds slowly, a small inoculum will initiate a pure culture.

American Review of Tuberculosis, New York

51:205-294 (March) 1945

*Pulmonary Alveolar Adenomatosis in Man: Is This the Same Disease as Jaagsiekte in Sheep? D. A. Wood and P. A. Pierson.—p. 205.
Congenital Tuberculosis: Its Clinical Importance. E. Lowenstein.—p. 225.
Frequency of Tuberculous Lesions at Autopsy: Some Epidemiologic Inferences (Second Report). K. E. Landé and G. Wolff.—p. 231.
Pathogenic Components of Tubercle Bacillus: Discussion of Recent Advances in Certain Fields of Tuberculosis Research and Postulation of Specific Component of Tubercle Bacillus Determining Virulence. G. Middlebrook.—p. 244.
Promin in Experimental Tuberculosis: Effects of Prolonged Treatment with Sodium P,P'-D'aminodiphenylsulfone-N,N'-Didextrose Sulfonate (Promin) on Subsequent Reinfection. W. H. Feldman and H. C. Hinshaw.—p. 268.
Types of Tubercle Bacilli in Birds and Mammals: Their Incidence, Isolation and Identification. A. M. S. Stadnichenko, H. C. Sweany and J. M. Kloeck.—p. 276.

Pulmonary Alveolar Adenomatosis.—A woman aged 57 had presented pulmonary symptoms for two years. Dyspnea with an initial dry cough gradually becoming productive constituted a prominent feature of the disease. Thin walled tension cavities developed in the right lower lobe. One of the cavities was opened surgically, sulfanilamide powder was instilled into the wound and the wound was tightly closed. The lesions in the lobectomy specimen resembled those of a noncaseating disseminated miliary tuberculosis. The most prominent microscopic feature was the multicentricity of hyperplastic columnar epithelial cells lining the alveolar walls, showing all degrees of proliferation from simple lining to papillary and cystadenomatous arrangements. Adenomatosis was confined to the right lower lobe for over a year. Foci were found in the other lobes post mortem. An adenoacanthoma of the uterine cervix was discovered three months prior to the patient's death. It had resulted in numerous distant metastases, most of which were below the diaphragm. Wood and Pierson are of the opinion that the uterine cancer developed independently of the pulmonary lesion.

Annals of Internal Medicine, Lancaster, Pa.

22:335-474 (March) 1945

*Hyperthyroidism and Thiouracil. M. Virginia Palmer.—p. 335.
*Use of Thiouracil in Preoperative Preparation of Patients with Severe Hyperthyroidism. E. C. Bartels.—p. 365.
*Intercapillary Glomerulosclerosis. I. I. Goodof.—p. 373.
Treatment of Arthritic Pain with Demerol: New Synthetic Analgesic. R. C. Batterman.—p. 382.
Severe Asthmatic Dyspnea as Sole Presenting Symptom of Generalized Endolymphatic Carcinomatosis: Report of 2 Cases with Autopsy Findings and Review of Pertinent Literature. A. I. Mendeloff.—p. 386.
"Chokes": Respiratory Manifestation of Aeroembolism in High Altitude Flying. E. V. Bridge, F. M. Henry, O. L. Williams and J. H. Lawrence.—p. 398.
Primary Atypical Pneumonia: Critical Analysis of 500 Cases. S. Karpel, I. M. Waggoner and O. S. McCown Jr.—p. 408.

Hyperthyroidism and Thiouracil.—Palmer reports observations on 50 unselected patients treated with thiouracil. Twenty-two of these had received the drug for a minimum of three months, but only 6 had received it for as long as nine months. The only criterion for treatment was that the basal metabolic rate had to exceed +30 per cent. Five of the patients had had one or more partial thyroidectomies. Twenty-two patients had received previous treatment with iodine, the results being unsatisfactory. The dosage schedule, which was arrived at without determination of blood concentration, was as follows: 0.1 Gm. of thiouracil every three hours for three days, 0.1 Gm. every four hours for three to six days and then 0.5 or 0.4 Gm. daily until clinical improvement is sustained. It is probable that 0.6 Gm. of thiouracil is the optimal maximum daily dose. With each dose of thiouracil 10 grains (0.65 Gm.) of sodium bicarbonate was given. All the patients treated during the past five months have received 100 mg. daily of ascorbic acid and also liver extract. Capsules of multivitamin concentrates were given two to three times a day. Every patient now receives thyroxin or desiccated thyroid. The thiouracil treatment failed in none of the patients, but some responded more satisfactorily than others. In general the higher the initial basal metabolic rate, the more dramatic was the response. It is believed that vitamins, sedation and rest enhance the efficiency

of thiouracil but have little intrinsic curative properties. There is a trend toward a normal endocrine balance on thiouracil therapy alone, but the restoration is brought about more completely and with less unpleasant side reactions when thyroid substance is given in combination with thiouracil. The patient coming to operation is treated in the same manner as one with simple colloid goiter, with the exception that measures are taken to control the greater vascularity encountered in a thyroid treated with thiouracil.

Thiouracil in Preoperative Management of Hyperthyroidism.—Thiouracil has been used at the Lahey Clinic in the preoperative management of 64 patients with hyperthyroidism. Fifty of the patients had primary hyperthyroidism or exophthalmic goiter and 14 patients had adenomatous goiter with hyperthyroidism. The duration of hyperthyroidism ranged from three months to fifteen years. The initial basal metabolic rate varied from +21 per cent to +98 per cent, the average rate being +51 per cent. Fifteen patients with adenomatous goiter were classified as thyrocardiac, having either heart failure or auricular fibrillation without heart failure. When thiouracil is used, maximum improvement must be striven for; patients should not be sent to operation until a normal or nearly normal basal metabolic rate is recorded. Unfavorable results in 2 cases of partial preoperative control with thiouracil has induced the authors to continue daily administration of 0.6 Gm. of thiouracil until the basal metabolic rate is practically normal and hyperthyroid symptoms have subsided. Approximately one day of treatment with thiouracil is required for each per cent of elevation in the basal rate. When the first patients receiving thiouracil underwent thyroidectomy the gland was found to be soft and friable, and bleeding was so extensive that there was difficulty in carrying out the usual surgical technic. The difficulty was overcome when Lugol's solution was administered with thiouracil. Thiouracil is given until the basal metabolic rate approaches +20 per cent, when iodine is started. It is continued for three weeks preoperatively, the thiouracil being discontinued one week before operation. This method produced a satisfactory state of involution, as determined at operation and by microscopic examination. Thiouracil is valuable in the preoperative management of hyperthyroidism.

Intercapillary Glomerulosclerosis.—Goodof observes that a history of diabetes mellitus was recorded in 214 of 10,000 consecutive necropsies performed at Washington University School of Medicine from 1910 to 1942. Microscopic sections of the kidneys and pancreas were studied. In all cases showing evidence of intercapillary glomerulosclerosis or of hyalinization of the islands of Langerhans, additional sections were prepared and stained with Heidenhain's aniline blue. Several series of controls were selected. One of these included 214 patients without diabetes mellitus. This group was chosen so that the ages corresponded with those of the test series. Another control series was composed of 100 consecutive nondiabetic patients in whom the kidneys showed arteriolar disease. To study the part played by age in the development of intercapillary glomerulosclerosis, 50 nondiabetic patients over 70 years of age were examined, and a similar number from 5 to 20 years of age. On the basis of these investigations it appears that intercapillary glomerulosclerosis occurs in 44 per cent of diabetic patients. Women are more likely to show the lesion than men, in a ratio of 10:7. It is more prevalent in patients whose diabetes is of long duration, and who are in older age groups. There is no association with insulin treatment. Thirty per cent of nondiabetic persons over 70 years of age have mild lesions of intercapillary glomerulosclerosis. None are present in a group of nondiabetic patients between 5 and 20 years of age. Mild lesions are present in 10 per cent of the population as a whole. Advanced lesions are present only in patients with diabetes mellitus. Clinically, the diagnosis of intercapillary glomerulosclerosis is justified in a patient who has had mild or moderately severe diabetes mellitus for a considerable period, usually over six years, who excretes albumin in the urine without evidence of other renal disease to account for the albuminuria.

Archives of Neurology and Psychiatry, Chicago

53:165-256 (March) 1945

Visual Disturbances Produced by Bilateral Lesions of Occipital Lobes with Central Scotomas. M. B. Bender and L. T. Furlow.—p. 165.
Vasothrombosis of Central Nervous System: Characteristic Vascular Syndrome Caused by Prolonged State of Vasoparalysis. I. M. Scheinker. —p. 171.
Polyradiculoneuritis with Albuminocytologic Dissociation: Pathoanatomic Report of 3 Cases. K. Lowenberg and D. B. Foster.—p. 185.
Lesions in Brain Associated with Malaria: Pathologic Study on Man and on Experimental Animals. R. H. Rigdon and D. E. Fletcher. —p. 191.
Characteristic Roentgenographic Changes Associated with Tuberous Sclerosis. W. W. Dickerson.—p. 199.
Hemifacial Spasm: Review of 106 Cases. G. Ehni and H. W. Woltman. —p. 205.
*Metrazol and Electric Convulsive Therapy of Affective Psychoses: Controlled Series of Observations Covering Period of Five Years. E. Ziskind, Esther Somerfeld-Ziskind and L. Ziskind.—p. 212.
Carcinoma of Uterine Fundus with Metastasis to Brain: Report of Case. G. B. Hodge and H. F. Steelman.—p. 218.
Causalgia: Report of Recovery Following Relief of Emotional Stress. J. Lidz and R. L. Payne Jr.—p. 222.
*Erotomania (Nymphomania) as Expression of Cortical Epileptiform Discharge. T. C. Erickson.—p. 226.

Metrazol and Electric Shock in Psychoses.—The Ziskinds present a comparison of treated and untreated patients with affective psychoses who were seen in private practice between 1938 and 1943. Of 88 patients treated the first 58 received metrazol and the other 30 were given electric shock therapy. The untreated control group included 109 patients, of whom 43 refused convulsive therapy, 50 had symptoms which were too mild to warrant this treatment and 16 had physical disease which contraindicated the method. The follow-up results were full remission in 90 per cent of the treated patients and in 75 per cent of the untreated patients. In the untreated patients there were nine deaths from suicide and four deaths from exhaustion, as compared with one death from suicide in the series of treated patients. Two patients with heart disease died during treatment. The incidence of ultimate full remission for patients with the longest period of follow-up observation (from June 1938 to June 1941) was about the same (88 and 86 per cent) for treated and for untreated patients respectively, provided the deaths were omitted from each series. New attacks occurred with almost equal frequency in the control and in the treated series. Thus the tendency to recurrence is apparently not influenced by treatment. Subconvulsive doses, incomplete therapy and old age are unfavorable factors. Subconvulsive reactions should be avoided. The benefits of convulsive therapy are to be gaged by the reduced period of illness and the decreased number of deaths. The treatment in itself is not responsible for any greater incidence of recovery than that which occurs spontaneously if the patient is shielded from death by suicide or exhaustion.

Erotomania as Expression of Epileptiform Discharge.—Erotomania as the initial manifestation of a cortical epileptiform discharge has not previously been described. Erickson's patient, a woman, began to manifest nymphomania in paroxysms of short duration at the age of 43. For two years she presented no symptoms other than the nymphomania. The significance of this symptom was evident only when the same sensory experience was followed by jacksonian seizures and finally by progressive hemiplegia. Examination finally revealed the presence of a neoplasm causing excitation of the topical projection of the genital structures in the right paracentral lobule. A year after operative removal of the neoplasm the nymphomania had disappeared.

Bulletin of Johns Hopkins Hospital, Baltimore

76:1-60 (Jan.) 1945

*Experimental Nonparalytic Poliomyelitis: Frequency, Range of Pathologic Involvement. D. Bodian and H. A. Howe.—p. 1.
*Further Observations on Presence of Poliomyelitis Virus in Human Oropharynx. H. A. Howe, D. Bodian and H. A. Wenner.—p. 19.
Performance in Relation to Environmental Temperature: Reactions of Normal Young Men to Hot, Humid (Simulated Jungle) Environment. L. W. Eichna, W. B. Bean, W. F. Ashe and M. Nelson.—p. 25.

Experimental Nonparalytic Poliomyelitis.—A series of 37 monkeys inoculated intracerebrally with material from throat swabs of poliomyelitic patients were examined histopathologically to make certain that nonparalytic poliomyelitis was not

missed as well as to confirm the clinical diagnosis of poliomyelitis in the paralytic monkeys. Ten of the 37 monkeys suffered attacks of poliomyelitis. Of these, 9 were paralyzed and 1 had a nonparalytic infection. The pathologic findings in all cases were typical of poliomyelitis. The occurrence of 1 nonparalytic infection in a total of 10 monkeys inoculated intracerebrally is to be compared with a similar frequency of nonparalytic infections in monkeys inoculated intranasally with human and chimpanzee stools (human stools, 45 paralytic and 5 nonparalytic; chimpanzee stools, 43 paralytic and 7 nonparalytic). Sixteen of the 23 negative animals examined histologically presented scattered perivascular infiltrations in the pia mater, which were interpreted as nonspecific reactions to the inoculation. Cord passage to 2 normal rhesus monkeys in each of 7 of these cases gave a negative result. The range of pathologic involvement in nonparalytic infections, as in paralytic cases, was found to be wide.

Poliomyelitis Virus in Oropharynx.—Howe and his collaborators state that poliomyelitis virus was recovered from half of 14 patients hospitalized in New Haven in 1943. In 20 cases studied in 1943 in New Haven and of 16 in Chicago the virus was recovered in 10, or 28 per cent This figure gives little idea of the factors actually involved In the 20 New Haven cases virus was isolated from 8 (40 per cent), while in the 16 cases of the Chicago series virus was found in only 2, or 12 per cent. This disparity is explained by the fact that in no instance was virus isolated after the third day of the disease. The apparently unfavorable result in the Chicago series was occasioned by the fact that two thirds of the swabs were obtained between the fourth and the ninth day of illness, whereas two thirds of the New Haven material was collected by the third day.

California and Western Medicine, San Francisco

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Malpractice Actions: Who Starts Them? L J Reagan —p 55.
Prepaid Medical Service Planning N. O. Gunderson —p 57.

62:103-152 (March) 1945

Compulsory Health Insurance: Radio Broadcast on Laws Submitted to California Legislature S. K Cochems —p 108
Diagnosis of Industrial Poisoning. Alice Hamilton —p. 110
Limitations of Objectives in Psychotherapy. J S. Kasanin —p. 113
Endemic Typhus Fever in Southern California H E. Meleney and R S French —p 116
Madurom ycosis of Ankle: Report of Case D A Wood —p 119.

Canadian Medical Association Journal, Montreal

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Medical Survey of Nutrition in Newfoundland J D Adamson and others —p 227.
Interesting Neuropathic Joint. F R. Tucker —p 251
*Prevention, Treatment and End Results of Meningitis N Silverthorne —p. 252.
Some Essentials in Examination of Ear. G E Hodge and E E Scharfe —p 256
Pseudo Right Indirect Inguinal Hernias A M Vineberg —p 263.
Calcium Content of Samples of Commercial Bread E. W McHenry. —p 265
Observations on Health Insurance. J. A Hannah —p. 268.
Industrial Medicine and Respiratory Diseases G J Wherrett.—p. 271.
Treatment of Simmonds' Disease with Male Sex Hormones M. M. Cantor.—p 275
Report of No 1 Canadian Neuropsychiatric Wing. G. S Burton. —p 278
Allergic Manifestations of Newborn Period. G A Campbell —p 280
Maxillary Sinusitis of Dental Origin. M. K MacGougan —p 283

Meningitis.—Silverthorne reviews 166 cases of influenzal meningitis and 271 cases of meningococcic infection (all bacteriologically proved) which were observed at the Hospital for Sick Children in Toronto between 1919 and 1944 The use of sulfonamides has been the most important method of treatment shortening the course and reducing the fatality Influenzal meningitis has been sporadic in its occurrence. Meningococcic infections were sporadic until 1939, but from 1940 to 1943 there was an increase in the incidence of cases of this infection. Bacteriologically, 70 of the 71 spinal fluid strains examined from patients with influenzal meningitis have been type B. Meningococcic infections during a sporadic occurrence of the disease have usually been caused by strains of type II. During an increase in the incidence of this infection in 1941 and 1942 there was a decided increase in the occurrence of group I strains. Most patients with influenzal meningitis followed after recovery have been normal mentally and physically. All patients with meningococcic infection treated with sulfonamides or with serum and sulfonamides have been normal on discharge from the hospital.

Diseases of Chest, Chicago

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Primary Bronchiogenic Carcinoma A Ochsner, J L Dixon and M DeBakey —p 97.
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Mechanical Paralysis of Left Hemidiaphragm Complicating Collapse Therapy in Pulmonary Tuberculosis O. Feinsilver —p 138
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Reconditioning of Military Personnel as Carried Out in Army S U. Marietta —p 156

Endocrinology, Springfield, Ill.

36:181-244 (March) 1945

Ovarian Hormones and Spontaneous Running Activity in Female Rat W. C. Young and W. R. Fish —p 181.
Gonadotropic Activity of Anterior Pituitary of Cockerels W. R Breneman —p 190.
Relative Thyroidal Potency of l and d, l Thyroxine E P Reineke and C. W Turner —p 200
Pituitary Adrenotrophic Hormone Control of Rate of Release of Serum Globulins from Lymphoid Tissue A. White and T. F. Dougherty. —p 207
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Indiana State Medical Assn. Journal, Indianapolis

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Medical Viewpoint on National Fitness J. W Wilce —p 77
Fitness for Duty of Military Patients on Discharge from Hospital G F Hull —p 82.
General Considerations of Physical Fitness Problem. W. D. Little —p 84
What is Physical Fitness? R. L Sensenich —p 86
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Physical Fitness from a Psychiatric Standpoint. E V Hahn —p 89
Some Practical Considerations of Cardiovascular Examinations in Youth A. B. Richter —p 91.

Iowa State Medical Society Journal, Des Moines

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Polycythemia Vera. R A Towle, F H Coulson and W. M. Fowler —p 79
Heart Disease and Pregnancy. E W. Anderson —p 83
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Observations on Bromide Intoxication C H Millikan —p 120
Value of Testing for Penicillin Resistance Before Administration in Cases of Chronic Osteomyelitis F. E Thornton and A P McKee —p 125
Meningitis and Other Infections Caused by Hemophilus Influenzae (Pfeiffer's Bacillus) H H Comly and A P. McKee —p 127.
Malaria and Its Diagnosis I H Borts —p 132
Clinical Perspective on Rh Factor E L DeGowin —p 136
Some Observations on Determination of Thiocyanate in Blood Serum and Plasma R. B Gibson —p 138
Bactericidal Lamp Conjunctivitis R Rooks —p 140

Journal of Immunology, Baltimore

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Sensitization to Ragweed Extract and Production of Antibodies by Means of Adjuvants Anna M Kulka and Dorothy Hirsch —p 127
Effect of Tuberculous and Sensitized Sera and Serum Fractions on Development of Tubercles in Chorioallantoic Membrane of Chick Emily W. Emmart and Florence B Seibert —p 143
*Weather and Susceptibility in Relation to Spread of Common Cold Effect of Ascorbic Acid, in Massive Dosage, on Duration W. B. Brown, F Mahoney, A Niedringhaus and A Locke —p 161
Differentiation of Typhus Strains by Slide Agglutinative Tests M Ruiz Castaneda —p. 179.
Natural Antibodies Against Yeastlike Fungi as Measured by Slide Agglutination. C H Drake —p 185

Weather and Ascorbic Acid in the Common Cold.—Brown and his associates present an analysis of the spread of the common cold through a group of 1,600 girls of college age, as affected by the weather, use of cigarets and relative susceptibility to the common cold, of the season to season changes in

physiologic fitness and of the effect, on duration of the common cold, of early recognition and the use of ascorbic acid in massive dosage. Sharp increases in the number of new colds per day occurred during periods of falling temperature accompanied by heavy rain. The increases began and were most steadily sustained in the girls with a total of four or more colds for the year. The smokers had a tendency to precede the nonsmokers. The rises in the incidence of colds precipitated by the weather tended to begin twenty-four to forty-eight hours after the beginning of the weather change and to persist for twenty-four to forty-eight hours after its cessation. Deterioration in average physiologic fitness occurred with the progress of the year in a small fraction, which was partially balanced by a smaller group showing improvement. The smokers appeared to be slightly less fit than the nonsmokers. Nose involvement predominated in the fall colds and throat involvement in the winter colds. A total of 298 patients with colds were studied for the ascorbic acid appraisal; 119 of these were controls who were given placebos of citric acid. Approximately 60 per cent of the colds with throat involvement appeared to respond only to the basic management given both the control and the ascorbic acid groups (restriction of activity, precaution against chilling and increased fluid intake) with a spontaneous checking of further development. The colds with nose involvement were equally responsive if recognized and submitted to care within seven hours of onset. For those not submitted to care until eight to twenty-eight hours after onset, the percentage of spontaneous checking was 59 ± 5 for those given 1 Gm. of ascorbic acid at examination and again twenty-four hours later and 21 ± 4 for those given citric acid.

Journal of Infectious Diseases, Chicago

76:1-82 (Jan.-Feb.) 1945. Partial Index

Mammalian and Avian Toxoplasma. R. D. Manwell, F. Coulston, Ellen C. Binckley and Virginia P. Jones.—p. 1.

Effects of Sulfonamide Diets on Infections of Plasmodium Elongatum in Canaries. P. E. Thompson.—p. 15.

Effects of *Penicillin*, Clavacin and Streptomycin on Tetanus Toxin. E. Neter, with technical assistance of Dessie Will.—p. 20.

Variations in Blood Picture of Cattle Following an Induced Infection with B. Abortus. L. C. Ferguson, M. R. Irwin and B. A. Beach. —p. 31.

Transmissibility of Infectious Myxomatosis. R. B. Houlihan and G. M. Lawson.—p. 40.

*Violacein, Antibiotic Pigment Produced by Chromobacterium Violaceum. H. C. Lichstein and Virginia F. Van De Sand.—p. 47.

Study of Seven Different Salts of Penicillin. H. Welch, V. L. Chandler, Ruth P. Davis and C. W. Price.—p. 52.

Studies on Lymphogranuloma Venereum: III. Action of Sulfonamides on Agent of Lymphogranuloma Venereum. Helen Jones, G. Rake and Barbara Stearns.—p. 55.

Combined Infection of Mice with H. Influenzae and Influenza Virus by Intranasal Route. T. Francis Jr. and M. Vicente De Torregrosa. —p. 70.

Study of Enterotoxin and Alpha and Beta Hemolysin Production by Certain Staphylococcus Cultures. M. J. Surgalla and K. Eileen Hite. —p. 78.

Violacein, an Antibiotic Pigment of Chromobacterium Violaceum.—According to Lichstein and Van De Sand the interest in Chromobacterium violaceum has been increased by the isolation of this germ from fatal human infections. The pigmentation surrounding the "anthrax-like" lesions of the skin and the relative absence of contaminating organisms in the lesions suggested the possibility that some metabolic product of this organism might possess an inhibitory action against certain forms of bacteria, particularly those found abundantly in the normal flora of the skin. The authors obtained 4 strains of Chr. violaceum, 3 of which were isolated from fatal human infections and were called the Shahan, Soule and Schattenberg strains and a fourth which was an old saprophytic laboratory strain. Those from pathologic sources produced a rich violet pigment, whereas the saprophytic strain exhibited little or no pigmentation during growth. Violacein was extracted from cultures of the Shahan strain in order to test antibiotic activity against micro-organisms. The pigment exhibited a considerable inhibitory effect on the growth of gram positive bacteria with the exception of Clostridium welchi and had little effect on the proliferation of gram negative bacteria save the meningococcus, which was highly susceptible. Of the molds tested, only Blastomyces dermatiditis was greatly susceptible to the action of the pigment. The activity of violacein is influenced only slightly by the number of bacteria in the test inoculum and is influenced strongly by the presence of serum.

Journal of International College of Surgeons, Chicago

8:1-108 (Jan.-Feb.) 1945

Floss Silk Lattice Repair for Direct Inguinal Hernia. R. Maingot. —p. 1.

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Preoperative and Postoperative Treatment of Cancer of Rectum and Pelvic Colon. H. E. Bacon, W. D. Todhunter, O. C. Gass and F. D. Wolfe.—p. 20.

Plastic Operations on Kidney. O. S. Lowsley.—p. 37.

Vaginal Hysterectomy: Indications and Advantages. L. Averett. —p. 53.

Unstable Spine: Discogenetic Syndrome Treatment with Self-Locking Prop Bone Graft. A. T. Moore.—p. 64.

Clinical and Roentgenologic Diagnosis of Diaphragmatic Hernia. L. J. Gariepy and J. H. Dempster.—p. 78.

Indications for Extraperitoneal Cesarean Section in Certain Cases of Dystocia of Soft Parts and in Infected Women. B. J. Gastélum. —p. 85.

Journal of Investigative Dermatology, Baltimore

6:1-93 (Feb.) 1945

Past, Present and Future in Investigative Dermatology in United States. F. D. Weidman.—p. 9.

Experimental Epidermal Methylcholanthrene Carcinogenesis in Mice: Second Summarizing Report. E. V. Cowdry.—p. 15.

Histologic Studies on Percutaneous Penetration, with Special Reference to Effect of Vehicles. G. M. MacKee, Marion B. Sulzberger, F. Herrmann and R. L. Baer.—p. 43.

Chemistry of Palmar Sweat: Preliminary Report: Apparatus and Technics. W. C. Lobitz Jr. and A. E. Osterberg.—p. 63.

Certain Effects of Central Nervous System Lesions on Cutaneous Reactions: Investigation of Cutaneous Reactivity Following Specific Diseases of Central Nervous System: Drug, Sensitization and Ultraviolet Reactions in Paralytics. E. S. Bereston.—p. 75.

Journal of Lab. and Clinical Medicine, St. Louis

30:195-292 (March) 1945

*Relation of Periarteritis Nodosa to Bronchial Asthma and Other Form of Human Hypersensitiveness. K. S. Wilson and H. L. Alexander —p. 195.

*Demonstration of Anti-Rh Agglutinins—Accurate and Rapid Slide Test L. K. Diamond and N. M. Abelson.—p. 204.

Basic Electrocardiographic Patterns in Bundle Branch Block. E. Goldberger.—p. 213.

The Production of Bactericidal Activity in Cod Liver Oil by Oxidation. C. A. Ross and Edgar J. Poth.—p. 226.

Serologic Diagnosis of Endemic Typhus: I. Use of Specially Prepared Rickettsial Suspensions and Commercial Typhus Vaccines as Antigens in Complement Fixation Test. S. R. Damon and Mary B. Johnson. —p. 233.

*Effect of Penicillin on Experimentally Produced Plague in Guinea Pigs. B. Witlin and C. L. Wilbar.—p. 237.

Congenital Hemolytic Anemia in Negro. J. H. Scherer and R. C. Cecil.—p. 244.

Oxyuriasis: Simplified Method of Diagnosis with Glass Slide; Incidence in Minnesota State Hospital; Result of Treatment with Gentian Violet. M. C. Petersen and J. Fahey.—p. 259.

Photosensitivity as Cause of Falsely Positive Cephalin-Cholesterol Flocculation Tests. C. Moses.—p. 267.

Kahn Triple Quantitative Verification Technic in Serology of Mal Del Pinto (Pinta). G. Varela, J. Olarte and S. C. Estrada.—p. 270.

Nitrogen Balance on Restricted Caloric Intake. R. Elman, H. W. Davey and R. Kiyasu.—p. 273.

Limitations of Correlation Between Red Cell Volume and Hemoglobin of Blood During Pregnancy. J. W. Mull.—p. 278.

Periarteritis Nodosa and Hypersensitivity.—Wilson and Alexander analyzed 300 consecutive cases of periarteritis nodosa and found many instances of associated atopy and atopic-like disorders. Particular attention was paid to bronchial asthma, of which there were 54 cases, an incidence of 18 per cent. When differential blood counts were available, all but 3 of 47 cases of asthma showed a hypereosinophilia ranging from 11 to 84 per cent, with an average of 53.5 per cent. This is in contrast to 151 cases without asthma in which there were but 9 instances of hypereosinophilia and the average eosinophil count was 2.5 per cent. Periarteritis nodosa appears to be the only evident manifestation which links together all types of human hypersensitivity with the exception of contact dermatitis. This fact points again to the role of the blood vessels in hypersensitive states.

Demonstration of Anti-Rh Agglutinins by Rapid Slide Test.—Diamond and Abelson describe a slide test for the detection of anti-Rh agglutinins. Approximately 0.2 cc. of fresh, oxalated, Rh negative, Rh_2 and Rh_1 group O whole bloods or washed cells are placed on an ordinary slide. With each of these is mixed 0.1 cc. of the serum to be tested. The mixture is gently rotated or repeatedly tilted. The reaction is accelerated when the slide is warmed to 37 C. Reading of the test is facilitated by holding the slide on a piece of ground glass placed over an ordinary electric light. When the serum is from a sensitized individual, plainly visible agglutination appears in one, and usually in both, of the Rh positive bloods usually within a minute and certainly within three minutes. The Rh negative blood serves as a control to eliminate errors through mistaking fibrin shreds, rouleau formation or nonspecific agglutination for actual Rh agglutination. In contrast to the incubation test, which fails to show the presence of anti-Rh agglutinins in over 50 per cent of cases, chiefly because of the presence of inhibitor substances, this slide test has demonstrated agglutinins in the serums of 79 of 80 women who have delivered infants with proved erythroblastosis fetalis and in 9 persons who had been sensitized by transfusions of Rh positive blood cells. In addition to demonstrating Rh sensitization in a higher percentage of cases than does any other single test, it more nearly pictures what is likely to occur in vivo when a relatively large amount of agglutinogen is ordinarily exposed to a smaller amount of agglutinin. Another advantage is that it permits the use of testing serums heretofore considered of no value.

Effect of Penicillin on Plague in Guinea Pigs.—Witlin and Wilbar prepared a pure culture of Pasteurella pestis organisms from a rat infected with plague. Guinea pigs weighing from 250 to 300 Gm. were used as experimental animals. Penicillin was administered prior to, simultaneously with and subsequent to the inoculation with P. pestis organisms. Penicillin appeared to be of no benefit in combating bubonic plague in guinea pigs. In vitro a concentration of 100,000 units of penicillin in Dunham's peptone solution was required to kill an inoculum of 2,500,000 P. pestis organisms when incubated at 29 C. for six days.

Journal of Urology, Baltimore

53:265-426 (Feb.) 1945

Renal Tuberculoma and Tuberculous Perinephric Abscess. J. A. Benjamin and H. L. Boyd.—p. 265.
Problem of Renal Lithiasis in Convalescent Patients. W. F. Leadbetter and H. C. Engster.—p. 269.
*Management of Urinary Lithiasis in Army General Hospital. J. H. Harrison, T. W. Botsford and F. R. Pierce.—p. 282.
Ureteral Syndromes in Male: Analysis of 100 Cases. I. E. LeDuc. —p. 295.
Use of T Tube Ureterostomy as Adjunct in Ureteroenterostomy. S. N. Vose—p. 319.
Cutaneous Ureterostomy with Contralateral Ureteral Ligation. C. Huggins and W. W. Scott.—p. 325.
Rhabdomyosarcoma of Testicle: Case Report. D. E. Beard and L. W. Hewit.—p. 344.
New Inspection Lens Sheath as Aid to Transurethral Resection. S. A. Vest.—p. 347.
Method for Eliminating Effects of Color and Turbidity in Reading of Phenolsulfonphthalein Renal Function Test. W. R. Kenny.—p. 354.

Urinary Lithiasis in Army General Hospital.—Harrison and his associates present observations on 100 consecutive patients with urinary calculi who were admitted to an army general hospital in the Southwest Pacific. It is their belief that climate is an important factor in the pathogenesis of urolithiasis, particularly in an army stationed in the tropics, owing to the great loss of water by perspiration, evaporation and respiration. Sustained dehydration results in the excretion of highly concentrated urine saturated with oxalate and phosphate salts, predisposing to urinary infection as well. Owing to such conditions, attacks of crystalluria accompanied by showers of red cells and transitory renal colic have occurred and, when continued without correction, have resulted in the formation of calculi. Malnutrition and debilitating tropical diseases such as malaria and dysentery disturb the water, mineral and acid base balance. Of the first 100 patients treated for calculous disease, 76 had served in the tropics for four to eighteen months and all of these had lost weight varying from 10 to 30 pounds (4.5 to 14 Kg.). Sixty-eight of the men were in the third decade, 25 were in the fourth decade and 7 were in the fifth decade. The management of these patients has been directed toward accurate localization of calculi, the treatment of infection and provision for drainage when obstruction is present by cystoscopic manipulation, ureteral catheterization and open operation where indicated. The soldier who has passed a calculus or who has been relieved by operative removal should be instructed as to the importance of a high fluid intake to prevent recurrence. Adequate salt consumption is important in the body's conservation of water in the tropics. Dietary measures should be instituted as prophylaxis against stone formation where practicable. Thirty-five patients were relieved of calculi as a result of cystoscopic manipulation; of 31 who required no operative intervention, 15 passed calculi spontaneously; 37 open operations were performed on the remaining 34 patients.

Maine Medical Association Journal, Portland

36:37-54 (March) 1945

Professional Service Accounting. T. R. Ponton.—p. 37.
Study of 100 Gallbladder Cases. L. F. King.—p. 41.

36:55-72 (April) 1945

War Neuroses. B. L. Keyes.—p. 55.
Sulfonamides in Ophthalmology. H. F. Hill.—p. 60.

Medical Annals of District of Columbia, Washington

14:103-140 (March) 1945

Delayed Rupture of Spleen: Report of Case and Discussion of Mechanism. T. Bradley.—p. 103.
Thyrotoxicosis in Child Managed with Thiouracil: Report of Case. F. G. Burke.—p. 108.
Polycythemia Vera: Report of Case in Young Man and Review of Recent Literature. J. W. Cooch.—p. 110.
Reticulum Cell Sarcoma Causing Choledochoduodenal Fistula and Liver Abscess. W. M. Yater and J. M. Moster Jr.—p. 114.

Medicine, Baltimore

24:1-110 (Feb.) 1945

Lymphogranuloma Venereum. H. Koteen.—p. 1.
Late Effects of Cerebral Birth Injuries. C. E. Benda.—p. 71.

Minnesota Medicine, St. Paul

28:89-168 (Feb.) 1945

Control of Medical Testimony: Minnesota Experiment. E. M. Hammes. —p. 111.
Observations on Chemotherapy. W. W. Spink.—p. 115.
Cholecystoduodenal Fistula: Report of Case. E. W. Minty.—p. 117.
St. Louis County Program of Tuberculosis Control. G. A. Hedberg. —p. 122.
Spreading Osteomyelitis of Maxilla. O. E. Hallberg.—p. 126.
Epidermolysis Bullosa in a Newborn. C. H. Schroder.—p. 128.
Rh Factor Transfusion Reaction and Transfusion Reaction Instructions. R. J. Eckman and A. H. Wells.—p. 131.

28:169-256 (March) 1945

Responsibility of Medicine. L. W. Larson.—p. 195.
Essential Thrombocytopenic Purpura. A. J. Hertzog.—p. 198.
Psychosomatic Approach to Certain Dermatoses. W. A. Carley.—p. 202.
Administration of Penicillin by Knee Joint Method. W. R. Bagley. —p. 205.

Nebraska State Medical Journal, Lincoln

30:77-112 (March) 1945

Study of Gonorrhea in Women: Practical Aspects of Preliminary Findings (1940-1944). W. R. Cooke and C. E. Lankford.—p. 80.
Head Injuries Consisting of Fractures of Skull. T. E. Riddell.—p. 84.
Sterility in Male. P. Adams.—p. 86.
Round Table Discussion on Industrial Health. E. J. Kirk.—p. 90.

30:113-156 (April) 1945

*Prevention of Recurrence in Peptic Ulcer. D. T. Quigley.—p. 116.
Importance of Accurate Reduction and Adequate Immobilization of Fractures of Lower Leg. E. Lathrop.—p. 120.
Cleft Palate and Cleft Lip. W. L. Shearer.—p. 125.

Prevention of Recurrence in Peptic Ulcer.—Quigley advises that after the acute stage of peptic ulcer has passed the ulcer patient gradually should have added to his diet roughage and food which is not easily digested. A function not used is a function lost. Whole grain flour should be used as soon as possible after the acute stage of the disease. The

so-called enriched flour is still lacking in many vital elements and should be forbidden the ulcer patient for life. Sugar furnishes calories without vitamins or minerals. It is a slow poison for the ulcer patient. Honey contains all necessary minerals (many trace minerals) and can thus be used freely for sweetening. The principal reason for the use of milk is that it is the best source of calcium. There is no need to neutralize excess acid with alkalis. Milk will relieve the pain and furnish other valuable elements. Orange juice should be used in the amount of 10 to 12 ounces a day. It is also alkaline in its effect and furnishes vitamin C and trace minerals. Biscuits, bread, muffins, waffles and pancakes made of whole grain flour can be used at a relatively early date after the acute episode. Any fruit or vegetable that can be served raw should be eaten raw. Fresh meat, rare when possible, should be eaten daily in amounts of from 3 to 6 ounces. No salt meat except occasional ham or breakfast bacon is allowed. Eggs, cheese, butter and cottage cheese may be used daily, but one or two meals a week should contain one of the sea foods. All cake, cookies, pastries and other sugar and white flour mixtures are forbidden. Sedatives and alkalis are of only temporary value, and the need for them rapidly diminishes when the patient is put on proper treatment.

Psychoanalytic Quarterly, Albany, N. Y.

14:1-148 (Jan.) 1945

Psychology and War Conditions E. Jones—p 1.
Affects, Personal and Social G. Zilboorg—p 28
Special Form of Self Punishment R M. Loewenstein—p 46.
Pathologic Weeping P. Greenacre—p. 62.
Five Layer Structure in Sublimation. E. Bergler—p 76

Review of Gastroenterology, New York

12:1-76 (Jan.-Feb.) 1945

Curability of Cancer of Large Bowel. C. G. Heyd—p 23
Idiopathic Ulcerative Colitis Perforation of Bowel I R Jankelson, C W McClure and I. Sweetsir.—p 31.
Sigmoidoscopy in Diagnosis and Treatment. F. C Yeomans—p 38.
Gastroduodenal Dyssynergia B. M Bernstein.—p 43
Ulcerative Colitis: Case Report H. Katz—p 47.

Surgery, St. Louis

17:319-474 (March) 1945

Significance of Polymorphonuclear Leukocytes in Gallbladders J P McKibbin and J. R McDonald—p 319.
Gastric Schwannoma. Report of Large Intragastric Lesion Simulating Bezoar J Sanguily and F. L Blanco—p 328
Perforation of Rectosigmoid L. R Kaufman, S Serpico and H. J. Mosig—p 337.
Regional Enteritis of Proximal Jejunum Following Trauma M A Spellberg and L W. Gray—p 343.
*Intraperitoneal Absorption Patterns of Sulfonamide Drugs (with Special Reference to Microcrystalline Sulfathiazole) and Comparison of Coincident Concentrations in Portal Vein, Systemic Circulation and Peritoneal Fluid A E Pearce, J. G Reinhold, Rose Feldman and J O Bower—p 351
Improved Method for Implantation of Sulfonamide Compounds in Abdominal Cavity and Local Wounds O E Fox—p 361
*Value of Staphylococcus Toxoid in Treatment and Prevention of Chronic Staphylococcus Infections Helen Z Jern, Catherine Caprarro and F L Meleney—p 363
Plastic Surgery in Reconstructing Enlarged Breasts One Stage Mastopexy E. S Lamont—p 379
Treatment of Pubertal Bilateral Gynecomastia Report of Case R E Burge, L T. Samuels and J S McCartney—p 397
Effects of Environmental Temperature on Traumatic Shock Produced by Ischemic Compression of Extremities H D. Green and Georges A. Bergeron—p 404
Arterial Spasm Secondary to Ligation and Retrograde Injection of Saphenous Vein I S Tunick, R L Nach and I. Weinkle—p 413
Vascular Insufficiency of Lower Extremity Due to Osteoma of Femur. Case Report R M. Rankin—p. 419.
Plastic Closure of Skull Defect Case Report Illustrating Use of Tantalum Plate and Pedicle Tube Graft. M. H Harris and B. Woodhall—p 422
Psychosomatic Factors in Surgical Practice. J A Shacter.—p 429
Iodine and Thyroidism A. H. Lason—p 440
Successful Removal of Foreign Body within Pericardium· Case Report. T. D. Watts and E C. Toone—p 454
Bone Regeneration Following Osteomyelitis L H Mayers—p 463

Intraperitoneal Absorption of Sulfonamides.—Pearce and his associates describe experiments which revealed that sulfathiazole introduced into the peritoneal cavity of normal dogs in the form of microcrystals was more rapidly absorbed than was crystalline sulfathiazole when compared on the basis of concentrations of drug in the plasma. Microcrystalline sulfathiazole injected into the peritoneum as a suspension gave higher concentrations of drug in blood plasma than did comparable amounts administered by insufflation, although the response to the former was not uniform High and sustained concentrations of sulfathiazole in plasma can be obtained by intraperitoneal injection of a suspension of microcrystals Simultaneously collected samples of blood from the portal vein and the heart contained practically identical concentrations of sulfonamide drugs sixty to three hundred and sixty minutes after intraperitoneal administration either as crystals or as microcrystals

Staphylococcus Toxoid in Staphylococcic Infections.—The study by Jern and her associates comprised a group of 200 cases of staphylococcic infections The majority were cases of recurrent furunculosis, most of which had proved resistant to other forms of therapy. The rest consisted of cases of axillary abscesses, cases of acute multiple furuncles and carbuncles A majority of the patients were treated with Lederle peptic digest toxoid alone. Some received a combined treatment with Lederle toxoid and autogenous vaccine and a few were treated with vaccine alone. The treatment of 93 patients with recurrent furunculosis and axillary abscesses with Lederle's pepsin digest toxoid resulted in a complete recovery of only 38 per cent. In the remaining 62 per cent recurrences developed within one year after the end of the treatment. Of 40 patients with recurrent furunculosis and axillary abscesses treated with Connaught toxoid 31, or 78 per cent, recovered. The 9 others had recurrences within the year The authors found that the antihemolysin test is not a strict measure of immunity, for there are exceptional cases in which there is a rise in titer and recurrences, and others in which no rise occurs and yet recovery seems to ensue. There may be some other immune factor which does not run strictly parallel with the antihemolysin titer which is of major importance but cannot be measured. The authors conclude that Staphylococcus toxoid made from toxigenic strains is able by means of repeated injections to increase the antihemolysin titer of the blood and to lessen significantly the incidence of recurrence of furuncles and carbuncles

Texas State Journal of Medicine, Fort Worth

40:509-564 (Feb.) 1945

Treatment of Closed Head Injuries S R. Snodgrass—p 516
Familial Hemolytic Jaundice J T Krueger—p 520
Physiologic Basis of Treatment of Peptic Ulcer C T Stone—p 523
Poliomyelitis. Cases in Dallas in 1943 J G Young—p 527
Nutritional Deficiencies Among Texas Children, with Special Reference to Austin, Texas J M. Coleman—p 531
Some Observations on Treatment of Glaucoma C R Potts—p 535
Role of Private Physician in Venereal Disease Education L Robbins—p 539.
Malaria Control in War Areas L J. Trotti—p 543.

40:565-620 (March) 1945

Acute Obstructions of Colon G V Brindley—p 571.
Rectal Bleeding A Baldwin—p 577.
Treatment of Infectious Enteritis of Newborn, with Particular Reference to Use of Continuous Drip Coupled with Plasma A Blossom—p 580
Clinical Observations of Etiology of Diabetes Insipidus G M Jones—p 583
Irradiation in Carcinoma of Breast R G Giles—p 585
Complications of Chronic Otitis Media Report of Case L Daily and J L Dean Jr—p 590
Infant Mortality in Large Cities in Texas in 1943 A E Hill—p 593
Whooping Cough Mortality in Texas W A. Davis and W D Carroll—p 596
Splenectomy for Thrombocytopenic Purpura Following Sulfathiazole Therapy B Farfel—p 602

West Virginia Medical Journal, Charleston

41:65-88 (March) 1945

Consideration of Certain Radical Procedures in Treatment of Cancer G T. Pack—p 65.
Postoperative Urinary Retention D W Palmer—p 72
Treatment of Nonspecific Infections of Vaginal Tract. J. G Smith—p 75.
State Legislation for Venereal Diseases C. A Hoffman—p 78

41:89-120 (April) 1945

Urinary Complications Following Sulfonamide Administration, with Emphasis on Calculi Formation. S. L. Schreiber and G G Irwin—p 89.
Quick and Simple Treatment of Low Back Pain Based on New Conception of Its Genesis A Farkas and G W. Easley—p 103
Plan for the Medical Indigent J R. Miller—p 108

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

29:57-112 (Feb) 1945

Penicillin and Control of Deep Intraocular Infection B W Rycroft. —p 57.
Ocular Manifestations of Hysteria in Relation to Flying C R Ironside and I. R. C Batchelor —p 88
Treatment of Trachoma, with Special Reference to Local Sulfonamide Therapy A. Sorsby —p 98
Case of Mustard Gas Keratitis Treated with Curettage of Cornea for Removal of Band Shaped Crystalline Deposit H Neame —p 102

29:113-168 (March) 1945

Penetrating War Wounds of Eye and Orbit H H Skeoch —p 113
Hysteria in Ophthalmology Experiences with New Zealand Troops in Middle East. H. Coverdale —p 120
*Heterophoria and Neurosis in Flying Personnel H C Beccle and E H. Kitching —p 125.
Macular Coloboma with Bilateral Grouped Pigmentation of Retina I S McGregor —p 132
Secondary Carcinoma in Anterior Chamber A J B Goldsmith —p 136
*Choice of Sulfonamide in Treatment of Ophthalmia Neonatorum. A Sorsby and Elizabeth E Hoffa —p 141
Suitability of Experimental Corneal Lesions for Evaluating Local Sulfonamide Therapy. W. T. S Cole, J L Hamilton Paterson and A. Sorsby —p 150
Case of Interstitial Keratitis at Early Age P J Devlin —p 155

Heterophoria and Neurosis.—Beccle and Kitching review observations on 57 cases of heterophoria in flying personnel. They find that heterophoria and neurosis frequently coexist and that in 50 of the 57 cases heterophoria was a symptom of hysterical and part of a generalized psychologic illness, which is the primary and major disorder. References to the literature indicate that this conclusion applies also to civilian cases. It is customary to give orthoptic, i. e. local, treatment in heterophoria, but in the treatment of neurotic symptoms local treatment alone is not enough. It should be preceded by a psychiatric examination Orthoptic treatment alone may cause the heterophoria to disappear. It will not cure the neurosis or render the patient less vulnerable to a recurrence. On the other hand it may confirm a hypochondriacal eye consciousness and render ultimate psychologic treatment much more difficult. Whether it should be employed or not, and what other measures are desirable, should be decided by collaboration between the ophthalmologist and the psychiatrist. The ultimate prognosis seems to depend more on the emotional stability of the patient than on the degree of ocular muscle imbalance

Choice of Sulfonamide in Ophthalmia Neonatorum.—On the basis of 333 cases of ophthalmia neonatorum treated with a standard dose of five different sulfonamides Sorsby and Hoffa conclude that the least tolerated drug is sulfanilamide and that sulfapyridine is less well tolerated than sulfamezathine, sulfathiazole or sulfadiazine. In their efficacy against the infection, as distinct from their tolerance by the babies, these five sulfonamides are not strikingly different. From 30 to 40 per cent of the cases in this series showed clinical cure within three days. Over 80 per cent were cured after eight days. Gonococcic ophthalmia neonatorum responds more readily than other varieties of ophthalmia. Cases showing inclusion bodies respond satisfactorily. Initial severity does not affect the course unfavorably. Many severe cases clear rapidly. Irrespective of the causal organism some 15 per cent of cases show a sluggish or poor response.

J. Neurology, Neurosurgery & Psychiatry, London

7:57-136 (July-Oct) 1944

Electroencephalography in Cases of Subcortical Tumor W G Walter and V. J. Dovey —p 57.
Wernicke Syndrome, with Special Reference to Manic Syndromes Associated with Hypothalamic Lesions A Meyer —p 66
Effect of Percussion of Nerve. D. Denny Brown and C Brenner —p 76
Electroencephalographic Localization of Intracranial Neoplasms W. A. Cobb —p 96
Electroencephalogram in Traumatic Epilepsy. D Williams —p 103.
Relation Between Effects of Blood Sugar Levels and Hyperventilation on Electroencephalogram. M. E. Heppenstall —p 112
Scope and Limitations of Visual and Automatic Analysis of Electroencephalogram. G D. Dawson and W. G. Walter —p 119.

Quarterly Journal of Medicine, Oxford

13:107-170 (Oct) 1944

*Cysticercosis (Tenia Solium) Further Ten Years' Clinical Study, Covering 284 Cases H. B. F. Dixon and W. H Hargreaves —p 107.
Action of Intravenous Digoxin in Man J. McMichael and E P. Sharpey Schafer.—p. 123.
Effects of Trauma, Direct and Indirect, on Heart H. Barber —p 137.

Cysticercosis (Tenia Solium): 284 Cases.—Dixon and Hargreaves have followed up all patients with cysticercosis who are still living and in addition they have collected a further 185 cases, bringing the total to 284. Cysticercosis in man results from accidental infection with the larval form of Tenia solium. This is brought about either by the ingestion of food or drink contaminated by human feces containing ova or by autoinfection in the host of a tapeworm. Seventy-seven patients in 284 gave a history of tapeworm. Of the series under consideration 274 were infected in India and 269 of them were soldiers and ex-soldiers. A history of "fits" varying from transient bouts of localized paresthesias and minor attacks possibly suggestive of petit mal to severe major epileptiform convulsions after residence in India must bring to mind the possibility of cysticercosis. Epileptiform attacks of jacksonsian type are well recognized, but minor symptoms are extremely common. Cysticerci disseminated throughout the brain may produce any variety of focal symptoms, motor, sensory or mental. Commonly elicited histories are those of transient monoplegias, paresthesias, localized anesthesia, visual and aural symptoms, aphasia and amnesia. A search for nodules by inspection and palpation of the whole body is the first step toward diagnosis. There was a history of transient nodules under the skin in 165 patients. The total number of cases in which the diagnosis was made radiographically came to 212. In a suspected case of cysticercosis radiographic search of the whole body is indicated. Too much importance has been attached to eosinophilia. It was found in only 10 per cent of the cases reviewed here The average period intervening between the time of arrival in India and the first cerebral symptoms was seven years. The time of appearance of nodules also varies greatly. The mortality from cysticercosis in this series has been only 8 per cent, with improvement in patients whose outlook for years appeared hopeless.

Deutsche Zeitschrift für Chirurgie, Berlin

258:511-766 (March 28) 1944. Partial Index

Surgical Treatment of Diabetes Mellitus and of Diabetic Gangrene. A Jentzer —p. 511.
Ewing's Sarcoma (Reticulosarcoma of Bone Marrow), with Special Consideration of Differential Diagnosis in 5 Cases of the Author. W. Brunner —p 540
Effective Surgical Removal of Ectopic Diverticulum of Septum of Ventricles of Heart W. Roessler.—p 561.
Technic of Electroresection: Perforation of Bladder and Its Prevention. H Friedrich —p. 594
*Osteomyelitis with Eosinophil Reaction (Eosinophilic Granuloma of Bone). E. Schairer.—p. 637.
Permanent Recovery from Cancer of the Breast Report of 150 Cases with Duration of Life from Fifteen to Thirty Years A Hintze. —p 672.

Osteomyelitis with Eosinophil Reaction. — Schairer describes a peculiar bone lesion in 3 of his own cases and in 12 cases listed in world literature. The lesion is designated as osteomyelitis with eosinophil reaction or as eosinophilic granuloma of bone. It presents a localized destructive process of bone-plates in the calvarium, ribs or scapula The clinical picture is that of a swelling above the involved bones. It develops in several weeks and is associated with more or less severe pain on palpation. Spontaneous pain was infrequent. There may be a slight rise of temperature. Microscopic examination revealed a characteristic picture of soft masses which replace the bone. There was granulation tissue rich in cells with large reticulum cells or fibroblasts, numerous mature eosinophilic leukocytes and giant cells of osteoclastic type. Necrosis in the granulation tissue or microabscesses, as well as deposits of hemosiderin, were demonstrated in some of the cases Eosinophilia of the blood and of the bone marrow was observed in some of the cases, and eosinophilia of a regional lymph node was found in 1. The prognosis is favorable. Recovery resulted in all cases. Treatment consists in the removal of the soft granulations. The cause of the disease is not known and bacteria could not be demonstrated Trauma may have been a causative factor in some of the cases

Book Notices

Atlas of the Blood in Children. By Kenneth D. Blackfan, M.D., and Louis K. Diamond, M.D., Assistant Professor of Pediatrics, Harvard Medical School, Boston. Cloth. Price, $12. Pp. 320, with illustrations by C. Merrill Leister, M.D., Associate Pediatrician, St. Luke's Hospital, Bethlehem, Pennsylvania. New York: Commonwealth Fund; London: Oxford University Press, 1944.

This atlas fills a much needed want in the library of most physicians. Besides the seventy brilliantly executed colored illustrations of blood cells in normal and pathologic states in infancy and childhood there is a brief but adequate description and discussion of various diseases affecting the blood forming organs at that period of life. The illustrations were done by Dr. Leister and reflect not only artistic ability but a keen perception of the finer morphologic detail of blood cells. The organization of the atlas is practical and expedient. The illustrations are so arranged as to aid the inexperienced to identify rapidly the predominant type of cell he finds in the questionable blood smear. The purpose of the atlas is not to replace experienced hematologic investigation of the patient but rather to provide orientation in this difficult field so that the need of such investigation will be apparent. Those interested primarily in hematology might take exception to the use of the term megaloblast to indicate an early member of the normal red cell series, but there are two sides to this question and in an overall estimation of the atlas this is an insignificant criticism. While the atlas will serve the pediatrician and the student especially, the illustrations depict morphologic detail of cells found in adult blood and should be useful to the general practitioner as well. The clinical descriptions are concise but complete. Essential information is not sacrificed because of brevity, and the material reflects the rich clinical background in hematology of Dr. Diamond and the late Dr. Blackfan. A well selected bibliography follows the descriptive material so that the reader may be well guided if he seeks further detail about any of the conditions discussed in the text. The book can be confidently recommended not only as an atlas but also as a concise and authoritative textbook of diseases affecting the blood forming organs of infants and children. Every medical and hospital library will want a copy of this unique atlas. The private sale among pediatricians, general practitioners and students will more than justify the cost of subsidizing this excellent presentation by the Commonwealth Fund. An atlas of this type could not have been made available at such a moderate price without that financial support. This bargain, then, which the Commonwealth Fund has provided, is a "must" for the practitioner's library.

Massage and Remedial Exercises in Medical and Surgical Conditions. By Noël M. Tidy, Sister-in-Charge of the Red Cross Massage Clinic, High Wycombe. Sixth edition. Cloth. Price, $6. Pp. 480, with 190 illustrations. Baltimore: William Wood & Company, 1944.

This edition presents material that is interesting, well organized and compact. It deals with problems that confront the physical therapist at various times. War injuries are not treated as fully in other textbooks. The divisions for each case such as etiology, pathologic changes, symptoms, after-effects and treatment give a vivid picture of the case. The physical treatment is defined and, if one is interested in that phase mainly, the book will prove to be a valuable source of information. Under treatment the subdivisions on precautions, prevention and remedial measures, treatment of specialized cases and treatment of severe cases are helpful. The illustrations are good and the explanations of the photographs are clear. The illustrations selected go well with the material and can readily make the reader understand what the author desires to explain. They also reflect the effect of movement and activity.

Pep, Pills and Politics: An Odyssey of Two States. By Arthur W. Hopkins, M.D. Cloth. Price, $2.50. Pp. 239, with 23 illustrations. Brattleboro, Vermont: Vermont Printing Company, 1944.

To add to the many works of reminiscences of the growth and development of physicians comes now this simple account of a practice in New England. The record contains in it much of amusement, much that is sentimental, a great deal that is of the warp and woof of general practice. Those who have had similar experiences will give it a most sympathetic reading.

Shoulder Lesions. By H. F. Moseley, M.A., D.M., M.Ch., Assistant Surgeon, Royal Victoria Hospital, Montreal. Cloth. Price, $4.50. Pp. 181, with 71 illustrations. Springfield, Ill.: Charles C Thomas, 1945.

This book presents a concise account of present day knowledge of shoulder lesions. The author has avoided detailed accounts of controversial subjects. He acknowledges that much of his information and enthusiasm were derived from Codman's masterpiece "The Shoulder." He has carried on the work where Codman left off. He discusses the use of procaine in diagnosis and therapy; the accumulation of knowledge on the morbid anatomy of simple and recurrent dislocations, the early diagnosis and treatment of complete ruptures of the "rotator cuff" of the shoulder, the recognition of lesions of the long tendon of the biceps, the application of Lewis and Kellgren's work on referred pain from muscles and fascias to the subject of fibrositis and the painful shoulder, the understanding of the cervical disk and scalenus syndromes, the advances in the diagnostic and therapeutic value of x-rays and the establishment of the position of rest and motion in shoulder disorders. Each chapter was written as a unit. Calcified deposits and the bicipital syndromes form separate groups of cases with definite pathologic changes, whereas the groups included under periarthritis are those with a similar symptom complex but with varying underlying causes. There is a chapter on neurologic aspects of shoulder pain by McNaughton and another on x-ray diagnosis and treatment by Bouchard and Peirce. There has been an attempt to stimulate interest in the subject by focusing attention to the arm-trunk mechanism rather than on the glenohumeral or shoulder joint. Some of the most interesting chapters cover the mechanism and examination of the shoulder, ruptures of the rotator cuff, subluxation and dislocations, calcified deposits in the rotator cuff, bicipital syndromes, periarthritis and specific injuries. Operative procedures are described and illustrated. There is a section on reeducation of shoulder function. One of the features of the book is a group of 30 representative case reports that are interesting and instructive. Unfortunately the recent work of Inman, Saunders and Abbott could not be included because Moseley's book was already in print.

Essentials of Allergy. By Leo H. Criep, M.D., Assistant Professor of Medicine, School of Medicine, University of Pittsburgh, Pittsburgh, Pa. With a foreword by Robert A. Cooke, M.D. Cloth. Price, $5. Pp. 381, with 43 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1945.

This book faithfully and successfully carries out the purpose announced in its preface. It is specifically designed for the undergraduate medical student and for the general practitioner. With this limitation in mind, this is an excellently written, well organized book, covering in a concise way a wealth of information on allergy. Immunology is not neglected. In the first twenty-six pages Criep gives briefly an excellent summary of the subject. The author skilfully saves space by avoiding repetition. An example is furnished in the chapter on nasal allergy. Under "treatment" the author refers to chapter v, on treatment of allergy. The forty-two black and white illustrations and the one color plate are quite adequate for undergraduate teaching purposes. They show the excellent discrimination and teaching experience of the author. Case reports at the end of many chapters are well chosen to accentuate the clinical subjects discussed. To summarize, this is one of the best books on allergy written specifically for the undergraduate student and the practicing physician.

A Textbook on Pathology of Labor, the Puerperium and the Newborn. By Charles O. McCormick, A.B., M.D., F.A.C.S., Clinical Professor of Obstetrics, Indiana University School of Medicine, Indianapolis, Ind. Cloth. Price, $7.50. Pp. 399, with 191 illustrations. St. Louis: C. V. Mosby Company, 1944.

In spite of the title, since only 27 of the 399 pages are devoted to the newborn, the book is almost exclusively limited to the pathology of labor and the puerperium. In the section on the pathology of labor the author includes abnormal labor, obstetric injuries, postpartum hemorrhage and obstetric operations. In the section dealing with the pathology of the puerperium are included puerperal infection, late postpartum hemorrhage, anomalies and diseases of the breast and other complications of the puerperium. The book is written in outline or symposium form and the references are inserted throughout the text instead

of at the end of each chapter. The author uses the terms pituitrin and ergotrate instead of the nonproprietary names posterior pituitary injection and ergonovine. Throughout the book are indications of a conservative attitude. However, like most obstetricians, McCormick favors cesarean section for placenta previa patients who have a rigid, closed or only slightly dilated cervix. The author's personal choice of forceps is the Tarnier with axis traction or Irving with axis traction, but most obstetricians seldom resort to axis traction. At the end of the book is a list of fifty aphorisms which are very useful. The book is abundantly and well illustrated and can be highly recommended to all physicians who want a separate volume devoted to the pathology of labor and the puerperium. This book does not, of course, attempt to supplant the standard textbooks of obstetrics, which contain much more material.

Home-Built Electric Dehydrator. Prepared by Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, U. S. Department of Agriculture. AWI-76. Paper. Pp. 12, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1944.

This pamphlet gives detailed directions and layout specifications for the construction of a home made food dehydrator. Step by step directions are provided for assembling the drier with its eight wire mesh trays and thermostatically controlled electric heating unit capable of maintaining a temperature of 150 F. Any handy home mechanic should have no difficulty preparing the equipment, although such materials as a ¼ horsepower motor, thermostat, wiring and heating elements may prove difficult to obtain today. Careful directions are given for preparing fruits and vegetables for the drier, with lists of the foods best suited to this method of preservation. It is recommended that light colored fruits be sulfured first to prevent darkening and that vegetables be steamed first to inactivate the enzymes. Tests are given to determine when the necessary degree of dryness has been attained. The booklet provides adequate directions to guide the home maker in the fabricating of a dehydrating unit and its profitable use subsequently.

The Specificity of Serological Reactions. By Karl Landsteiner, M.D. With a chapter on Molecular Structure and Intermolecular Forces by Linus Pauling. Revised edition. Cloth. Price, $5. Pp. 310, with illustrations. Cambridge, Mass.: Harvard University Press; London: Oxford University Press, 1945.

The textual revision was completed before the author's death in June 1943. Much new material has been included. In his preface the author mentions with regret that the most recent European literature, other than British, could not be considered because it was not available. The original plan of the book has been maintained. The first chapters deal with natural antigens and antibodies; then artificial conjugated antigens and the serologic reactivity of simple chemical compounds (including experiments on "drug allergy") are considered; chapters 6 and 7 are devoted to the chemistry of specific nonprotein cell substances and to the consideration of antigen-antibody reactions from a physiochemical approach. The chapter by Linus Pauling on molecular structure and intermolecular forces concludes the text. Every paragraph in this classic book reveals the firm, comprehensive grasp of serologic problems by a great investigator.

The Etiology, Diagnosis, and Treatment of Amebiasis. By Charles Franklin Craig, M.D., M.A., F.A.C.S. Cloth. Price, $4.50. Pp. 332, with 45 illustrations. Baltimore: Williams & Wilkins Company, 1944.

This is the second monograph published by the author on the same subject. It is up to date and covers the subject thoroughly. About 10 per cent of the population of the United States have an infection with the Endameba histolytica parasite. At present a large number of our troops are serving in regions where amebiasis is common and many will come back infected and add a serious factor to the problem. Hence it is vital that all physicians become familiar with the diagnosis and treatment of this treacherous infection. The author believes that there are no "healthy carriers." The parasite invades the tissue of its host and produces lesions. These lesions may be microscopic and may be accompanied by symptoms, but many of them may develop acute trouble later on. The chapters on the etiology, pathology and symptomatology are complete, clear and concise. The treatment is given in full detail for both acute and chronic cases and includes all the complications.

State Board Questions and Answers for Nurses: Essay and Objective Types. Compiled from Actual Examination Questions Given Throughout the Country by State Examining Boards. Twenty-third edition. Cloth. Price, $3.50. Pp. 1,159, with 5 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1945.

The twenty-third edition of this useful volume brings the work up to date with the addition of certain new material covering visual devices for fact testing. This involves various simple line drawings about which questions are asked, especially in the field of anatomy, physiology, surgical nursing, obstetrics and gynecology. The book contains questions which have been asked in state board examinations throughout the country covering all fields of nursing education in a well organized manner. Each question is followed by the correct answer. The answers have been reviewed by an editorial panel consisting of competent authorities in this field. There are essay type questions as well as objective forms. The brief essay "To the Student Preparing for the State Examination" contains numerous useful suggestions and principles in writing board examinations. It is necessary to sound a note of warning in connection with the use of books of this kind. There is always the danger of an undue emphasis on examinations and the substitution of question and answer study for the sounder methods based on textbooks, journals and reference volumes. Memorizing of answers may replace a sound understanding of the subject matter. The Editorial Panel is aware of this danger and advises the student that the "goal should be a thorough knowledge rather than a passing grade." The proper use of the book should be to supplement the textbook review of each subject by going through the questions in this book. "Do not study the answer with the question, but ask yourself the question and attempt to answer it. Check your answer with that in the book and find out which is the better answer."

Clinical Lectures on the Gallbladder and Bile Ducts. By Samuel Weiss, M.D., F.A.C.P., Clinical Professor of Gastroenterology, N. Y. Polyclinic Medical School and Hospital. Cloth. Price, $5.50. Pp. 504, with 125 illustrations. Chicago: Year Book Publishers, Inc., 1944.

In his preface to the book Dr. Weiss states that these lectures as presented are to be regarded as a guide in the diagnosis and treatment of the patient. This is indeed the key to the book. Starting with the basic formulas of medicine the reader is led through anatomy, physiology and thence to history taking and the physical examination of the patient. Then after a section on radiology comes an evaluation of the discussion of clinical material on diseases of the gallbladder. Treatment of the subject is complete, clear and comprehensive as to etiology, pathology, diagnosis and therapy. Stress is laid on the fact that therapy must be individualized and that frequently other organs are involved in gallbladder disease. Thus mention is made of arthritis, the pancreas and so on. The book is as adequate a treatise as any available, and it is to be recommended as an addition to the best list of references on the subject.

A Shorter History of Science. By Sir William Cecil Dampier (formerly Whetham), Sc.D., F.R.S. Cloth. Price, $2. Pp. 189, with 23 illustrations. New York: Macmillan Company; Cambridge: University Press, 1944.

The place of medicine in the whole picture of science becomes apparent in this easily readable contribution from Cambridge. The approach is from the point of view both of the subject and of the pioneer who gave to that subject a new trend. By far the majority of the work is concerned with subjects ancillary to medicine, but there are good notes regarding the development of anatomy, physiology and biology. The concluding chapters dealing with the new physics and chemistry and the stellar universe are an indication of our present trend in science.

Eighth Annual Report of the Empire Rheumatism Council (to Organise Research Throughout the British Empire into the Causes, and Means of Treatment, of Rheumatic Disease), 1944. President: H. R. H. The Duke of Gloucester, K.G. Paper. Pp. 12. London, [n. d.].

For eight years the Empire Rheumatism Council, which was organized to foster research throughout the British Empire into the causes and means of treatment of rheumatic disease, has issued an annual report of its accomplishments. During the past year there has again been an increase in the reserve fund of the council. Clinical research, of course, has been hampered by the war, but its resumption soon under favorable conditions should be greatly assisted by this organization.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

BLOOD TRANSFUSION IN RH SENSITIVITY

To the Editor:—*Is Rh incompatibility ruled out if, for transfusions, the recipient's blood is cross matched with the donor's—cells against serum and serum against cells—and no agglutination is observed? If, for example, a woman who is Rh negative but who has been sensitized to Rh positive blood by a transfusion of Rh positive blood or by pregnancy with an Rh positive fetus is to receive a transfusion, would cross matching show up the incompatibility by agglutination even though both recipient and donor were of the same blood type but the donor was Rh positive? If no agglutination occurs in cross matching why should there be a transfusion reaction?*

Alexander Soloska, M.D., Salisbury, Pa.

ANSWER.—It has been found that many Rh negative patients though strongly sensitized to the Rh factor, as proved by the occurrence of severe hemolytic reactions following transfusions of Rh positive blood, nevertheless do not have detectable anti-Rh agglutinins in their plasma (Wiener, A. S.: Hemolytic Reactions Following Transfusions of Blood of the Homologous Group: II. Further Observations on the Role of Property Rh, Particularly in Cases Without Demonstrable Isoantibodies, *Arch. Path.* **32**:227 [Aug.] 1941). In a few cases this has been explained by the performance of the tests for anti-Rh agglutinins too soon after the transfusion which caused the hemolytic reaction, at which time the patient is in a negative phase as the result of the absorption of the Rh agglutinins from the plasma by the hemolyzed Rh positive cells. Frequently the phenomenon can be explained by the presence of a special sort of Rh antibody (blocking antibodies) in the patient's plasma (Wiener, A. S.: A New Test [Blocking Test] for Rh Sensitization, *Proc. Soc. Exper. Biol. & Med.* **76**:173 [June] 1944). The blocking antibodies have the capacity of combining specifically with Rh positive blood cells, but without producing a visible reaction. To detect blocking antibodies, Wiener recommends the following technic: A drop of a 2 per cent. suspension of Rh positive red cells and a drop of the patient's serum are mixed in a small test tube and allowed to react in a water bath at 38 C. for thirty to sixty minutes. Then a drop of a suitable dilution of an active anti-Rh serum is added, and after an additional period of incubation for thirty to sixty minutes the reactions are read. If blocking antibodies are present, no agglutination will occur or the clumping will be definitely weakened. Obviously, then, the routine cross matching tests are inadequate to detect all instances of Rh incompatibility, so if the presence of Rh sensitization is suspected it is safest to use an Rh negative donor, unless one precedes the transfusion by a biologic test (Wiener, A. S.: Blood Groups and Transfusion, ed. 3, Springfield, Ill., Charles C Thomas, 1943, p. 71).

CONTRACEPTIVE METHODS

To the Editor:—*Is there a vaginal jelly that can be used as a contraceptive agent with reasonable safety? The diaphragm in this particular instance has resulted in another pregnancy. The patient is not yet 20 years old and has had four babies.*

M.D., Iowa.

ANSWER.—Contraceptive jellies which have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association have a spermicidal time of under thirty minutes as tested by the Brown and Gamble method and may be used alone as contraceptive agents with reasonable safety. Indeed, they are usually sold with an applicator appropriate for this type of use. However, the protection afforded by this technic is definitely less than that provided by the diaphragm and jelly together.

ADMINISTRATION OF INTRAVENOUS SOLUTIONS

To the Editor:—*Will raising a bottle of intravenous solution two to three feet when it is already four feet above heart level affect the rate of flow in the vein? Are there any venous reflexes which would impede the rate of flow of the solution into the vein in a normal individual?*

Eli Kamellia, M.D., Fresno, Calif.

ANSWER.—The rate at which fluid flows from a bottle of intravenous solution into the vein depends on the viscosity of the fluid, the resistance offered by the tubing and needle and the relation between venous pressure and the height of the bottle. Hence, other things remaining constant, raising the bottle will increase the rate of flow in proportion to the amount by which the hydrostatic pressure in the infusion system exceeds the venous pressure.

Irritation of a vein, as by venipuncture or by the injection of irritating solutions, may in some instances produce spasm of the vein, but this usually disappears after a short time. Under ordinary conditions such spasm is not often observed, and a slow rate of flow into a vein in a normal person is usually due to mechanical blockage which can almost always be overcome by readjusting the position of the needle.

DIAPER WHITE

To the Editor:—*Is the preparation Diaper White a safe one to use in cleaning infants' diapers?*

Charles A. Weymuller, M.D., Brooklyn.

ANSWER.—There is reason to believe that Diaper White essentially is a mixture of alkaline water softeners, about one half the product being sodium carbonate (soda ash) and the remaining half representing smaller quantities of trisodium phosphate, pyrophosphate and soap. Freedom from irritants on diapers after the use of this substance almost entirely rests on the degree of rinsing. If diapers are washed by hand there is some risk of skin irritation on contact surfaces. This product is similar to other substances used in connection with laundering or other types of cleaning.

PERSISTENCE OF CUTANEOUS LESIONS IN SYPHILIS

To the Editor:—*A man aged 33 consulted me about three and a half months ago for the treatment of syphilis. Three years ago a primary lesion developed which was treated with sulfarsphenamine: he received 0.4 Gm. intramuscularly weekly for twelve doses and then monthly for the remainder of a three year period. During this time lesions appeared recurrently on the glans and on the scrotum. When I first examined him, all observations were normal except for annular lesions on the scrotum and a few papules on the glans, undoubtedly syphilitic. His weight was 220 pounds (99.8 Kg.). Wassermann and Kahn reactions of the blood were positive for syphilis. The spinal fluid contained 15 white blood cells per cubic millimeter; there was a positive reaction for globulin, a gold curve of 5554320000 and a total protein count of 44 mg. per hundred cubic centimeters; the Wassermann reaction of the spinal fluid was positive for syphilis. I started him on 0.06 Gm. of mapharsen twice weekly and 0.2 Gm. of bismuth subsalicylate once a week. The skin lesions showed decided improvement in ten days. After nineteen injections of mapharsen, however, there was a slight flare-up of the lesions on the scrotum. The patient was immediately hospitalized and given 2,400,000 units of penicillin, 40,000 units intramuscularly every three hours, and concurrently received 0.04 Gm. of mapharsen daily for a total of eight doses. During the last three days of this treatment he was given two baths to produce hyperpyrexia, as I was unable to schedule him for electropyrexia. Following dismissal from the hospital I started him on bismuth alone, but on his second visit to the office I again noticed an exacerbation of the scrotal lesions. What plan of treatment would you suggest for this patient?*

Harry L. Douglas, M.D., Kansas City, Mo.

ANSWER.—The treatment given to this patient when the chancre was first recognized might account for the persistence of the mucocutaneous relapses and accordingly is subject to criticism. Sulfarsphenamine given at weekly intervals for twelve doses followed by monthly injections for three years is a poor system of treatment for early syphilis, first because of the inefficiency of sulfarsphenamine, secondary because the intervals between injections were much too long and thirdly because a heavy metal such as bismuth was not also employed. Recurrences of lesions of the mucous membrane are frequently seen in patients when arsenicals are received at irregular intervals or when the time between injections is too long or if heavy metals are omitted, as in this case. It must be acknowledged, however, that occasionally a patient is encountered who will develop a mucocutaneous relapse in spite of intensive treatment An alternative consideration is that not all annular lesions on the genitalia are due to syphilis, because lichen planus also produces annular lesions. In view of the inability to prevent the recurrences of the lesions with penicillin, nineteen injections of oxophenarsine hydrochloride (mapharsen) and an equal number of injections of bismuth subsalicylate should be given and, in view of the reaction of the spinal fluid, a course of fever therapy, preferably malaria therapy. Four months after the fever course, or sooner if the recurrent lesions reappear, the use of arsphenamine in doses of 0.3 to 0.5 Gm. at five day intervals for ten injections and a soluble mercurial, such as mercuric succinimide in ⅙ grain (11 mg.) doses six times a week for three weeks should be tried. Occasionally the use of arsphenamine given simultaneously with daily intramuscular injections of a mercurial will prevent recurrences of a lesion of this type when the newer arsenicals have failed to do so.

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VENOUS THROMBOSIS AND PULMONARY EMBOLISM

FURTHER EXPERIENCE WITH THROMBECTOMY AND FEMORAL VEIN INTERRUPTION

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AND
GORDON A. DONALDSON, M.D.
BOSTON

In previous communications from the staff of the Massachusetts General Hospital we have indicated that we are confronted with a serious problem concerning venous thrombosis with resulting pulmonary embolism.

Hampton and Castleman [1] have shown that infarcts to the lungs are easily interpreted by roentgenographic studies. Many of the postoperative pulmonary sequelae, previously attributed to other causes, are embolic in origin. Castleman,[2] from autopsy studies, has found the source of pulmonary embolus in our clinic to be from the deep veins of the legs in approximately 95 per cent of the cases.

Miller and Rogers [3] in earlier studies recognized the importance of this syndrome in our clinic. Data collected by Davis [4] prior to 1925 showed that 3 patients in each thousand subjected to major surgical procedures succumbed to pulmonary embolism. Methods to prevent venous stasis by posture, combined with early passive and active exercise, reduced the incidence of fatal embolus to approximately 1 in 800 surgical patients.[5] Even this improvement did not eliminate the terrific morbidity with which we were confronted, since all conservative methods of treatment of thrombophlebitis in our clinic included a prolonged period of bed rest and hospitalization.

It will be obvious to all that venous thrombosis is more common in certain clinics and in certain geographic locations than in others. In the deep South, clinics treating a similar group of patients to ours will have fewer instances of thrombosis and consequently fewer deaths from pulmonary embolism. Also it is obvious that the average severity of the process in warmer climates is milder and response to conservative treatment better. In those regions where respiratory tract infections approximate those seen in New England during the summer months, thrombosis and embolism in severity and incidence correspond more closely to our experience during the warm season (table 1).

"Bland thrombosis," Homans,[6] or "phlebothrombosis," Ochsner and De Bakey,[7] produces a symptomless, afebrile condition in our section of the country with resulting unexpected fatal pulmonary embolism. We are impressed, however, by all gradations from completely reactionless bland thrombosis to typical phlegmasia alba dolens. Many patients with phlebothrombosis will progress to the painful tender, swollen extremity stage with fever, leukocytosis and high sedimentation rate seen in typical thrombophlebitis. Often this change in character of the process is further complicated by the fever and leukocytosis accompanying pulmonary infarct. Although we recognize the comparative safety as regards massive pulmonary embolism in true thrombophlebitis, we feel that the course of this disease can be altered by radical treatment if recognized in the first days of the process. We do not believe that femoral vein interruption has any place in the treatment of true thrombophlebitis after the seventh day of the disease unless infarcts have occurred. We do see cases with phlebothrombosis and repeated infarcts that can be satisfactorily treated by vein interruption weeks after the onset of the process. It is obvious to us that, the earlier the diagnosis of phlebothrombosis or thrombophlebitis with immediate bilateral femoral vein interruption, the shorter the period of disability. If one delays operation until repeated infarcts have occurred or until swelling of the leg has existed for a week or more, then the convalescence will be prolonged and the outcome doubtful. This is due to the time required for the dissolution of the embolic process in the lungs as well as for the subsidence of swelling in the extremities. Both early and late edema of the legs are greatly influenced by the extent and duration of the thrombosis prior to thrombectomy and vein interruption.

The age of the patient is of utmost importance in the consideration of the danger of fatal embolism in thromboembolic disease. Clinics treating a high percentage of elderly patients with serious pathologic processes will encounter a larger ratio of thrombosis and embolism. Welch and Faxon showed the importance of the age factor in our clinic.[5] The older the patient, the greater likelihood of fatal embolus complicating illness or surgery. A personal communication from these men now serving in a general army hospital in a foreign zone brings the fact that in 10,000 wounded and sick soldiers treated there were only 7 instances of

From the Surgical Services of the Massachusetts General Hospital.
Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Hampton, A. O., and Castleman, B.: Correlation of Postmortem Chest Teleoroentgenograms with Autopsy Findings, Am. J. Radiol. **43**: 305-326 (March) 1940.
2. Castleman, B.: Personal communication to the authors.
3. Miller, R. H., and Rogers, H.: Postoperative Embolism and Phlebitis, J. A. M. A. **93**: 1452 (Nov. 9) 1929.
4. Davis, L.: Personal communications, cited by Allen, A. W., in Vascular Disease, in Nelson Loose-Leaf Medicine, New York, Thomas Nelson & Sons, 1931, vol. 4, chapter 6, pp. 531-580.
5. Welch, C. E., and Faxon, H. H.: Thrombophlebitis and Pulmonary Embolism, J. A. M. A. **117**: 1502-1508 (Nov. 1) 1941.
6. Homans, J.: Thrombosis of the Deep Veins of the Lower Leg Causing Pulmonary Embolism, New England J. Med. **211**: 993-997 (Nov. 29) 1934.
7. Ochsner, A., and De Bakey, M.: Therapeutic Considerations of Thrombophlebitis and Phlebothrombosis, New England J. Med. **225**: 207-227 (Aug. 7) 1941.

thrombophlebitis. Two factors are responsible for this difference in their own experience, the previous physical fitness and youth of the patients being primary, while a warm climate doubtless must be taken into consideration. We have become so impressed with the increased danger from fatal pulmonary embolus in the aged that we have actually carried out prophylactic femoral vein interruptions on 34 patients since Jan. 1, 1943. We

TABLE 1.—*Incidence of Thromboembolic Disease According to Season*

	No. of Cases	Incidence, per Cent
Winter	109	32 9
Spring	73	21.9
Summer	63	18 9
Fall	87	26 o
Total	332	100 0

believe that future reports from our clinic may give a very decided increase in the ratio of this preventive measure. Veal [8] has advocated concomitant femoral vein interruption in low thigh amputations. This is a precaution we have used a few times and one we shall use more often in the future.

This method of treatment may seem radical in the younger patient (table 2). Actually the process rarely produces fatal embolus in patients under 40 years of age. Since death occasionally occurs in this group, it is justifiable for this reason alone. In addition to this we know that sublethal infarcts and prolonged hospitalization can be avoided in this age group by the early recognition and radical treatment of phlebothrombosis and thrombophlebitis. The late sequelae of postphlebitic phlegmon and ulcer is reduced to a minimum if thrombectomy and femoral vein interruption with its early ambulation are carried out.

In the cardiac group we are asked to do femoral vein interruption if infarct occurs or if there are any signs of thrombosis in the leg veins. Recently we have had a few requests for this operation as a prophylactic

TABLE 2.—*Age of Patient in Decades*

	No. of Cases	Percentage	
0 - 10	1	0 3	17.7
10 - 20	6	1.6	
20 - 30	14	3 8	
30 - 40	44	12 0	
40 - 50	68	18 5	82 3
50 - 60	93	25 3	
60 - 70	84	22 9	
70 - 80	48	13 1	
80 - 90	7	1 9	
90 - 100	2	0 6	
	367		

procedure. It is well known that many of the pulmonary infarcts in cardiac patients come from the heart itself. We have shown, however, that a fair proportion of these emboli come from the legs in this group of patients.[9] Femoral vein interruption has not been responsible for a single death in our clinic to date. For these reasons the cardiologists feel that this operation is indicated in these patients on slight provocation It allows them to discount the possibility of a fatal embolus from the leg veins.

A small group of patients with fracture of the hip region requiring operative procedures have been subjected to prophylactic femoral vein interruption. This has been brought about by the frequency of fatal embolus in these aged patients, particularly those with intertrochanteric fractures. Elderly men requiring prostatectomy are beginning to be considered in the same light as are those who are to undergo serious operations for malignant disease. It is hoped that we may be able to work out better criteria for prophylactic vein interruption. At the moment we are not urging this practice. If it could be standardized we could prevent approximately five deaths a year in our clinic from massive embolus that occur in the aged group of patients who give no warning of phlebothrombosis This may be illustrated by the following case report:

Patient M., aged 74, was referred to us with extensive cancer of the stomach. Aside from considerable weight loss due to anorexia, he was in fair condition After proper

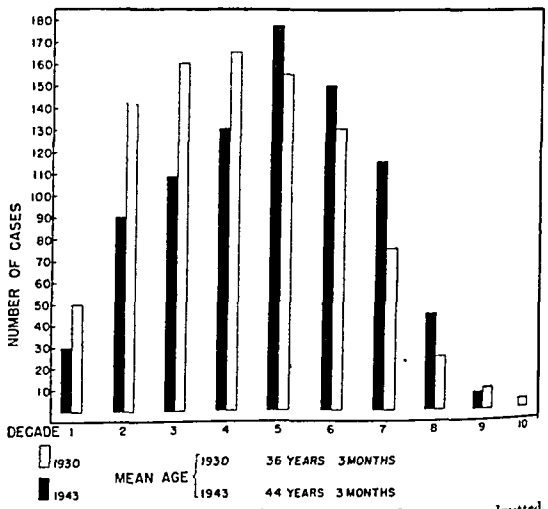


Fig 1.—Age in decades and the mean age of patients admitted to the surgical services of the Massachusetts General Hospital for a corresponding three month period in 1930 and 1943 Note the greater number of patients admitted in 1943 between the ages of 40 and 80 years Many of these required major surgery for malignant disease Both of these factors, age and malignancy, increase the incidence of thromboembolic disease

preparation he was subjected to total gastrectomy by the abdominal approach. He did well and was taking a liberal bland diet by his fourteenth postoperative day. He complained at this time of malaise and lack of any interest in food as well as slight discomfort in the epigastrium. He was afebrile, and physical examination revealed only a slight amount of tenderness in the well healed operative region. There was a small amount of edema of his ankles, present before operation and attributed to nutritional deficiency. There was no evidence of tenderness in the calves or popliteal regions or over the course of the deep leg veins, and no dilatation of the superficial veins. He had no pain in his chest, no cough and no leg symptoms. The change in his condition was explained on the basis of overfeeding and reaction about the operative region. He improved during the next forty-eight hours and was taking food well. On his nineteenth postoperative day, while returning from the bathroom, he collapsed in the corridor and died within five minutes. Autopsy showed a massive pulmonary embolus of the type coming from the deep veins of the legs. There were two old small infarcts in the lungs

8. Veal, J. R.: The Prevention of Pulmonary Complications Following Thigh Amputations by High Ligation of the Femoral Vein, J. A. M. A. **121**: 240 244 (Jan. 23) 1943.

9. Allen, A. W.; Linton, R. R., and Donaldson, G. A.: Thrombosis and Embolism: Review of 202 Patients Treated by Femoral Vein Interruption, Ann. Surg. **118**: 728 740 (Oct.) 1943.

In retrospect, we could have prevented his death by roentgen examination of the chest at the time of his first symptoms on the fourteenth postoperative day. This would have given us the true cause of the sudden change in his progress. Thrombectomy with femoral vein interruption at this time would have forestalled the massive embolus. Prophylactic bilateral venous interruption would have been justified at the time of, prior to or a day or two after his gastrectomy.

Much has been said recently regarding the advantages of early ambulation in postoperative patients. That this method of treatment has much to commend it we accept, and we make use of it in many cases. It does not, however, prevent thrombosis of the leg veins in all instances, but our future data may show reduction in this complication on this basis.

In a 78 year old mother of a physician we were asked to repair an umbilical hernia that had recently become incarcerated during a bout of coughing associated with acute bronchitis. The hernia could be kept reduced by careful strapping, and this was done until all acute pulmonary symptoms had subsided. A repair of the hernia was then done under spinal anesthesia with interrupted number 30 cotton sutures. The patient was cerefully nursed and, in addition to passive exercises of the legs and pressure bandages, the patient was got out of bed several times daily after the first postoperative day. On the evening of the eighth day a slight swelling was noticed in the left foot. There was no elevation of temperature and no evidence of tenderness over the deep veins of the leg. The superficial veins were not dilated. The next morning the calf measured 2 cm. greater on the left side and there was minimal discomfort in the calf muscles on dorsiflexion of the foot. At noon, eighteen hours following the first sign of phlebothrombosis, the femoral vein was exposed

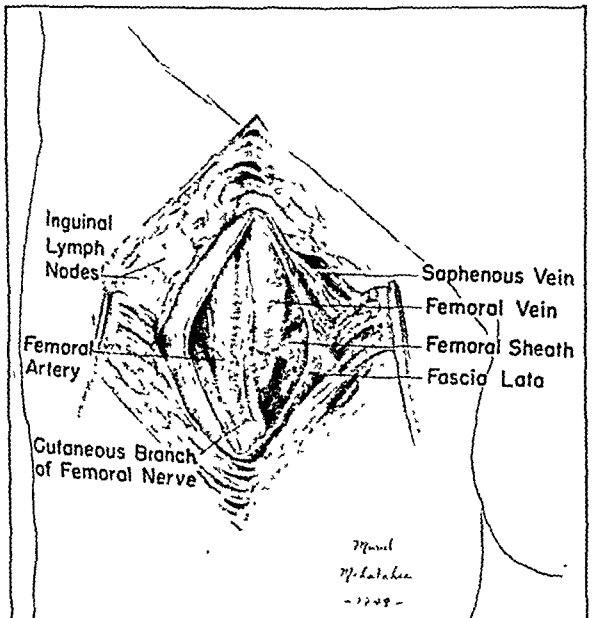


Fig. 2.—Schematic drawing to show the exposure of the femoral sheath. A vertical incision is used over the femoral vessels. This type of incision avoids severance of the lymphatics, since it parallels them. Note that the femoral vein lies medial and partially posterior to the femoral artery. The latter must be retracted lateralward to expose the vein. The saphenous vein is exposed but carefully preserved, provided it is not thrombosed. The inguinal lymph nodes are retracted lateralward.

under procaine anesthesia. On opening the vein a considerable amount of completely loose thrombus was removed by suction from the iliac as well as from the distal segment of the femoral vein. The superficial femoral vein was divided between ligatures and the wound closed. The patient had a low fever for three days, after which she was again made ambulatory and was discharged home on the twenty-first hospital day. The right vein was not interrupted, but this leg was carefully watched

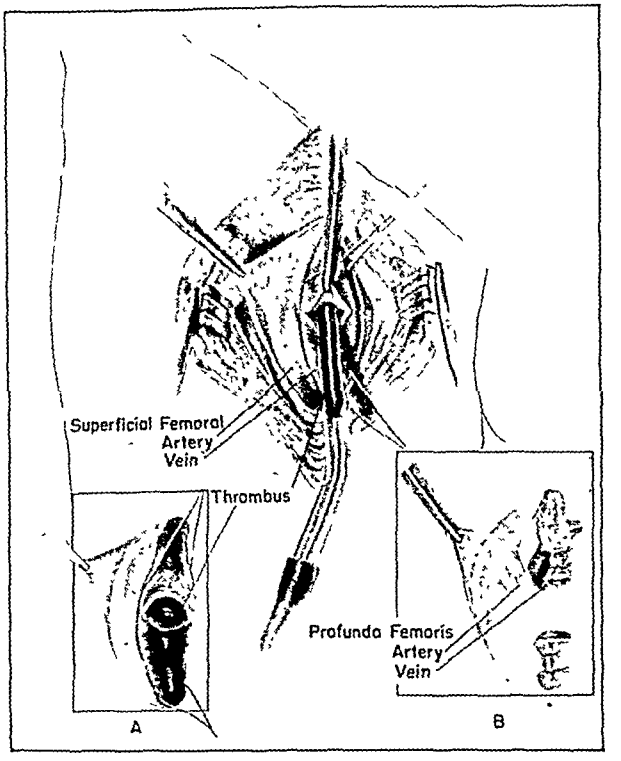


Fig. 3.—Schematic drawing to show the aspiration of a thrombus from the femoral and iliac veins through the superficial femoral vein. The cephalad segment is first cleared, then the distal one. The vein should not be ligated before aspiration of the thrombus. Note it in the glass cannula. (*A*) The inset shows the thrombus protruding through the transverse incision in the superficial femoral vein. Note the traction ligatures proximal and distal to the vein incision for control of the bleeding after thrombectomy. (*B*) The inset shows the ligation and division of the superficial femoral vein. Note the retraction of the vein ends. Each is ligated, then reinforced with stitch ligatures in each vein cuff distal to the primary ligature for additional safety against postoperative hemorrhage.

for any sign of thrombosis. She was seen one month after discharge with a barely perceptible amount of lower leg edema. Her only complaint was a slight swelling in the operative site from a small collection of lymph. This has absorbed and the patient has had no further complication.

Our experience with heparin in the treatment of thromboembolic disease has not been in accord with that of Murray.[10] In our clinic patients were apt to do well while heparinization was carried out only to have a recurrence of symptoms and signs after the heparin was stopped ten to fourteen days after its beginning. One patient died of a fatal embolus the day following two weeks of adequate heparinization. We have found this method of treatment of great value if repeated minor infarcts have occurred after femoral vein interruption. Also it is used routinely after any arterial surgery.

Dicumarol has been used cautiously in a small number of cases. We are of the opinion that this method of treatment may become sufficiently standardized to warrant its use more extensively. At this time, however, we do not believe that it is as safe or as innocuous as femoral vein interruption. Certainly this is true in our clinic during the pressure of war curtailment in laboratory control and experience of personnel.

10. Murray, G. D. W.: Heparin in Thrombosis and Embolism, Brit. J. Surg. 27: 567-598 (Jan.) 1940.

To June 1, 1944 we have interrupted the femoral veins for the treatment of, or the prevention of, thromboembolic disease on 464 patients. There has been no fatal complication as a result of this procedure in this entire series. Data are available for more detailed analysis on the 367 patients operated on before Jan. 1, 1944 and these are herewith presented.

That we have approached this form of treatment with caution but with increasing enthusiasm is indicated in table 3. The increasing incidence of bilateral femoral vein interruption as shown in table 4 has come about as a natural result of experience. So often have we had signs appear in the opposite leg or a new infarct occur a few days after unilateral interruption that we now feel that the two femoral veins should be interrupted at the same sitting. This has been further supported by the fact that the interruption of a normal femoral vein is harmless. Also we have found thrombosis in many opposite femoral veins that were thought to be normal by all our preoperative criteria. It is our present attitude to recommend bilateral femoral vein interruption routinely if either side is done. It is true that there is a slight predilection for thrombosis on the left side. This is indicated in table 5, which also includes the location of phlebotomy and interruption.

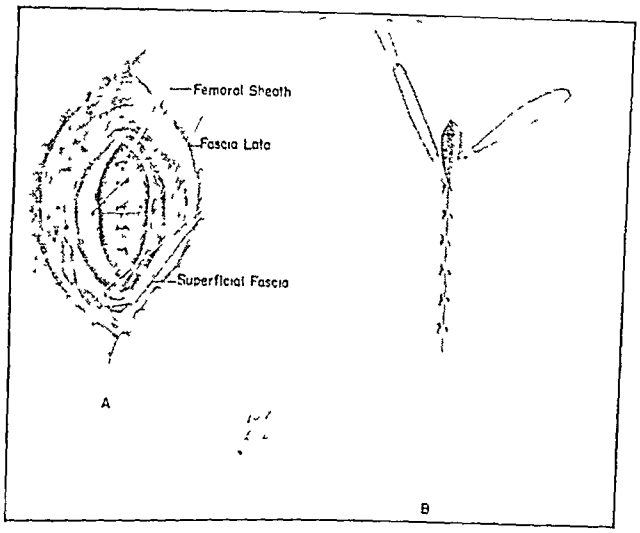


Fig. 4.—*A*, schematic drawing to show the closure of the femoral sheath, the fascia lata and the superficial fascia with interrupted sutures of fine cotton. *B*, schematic drawing to show the skin closure with interrupted vertical mattress sutures of fine silk.

This brings to mind the question of where the vein should be opened and interrupted. It has been our feeling that the superficial femoral vein just below the profunda femoris was the ideal site. This area is easily exposed and offers a segment of at least 2 cm. in length that is free of muscular branches. There is less danger of accidental hemorrhage in this area than in the common femoral vein. Thrombi can be removed from the iliac region adequately by suction through this approach. Although it is recognized that sublethal infarcts can occur from the saphenous or the profunda, we have not experienced a single instance of fatal embolus after interruption of the superficial femoral at the level used. Actually only 5 per cent of our patients have had infarcts of any degree following this procedure and most of them have been of minor importance. In a few instances these have been multiple and, when added to the damage already done by infarcts that had occurred before femoral vein interruption, have caused serious alarm. It is in this type of patient that heparin has occasionally been used with definite benefit. We have supposed that many of these post-vein interruption infarcts have come from the iliac region where thrombi may have recurred or in cases in which the removal by suction has been incomplete.

One of us (R. R. L.) has favored interruption of the common femoral instead of the superficial femoral

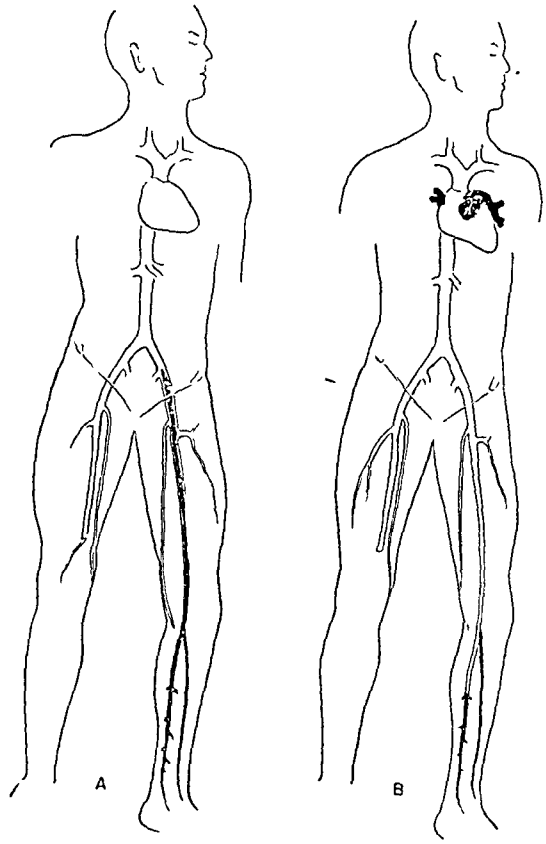


Fig. 5.—*A*, schematic drawing to show a bland thrombosis of deep veins of the left lower extremity. Note that the thrombus is attached to the femoral and iliac veins. *B*, schematic drawing show the free portion of the thrombus coiled in and occluding the monary artery, producing fatal pulmonary embolism. This catastr can be prevented by thrombectomy and femoral vein interruption

during the past year. He feels that in rare instanc the profunda femoris may unload sufficient thrombus produce a lethal outcome, particularly in the patie who has already had massive, repeated or subleth emboli. He has no proved instance of this occurrence but believes it is a possible explanation of one fatality in his experience. He recommends that the interruption be made below the saphenous if it is patent, since interruption above the profunda and including the

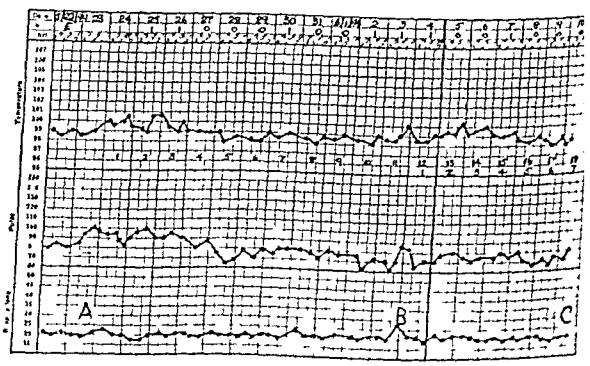


Fig. 6.—Temperature, pulse and respiration. *A*, combined abdominoperineal resection; *B*, bilateral femoral ligation, *C*, discharge

saphenous has caused venous congestion of a troublesome degree in a few instances It is admitted that interruption of the common femoral is technically more difficult to accomplish. Because of muscular branches in this segment, hemorrhage is harder to control. Also this feature makes it necessary to ligate in continuity after phlebotomy and thrombectomy There may be no advantage in division of the vein as we have practiced it in the superficial femoral, but the obvious elimination of tension on the vein when divided may well have a beneficial influence on the final result

Indications of venous thrombosis are multiple Often chest pain is the first warning, while in many instances the routine bidaily examination of the legs may reveal a clue. The clinical chart may offer the first evidence of thrombosis and infarcts. The patient less often complains of discomfort in the foot or calf muscles. Chest pain appearing suddenly, often associated with uncomfortable deep breathing and cough with blood tinged sputum, is so characteristic that confirmatory roentgenograms are unnecessary Often, however, infarcts occur that give no sign or symptom but are

TABLE 3—*Femoral Vein Interruptions in 367 Cases According to Year* *

1937	1
1938	0
1939	8
1940	5
1941	53
1942	211
1943	299

* Bilateral interruptions account for the discrepancy in total figures

TABLE 4—*Analysis of Unilateral and Bilateral Femoral Vein Interruptions*

	No of Cases	Percentage
1937 to 1942 inclusive		
Unilateral femoral vein interruption	124	61 0
Bilateral femoral vein interruption	78	39 0
Total	202	100 0
1943 (only)		
Unilateral femoral vein interruption	31	19 0
Bilateral femoral vein interruption	134	81 0
Total	165	100 0

easily seen in the x-ray film of the chest Ninety-five per cent of these infarcts are in the lower lobes and 55 per cent are in the left lower lobe (table 6).

Thirty-eight per cent of our cases presented chest symptoms first, while 62 per cent evidenced the initial difficulty by one of the leg signs or symptoms The latter include pain, swelling, tenderness or dilated superficial veins Homans has called attention to the dorsiflexion sign, which is pathognomonic when present This test is carried out by gentle but forceful dorsiflexion of the foot with the leg extended If discomfort in the calf muscles or the popliteal space is experienced during this maneuver, one can be sure that deep venous thrombosis exists Forty one per cent of our cases examined in this manner showed a positive Homans sign Sixty-six per cent showed swelling of the extremity in some degree Two thirds of the cases examined for tenderness over the calf muscles or deep veins gave this evidence of thrombosis

We have noted a typical change in the clinical chart when thrombosis and infarct have occurred even without symptoms. If one observes a slight rise in temperature, pulse and respiration on the same recording, then a thrombosis and infarct has occurred. This sign was found to be a reliable guide as to treatment in approximately 78 per cent of the charts suitable for analysis. In many instances one may get an elevation of one or two of the three lines for other reasons, but if they occur synchronously one must assume that the thromboembolic syndrome has occurred.

TABLE 5—*Analysis of Femoral Vein Interruptions*

	Number	Percentage
Vein interrupted		
Right common femoral	40	14 0
Right superficial femoral	239	86 0
Total right	279	48 0
Left common femoral	59	20 0
Left superficial femoral	241	80 0
Total left	300	52 0
Total right and left	579	100 0

The use of phlebograms in our clinic, once believed to be so important,[11] has gradually been discarded. This has come about as a natural result of experience. Phlebograms require a special time consuming technic and much practice in the interpretation of the films. Owing to the pressure of work and rapid changes in personnel, it became obvious to us that other criteria were less time consuming and more reliable.[12] During the year 1943 we used phlebograms in only 3 instances. One of us (R R. L) believes that phlebography is not innocuous and that this procedure may have been responsible for thrombosis in some instances and fatal embolism in 1 case with phlebograms interpreted as negative for thrombosis. He therefore feels that if phlebography is done, regardless of its interpretation, one is committed to femoral vein interruption

Morbidity following femoral vein interruption is less than we expected. The average number of days from this procedure to a normal chart was 5.3. This means that early rising can be safely carried out Some of the patients have been kept ambulatory in spite of a slightly elevated chart, but this has not been the rule Patients were discharged from the hospital in an average of 8 9 days following femoral vein interruption.

In the series of 367 cases analyzed there were only 5 instances of wound infection. This is particularly surprising when one considers the location of the

TABLE 6—*Location of Emboli*

	Percentage
Left lower lobe	55 0
Right lower lobe	40 0
Left upper lobe	1 7
Right upper lobe	3
Right middle lobe	0
	100 0

wound and the more or less emergency nature of the operation Instruments, gloves, gowns and drapes are changed before the second side is done.

Hemorrhage from the slipping of a ligature has occurred in 3 cases. This accident is unwarranted and will not occur if a stitch ligature is used distal to the original tie. If this complication arises, it is best to

11 Welch, C E, Faxon, H H, and McGahey, C L The Application of Phlebography to the Therapy of Thrombosis and Embolism, Surgery **12**: 163 183 (Aug) 1942

12 Allen, A W Peripheral Circulation in Relation to Trauma, with Special Reference to Thrombosis and Embolism, Am J. Surg **59**: 177 185 (Feb) 1943

return the patient to the operating room, remove the hematoma and properly secure the vessel.

Lymphorrhea has occurred in 15 instances. This is troublesome but soon ceases of its own accord. Patients having this complication are kept in the hospital until their wounds are dry. One may keep this complication at a minimum by carefully making the incision through all tissue parallel to the vessels. Often dissection mesially to ascertain the location of the saphenous is unnecessary. At times one can identify and ligate a transected lymphatic vessel. There have been an additional number of wounds that have filled to some extent with lymph, without actual discharge of this fluid from the wound. It is best not to aspirate this collection; if left alone, it will be absorbed in three to five weeks. Much of this can be avoided by carefully closing the deeper tissues with fine interrupted cotton sutures.

There have not been any deaths in the group of 464 cases reported as the result of femoral vein interruption.

TABLE 7.—*Analysis of Deaths*

Case	Age	Sex	Diagnosis	Veins * Interrupted	Autopsy	Emboli		Days from Ligature of Veins to Death	Cause of Death
						Old	New		
1. W. C.	65	♂	Glaucoma, arteriosclerotic heart disease	L. S. F.	+	+	0	11	Cardiac failure
2. M. P.	66	♂	Carcinoma of stomach	L. S. F.	0	—	—	2	Peritonitis
3. A. M.	62	♂	Carcinoma of colon	R. S. F. L. S. F.	0	—	—	52	Recurrent carcinoma; intestinal obstruction
4. J. G.	45	♂	Carcinoma of bladder	R. C. F.	+	+	0	10	Sepsis about right kidney
5. A. C.	62	♂	Carcinoma of colon; acute cholecystitis with bile peritonitis	R. S. F. L. C. F.	+	0	0	7	Bile peritonitis
6. T. L.	52	♂	Coronary heart disease	R. S. F.	+	+	0	28	Coronary infarct
7. A. R. S.	39	♂	Coronary heart disease	L. S. F.	0	—	—	15	Coronary heart disease
8. M. B. S.	69	♀	Coronary heart disease	L. S. F.	+	+	0	27	Coronary heart disease
9. H. H.	79	♂	Sprained ankle	R. C. F.	+	0	0	30	Pneumonia
10. B. E.	39	♀	Carcinoma of uterus	L. C. F.	+	+	0	8	Uremia
11. G. G. R.	52	♂	Dermatomyositis	R. C. F. L. C. F.	+	+	+	3	Dermatomyositis
12. C. S.	40	♀	Rheumatic heart disease	R. S. F. L. C. F.	+	+	+	49	*Multiple infarcts*
13. M. N.	85	♀	Fracture of right hip	R. S. F. L. S. F.	+	0	0	22	Bronchopneumonia
14. E. H.	75	♂	Coronary occlusion	R. S. F. L. S. F.	+	+	0	9	Cardiac failure
15. E. H.	71	♂	Suppurative cholangitis	R. S. F. L. S. F.	+	0	0	27	*Bronchopneumonia*
16. E. M. K.	61	♀	Arteriosclerotic gangrene	R. C. F. L. C. F.	0	—	—	45	Cardiac failure
17. A. R. B.	80	♀	Intestinal obstruction	R. S. F. L. S. F.	0	—	—	5	Congestive heart failure
18. M. M. M.	75	♀	Cardiac asthma	R. S. F. L. S. F.	+	+	+	8	*Multiple pulmonary infarcts* with abscess
19. W. J. C.	65	♂	Fracture of lower right leg	R. S. F. L. S. F.	+	0	0	39	Miliary tuberculosis
20. W. K.	61	♂	Coronary heart disease	R. C. F. L. C. F.	+	+	0	22	Myocardial infarction with cerebral infarction
21. H. C. M.	66	♂	Carcinoma of prostate	R. C. F. L. S. F.	+	0	0	13	Myocardial infarct
22. A. C.†	62	♂	Coronary thrombosis with bilateral femoral emboli	L. S. F.	+	0	+	10	Massive pulmonary emboli
23. C. H.	66	♂	Carcinoma of rectum	R. S. F. L. S. F.	0	+	0	12	Cardiac failure

* R. & L. S. F. = right and left superficial femoral vein; R. & L. C. F. = right and left common femoral vein.
† The fatal embolism in this case originated from the uninterrupted right femoral vein.

OPERATIVE TECHNIC

Under local infiltration 1 per cent procaine hydrochloride anesthesia, a 4 inch incision is made from the crease of the groin distalward along the course of the pulsating femoral artery. The skin edges are carefully protected by sterile towels. The dissection is carried through the fat and superficial fascia to the vascular bundle. The femoral artery overlies the vein somewhat in this region and is freed sufficiently so that it can be retracted laterally. The center of this wound exposes the superficial femoral vein, which can be dissected sufficiently to identify its main branches in this region. If the saphenous vein is normal, it is left alone; if it is thrombosed, it is interrupted. Having identified the profunda femoris, the superficial femoral is freed on its posterior avascular segment approximately 2 cm. distally. Under this is passed two strands of 0 chromic catgut or number 30 cotton. These are held by hemostats at the proximal and distal ends of the free segment. The center of this segment of the superficial femoral vein is then incised transversely through half its diameter. If the thrombus has extended to this level, it begins to extrude itself. Suction is applied through an angulated glass tube and the proximal vein freed of thrombi until free bleeding occurs. The upper control ligature is then tied. The distal segment of vein is then cleared of thrombus as well as possible by the suction tube. The more adequately this is accomplished, the freer the bleeding. This end is now tied and the vein completely divided. Stitch ligatures are then applied through the cut ends distal to the ties. The wound is irrigated with isotonic solution of sodium chloride and closed without drainage. Woven bandages are applied to the foot and leg up to the knee. These are advocated during ambulation as long as there is swelling or as long as it gives the patient comfort.

It is interesting to note that patients who have had infarcts before femoral vein interruption are less likely to have thrombi at the site of operation than those who are operated on before infarcts occur. The ideal situation is to make the diagnosis on minimal leg symptoms and signs, thereby interrupting the vein above the thrombus. Certainly the earlier this is done the shorter

the convalescence, both immediate and ultimate. Fever is dependent mainly on a pathologic condition of the lung in the form of infarct, but in many instances the inflammatory reaction about the vein itself plays a role. All the patients have some swelling of the leg after vein interruption and a few of them develop swelling of the thigh. This will last a variable time. If the operation is done for minimal signs early, the postoperative swelling is almost imperceptible. If the thrombus is such that it can be completely cleared out, the swelling lasts only a short time. The longer the process has existed in the vein, the longer it takes for all the postoperative edema to subside. The average patient will discard bandages in from four to twelve weeks. Occasionally these will be worn for six months. We have seen only 1 instance of postphlebitic phlegmon and ulcer so frequently seen in spontaneous recovery from thrombophlebitis. In this case phlebothrombosis had occurred with repeated infarcts diagnosed as recurring pneumonia over a period of six months prior to thrombectomy and femoral vein interruption.

It should be mentioned that inferior vena cava ligation has been done in 10 cases by one of us (R. R. L.). These were for iliac thrombosis of considerable standing with repeated infarcts. It is simpler to expose the vena cava through an abdominal incision without entering the peritoneum, since this structure can be reflected intact with ease, especially from the right. This procedure is preferable to bilateral iliac interruption, which creates technical difficulties and has been done at two sittings through elongated ureteral-like exposures. If the thrombus is of long duration it is unlikely that it can be successfully aspirated through a femoral exposure. Although this has been done several times, the resulting sublethal infarcts have been troublesome and the postoperative edema has been of long duration. It is surprising to see the rapid subsidence and the minimal edema following vena cava ligation in the cases treated by this method.

SUMMARY AND CONCLUSIONS

1. Bilateral femoral vein interruption is a safe procedure which can be carried out on extremely ill patients and will prevent massive fatal pulmonary embolism.

2. This operation should be carried out (1) on patients who have developed nonfatal pulmonary embolism, even though no positive signs of venous thrombosis in the legs can be detected, and (2) on any patient who develops phlebitis, as evidenced by pain, tenderness, swelling in the lower extremities, dilated superficial veins or pain in the calf muscles when the foot is forcefully dorsiflexed (Homans' sign). It is rare that all these signs are present, so that the decision to operate may depend on one or two criteria.

3. Bilateral femoral vein interruption, *if any is done*, is indicated on all patients except on very rare occasions. This is because in a number of instances thrombus formation has been found present in the apparently normal unaffected extremity.

4. Femoral vein interruption has been used prophylactically without harm for a few elderly patients with intertrochanteric fractures of the hip and in some requiring major abdominal surgery for cancer.

5. Every attempt should be made to make the diagnosis of thrombophlebitis before the femoral and iliac veins have become involved, since by early treatment the postoperative sequelae are reduced.

6. In cases with femoral-iliac thrombosis, the mechanical removal of thrombus from the vein by aspiration has been demonstrated to be a safe procedure. It should be done as early as possible after the thrombosis has been diagnosed. This reduces the pain and swelling in the leg and hastens the recovery, in addition to preventing massive fatal pulmonary embolism.

7. No deaths have occurred in the group of 464 cases reported as the result of femoral vein interruption.

8. The morbidity of thromboembolic disease is tremendously reduced by this operation.

ABSTRACT OF DISCUSSION

DR. ALTON OCHSNER, New Orleans: At one of the recent surgical society meetings, a new operation was described for the removal of a pulmonary embolism. We all know what happens when a person develops a pulmonary embolism, and if he is sick enough to be operated on the result is almost invariably a fatality. There is only one treatment for pulmonary embolism and it is prophylaxis. A great deal can be accomplished by preventing the clot originally, as the authors have emphasized. It is my belief that every patient past 45 years of age who has to be operated on should have his extremities wrapped from his toes to his groin before he goes to the operating room. This wrapping is maintained during his postoperative period until he is able to move his extremities actively. Early ambulation has undoubtedly done a great deal to cut down the incidence of postoperative thrombosis. Dr. Allen has referred to the geographic incidence of this condition. It is true. In the South we see a great deal less of it. Another factor is undoubtedly the temperature. It has been shown that in the Northern clinics, as Dr. Allen and his associates showed today, the incidence of thrombosis is higher in the winter months. I believe that this is probably due to the vasospastic influence, which is more likely to occur during the winter months. The patient who has a true thrombophlebitis does not require a vein ligation, and injection of sympathetic ganglions with procaine is all that is necessary. On the other hand in the presence of a hard thrombus, i. e. phlebothrombus, in which the clot is not firmly attached, prophylactic ligation of the vein is essential. In this way embolism is prevented. In older persons we routinely look at their extremities, look for tenderness in the calf and the plantar veins, determine the Homan dorsiflexion sign and look for tenderness along the course of the femoral vessels. Whenever tenderness is present or whenever there is an elevation of pulse rate out of proportion to anything else, we suspect intravenous clotting and will tie them up. I believe, as Dr. Allen does, that phlebography hasn't the place that we originally thought it did. It is nice to demonstrate the presence of a clot, but probably it is best to ligate the femoral and then one can be sure in a suspected case. The bilateral ligation should certainly be done in most cases.

DR. ARTHUR W. ALLEN, Boston: Heparinization requires the patient to be pretty well confined to the hospital bed or, certainly, to the hospital room. Now, the prophylactic use of heparin and dicumarol has a real future. We are observing it carefully and cautiously. We have had no serious sequelae with the use of dicumarol given in small doses shortly after operation and carried on afterward. In our city Dr. George Van S. Smith has routinely given his elderly patients 200 mg. of dicumarol after operation, repeated in five days, and occasionally a third dose is given. He has made a careful check on these patients and we can depend eventually on his report, which he is not quite ready yet to make. The only difficulties he has had have been hemorrhage in the vaginal plastic operations. These have been troublesome, sometimes requiring subsequent repair. There have been no serious abdominal hemorrhages in his group so far. Dr. Smith believes now that he has reduced the incidence of thromboembolic disease a great deal, probably as much as 75 per cent. When we can get the use of this drug standardized we shall find it tremendously helpful and possibly we can avoid many of these simple and innocuous surgical procedures which I have described.

SINGLE INJECTION TREATMENT OF GONORRHEA WITH PENICILLIN IN BEESWAX-PEANUT OIL

RESULTS IN 175 CASES

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In previous reports [1] two of us have described a method for prolonging the action of calcium penicillin by suspending it in beeswax-peanut oil and have shown successful results attained in a small group of patients with gonorrhea by a single injection of this mixture.

Our purpose here is to give the results obtained in the treatment of 175 cases of gonorrhea in males by a single injection of penicillin beeswax-peanut oil. The excellent results in the treatment of gonorrhea with penicillin in saline solution and the various methods and schedules of utilization have been reported by others.[2]

In our first reports [1] a suspension of penicillin beeswax-peanut oil was obtained by shaking the mixture for ten to fifteen minutes by hand. We have since used a mechanical blender, which has proved more efficient and practical for preparing larger quantities. It is necessary to emphasize that the preparation of a satisfactory penicillin beeswax-peanut oil mixture is contingent on the use of calcium penicillin, highly refined peanut oil and bleached U. S. P. beeswax.

The peanut oil is sterilized by the following procedure: It is first Seitz filtered, then passed through six layers of sterile gauze or a sintered glass filter, and finally autoclaved at 17 pounds of steam pressure for twenty minutes. The beeswax is heated to a liquid state and filtered through six layers of sterile gauze. It is then autoclaved at 17 pounds of steam pressure for twenty minutes. The most satisfactory mixture used in this study was 100,000 units of calcium penicillin in 1 cc. of 4 per cent (by volume; 3.2 per cent by weight) beeswax in peanut oil. This can be prepared in the following manner: The desired quantity of penicillin is placed in the sterile mechanical blender or mixer, and to this is added 1 cc. of a sterile 4 per cent mixture of beeswax in peanut oil for each hundred thousand units of penicillin. Prior to adding the beeswax-peanut oil, it is heated until clear. The mixture is then blended until the penicillin is completely suspended in the beeswax-peanut oil. At this time the mixture is sufficiently liquid so that it will not only pass through a 19 or 20 gage needle but will even go through a 26 gage needle. Sodium penicillin in beeswax-peanut oil has not produced as satisfactory a mixture or as consistent results as the calcium penicillin. Therefore its use is inadvisable for the present.

Detailed studies on the absorption and excretion of 200,000, 250,000 and 300,000 units of penicillin in 1 cc. of beeswax-peanut oil will be reported later.

Studies on the stability [1] of penicillin in beeswax-peanut oil will also be reported later. However, assay of this material, which has already been maintained at ice box, room and 37 C. temperatures for six months has shown no loss of potency.

Additional follow-up [1] on the gross and microscopic studies of the tissues from the site of the injection of the mixture shows minimal residual findings at five months in hamsters and two and one-half months in rabbits. Details on these results will also be reported.

The cases of gonorrhea in this study were treated by both the hand shaken and the mechanically blended mixtures of penicillin beeswax-peanut oil. Table 1 shows

TABLE 1.—*Number of Cases of Gonorrhea Treated with Penicillin in Varying Volumes and Proportions of Beeswax and Peanut Oil*

Number of Cases	Volume of Beeswax-Peanut Oil, Cc.	Per Cent of Beeswax
100,000 Oxford Units of Calcium penicillin		
52	2.0	3
24	1.0	3
5	1.0	5
5	3.0	3
5	1.0	4
4	1.8	3
3	0.75	5
1	2.0	4
1	3.0	6
150,000 Oxford Units of Calcium Penicillin		
41	1.5	4
9	1.5	3
8	4.0	3
7	3.0	3
6	2.0	3
1	3.0	4
1	2.5	3
1	1.5	5
1	1.7	6.7

the various combinations of the penicillin mixture used in the single injection treatment of 175 cases of gonorrhea in males.

Of the 100 patients who received a single injection of 100,000 units, 85 had penicillin assays [3] of the blood determined at intervals of one hour for ten hours. Assays of penicillin in the urine were also done to determine for how long a period penicillin continued to be excreted. In this group of patients the average duration of assayable penicillin in the blood was seven and one-half hours. The average highest level in the blood was 0.156 Oxford unit of penicillin per cubic centimeter. The average duration of excretion of penicillin in the urine was twenty-four hours.

By contrast, a single injection of 100,000 units of penicillin in saline solution will produce a very high initial blood level of penicillin in the first hour, which rapidly diminishes to a vanishing point in four to four and one-half hours, with excretion of penicillin in the urine continuing for only six to eight hours.

From the Penicillin Section, Laboratory Service, and Medical Service, Walter Reed General Hospital.

Technical assistance was rendered by Technician (4th Grade) Minna Levy, Miss Dorothy Talbot, Technician (5th Grade) George W. Saip, Staff Sergeant Leslie H. Wood, Technician (4th Grade) Walter S. Eccard, Sergeant William J. Moon and Sergeant Herman Tanner.

1. Romansky, M. J., and Rittman, G. E.: Method of Prolonging Action of Penicillin, Science **100**: 196 (Sept. 1) 1944; Penicillin: Prolonged Action in Beeswax-Peanut Oil Mixture, Bull. U. S. Army M. Dept., October 1944, no. 81, p. 43.

2. Mahoney, J. F.; Ferguson, C.; Buchholtz, M., and Van Slyke, C. J.: The Use of Penicillin Sodium in the Treatment of Sulfonamide Resistant Gonorrhea in Men, Am. J. Syph., Gonor. & Ven. Dis. **27**: 525 (Sept.) 1943. Herrell, W. E.; Cook, E. N., and Thompson, L.: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, J. A. M. A. **122**: 289 (May 29) 1943. Sternberg, T. H., and Turner, T. B.: The Treatment of Sulfonamide-Resistant Gonorrhea with Penicillin Sodium, ibid. **126**: 157 (Sept. 16) 1944. Murphy.[5]

3. Assays of the blood were done by the method of C. H. Rammelkamp (Proc. Soc. Exper. Biol. & Med. **51**: 95 [Oct.] 1942) with minor modifications. The penicillin assays of the urine were done by the methods of Rake and Jones (ibid. **54**: 189 [Nov.] 1943) and of Rammelkamp.

Sixty of the 75 patients who received a single injection of 150,000 units had penicillin assays of the blood determined at intervals of one hour for twelve hours and had penicillin assays of the urine determined. In this group of patients the average duration of assayable penicillin in the blood was ten hours. The average highest level in the blood was 0.204 Oxford unit of penicillin per cubic centimeter. The average duration of excretion of penicillin in the urine was thirty-two hours.

TABLE 2.—*Time Interval for Change from Purulent to Mucoid Urethral Discharge in Gonorrhea Treated with a Single Injection of 100,000 Units of Penicillin in Beeswax-Peanut Oil*

Hours	2	4	5	6	7	8	10	12	18	24	36	48	72
Cases	5	13	3	17	6	16	7	16	6	6	2	2	1

The in vitro susceptibility[4] of the gonococcus to penicillin was determined in 52 patients. The range of susceptibility to penicillin was 0.0039 to 0.0625 Oxford unit per cubic centimeter.

All the 175 cases of gonorrhea treated gave definite clinical signs of urethritis with a frank urethral discharge. In addition, all cases gave a positive smear and culture for the gonococcus prior to the institution of therapy. All individuals admitted to the hospital for gonorrheal infection were treated regardless of the length of time the disease was present or whether previous treatment had been administered. No attempt at selection was undertaken, and no other treatment, either local or systemic, was given to patients receiving the single injection of penicillin in beeswax-peanut oil. All patients were confined to the hospital during their treatment and follow-up period to determine their cure, thereby eliminating any possibility of confusion between treatment failures and reinfection. The period of observation in all instances was a minimum of two weeks from the time of injection of penicillin in oil. Patients were inspected daily during the period of observation, and prostatic smears and cultures were done at two, four and seven days. This period of observation and the intervals at which cultures were obtained were based on previous experience[5] with the use of penicillin in saline solution in the treatment of gonorrhea. In addition, smears and cultures were taken from the third through the seventh hour after the injection of penicillin in oil in order to determine at what hour they might become negative. Duplicate cultures, to which had been added penicillinase (Clarase) were also taken in order to eliminate the possibility of inhibition of growth by penicillin which might be present in the secretion.

TABLE 3.—*Time Interval for Cessation of Mucoid Urethral Discharge in Gonorrhea Treated with a Single Injection of 100,000 Units of Penicillin in Beeswax-Peanut Oil*

Hours	24	48	72	96	120	168
Cases	21	11	32	16	10	3

The first group of 100 patients was treated by a single injection of 100,000 units of penicillin in beeswax-peanut oil. Injections were given in the upper outer quadrant of the buttock. Table 1 indicates the various volumes of the mixture and percentages of beeswax used. Of the 100 patients, 76 were white and 24 Negro. Seventy-one had had no previous treatment, and 29 were sulfonamide resistant. Ninety-three of the 100 patients were cured by the single injection. Seven required retreatment with a single injection of 150,000 units of penicillin in beeswax-peanut oil and were cured. Five were white and 2 Negroes; 2 of the white and 1 of the Negro patients had been sulfonamide resistant.

Of particular interest from the clinical standpoint was the rapid change from a purulent yellow urethral discharge to a scant, watery, mucoid type, as shown in table 2.

Eighty-three per cent showed this change in twelve hours and 95 per cent by twenty-four hours. The remaining 5 per cent changed by the seventy-second hour. Included in table 2 are the 7 failures with 100,000 units. These 7 cases also changed from a purulent to a mucoid discharge from one to twelve hours after their injection.

TABLE 4.—*Time Interval Between Treatment and Bacteriologic Negativity in 93 Cases of Gonorrhea Treated with a Single Injection of 100,000 Units of Penicillin in Beeswax-Peanut Oil*

Hours	3	4	5	6	7	24 to 48
Cases	22	9	12	14	22	14

TABLE 5.—*Progress of 7 Gonorrhea Patients Retreated with a Single Injection of 150,000 Units of Penicillin in Beeswax-Peanut Oil After Failure with a Single Injection of 100,000 Units*

Purulent to mucoid discharge					
Hours	6	7	8	16	24
Cases	3	1	1	1	1
Cessation of mucoid discharge					
Hours	18	24	36	72	
Cases	1	4	1	1	
Bacteriologic negativity					
Hours	3	4	6	7	24
Cases	2	1	1	1	2

The 93 patients cured by the single injection of 100,000 units had complete cessation of the mucoid discharge, as shown in table 3.

At the end of a three day period following the institution of treatment 66.8 per cent were entirely negative for evidence of mucoid discharge, by the fifth day 96.7 per cent and by the seventh day the remaining 3.3 per cent. In the 7 cases which were failures a recurrence of the purulent discharge was present in forty-eight to seventy-two hours.

Of the 100 patients 79 per cent were bacteriologically negative within seven hours after the single injection of penicillin in oil (table 4) and 14 per cent were negative within seven to forty-eight hours. The remaining 7 per cent in this group of 100 patients receiving 100,000 units were the failures mentioned. These 7 were bacteriologically positive forty-eight hours after their injection. Subsequently they responded to a single injection of 150,000 units of penicillin in beeswax-peanut oil. Table 5 shows in these 7 cases the changes from purulent to mucoid discharge, the cessa-

4. Romansky, M. J., and Robin, E. V. D.: Unpublished data.
5. Murphy, R. J.: Experimental Use of Penicillin in Treatment of Sulfonamide Resistant Gonorrhea, Bull. U. S. Army M. Dept., August 1944, no. 79, p. 101.

tion of the mucoid discharge and the hours at which the smears and cultures became negative. Contrasted with these findings, the treatment of gonorrhea with a single injection of 100,000 units of penicillin in saline solution resulted in only 74 per cent cure.[6]

Group 2 consisted of 75 patients who received a single injection of 150,000 units of penicillin in beeswax-peanut oil. In this group there were 54 white and 21 Negro patients. Sixteen of the 75 were sulfonamide resistant and 59 had had no previous treatment. There were no failures in this group of 75 patients receiving 150,000 units of penicillin in beeswax-peanut oil. The purulent urethral discharge became mucoid, as shown in table 6, within seven hours in 73.3 per cent of the cases, twelve hours in 92 per cent and twenty-four hours in 100 per cent.

The time required for the mucoid discharge to subside entirely in these 75 cases is illustrated in table 7,

TABLE 6.—*Time Interval for Change from Purulent to Mucoid Urethral Discharge in Gonorrhea Treated with a Single Injection of 150,000 Units of Penicillin in Beeswax-Peanut Oil*

Hours	4	5	6	7	8	10	12	15	18	24
Cases	9	15	22	9	8	3	3	1	2	3

TABLE 7.—*Time Interval for Cessation of Mucoid Urethral Discharge in Gonorrhea Treated with a Single Injection of 150,000 Units of Penicillin in Beeswax-Peanut Oil*

Hours	18	20	24	30	36	42	48	72	96	120	163
Cases	4	1	35	1	1	2	20	4	3	2	2

TABLE 8.—*Time Interval Between Treatment and Bacteriologic Negativity in Gonorrhea Treated with a Single Injection of 150,000 Units of Penicillin in Beeswax-Peanut Oil*

Hours	3	4	5	6	7	24	48
Cases	26	8	5	13	10	1	12

in which 85.3 per cent showed this change in two days and 94.6 per cent in four days, with the remaining 5.4 per cent free from discharge by the seventh day.

Of the 75 patients, 82.6 per cent were bacteriologically negative within seven hours, as shown in table 8. The remaining 17.4 per cent in this group were negative within seven to forty-eight hours.

Of the 175 patients, 11 had severe acute prostatitis as evidenced by a greatly enlarged, exquisitely tender prostate. The smallest was twice the normal size, and the largest did not allow one digit of the examining finger to be introduced into the rectum. The effect of penicillin in oil on such complications appeared to be quite dramatic. Following the institution of treatment, in every instance, the prostate was about 25 per cent reduced in size by the end of the second day and 75 per cent reduced at the end of four days. By the seventh day culture the prostate had returned to its normal size. The response of prostatitis was much more striking than in cases previously treated with intermittent doses of penicillin in saline solution.

6. Leifer, William: Personal communication to the authors.

Three patients with epididymitis had complete relief from pain the day following treatment. However, it was not felt that there was more rapid reduction in swelling than in patients treated with penicillin in saline solution.

COMMENT

Striking features in the treatment of these patients with penicillin in beeswax-peanut oil were the rapid disappearance, usually within seven hours, of the subjective symptoms, especially frequency and pain on urination, the rapidity with which the purulent discharge became mucoid and disappeared, and the early attainment of bacteriologic negativity.

The degenerated coccoid organisms which have been described[7] were usually found in the smears which were taken in the third to the seventh hour.

The fact that the duplicate culture plates containing penicillinase yielded the same results as the regular culture plates indicated that if penicillin was present in the secretion obtained in the third to the seventh hours it was in insufficient quantities to inhibit the organism's growth on culture mediums.

The injection of the penicillin in beeswax-peanut oil produced no immediate discomfort. Twenty-four hours following the injection slight soreness was present to pressure, but this was gone within forty-eight hours. In none of the patients in this series were there any allergic manifestations to the mixture. No history of sensitivity to peanuts was obtained. Further allergy studies, including skin and patch tests on patients who have received the penicillin in beeswax-peanut oil and on a control group, are being carried out.

Approximately 30 patients in this group had complete hematologic studies including bleeding, clotting and prothrombin times. In addition, studies of the urine prior to the injection of the mixture and for seven days subsequently were obtained. These studies revealed no adverse effects from the penicillin in beeswax-peanut oil.

It may be noted in passing, in view of studies which are now being conducted, that single daily injections of penicillin in beeswax-peanut oil have also proved effective in pneumonia, impetigo, staphylococcic infections and other conditions which respond to penicillin in saline solution.

In addition, it is not inconceivable that a large enough single injection, such as 300,000 units or more, given at the time gonorrhea appears, might prevent the development of syphilis in cases exposed to the two diseases simultaneously.

SUMMARY

1. One hundred and seventy-five cases of gonorrhea in males were treated by a single injection of calcium penicillin in beeswax-peanut oil. There were no failures among 75 patients receiving a single injection of 150,000 units. Ninety-three of the 100 patients who received a single injection of 100,000 units were cured. The remaining 7 who received 100,000 units were failures and responded to a second single injection of 150,000 units of penicillin in beeswax-peanut oil.

2. A single injection of 100,000 to 150,000 units of calcium penicillin in beeswax-peanut oil will produce and maintain assayable levels of penicillin in the blood

7. Miller, C. P.; Scott, W. W., and Moeller, V.: Studies on the Action of Penicillin, J. A. M. A. 125:607 (July 1) 1944.

for seven and one-half to ten hours, with excretion of penicillin continuing in the urine for twenty-four to thirty-two hours.

3. The penicillin in beeswax-peanut oil mixture has produced no abnormal reactions locally or constitutionally.

PYELITIS OF PREGNANCY

FOCI OF INFECTION IN ITS PREVENTION

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For a long time we have been impressed by the fact that with the passing of the years we see fewer and fewer cases of pyelitis of pregnancy. When we first started out in practice, pyelitis of pregnancy was a frequent as well as a disturbing complication for which urologic consultation was often requested, and the patients were usually extremely ill.

In order to verify our impressions regarding the incidence of pyelitis of pregnancy in the Presbyterian Hospital of Chicago, the records of the obstetric department for the past ten years were reviewed. During this time 9,802 deliveries took place and there were 31 cases of pyelitis. This study gave us an incidence of only 0.3 per cent: this is the lowest figure with which we are familiar. Crabtree [1] presents a table in which the incidence varied from 0.8 to 16.3 per cent.

Early studies disclosed that all patients with pyelitis of pregnancy had pronounced dilatation of the upper urinary tract. To ascertain whether dilatation was present only in such pregnant women as developed pyelitis or whether dilatation of the urinary tract was commonly present during normal pregnancy, Kretschmer and Heaney [2] studied the urinary tracts of 19 cases of normal pregnancy by means of retrograde pyelograms. All of these women were free of all signs and symptoms of urinary tract infection. In 47.36 per cent bilateral dilatation was found and in 35.84 per cent the kidney pelvis and ureter were dilated on one side only, while in 15.8 per cent no dilatation was found. In a later paper Kretschmer, Heaney and Ockuly [3] reported their findings in a similar study by means of intravenous urograms. In this series dilatation of the kidney pelvis and ureter occurred in 100 per cent of cases during pregnancy and the puerperium. A striking feature of the dilatation was that it was almost uniformly above the brim of the pelvis. This study, furthermore, showed that dilatation is progressive with pregnancy. There was one exception to this statement, in which the ureter was normal in advanced pregnancy when earlier it was dilated. Further, it was found that lateral displacement of the ureter, when found early in pregnancy, tends to increase as the pregnancy advances. In none of the cases studied did pyelitis develop during pregnancy, although pronounced dilatation and displacement was present.

Many reasons have been given to explain the dilatation. Increased intra-abdominal pressure, compression of the ureter by the presenting parts and pressure produced by the growing pregnant uterus are commonly used explanations. Some are satisfied by ascribing the dilatation to the hormones which at the same time produce the usual changes peculiar to pregnancy, the enlargement of the breasts, the softening of the pelvic structures and the enlargement of the vaginal tract. What the purpose and use of the dilatation of the urinary tract and increased bladder capacity, if due to hormonal action, is not clear. However, stasis of urine in the ureter and kidney pelvis results, and, whenever stasis in the body occurs, infection may result if the causative organisms are introduced.

At one time it was believed that the infection gained ingress from the vulva because of the shortness of the female urethra and that a cystitis occurred first and the infection then ascended the urinary tract.

In the light of modern knowledge we know that in systemic diseases bacteria frequently enter the blood stream and pass from the blood stream through the kidneys and are eliminated through the urine. When the kidneys are sound and the urinary tract is open, the organisms escape without injury to the urinary tract; but when obstruction to the urinary tract is present, pyelitis may result. We see pyelitis develop following acute colds and not infrequently during acute infectious diseases such as measles. Pyelitis in children's hospitals and orphanages following gastroenteritis is fairly common. We have seen pyelitis of pregnancy occur after acute food poisoning in which all members of a family had been equally sick but the pregnant mother became acutely ill of pyelitis because in her instance stasis of the urinary tract was present as a result of her pregnancy.

Billings and his associates many years ago directed the attention of the world to the role of foci of infection, particularly in the teeth and tonsils, in the production of disease in distant parts of the body. His work at first was with regard to arthritis and its cause. Experience and time demonstrated the major role that foci of infection played in the etiology of many previously obscure conditions. As our knowledge grew at the Presbyterian Hospital of the impressive role that foci of infection had to do with the production of systemic disease we instituted the routine eradication of foci of infection before elective surgical operations and at the beginning of pregnancy. We are quite certain that as a result of this routine we have seen postoperative mortality and morbidity reduced to a minimum. Postoperative wound infections, thrombosis and emboli, previously quite common, are now rarely seen. Postpartum breast abscesses and thrombophlebitis infrequently occur. Parallel with these decreases in postoperative and postdelivery morbidity, pyelitis of pregnancy has also been much reduced, and, since other factors in its causation remain the same, we cannot but attribute this reduction to the eradication of foci of infection in the teeth and tonsils of patients applying for obstetric attention.

Earlier we based our diagnosis of infection in the teeth on x-ray evidence of abscess formation or visibly loose or obviously carious teeth or stumps. Now we know that devitalized teeth, even though the x-rays

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From the Orson Wells Fund, Presbyterian Hospital.
Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Urology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Crabtree, E. G.: Urological Diseases of Pregnancy, Boston, Little, Brown & Co., 1943, p. 134.
2. Kretschmer, H. L., and Heaney, N. S.: Dilatation of Ureter and Kidney Pelvis During Pregnancy, J. A. M. A. 85: 406-409 (Aug. 8) 1925.
3. Kretschmer, H. L.; Heaney, N. S., and Ockuly, E. A.: Dilatation of Kidney Pelvis and Ureter During Pregnancy and Puerperium, J. A. M. A. 101: 2025-2028 (Dec. 23) 1933.

disclose no evidence of abscess formation, may nevertheless yield virulent organisms if after extraction the teeth are submitted to bacteriologic examination. Similarly we know that as soon as a tooth dies it may act as a focus of infection, though the x-rays reveal no pathologic changes. The electric pulp tester will occasionally disclose the presence of dangerous dead teeth that appear harmless and normal on ordinary clinical examination.

In the light of this more recently acquired knowledge it is possible that some of the earlier cases supposedly freed from foci of infection may nevertheless have owed their pyelitis to the existence of foci then not recognized or understood.

It is our purpose in this paper once again to reiterate the importance of the routine eradication of foci of infection in the preparation of women for expected pregnancy.

An analysis of the hospital records of the 31 patients who developed pyelitis was exceedingly interesting. In 2 patients the records were incomplete and in 2 others no foci of infection were recorded, leaving 27 case histories for consideration in this study. It is possible, as already stated, that foci were present but were either

Occurrence of Foci of Infection

	Incidence of Focus
Teeth, carious, abscessed	14
Tonsils	6
Injected (deep) pharynx	6
Colds	5
Constipation	5
Sore throat	2
Influenza	2
Pneumonia	2
Kidney stones	2
Cough	1
Chronic appendicitis	1
Respiratory	1
Total	47

overlooked with the methods used or for one reason or another not recorded in the histories.

It is to be noted that there were 17 patients with one focus, 4 with two foci, 3 with three foci, 2 with four foci and 1 with five foci.

Some of the patients came in when in labor; hence there was no opportunity for antepartum care.

We do not wish to present the various combinations of foci except to call attention to this possibility; hence in antepartum care one must bear this possibility in mind during the antepartum period.

In the accompanying table are listed the various foci found.

From the point of view of prevention of pyelitis of pregnancy these foci may be considered as chronic and intercurrent. The chronic lesions, provided the patient comes to the physician during the pregnancy and not in labor, can and should be removed. The acute intercurrent infections should, as far as possible, be prevented by appropriate management.

In conclusion, we are of the opinion that pyelitis of pregnancy is a preventable disease or, if not completely preventable, the incidence of its occurrence can be reduced to a minimum. We make this statement on the basis of our experience at the Presbyterian Hospital.

122 South Michigan Avenue.

THE FEMALE URETHRA

THE CONNECTING LINK BETWEEN THE UROLOGIST AND THE GYNECOLOGIST

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In discussing this subject with the Section on Obstetrics and Gynecology and the Section on Urology it would profit us both if we followed the admonition of the prophet of old who said "Come let us reason together." For we think that there are some fundamental misconceptions by both groups about what we would like to designate our connecting link, the female urethra.

We feel that we[1] and others (DeGraaf,[2] Virchow,[3] Johnson,[4] Caldwell,[5] Evatt,[6] Korinchevsky[7]) have proved that there exists a definite group of glands surrounding the posterior part of the female urethra, that this group of glands is identical in morphology, distribution, secretory activity and location with the male prostate and that in fact this group of glands should and will ultimately be spoken of as the female prostate gland just as we speak of the male mammary gland. In size the mammary gland in the male may be really infinitesimal as compared with some of the more luxurious adornments of the female torso yet, in fact, it is a miniature mammary gland. Just as the male breast is a homologue of the female breast, so also, in our opinion, is this group of glands the homologue of the male prostate gland.

Figures 1 to 5 will show that in the urethras here sectioned there exist gland structures in this region. Whether or not they shall be called prostatic is entirely outside the scope of this paper. The important thing is that this group of glands does exist. Some urologists have denied even the existence of glands in this region, but by now we believe that nearly all are agreed that they do exist, although some are not yet ready to call these glands the female prostate.

These glands do become infected in very early infancy and may remain infected for many years or even throughout life, producing a varied and at times a bizarre papillary posterior urethritis. Just how they become infected has not as yet been proved. In former contributions we have suggested that the infectious organisms reached the glands through the rather open funnel shaped, short urethral canal from the feces during the diaper stage. The infections of the cervix may and in some cases do have a part in keeping alive, if not actually producing, these infections.

This inflammatory urethritis may vary from a mild granular urethritis, as seen through the close visioned cystourethroscope (fig. 6), or may appear as a more definite papillary urethritis as in figure 7. The following

From the Department of Urology of Southwest Medical College.
Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Urology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1 Folsom, A. I., and O'Brien, H. A.: The Female Obstructing Prostate, J. A. M. A. **121**: 573-579 (Feb. 20) 1942.

2 Petrowa, E. M.; Karaeewa, C. C., and Berkowskaja, A. F.: The Structure of the Female Urethra, Arch. Gynec. **163**: 343-357, 1939.

3 Virchow: Virchows Arch. f. path. Anat. **5**: 403, 1853.

4 Johnson, E. P.: Homologue of the Prostate in the Female, J. Urol. **8**: 13-34, 1926.

5 Caldwell, G. T.: The Glands of the Posterior Female Urethra, Texas State J. Med. **36**: 627-632, 1941.

6 Evatt, E. J.: A Contribution to the Development of the Prostate Gland in the Human Female and a Study of the Homologies of the Urethra and Vagina of the Sexes, J. Anat. & Physiol. **45**: 122-130, 1910-1911.

7. Korinchevsky, V.: The Female Prostate Gland and Its Reaction to the Male Compounds, J. Physiol. **90**: 371-376, 1937.

illustrations will show that this inflammatory reaction may vary from a mild infiltration as in figure 5 to a vicious inflammatory process as in figures 8 and 9. In some cases true prostatic calculi have been found.

From the foregoing we think it will be agreed at least that these women do have an active inflammatory process in their posterior urethras. This process may be acute, subacute or chronic. In many cases the urethral lumen is definitely strictured as shown by Stevens and others; and these strictures are an integral part of the pathologic picture we are trying to focus attention upon. The two processes, viz. the severe papillary or granular posterior urethritis and the stricture, go hand in hand to produce a pathologic clinical entity which can and does cause many women untold suffering.

There are two groups of clinical symptoms that are produced by this inflammatory posterior urethritis, bladder irritation and pain, and these two cannot be overemphasized; for so many women suffer from frequency, burning and some type of pain around the pelvis that it becomes of real importance to doctors dealing with women. These two groups of symptoms should be engraved on the mind in letters so bold and so bright

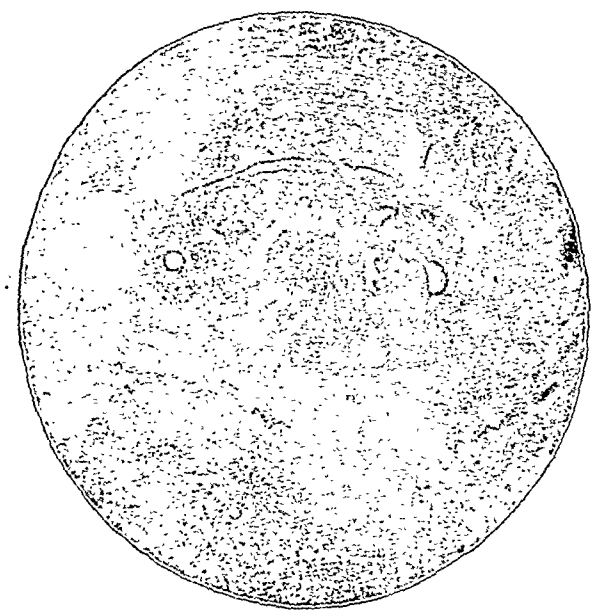


Fig. 1.—Section of full term fetus showing two lateral groups of glands.

that one can no longer fail to recognize that those irritable bladders and some pain it has not been possible to account for may have as their common denominator this inflammatory posterior urethra.

Many women suffer for years with either a continuous or a frequently recurring bladder irritation characterized by frequency and burning. These symptoms vary widely in different women; some are merely annoyed by occasional attacks of a mild degree, while others may have almost a constant frequency and burning which makes them miserable and, as one can well imagine, they get extremely nervous from this constant assault on their nervous systems.

In our experience, if we take all women who come to us for any urologic complaint, at least 90 per cent have this bladder irritation as one of the presenting symptoms, if not the main one. Of this group, 90 per cent have as the sole cause of this troublesome symptom complex an inflammatory urethritis. In spite of this, the urine in these cases is usually free from pus.

Some of these women have suffered for years and have consulted numerous physicians, gynecologists and urologists. They have had their bladders irrigated with solutions of every color of the rainbow, from the Stygian blackness of argyrol to the passionate light orchid of



Fig. 2.—Section showing numerous gland structures around posterior female urethra.

a pale potassium permanganate solution. They have been given the classic prescriptions of saw palmetto, bucu, juniper, potassium acetate and so on. But in spite of all the irrigations and medicines they go along getting no relief from anything.



Fig. 3.—High power view of section showing typical prostatic-like gland structures.

These patients remind us of the old woman in St. Luke who had suffered many things at the hands of many physicians, had spent all her money and instead of getting better rather grew worse.

Until a few years ago we urologists had overlooked these lesions in the posterior urethra of the female, and even now some of our brethren are not too intimately familiar with this very definite clinical and pathologic picture. These women have been told by some of the best urologists in the country that they had no pathologic



Fig. 4.—Section showing wide distribution of glands around posterior female urethra.

condition of the urinary tract, that their trouble was in their head and that they should go home and forget about it by getting interested in some form of outdoor exercise. One such woman so advised went home and started horseback riding. It did not take long to convince her that this form of diversion might be good for her mind but that bouncing around on her bottom with an inflammatory grass bur in the center of it was not so good.



Fig. 5.—Section showing periglandular inflammatory infiltration.

Through the years we have believed that, when some one came in complaining of a very definite trouble and always told the same story, one should be very loath to accuse such a patient of being neurotic. This is particularly true of these patients for, while they are terribly nervous, yet they have a definite cause for their nervousness. It is this ceaseless irritation that causes them to be nervous rather than the nervousness causing the irritation, for as far as we have observed there is no such thing as a nervous bladder.

Many women who suffer as we have outlined have had, or have been advised to have, a suspension of the uterus to lift it up away from where it was pressing on the bladder. The surgeon or gynecologist told them that the uterus had fallen forward so that it was pressing on the bladder and that this was the cause of their bladder irritation. In our judgment there is nothing more fallacious than this, because we have seen so many women who have had suspensions done for the relief of bladder irritation and then continued to have the same trouble until this urethral lesion was properly treated.

The Great Architect of our bodies did not make many errors in design, and He so placed the uterus that it must live in rather intimate association with the bladder; therefore its anterior surface must be almost constantly pressed against the bladder wall.

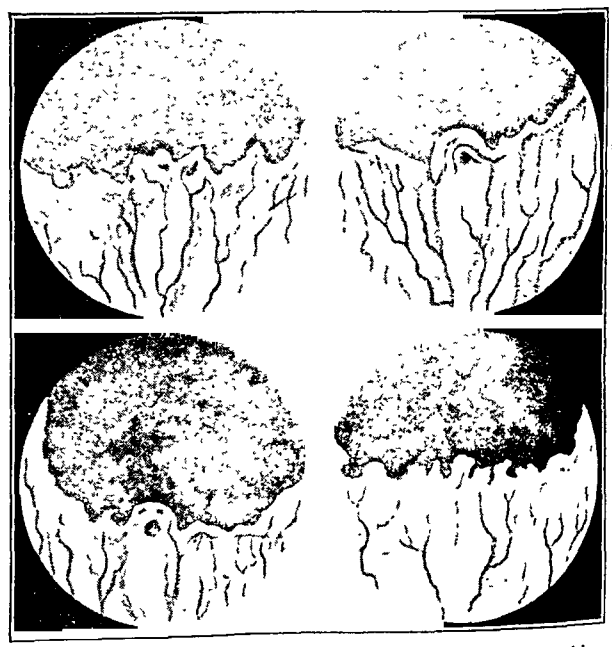


Fig. 6.—Cystourethroscopic view showing granular posterior urethritis.

Let us hasten to say that we are not by any means suggesting that suspensions should not be done for definite gynecologic reasons; but what we are saying is that if one is doing the suspension primarily to relieve a trying bladder irritation then we think that one is wrong; and one's failures will finally be cured by the alert urologists who find and clear up these inflammatory posterior urethras.

Repairs of cystoceles have also been done for the relief of bladder irritation. We feel again that if one has a definite reason for doing a cystocele operation it should certainly be done; but if one is doing the cystocele operation primarily to relieve the woman of bladder irritation one should first have the posterior urethra studied very carefully before operating; for in the great majority of such cases one will fail to get a result, not because one did a poor operation but because the real cause of the woman's trouble was not the cystocele but a chronic inflammatory posterior urethra. We have literally scores of these cases in our files, in which successful repairs of cystoceles have been done and the bladder irritation has continued. These patients had

this lesion of the posterior urethra, and when it was cleared up they were finally cured.

Once more we want to emphasize that we do not advise against cystocele repair—far from it—but, if one has only bladder irritation as an indication for the procedure, then we feel that one should stop, look and listen.

The next symptom produced by this inflammatory posterior urethritis is pain. This pain is a referred pain manifesting itself in various locations. These pains are, as a rule, dull and aching in character, but at times they may be so closely similar to renal colic in location and severity that it may be difficult for one to be sure one is not confronted with a true renal pain. A Frenchman, Civiale, in 1850 first called our attention to the fact that pains in and around the female pelvis may and can be caused by the urethra; but the dust of nearly a century had covered over his statement until we excavated it from the ruins and gave him due credit in a paper we wrote in 1934.

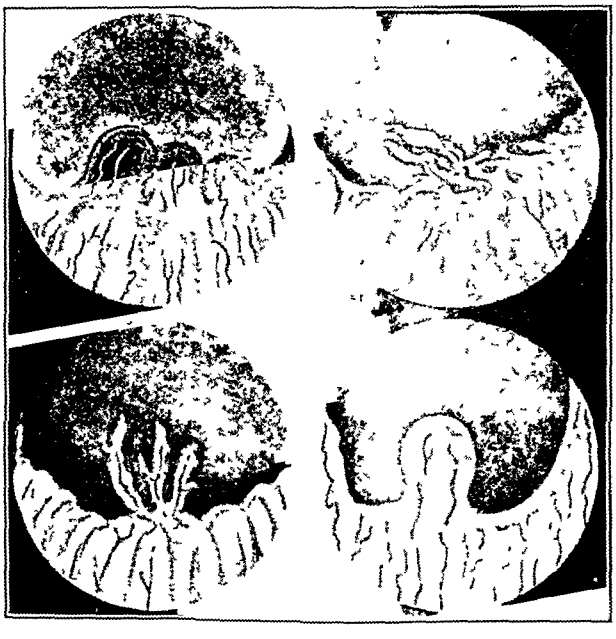


Fig 7.—Cystourethroscopic view showing papillary posterior urethritis

The most frequent sites for this referred pain are either (1) in the right or the left iliac region, low down, (2) the lumbosacral region of the back . . . and how many women have the backache there, (3) either loin, where if the pain is severe it may be, and has frequently been, mistaken for renal or ureteral disorder or (4) the inner side of the thighs. In fact, in recent years we have paraphrased one of Richard Cabot's famous dicta thus: "Any pain within 2 feet of the female urethra for which one cannot find an adequate explanation should be suspected of coming from the female urethra."

The pain most usually seen is in the iliac regions, and it is well known that any woman with a pain in either iliac region is in danger of being operated on by some good surgeon or gynecologist for some real or fancied pelvic disease. An appendix is not entirely safe under such circumstances, for an appendix may, as is also known, be found on the left side.

Our records are literally filled with women who have had, through the years, just two definite symptoms, bladder irritation and pain, in one of these locations. They have had from one to six or eight abdominal operations with absolutely no relief from either the bladder irritation or the pain. We have in a tremendous majority found these women to be suffering from a chronic papillary or granular posterior urethritis, and the correction of this trouble has almost uniformly given



Fig 8.—Anatomic specimen of bladder opened from above, showing internal urethral orifice filled with papillary structures

them relief, not alone from one, but from both complaints

As Bulwer-Lytton once asked in the title of his great English novel "What Will He Do with It?" so you already are asking What shall we do with it? The foundation work of the treatment of this troublesome pathologic condition is urethral dilations. This should be done twice a week regularly, beginning with the size sound that will stretch but not tear the urethral mucosa. Then the size of the sound should be gradually increased until a 30 or 32 F. will go easily. After each dilation we instil 10 to 15 cc. of 0.25 per cent solution of strong

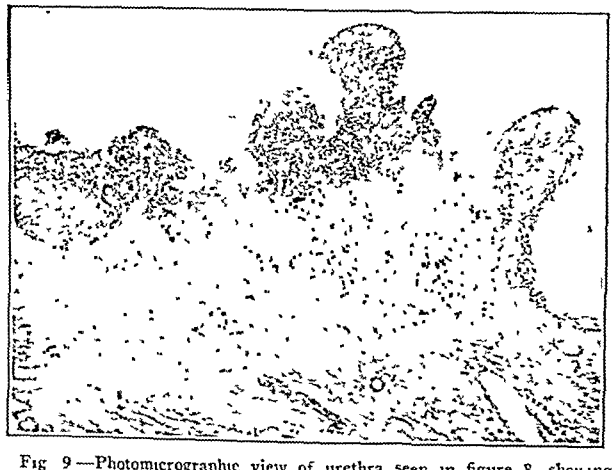


Fig 9.—Photomicrographic view of urethra seen in figure 8, showing intense inflammatory infiltration and replacement of normal transitional by stratified squamous epithelium.

protein silver. We really do not believe that this instillation has any virtue but out of respect to the ancient faith in solutions in the bladder we continue the practice.

When the urethra has been dilated for about six weeks, the next thing to do is to fulgurate some of the pathologic tissue in the posterior urethra. After this fulguration the patient is allowed to rest for two weeks.

Then the dilations are resumed and given for a period of six weeks to two months, when another fulguration may be done. This routine is followed until the patient is relieved and there is no further evidence of pathologic change present in the posterior urethra.

In some cases that are refractory to treatment one should never lose sight of the fact that there is a very intimate lymphatic connection between the cervix uteri and the posterior urethra and trigone. Hence these patients may be and often are helped by clearing up an old endocervicitis, which may have been playing a part in the perpetuation of the urethral infection.

These women have not been operated on by the wagonyard group of surgeons and gynecologists but by some of the best in either group; and we are not pointing the finger of scorn, as we live in too fragile a domicile. We are simply trying to point out that the female urethra is not the insignificant structure we have been taught to believe, but that it harbors a clinical and pathologic entity worthy of the most serious consideration.

REPORT OF CASES

Mrs. J. W. K., aged 44, white, who was examined Feb. 5, 1944, stated that for five years she had suffered from a dull aching pain in both iliac regions and the suprapubic area. Six months after the onset she was operated on and both tubes and a portion of one ovary were removed without any relief from her pain. One year later she was again operated on because of the pain. At this time some adhesions were broken up and some tissue removed but she does not know the nature of this; however, it did not affect the pains. She had to be catheterized several times after this operation and has had increased frequency of urination since then. Examination of the urinary tract was negative at this time. The patient then went to a clinic, where a third operation was done, this time releasing adhesions. Again her pains were not relieved, but in addition she developed a new pain in the region of the right kidney. This pain increased when the bladder was filled and was always relieved by voiding. During the past year she had become extremely nervous. Our examination revealed a tight urethral stricture with a pronounced chronic urethritis. There was immediate response to urethral dilations in that the patient felt definitely that she had less pain. Following the first fulguration she experienced a practically complete relief from her symptoms. The urethra was fulgurated again on June 4, 1944 and since then she has been completely comfortable.

Mrs. G. A. E., aged 46, white, first examined June 3, 1941, complained of suprapubic burning pain of many years' duration. In addition she stated that for over fifteen years she had suffered from repeated mild attacks of urinary frequency, urgency and dysuria with associated low lumbar backaches. The attacks would last from three to five days and recurred every three to four months. Because of the bladder irritation she felt that she had become increasingly nervous during the past two or three years. Examination revealed a stricture of the urethra size 14 French. In addition there was a pronounced chronic urethritis. The remainder of the urinary tract findings were normal. Urinalysis was negative. Following dilation of the urethra and fulguration of the urethral mucosa the patient has been entirely relieved of her trouble. There have not been any attacks of bladder irritation in three years.

Mrs. S. P., aged 57, white, first seen Oct. 1, 1941, for five years had been suffering from urinary frequency, dysuria, urgency and a lack of feeling of relief after voiding. About every three months the bladder symptoms would be increased in severity and she would have fever ranging from 101 to 103 F. and lasting three or four days. In 1940 she was treated for two months for a right ureteral stricture and after a rest for six months these dilations of the right ureter were again repeated without any relief from symptoms. Following this the urethra was fulgurated on two occasions, and later a "caruncle" was burned out. In spite of this her symptoms persisted. Two weeks before our examination she had gone through a typical attack of increased urinary symptoms and fever of three days' duration. The general physical examin tion was essentially normal. There was some distortion of tl external urethral meatus. The urethra was strictured so th a No. 20 French bulbous bougie passed with difficulty. In tl midportion of the urethra there were abundant granulations an a few papillary masses. The posterior urethra was clear, havin previously been fulgurated. The bladder was normal. Th left pyeloureterogram was normal. The right pyeloureterogra was normal except for slight angulation in the upper thir The bladder urine showed 10 white blood cells per high pow field. Urine from both kidneys was negative on microscopi examination.

The urethra was dilated twice weekly until a 30 French sound could be easily passed. Following this the granulations and papillary tissue were destroyed by fulguration. Since then the patient has been relieved and has had no febrile attacks.

Mrs. L. A. J., aged 45, white, first examined June 26, 1939 complained of a constant sense of discomfort in the region o the bladder and urethra. She described this as feeling as i one had a "raw sore throat." There were no symptoms o bladder irritation. Several years before the patient had a pelvic operation to get relief from this pain, but it did not help. A year ago she passed some bloody urine on one occasion and following this had a severe lumbosacral backache for several days. Complete urologic study was negative except for pronounced chronic posterior urethritis. The urethra was dilated, and following this the granular and papillary masses in the urethral mucosa were fulgurated on four occasions. She has experienced complete relief from her pain and has remained well since then.

Mrs. D. G., aged 37, white, examined July 16, 1942, complained of pain generalized over the lumbar area for the past ten years; at times this would be severe enough to keep her in bed two or three days. She thought at times that the backache would be relieved somewhat by voiding. Also for ten years she had increased frequency of voiding during the day, nocturia two to five times and slight dysuria. On several occasions examinations revealed pus in the urine, and irrigations of the kidney pelves were carried out. She would always experience relief from her backache and urinary symptoms for about a week following this. At no time has she had any spells of high fever. Urinalysis showed 8 to 10 pus cells per high power field; there was a tight urethral stricture and a chronic urethritis; there was slight congestion of the trigone. The remainder of the bladder was normal. Urine from each kidney was free of pus, and pyeloureterograms were normal. Dilation of the urethral stricture and fulguration of the urethral mucosa twice at two month intervals cured the condition.

Mrs. J. D. E., aged 30, white, for several years suffered from constant lumbar backache and nervous and mild attacks of urinary frequency. In August 1941 she had a suspension of her uterus and partial removal of one ovary. She had to be catheterized several times afterward, and following this she was bothered a great deal with frequency of urination in the daytime, mild dysuria and a lack of sense of relief after voiding. At the time of our examination in January 1942 she still had the original backache and was extremely nervous. Urinalysis was negative. There was a pronounced chronic posterior urethritis. The urethra had been widely dilated without relieving her symptoms. Fulguration of the granular and papillary masses in the urethra on two occasions relieved her completely of backache, bladder symptoms and nervousness.

Mrs. W. F. J., aged 35, examined May 11, 1941, had suffered for seven years from frequency, dysuria and at times difficulty in voiding. Two years after the onset of these symptoms hysterectomy was performed to relieve "pressure on the bladder," but this did not give any relief. About one year ago the patient developed burning pain in the right hypochondrium, right loin and right lumbosacral area. Urinalysis was negative except for an occasional white blood cell. Complete urologic study revealed a stricture of the urethra and a chronic granular and papillary urethritis. Following dilation of the urethra to 30 French caliber and fulguration of the granular and papillary areas in the urethra mucosa the patient was completely relieved of her pain and her urinary symptoms and has not had any recurrence of trouble since then.

Mrs. C. G. H., aged 32, seen first in June 1940, complained of a severe pain in the right loin, beginning in the costovertebral angle and radiating along the ureter. At times she required hypodermic injections for relief. She also had frequent attacks of bladder irritation (frequency and burning). These symptoms had been present for eight years. She had had one pelvic operation with no relief, and one of the best urologists in our part of the country had done a nephropexy. This also failed to give her any relief in spite of the fact that our pyelogram in the erect position showed that the kidney was normal and well up in position. Our examination showed a moderate tightness of the urethra and a normal bladder, but a pronounced papillary posterior urethritis. Dilation and fulguration relieved her not only of the bladder irritation but of the pain in the right loin.

Mrs. M. C., aged 43, seen April 3, 1944, fourteen years ago, following delivery, began to have pain in the right loin, the right iliac region and the inner side of the right thigh. She began also to have a bladder frequency and burning. These symptoms had persisted in spite of several operations for their relief. A suspension was done, at which time the appendix was removed. Then the right tube and ovary were removed. Then a hysterectomy was done. Next a plastic operation on the right ureteropelvic junction was done, and finally the right kidney was removed. But in spite of all these various operations she continued to suffer from bladder irritation and the aforementioned pains. The first observation made on cystoscopy was that she had a grossly trabeculated bladder. She was then asked about difficulty in voiding, which she said had been present for the past four years. Otherwise the bladder was normal. There was a pronounced collarette surrounding the internal urethral orifice and also some papillary masses and granulation tissue. She had suffered so long and had had so many operations without relief that we decided to do a transurethral resection of the entire pathologic area in the region of the internal urethral orifice. This was done March 4, 1944. Following this she was relieved within twenty-four hours not only of her bladder irritation but also of the pain in the right loin, iliac region and inner side of the thigh. In our wildest enthusiasm we had not hoped for such an immediate and complete relief. But we have had a report from her doctor and she is still relieved.

1719 Pacific Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HEANEY AND KRETSCHMER AND DRS. FOLSOM AND O'BRIEN

DR. VINCENT J. O'CONOR, Chicago: Obstructive lesions at the neck of the bladder in women are confusing from the point of view of interpretation. I have the material of 19 transurethral sections of the female bladder neck, individuals studied carefully with urinary obstruction, not the simple type with multiple polyps of the posterior urethra and vesical neck which we all see so frequently but individuals with actual retention of urine not due to mechanical causes from a relaxed bladder. A study of this material shows that the character of the tissue varies from pure muscular tissue, pure fibrotic tissue, to mixed glandular elements and in some instances hyperplasia and inflammatory tissue, so that it is a waste of time to argue about the exact nature of the obstructing tissue at the bladder neck in women. Many of these women who have frequent dysuria, difficulty in urinating and perhaps recurrent attacks of upper urinary infection, which are probably precipitated by the urethral lesion, can be benefited by relieving the mechanical obstruction at the bladder neck, providing for free urination, and restoration of complete bladder emptying. This operation is one, of course, which we enter rather with trepidation because of the small amount of tissue one can remove without running the danger of making the patient incontinent.

DR. V. D. LESPINASSE, Chicago: A woman of this type was catheterized with the ordinary metal female catheter. Everything was strictly orthodox up to the point of removing the catheter. The catheter was about half removed when it stuck, and it reminded me of an experience I had some twenty-five years ago when a rat tail catheter coiled up in the bladder; in this situation we had no long catheter to tie into a knot, so after deliberating a short time I decided to put traction on the catheter. This I did and suddenly it came away with a few drops of blood. In the eye of the catheter, firmly wedged, was a urethral polyp of the kind under discussion. Immediate cystoscopy revealed clearly the source of this hemorrhage just at the urethrovesical junction. So, as the urine was flowing into the catheter, the little polyp went through the eye with it and was caught and torn off when the catheter was removed.

DR. JOHN ORMOND, Detroit: In my experience a great many of these women who come in with these urinary symptoms are not improved by treatment to the urethra alone. We have to consider the trigone, which seems to be a frequent source of infection to the urethra. The procedure that I have been using may not be new. I haven't seen it described. It is merely to take the retrospective cystoscope that comes with the resectoscope, fill the bladder with water, insert the retrospective cystoscope and examine the orifice from the inside.

DR. H. W. HOWARD, Portland, Ore.: The admitted infection of the paraurethral glands may have a lymphatic drainage from the focus to the pelvis and thus account for the remote conveyance of symptoms, as Drs. Folsom and O'Brien have mentioned, into the hip and the inside of the thigh. The ordinary tissue in the suprapubic space is lacy and pink and allows free movement of all the organs contained, but as lymphangitis develops there the tissue takes on a firmer and a whiter appearance. It seems clear that certain irregularities in the ureters which had been noticed in well made urethral glands in the pelvic level otherwise not accounted for were now accounted for on the basis of lymphangitis because of scarring of these areas, with constriction and deformity on the urethra. When the wall of the pelvis is palpated as far as the finger can reach, using the rectum as a means of approach, the wall of the pelvis is tender throughout. One easily palpates the sides, which under these circumstances are tender. Likewise the trigone is tender at the point of which the tenderness is at the junction of the trigone and urethra with these glands which are presumed to be most abundant.

LIEUTENANT COLONEL HARRY KIRSCHBAUM, M. C., A. U. S.: The gynecologist who is interested in urology of course recognizes these conditions, but the gynecologist has a difficult time convincing the urologist that they exist. There are, however, many cases showing these findings and no symptoms. Of course, having gynecologic patients—20 per cent of them have a frequency in urination—I feel that it is a gynecologist's duty to be thoroughly familiar with the female bladder. I want to ask Drs. Folsom and O'Brien what their percentage of cures was as far as they have noticed in connection with cauterization of the cervix for endocervicitis. If a patient with endocervicitis is cured, will the urethral symptoms clear up spontaneously or will they require further urethral treatment?

DR. H. L. KRETSCHMER, Chicago: Dr. Heaney and I have been impressed for a long time with the fact that we see so few cases at the Presbyterian Hospital. I gained the impression in talking with urologists in various sections of the country that they see many more cases than we do. This led to a study of the cases of pyelitis of pregnancy that occurred in the hospital for the past ten years. The results of our study form the basis of our paper. We believe that the number of cases that occur in any large clinic or hospital is in direct ratio to the care and attention given to the removal of foci of infection during the antepartum period. I agree with Drs. Folsom and O'Brien that the female urethra is frequently the seat of chronic infection and that this in turn is responsible for the patients' symptoms. Unfortunately this fact is overlooked. Besides chronic urethritis may I call attention to infection in the paraurethral and periurethral glands as a frequent cause of the symptoms. The diagnosis is relatively simple if we only bear them in mind.

DR. A. I. FOLSOM, Dallas, Texas: In my experience the caruncle has been greatly exaggerated. In the majority of instances that I have seen, these women who have had caruncles burned off and excised still have their trouble and we find the real cause of it in the posterior urethra. Dr. Kretschmer emphasizes that he sees many of these cases that do not show any symptoms and, of course, that is entirely true, and I have no explanation for it. Dr. Ormond says that some of these

persistent cases that do not respond to ordinary treatment show a definite trigonitis. The interesting thing to me about trigonitis is that it has been considered a clinical entity, whereas it is not a clinical entity at all. It is simply an extension of this inflammatory lesion in the posterior urethra on to the trigone. I have seen actual leukoplakia extending down from the urethral orifice and over the trigone and I have had to use fulguration to get relief. The cervix is definitely connected with the urethra and in many of these resistant cases there is a chronic endocervicitis; clearing that up will help the patient materially. This is not always true because there is not always this connection, but in a persistently resistant case one should never overlook the possibility of there being also an infection in the cervix.

INSULIN MIXTURES IN THE TREATMENT OF DIABETES

VARIABLE VERSUS FIXED RATIOS OF INSULIN AND PROTAMINE ZINC INSULIN

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AND
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The introduction of protamine insulin by Hagedorn and his co-workers [1] in 1935 represented a milestone in the development of insulin therapy in diabetes. The result of extensive efforts to prolong the action of insulin, it simplified treatment in many ways. Multiple injections, even in severe cases, were reduced to one injection, glycosuria and ketosis were better controlled and hypoglycemic shocks occurred less frequently. Despite the enthusiastic reception of the new insulin preparation, many authors in Europe and America [2] called attention to disadvantages caused by insolubility and slow rate of absorption of protamine insulin. In some, particularly in severe cases, the difficulties encountered were excessive glycosuria after meals and hypoglycemic reactions occurring at night and in the morning. Raising the dose to reduce the postprandial glycosuria provoked early morning shocks, while reducing the dose to avoid repeated reactions aggravated the diurnal glycosuria.

The limitations inherent in the product were increased by two further developments: 1. The addition of zinc to protamine insulin improved its stability but led to further prolongation of action.[3] The general trend toward higher carbohydrate diets [4] intensified diurnal glycosuria, particularly in severe diabetes.

The difficulties encountered in the practical use of protamine zinc insulin produced two reactions among clinicians. One group relaxed the standards of control considerably in severe cases and tolerated philosophically even pronounced glycosuria as long as ketosis, loss of weight, increased thirst and polyuria were absent.[5] The other group, adhering to more rigid standards of control, attempted to circumvent the limitations of insoluble insulin by various devices. Attempts were made to adapt the diet to the mode of action of protamine zinc insulin by altering the distribution or the carbohydrate and protein composition of meals, by extra feedings before retiring, and similar procedures.[6] Others tried to modify the action of protamine zinc insulin by giving it in two injections a day or by supplementing it with a separate dose of regular insulin.[7] Mixing soluble and insoluble insulin was considered at that time incompatible, and various stratagems were devised to separate them in the syringe, such as "layering" the insulin or the use of a double barreled syringe.[8] Later the practicability of mixing the two insulins in a vial or in the syringe was accepted.

It is interesting to note that the first effort to correct the slow action of protamine insulin was made by Krarup.[9] His experience with "insulin 341" revealed both quick effect and long duration. Protamine zinc insulin contains an excess of protamine, which precipitates part of added soluble insulin. By using varying proportions of soluble and insoluble insulin, various degrees of immediate and prolonged activity can be achieved. The prompt effect of mixtures depends on the amount and ratio of the two components, the excess of protamine present and the resultant p_H. These factors have been fully discussed in many publications.[10] Peck's [11] studies finally proved that in buffered mixtures of soluble and insoluble insulin the prompt effect runs parallel to the proportion of regular and the delayed effect to the proportion of protamine zinc insulin: e. g., a mixture of regular and protamine zinc insulin in the ratio 1 : 3 contained approximately 10 per cent rapidly acting insulin, a 1 : 1 mixture 25 per cent and a 3 : 1 mixture 65 per cent.

While most clinicians employed various types of mixtures, others advocated fixed ratios of soluble and insoluble insulin. The arguments [12] in favor of a uniform mixture were standardization of therapy and simplification of procedure by the use of only one

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insulin mixture in all cases, avoidance of inaccuracy of measurement and of confusion "created by the use of two preparations with different properties."

Table 1 lists the insulin mixtures proposed. It is evident that the ratios vary considerably. Satisfactory results were apparently achieved with ratios of soluble and insoluble insulin varying from 3 : 1 to 1 : 3.

TABLE 1.—*Proposed Mixtures of Regular and Protamine Zinc Insulin*

Ratio of Regular to Protamine Zinc Insulin	Author	Date
1 : 1*	Krarup [1]	1935
1 : 1	Graham [10]	1938
2 : 1 2 : 3 1 : 1	Lawrence [18]	1938
3 : 2	Ulrich [19]	1941
2 : 1 3 : 1	Colwell and Izzo [12]	1942
1 : 1†	MacBryde and Roberts [1]	1942
1 : 1 3 : 2 2 : 1	Peck [11]	1942
3 : 1	Fearrington [10]	1942
1 : 1 2 : 1 1 : 2	Sparks and John [17]	1943
1 : 1 2 : 1 3 : 2 3 : 1	Hildebrand and Rynearson [13]	1943

* Insulin 341. † Buffered to *pH* 7.2.

ANALYSIS OF CLINICAL MATERIAL

This report presents a study of 1,131 patients from the diabetes clinic of a large general hospital. The group includes all types of diabetes above the age of 14. As indicated in table 2, 46 per cent were mild cases of diabetes treated with diet alone without insulin; 54 per cent required insulin. Of the 611 patients treated with insulin only 15 (2.5 per cent) have been using two injections a day and only 1 used three injections; 596 patients (97.5 per cent) received but one daily injection.

Efficacy of Protamine Zinc Insulin Alone.—Of the insulin group 484 patients (79 per cent) were managed satisfactorily with one daily injection of protamine zinc insulin. The daily doses varied from 6 to 200 units

TABLE 2.—*Analysis of Clinical Material*

	Number	Per Cent
Diet alone, no insulin	520	46
Insulin treated	611	54
Total number of cases	1,131	100
Insulin treated cases		
[illegible]	484	79
	80	13
	30	5
[illegible] insulin	17	3
Total number of cases	611	100

(chart 1). Almost half the patients received 5 to 20 units, one third 25 to 40 units, one eighth 45 to 60 units and only one twelfth 65 to 80 units. In other words, 77 per cent received 40 units or less.

The results of one daily injection of protamine zinc insulin were very satisfactory. This insulin was of particular advantage in the great mass of mild and moderately severe cases. But even in severe diabetes good results could often be obtained. Sixty-four patients were satisfactorily controlled with 45 to 60 units and 35 patients with 65 to 80 units.

It was the practice in the clinic to begin treatment with protamine zinc insulin solely whenever the diabetes could not be controlled by diet alone. The dose was gradually increased until normal fasting blood sugar levels were approximated and postprandial glycosuria absent or reduced to moderate amounts (0.5 to 1 per cent). In about one eighth of the cases this result could not be achieved. It was impossible to increase the dose of protamine zinc insulin in the presence of nocturnal hypoglycemic reactions or a normal or subnormal fasting blood sugar level. The pronounced diurnal glycosuria in these cases necessitated the use of regular insulin in a mixture.

On the other hand the diabetes of a few patients was better controlled with protamine zinc insulin alone than with mixtures. Frequent diurnal hypoglycemic reactions were precipitated by the prompt effect of the regular insulin. This occurred in a few insulin sensitive patients who because of strenuous physical work or irregular delayed mealtimes had hypoglycemic reactions on mixtures containing [illegible] small amounts of regular insulin. The [illegible] amounts of regular insulin is usually tantamount to increasing the total dose of protamine zinc insulin. However, the following case illustrates the daytime shocks caused by small doses of regular insulin in the mixture:

CASE 1.—A woman aged 47 who had had diabetes for over two years had been taking a mixture of 15 units regular plus 35 units protamine zinc insulin in one injection before breakfast

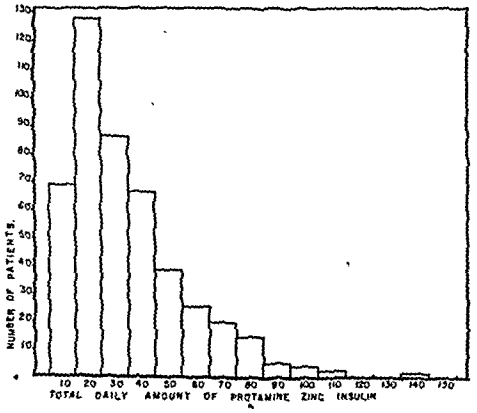


Chart 1.—Doses of protamine zinc insulin used by 484 patients.

at the suggestion of another physician. This provoked many severe shocks around noon, requiring hospitalization on two occasions. Because of the frequent reactions in the presence of a practically normal fasting blood sugar level, regular insulin was discontinued and the patient was given 40 units of protamine zinc insulin alone. Since then she has remained entirely free from hypoglycemic shocks and has been well controlled.

The diets prescribed for patients taking all types of insulin ranged from 150 to 250 Gm. of carbohydrate, 60 to 80 Gm. of protein and 60 to 100 Gm. of fat, with the accepted variations depending on age, sex, nutritional status and occupation. One group of 50 patients has been maintained on an unlimited carbohydrate intake (up to 500 Gm.) for a special study. Eight of this group are represented in chart 1 as taking over 90 units of protamine zinc insulin. These were most severe cases of diabetes observed over a long period of time who because of persistent glycosuria were therapeutic problems under any diet-insulin regimen attempted heretofore. Others of this group were more satisfactorily controlled on mixtures of regular and protamine zinc insulin.

Mixtures of Regular and Protamine Zinc Insulin.—As early as 1938 the difficulty in controlling some patients of the Diabetes Clinic of the Mount Sinai Hospital with one injection of protamine zinc insulin led to the additional use of small amounts of regular insulin. At first the two types were administered in separate injections. As the possibility of mixing the two in the syringe became practicable, several types of mixtures were used. Starting with 5 to 15 units of regular insulin added to two to five times as much protamine zinc insulin, it soon became evident that the proportion of regular insulin had to be increased to achieve the desired double action of the mixture. In the course of time equal proportions of the two types of insulin were frequently used and not infrequently the regular exceeded the protamine zinc insulin in the mixtures.

For practical purposes no difference exists between regular and crystalline zinc insulin in mixtures, and the term regular in this paper is applied to both types. Fifty-six per cent of the patients treated with mixtures used crystalline zinc insulin and 44 per cent regular insulin. The mixtures were prepared by the patients directly in the syringe, immediately before injection; no stock solutions of fixed proportions were used. The patients followed the accepted technic in taking the regular insulin into the syringe first to avoid beclouding

TABLE 3.—*Grouping of Patients According to Total Dose of Insulin Mixtures*

Total Units of Insulin Used in Mixtures	Number of Cases	Per Cent
10 - 20	5	6.25
25 - 40	19	23.75
45 - 60	18	22.50
65 - 80	19	23.75
85 - 100	15	18.75
105 - 200	4	5.0
	80	100.0

the regular insulin by possible admixture with protamine. The same strengths were used for the two types of insulin to avoid confusion; that is, no mixtures of U 40 with U 80 were permitted. Under these circumstances no confusion or difficulties were encountered in the preparation of the mixtures.

Whenever a patient could not be controlled on protamine zinc insulin alone without either nocturnal hypoglycemic reactions and/or considerable diurnal glycosuria, mixtures were indicated. At first the total dose of insulin was not changed but one fourth or one third of it was given as regular insulin. Guided by the fasting blood sugar level and the daily fractional urine specimens subsequent alterations were made in the dosage of regular or protamine zinc insulin or both. If the fasting blood sugar level remained within acceptable limits (100 to 150 mg. per hundred cubic centimeters) yet diurnal glycosuria persisted, the proportion of regular insulin was progressively increased while the dose of protamine zinc insulin remained unchanged or was proportionately reduced; the original ratio of 1:3 or 1:2 thus became 1:1 or even greater with respect to the regular insulin. If substitution of regular insulin for a part of the original dose of protamine zinc insulin led to elevation of the fasting blood sugar level in the absence of diurnal glycosuria, an increase in the amount of protamine zinc insulin was indicated. On the other hand, nocturnal hypoglycemic reactions or subnormal fasting blood sugar levels without manifest hypoglycemic symptoms necessitated reduction of the protamine zinc insulin fraction. The daily insulin requirement was often lessened with the use of mixtures. In insulin sensitive patients especially it proved advisable to reduce the total dose by 20 to 30 per cent when changing to mixtures. Under continued observation of both fasting blood sugar level and fractional urine specimens the optimal ratio and

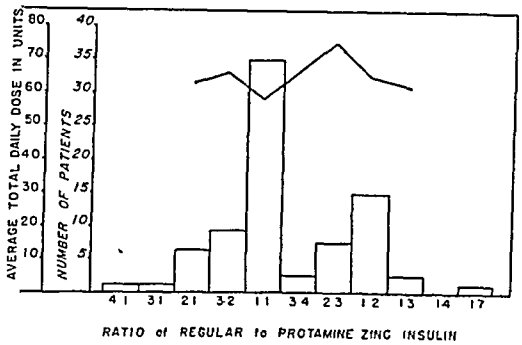


Chart 2.—Distribution of the ratios and total amounts of regular and protamine zinc insulin used by 80 patients. The columns present the number of cases on each ratio, the upper curve the average total dose of insulin.

dose of regular and protamine zinc insulin were established for each individual. Since the full effect of protamine zinc insulin and mixtures is not obtained in the first twenty-four hours, evaluation of the final action of any mixture requires observation for at least three to four days and longer. Conclusions based on one day studies are not reliable.

For convenience, mixture of the same amount of regular and protamine zinc insulin was termed "equal" mixture, while the term "surplus regular" mixture applied to one containing over 50 per cent regular insulin, and the term "surplus protamine" mixture to one containing less than 50 per cent regular insulin.

Eighty patients, or 13 per cent, of those treated with insulin, have been receiving mixtures. Chart 2 presents the distribution of the various ratios and the daily amounts of insulin. It appears that 75 patients (94 per cent) have been on ratios of regular to protamine zinc insulin ranging from 2:1 to 1:2, while the wider ratios were used by only 5 patients. Thirty-five (44 per cent) were maintained on "equal" mixtures. Seventeen (21 per cent) were maintained on "surplus regular" mixtures (ratios 4:1, 3:1, 2:1, 3:2); 28 (35 per cent) were taking "surplus protamine" mixtures (ratios 3:4, 2:3, 1:2, 1:3, 1:4, 1:7), as shown in chart 3. Although the tendency in the past few years has been to increase the proportion of regular insulin in the mixture, it is of interest to note that one third of the patients were still satisfactorily controlled on mixtures containing less than 50 per cent of regular insulin, while only one fifth of the patients required proportions of regular insulin of over 50 per cent.

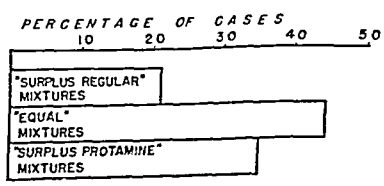


Chart 3.—Relative distribution of the three types of mixtures.

The total amount of insulin used daily in the mixtures varied widely from 10 to 200 units. Table 3 groups the patients according to the dose. Only 24 used 10 to 40 units daily, while 56 required over 45 units, indicating that this series contains a greater proportion of cases of severe diabetes. The relationship between the average total dose and the ratio of regular to protamine zinc insulin is presented in the upper curve

of chart 2. The lowest daily total dose was found in the "equal" mixture group (average 59 units), the highest in the group on ratio 2:3 (average 76 units). The average daily dose of mixtures for all patients was 64.6 units. It should be noted that practically the same total dose of the mixtures prevailed with widely different ratios. In other words, depending on the individual needs of the patients, similar doses of insulin mixtures have been used with "equal," "surplus regular" and "surplus protamine" mixtures.

The following cases illustrate the technic of flexible adjustment of insulin ratios to the individual requirements of patients. These patients were purposefully selected from the group because of the severity of the diabetes and the difficulties in management prior to the institution of mixtures. No alterations in the diet were made during these studies.

CASE 2.—A woman aged 66 with diabetes for twenty-one years presented considerable difficulties in management because of shocks, severe hyperglycemia and glycosuria. She required over 100 units of regular insulin at first and later the same amount of protamine zinc insulin. For the past two years she took 30 units of regular and 60 units of protamine zinc insulin in two separate injections. The fasting blood sugar values were persistently over 250 mg. per hundred cubic centimeters with daily glycosuria of 2 to 5 per cent and occasional nocturnal hypoglycemic reactions. The administration of the two types of insulin in the same dosage as a mixture in one syringe had no striking effect. Definite improvement, however, followed the use of a different ratio (45-45), leaving the total dose unchanged. Fasting blood sugar levels dropped to around 160 mg. per hundred cubic centimeters and fractional urine specimens ranged from 0 to 1 per cent. Much subjective improvement was noted. See table 4, case 2, for day profile.

CASE 3.—A girl aged 17 years with diabetes for eight years had been taking 20 units of regular and 60 units of protamine zinc insulin in two separate injections for the past three years. On this regimen the fasting blood sugar levels were over 200 mg. per hundred cubic centimeters and considerable glycosuria was present. One daily injection of a mixture containing the former unitage of regular and protamine zinc insulin effected better control of the glycosuria. The total dose was gradually reduced to 20 units of regular and 44 units of protamine zinc insulin. Fasting blood sugar levels ranged between 98 and 133 mg. per hundred cubic centimeters and the daily glycosuria from 0 to 1 per cent.

CASE 4.—A man aged 48 with diabetes for ten years developed frequent morning shocks when changed from 40 units of regular insulin given in two equal injections to an identical dose of protamine zinc insulin in one injection. To overcome this difficulty he was placed on a mixture of 10 units of regular and 20 units of protamine zinc insulin (1:2) but developed considerable glycosuria and thirst in the afternoon and evening. The ratio was then reversed to 20 units of regular and 10 units of protamine zinc insulin (2:1) to counteract the glycosuria, but severe hypoglycemic reactions occurred at noon. At present with one daily injection of 10 units of regular and 23 units of protamine zinc insulin in a mixture he is satisfactorily controlled without shocks. Fasting blood sugar levels ranged from 100 to 145 mg. per hundred cubic centimeters and fractional urine specimens were negative for sugar. See table 4, case 4, for day profile.

CASE 5.—A woman aged 24 with diabetes for fifteen years had uncontrollable glycosuria and loss of weight despite the use of 84 units of protamine zinc insulin. Mixtures of regular and protamine zinc insulin with ratios of 20:60, 30:60 and 40:40 (1:3, 1:2 and 1:1) were given over a two year period with unsatisfactory results owing to persistent glycosuria and inability to gain weight. Finally a mixture of 60:30 (2:1) effected good control of the diabetes with subsequent gain of 10 pounds (4.5 Kg.) in weight. The fasting blood sugar levels ranged from 120 to 136 mg. per hundred cubic centimeters, and fractional urine specimens were sugar free. See table 4, case 5, for day profile.

CASE 6.—A woman aged 50 with diabetes for eighteen years had been taking 90 to 120 units daily of regular or protamine zinc insulin with fasting blood sugar levels of 300 mg. per hundred cubic centimeters and fractional urine specimens of 3.3 to 5 per cent. A change to an equal mixture of 50 units of regular and 50 units of protamine zinc insulin had an excellent effect. Fasting blood sugar levels ranged now from 172 to 200 mg. per hundred cubic centimeters and fractional urine specimens from 0 to 1 per cent. She has gained 9 pounds (4.1 Kg.) in weight. See table 4, case 6, for day profile.

The striking decrease in the daily insulin requirement seen not infrequently is illustrated by the following cases, in which only the insulin dosage and ratio were altered while the diets remained unchanged:

CASE 7.—A man aged 44 with diabetes for eleven years took 80 units of regular insulin twice daily (total 160 units) for *many* years. His fasting blood sugar levels ranged around 200 mg. per hundred cubic centimeters, and considerable glycosuria was present before dinner. With the administration of mixtures, satisfactory control was achieved with a total dose of 90 units consisting of 30 units of regular plus 60 units of protamine zinc insulin (1:2). Fasting blood sugar levels varied from 120 to 167 mg. per hundred cubic centimeters, and fractional urine specimens contained 0 to 0.6 per cent of sugar.

CASE 8.—A man aged 32 with diabetes for four years had been taking 120 units of protamine zinc insulin when he developed repeated hypoglycemic reactions. Progressive reduction of the dose to 80 units led to disappearance of the shocks but provoked severe glycosuria. An "equal" mixture of 60 units of regular and 60 units of protamine zinc insulin (total 120 units) controlled both difficulties. In the course of time reduction to 36 units of regular and 36 units of protamine zinc insulin (total 72 units) was possible. Fasting blood sugar levels ranged from 100 to 116 mg. per hundred cubic centimeters with no sugar in the fractional urine specimens. See table 4, case 7, for day profile.

These 7 patients typify the group with severe diabetes in whom the use of insulin mixtures represents a definite advance. The comparative ease with which mild and moderately severe cases of diabetes have been controlled by protamine zinc insulin alone made the use of mixtures for this group unnecessary as a rule.

TABLE 4.—*"Day Profiles" of Glycemia and Glycosuria of Seven Cases of Severe Diabetes Treated with Different Mixtures of Regular and Protamine Zinc Insulin*

Case	Total Dose of Mixture	Units Regular Insulin	Units Protamine Zinc Insulin	Ratio	Blood Sugar, Mg. per 100 Cc.				Urine Sugar, Gm. per 100 Cc.			
					8 A. M.	12 N.	4 P. M.	8 P. M.	8 A. M.	12 N.	4 P. M.	8 P. M.
1	80	20	60	1:3	160	198	166	184	0	0.5	0	0.5
2	90	45	45	1:1	160	167	222	222	0	0	0.5	1.0
3	50	25	25	1:1	134	204	141	177	0	0.5	Trace	0
4	46	22	24	1:1	111	250	222	222	0	0.5	0.5	1.0
5	90	60	30	2:1	156	165	138	183	0	0	0	0
6	100	50	50	1:1	172	182	154	182	0	0.5	0.5	0.5
7	72	36	36	1:1	116	195	152	152	0	0	0	0

In the clinic of the Mount Sinai Hospital the use of mixtures was reserved generally for patients with severe diabetes and the "problem" cases. The total dose in this group of patients is higher than that reported by other clinics using insulin mixtures for milder cases of diabetes.[13] Consequently, in evaluating the therapeutic results in the patients presented in this paper the difference in severity of the disease should be considered. In our opinion the use of mixtures led to better control of the diabetes by eliminating diurnal glycosuria, decreasing the frequency of hypoglycemic reactions, reducing the total dose of insulin required, making it possible for even the severely diabetic patient to use but a single daily injection. The administration of mixtures permits a greater flexibility and individualization of therapy than one daily injection of any other type of insulin alone. The degree of control possible with large doses of insulin in severe diabetes when different ratios are used is demonstrated in table 4. It presents the "day profiles" of blood sugar levels and glycosuria of 7 severely diabetic patients, some of whose histories have been given.

Globin Insulin.—Seventeen patients (2.8 per cent of all insulin cases) have been treated with one daily injection of globin insulin. The daily dose varied from 10 to 60 units, the average being 30 units. The group is too small to permit any conclusions.

Indications for Regular Insulin Alone.—Thirty patients (5 per cent of those requiring insulin) were controlled on regular insulin alone. Eighteen have been using one injection, 11 two injections and only 1 three injections daily. The average mild case was controlled with 10 to 20 units, while moderately severe cases received 30 to 40 units in two injections. Only 1 patient had 60 and 1 had 75 units.

Despite the satisfactory results with protamine zinc insulin and mixtures there still remains a group best controlled with one or two injections of regular insulin.[14] A few patients presented severe local irritation from protamine zinc and globin insulin, which in contrast to the usual experience did not subside with continued use. These patients preferred regular insulin even if two injections were required. A small group favored the use of regular insulin because of peculiarities of their occupation, such as frequent changes from day to night shifts. There is no reason to force these patients who have been doing well on one to two injections of regular insulin to change to other types of insulin.

Regular insulin remains the preparation of choice for the treatment of complications and emergencies of diabetes: infections, cardiac failure, angina pectoris and coronary occlusion, cerebral accidents, preoperative and postoperative treatment, and so on. Whenever maximum flexibility of therapy and avoidance of complicating hypoglycemia of even mild degree are imperative, as in angina pectoris, regular or crystalline insulin is preferable because of the prompt and short action.

COMMENT

Review of 1,131 diabetic patients of a large general hospital revealed several salient points. Approximately half were controlled by diet alone without insulin; the rest required insulin. Seventy-nine per cent of the latter group were maintained satisfactorily with protamine zinc insulin alone. This compares with the experience of other large clinics as follows: Joslin[15] 90 per cent, Peck[16] 75 per cent and John[17] 53 per cent and proves the value of protamine zinc insulin alone in controlling the vast majority of insulin treated diabetic patients. This group consists of mild, moderately severe and to a certain extent even the severe forms of the disease. It was in the latter group that mixtures of regular and protamine zinc insulin were employed with many advantages. Difficulties in management of this group with protamine zinc insulin alone led either to neglect of a considerable glycosuria or necessitated the administration of additional injections in the course of the day when the usual conservative standards of control were applied. Mixtures of insulin providing both the prompt effect of regular and the protracted effect of protamine zinc insulin helped to overcome these problems.

Eighty patients (13 per cent of those taking insulin) were maintained with various insulin mixtures, the average daily dose being 64.6 units. The results were in accord with those of Lawrence, the first to report the use of mixtures, and others. It was possible to control severe diabetes with a single daily injection of a mixture, maintain an acceptable blood sugar level, reduce glycosuria to minimal quantities and prevent disturbing hypoglycemic reactions. This was accomplished with diets containing liberal ratios of carbohydrate, protein and fat.

Devious dietary stratagems formerly proposed to overcome the limitations of protamine zinc insulin should be avoided usually since they impose unnatural restrictions (such as frequent feedings, limited carbohydrate intake for breakfast or high protein feeding on retiring). One of the aims of modern diabetic therapy should be close approximation to a normal life for the patient, especially with regard to the composition of food and the distribution and time of meals. Mixtures of insulin enable the physician to adapt the insulin-diet regimen to the individual instead of molding the patient to fit the peculiarities of any special diet or type of insulin. The wide flexibility of the ratios in variable mixtures fulfils the individual requirements of therapy in severe and "problem" cases of diabetes. The increasing importance of mixtures is indicated by the fact that the Food and Drug Administration has conducted a survey on this subject.

Initially small ratios of regular insulin in the mixtures were employed in the clinic. In the course of time the advantage of higher proportions of regular insulin became apparent. The procedure employed in arriving at the optimal ratio for each patient has been discussed. Selection of the ultimate ratio for each patient followed prolonged trial with less effective ratios.

Of the 80 patients using mixtures, almost one half have been employing "equal" mixtures (1:1), one fifth "surplus regular" mixtures and one third "surplus protamine" mixtures. While the general trend has been to increase the proportions of regular insulin in mixtures to 50 per cent or more, it is noteworthy that one third of the patients were satisfactorily controlled on mixtures containing less than 50 per cent of regular insulin. In vitro, small doses of regular insulin in

13. Hildebrand, A. G., and Rynearson, E. H.: Clinical Experience with Mixtures of Protamine Zinc and Unmodified Insulins, Arch. Int. Med. 72: 37-45 (July) 1943. Sparks and John.[17]

14. Lavietes, P. H.: The Use of Insulin and Protamine Insulin in the Treatment of Diabetes, in Steele, J. M., and others: Advances in Internal Medicine, New York, Interscience Publishers, Inc., vol. 1, pp. 31-61, 1942.

15. Joslin, E. P., in Round Table Discussion on Diabetes Mellitus, Proc. Am. Diabetes A. 2: 55, 1942.

16. Peck, F. B., in Round Table Discussion on Diabetes Mellitus, Proc. Am. Diabetes A. 2: 58, 1942.

17. Sparks, M. I., and John, H. J.: Clinical Use of Mixtures of Insulin, Ohio State M. J. 39: 226-228 (March) 1943.

mixtures with larger amounts of protamine zinc insulin are immediately precipitated by the excess protamine, thereby increasing the dose of protamine zinc insulin by the amount of regular insulin added. No rapid insulin action could therefore be expected. Clinical experience is at variance with the results obtained in vitro. Our results with "surplus protamine" mixtures revealed definite prompt insulin effects not obtained with [illegible] of protamine zinc insulin alone. [illegible] with reports by Lawrence,[18] Peck[11] and Sparks and John.[17] The discrepancy between the results in vitro and in vivo may be explained by the increased solubility of the mixture resulting in a more rapid release of insulin in the tissues.

What is the advantage of variable insulin mixtures compared with fixed preparations? Contrary to the proponents of stock mixtures with fixed proportions, no technical difficulties in the preparation of mixtures by the patients were encountered in the clinic, nor were inaccuracies in measurements a problem. Simple demonstration of the technic of administration and the use of the same strengths for the two types of insulin precluded any confusion. Constant employment of the same brand of insulin prevented any error possible by variation of the excess protamine in different makes. Although the use of a single mixture would simplify the treatment of diabetes, there is at present no agreement as to the ideal ratio (table 1). Our experience indicates the impracticability of one stock mixture of fixed proportion. The use of a single fixed ratio at times requires individualization "by means of adjustment of the diet and frequency and dosage of injection,"[19] thereby negating the principle of simplified therapy. It must be appreciated that "patients are different and require insulins having different time activities."[16] Variability of ratios provides for flexible and individual treatment in a "tailor-made" fashion. The introduction of one or more stock mixtures is not recommended at present, but future investigations may effect a change in this opinion. We agree fully with the statement by Joslin[20] that "the fewer the types of insulin for sale, the less confused will patients be."

SUMMARY

1. A review of 1,131 diabetic patients of a large general hospital revealed that 46 per cent were controlled with diet alone, while 54 per cent required insulin.

2. In the insulin group 79 per cent were satisfactorily maintained by one daily injection of protamine zinc insulin, 5 per cent by one to three injections of regular insulin, 3 per cent by one injection of globin insulin and 13 per cent by mixtures of regular and protamine zinc insulin.

3. Of the 80 patients using mixtures, 44 per cent were on "equal" mixtures, 35 per cent on "surplus protamine" and 21 per cent on "surplus regular" mixtures. Mixtures present a decided advance in the treatment of severe diabetes.

4. The chief advantages of mixtures are flexibility and adaptability to the requirements of the individual. The use of a single stock mixture in fixed proportions for the treatment of diabetes is at present not recommended.

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18. Lawrence, R. D.: Zinc Protamine Insulin in Diabetes: Treatment by One Daily Injection, Brit. M. J. **1**: 1077-1080 (May 27) 1939.
19. Colwell and Izzo: Protamine Zinc Insulin,[12] p. 1236.
20. Joslin, E. P.: Treatment of Diabetes Mellitus, ed. 7, Philadelphia, Lea & Febiger, 1940, p. 316.

ABSTRACT OF DISCUSSION

DR. HOWARD F. ROOT, Boston: At present many doctors feel somewhat bewildered by the pressure applied in favor of one type of insulin or another. Patients may be taking, for various reasons, histone insulin, globin insulin, cloudy protamine insulin, clear protamine insulin which is pretty acid, crystalline insulin or regular insulin or, finally, mixtures of clear and protamine insulin varying in proportions from 1:1 to 6:1. Doctors might be pardoned for forgetting some important facts in dealing with such a variety of insulins. Since the proportions have varied from 1:3 to 6:1, Drs. Adlersberg and Dolger conclude that probably no one fixed mixture yet has been found which will suit all or even a large majority of patients. It is fine that they have found no difficulty in teaching patients to adjust the mixtures, particularly if the same strength, either 40 or 80 units, is used for the two insulins. Another point mentioned by the authors is important. With any insulin combination there will still be the occasional diabetic patient who is so sensitive not merely to insulin but to the effects of exercise, to changes in his own internal metabolism, that he will need individual adjustment of diet and occasionally supplementary insulin. At present, at the Deaconess Hospital in Boston, the number of patients on these various types of insulin is being reduced. We are trying to work toward simpler and fewer insulins. But this study gives us more confidence that soon, with the aid of the chemists, there will emerge one protamine zinc insulin with some rapid insulin in the mixture so that one can count on one protamine insulin and one other rapid insulin as the total armamentarium as far as insulin is concerned.

THIOURACIL IN THYROTOXICOSIS

OBSERVATIONS IN THE TREATMENT OF THIRTY-TWO PATIENTS

WILLIAM S. REVENO, M.D.

DETROIT

In the relatively short period of time since Astwood[1] first reported on the action of the thyroid inhibitors, thiourea and thiouracil, numerous reports, generally confirming the original observations, have appeared.[2] Most of the experience has been with thiouracil, and few instances of resistance to the drug have been recorded.[3] Unfavorable reactions[4] have been encoun-

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Thiouracil was supplied by Dr. Stanton M. Hardy of the Lederle Laboratories, Inc., Pearl River, N. Y.

1. Astwood, E. B.: Treatment of Hyperthyroidism with Thiourea and Thiouracil, J. A. M. A. **122**: 78-81 (May 8) 1943.

2. Astwood, E. B.: The Chemical Nature of Compounds Which Inhibit the Function of the Thyroid Gland, J. Pharmacol. & Exper. Therap. **78**: 79 (May) 1943; Thiouracil Treatment in Hyperthyroidism, J. Clin. Endocrinol. **4**: 229 (June) 1944. Williams, R. H., and Bissell, G. W.: Thiouracil in the Treatment of Thyrotoxicosis, New England J. Med. **229**: 97-108 (July 15) 1943. Himsworth, H. P.: Thyrotoxicosis Treated with Thiourea, Lancet **2**: 465-466 (Oct. 16) 1943. Bartels, E. C.: Thiouracil: Its Use in the Preoperative Management of Severe Hyperthyroidism: Preliminary Report, J. A. M. A. **125**: 24 (May 6) 1944. Sprunt, T. P.: The Management of Thyrotoxicosis by the Classical Iodization Method and by the Use of Thiouracil, J. South Carolina M. A. **40**: 91 (May) 1944. McGavack, T. H.; Gerl, A. J.; Vogel, Mildred, and Schwimmer, D.: The Treatment of 2[illegible] Thiouracil and a Review of Toxic Reactions in [illegible] J. Clin. Endocrinol. **4**: 249 (June) 1944. Schorr, E.: Metabolic Effects of Thiouracil **99**: 305-307 (April 14) 1944. Moore, F. D.; [illegible] Cope, Oliver; Rawson, R. W., and Means, J. H.: Thiouracil in Thyroidectomy, Ann. Surg. **120**: 152 (Aug.) 1944. Grollman, A., and Gryte, C. F.: The Use of Thiouracil in Thyrotoxicosis, J. Clin. Endocrinol. **4**: 444 (Sept.) 1944. Beardwood, J. T., Jr., and Levinson, D.: The Use of Thiouracil in the Medical Management of Thyrotoxicosis, Clinics **3**: 672 (Oct.) 1944. Paschkis, K. E.: Treatment of Thyrotoxicosis with Thiouracil, M. Clin. North America **28**: 1362 (Nov.) 1944. Rose and McConnell.[3]

3. Rose, Edward, and McConnell, Jeanette: Thiouracil in The Treatment of Thyrotoxicosis: Clinical Experience with 37 Cases, Am. J. M. Sc. **208**: 561 (Nov.) 1944.

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tered in approximately 10 per cent of those treated, the most alarming disturbance being agranulocytosis. Despite this obstacle, investigations are continuing and a sizable and revealing clinical experience is gradually being acquired.

In an earlier report in THE JOURNAL I [5] described the treatment of 9 patients, of whom 6 were improved, 2 stopped treatment too early and 1 failed to respond. The present report deals with a broader series of observations made in the treatment of 32 patients. Fifteen of these, 11 females and 4 males, ranging in age from 16 to 66, had toxic diffuse goiters. Seventeen, 12 women and 5 men, aged 39 to 82, had toxic nodular goiters. Symptoms had been present for from two months to fifteen years in the first group and from two weeks to twenty years in the second. Twenty of the total had iodine up to the beginning of treatment with thiouracil, and 2 of these (both with toxic diffuse goiters) had x-ray therapy in addition. Five had had surgery for toxic diffuse goiter, 1 of these having had two thyroidectomies. The average initial basal metabolism was plus 32 per cent in those with toxic diffuse goiters and plus 22 per cent in those with the adenomatous type. All were ambulatory from the beginning of treatment except 3 hospitalized patients who soon were returned to general circulation.

INITIAL DOSAGE OF THIOURACIL

Thirteen of the patients (mostly those included in the first study) were started on 0.8 Gm. daily divided into four doses. The remainder were started on 0.6 Gm. divided into three doses. This appears to be an adequate starting dose for all ordinary purposes, particularly for patients not previously iodized. As soon as the rate of metabolism reached zero or a minus level, reduction was made to 0.4 Gm. daily divided into two doses. Further reduction to 0.1 Gm. twice daily was made as soon as the basal metabolic rate stabilized between plus 5 per cent and minus 10 per cent. Observations, including blood studies, were made every two weeks until stabilization and every four weeks thereafter. Blood cholesterol determinations have been discontinued, since they added little of value to the study.

CLINICAL IMPROVEMENT

In the patients with diffuse goiters, subjective improvement occurred earlier than in those with the adenomatous type. The average time in the former was a little over three weeks, with little difference existing because of previous iodization. In the latter the average time was over nine weeks, the longest interval occurring in those who had had iodine. Weight gain was noted in all patients.

NORMAL BASAL METABOLIC RATE

When the basal metabolism reached plus 5 or lower, it was considered that a normal level had been attained. Patients with diffuse goiters took from three to ten weeks to reach this point, previous iodization exerting little influence. In the second group, a normal level was reached anywhere from two weeks to thirteen months, the longest time being taken by those previously iodized.

Of special interest is the rise in the basal metabolic rate noted shortly after beginning thiouracil therapy, in those patients formerly taking iodine. This was noted in 5 instances and was first attributed to resistance to thiouracil. However, subsequent drop in the basal metabolic rate proved the initial rise to have been due to release from iodine influence coupled with a delay in appearance of thiouracil effect. Unless this is kept in mind, the drug may be discredited and its benefits denied some patients. It is therefore important to persist with the administration of thiouracil, particularly in those who have been previously iodized.

DURATION AND RESULTS OF TREATMENT

Nine patients have been under treatment longer than six months. All except 2 (both with toxic adenomas) have normal rates of metabolism and are symptom free. One of these 2 who failed to respond in expected fashion has now been under observation sixteen months and was first classed as a failure in the initial series of cases reported. The other had been satisfactorily controlled after five months' treatment and voluntarily stopped taking the drug. Within three weeks the former symptoms recurred, and there was rapid enlargement of the right lobe with an increase in the basal metabolic rate to plus 21 per cent. Thyroidectomy was successfully performed and the gland showed recent hemorrhage. Four months later the basal metabolic rate was plus 14 per cent without treatment of any kind. The patient has not returned for further observation.

Twenty-one patients observed less than six months are in remission. One of the remaining 2 has not been treated long enough to be classified finally, while the other has failed to return after an early favorable response. One patient in this group had a successful thyroidectomy after six weeks' treatment, having previously failed to respond to iodine.

Twenty-nine of the 32 patients have responded favorably, 2 have not been treated long enough, and only 1 has failed to respond.

FINAL MAINTENANCE DOSAGE AND EFFECT OF STOPPING THE DRUG

Out of 28 patients in remission, 1 (with tox adenoma) has been taking no thiouracil for the past tw months (after fourteen months' treatment); 1 (wit toxic adenoma) has had no thiouracil for five month (after ten months' treatment). The first patient i beginning to show some evidence of renewed activity while the second is holding steadfastly to her state o remission. One patient (with toxic adenoma), in remis sion after eleven months' treatment, showed a return o symptoms seven weeks after stopping thiouracil and i now controlled by 0.1 Gm. daily. One patient with recurrent hyperthyroidism (toxic diffuse), brought under control in eight weeks' time, was maintained on 0.2 Gm. daily for another eight weeks, at which time the drug was stopped. Within three days symptoms had returned and she is now back in remission on a maintenance dose of 0.4 Gm. daily. Still another patient with toxic diffuse goiter showed a return of symptoms seventeen days after stopping treatment and is back again in remission on 0.2 Gm. daily.

Of 5 patients (3 with toxic adenomas and 2 with toxic diffuse goiters) only 1 has remained in remission after stopping the drug. Three have relapsed and are back under control on small doses of thiouracil, while the fourth shows evidence of relapsing. From this small experience it is difficult to predict when and in whom the drug may be stopped. At this point it appears desirable to determine an individual minimum maintenance dose and to continue with this for an indeterminate period. The average maintenance dose ranges from 0.1 to 0.4 Gm. daily.

5. Reveno, W. S.: Thyrotoxicosis Treated with Thiouracil, J. A. M. A. 126: 153 (Sept. 16) 1944.

CHANGES IN THE THYROID GLAND

Under the influence of treatment, goiters tend to increase in size and become softer during the first few weeks. In the toxic diffuse goiters the enlargement may at first cause concern, but, as the speed and force of the circulation are reduced, congestion is diminished and the size of the gland decreases. Where the initial enlargement was not pronounced, the goiter tended to recede to barely palpable size in a comparatively short time.

In toxic adenoma the initial enlargement with treatment is not as noticeable and the recession takes place more slowly. In no instance in the entire series where the patient originally presented a palpable or visible thyroid enlargement has there been complete disappearance of the enlargement.

REACTIONS

Minor disturbances such as nausea, vomiting and epigastric cramping occurred in 5 patients: one each in two, eleven, fourteen, nineteen and twenty-four days. The initial dose was 0.6 Gm. in 3 and 0.8 Gm. in 2. Symptoms were promptly arrested in all by discontinuing the drug for two days and then resuming at a lower dosage level. One patient who suffered a gastric upset on the eleventh day and subsequently went on to remission after sixteen weeks' treatment developed a sore throat during the ninth month of treatment and two weeks later became quite ill with fever and a blotchy maculopapular eruption over the entire body. The drug was stopped and the symptoms promptly subsided. At the end of a week a single dose of 0.1 Gm. produced a similar reaction within a few hours. No further attempt at treatment has been made, and the patient has fortunately remained in remission for the past five months.

Three patients showed a fine morbilliform rash over the entire body, 2 of these within the first two weeks after treatment, and 1, significantly, before treatment was started. The latter patient provided a possible explanation for this type of rash, viz. miliaria due to the excess sweating that is so common in thyrotoxicosis. The drug was not discontinued, and the rash disappeared as soon as sweating decreased. Consideration should therefore be given this possible factor in the evaluation of any skin rash occurring in the course of treatment.

IODINE RESISTANT PATIENTS

Six iodine resistant patients have been observed. One who had also had x-ray therapy was brought under control in nine weeks, 1 in six weeks, 2 in four weeks and 1 in two weeks. The sixth patient, a woman aged 27 with a toxic diffuse goiter of six months' duration, was given iodine for three and one-half months without any response. The basal metabolic rate had dropped from plus 88 per cent to plus 66 per cent without decrease in toxicity. Iodine was discontinued and thiouracil started. The basal metabolic rate promptly rose to plus 88 per cent and then gradually dropped to plus 62 per cent in five weeks' time with a decrease in size of the goiter, lessening of toxicity, recession of the exophthalmos and a stabilization in body weight. She was discharged from the hospital and in two more weeks the basal metabolic rate was plus 35 per cent with further reduction in toxicity and a weight gain of 6 pounds (2.7 Kg.). To all appearance the patient was well on the way to the remission that was unattainable through the use of iodine.

RECURRENT HYPERTHYROIDISM

Five patients with recurrent hyperthyroidism following thyroidectomy are included in the group studied. One is a 75 year old man who had had thyroidectomy eighteen years before and who continued to have nervousness, tachycardia, tremor, exophthalmos and weight loss. At the beginning of treatment with thiouracil his basal metabolic rate was plus 51 per cent. There was no palpable thyroid tissue and he had had no iodine. He was clinically improved in four weeks and his basal metabolic rate was minus 8 per cent at the end of six weeks. He is now on a maintenance dose of 0.1 Gm. of thiouracil daily.

The second patient, a woman aged 31, had had a thyroidectomy for toxic diffuse goiter six years before and was well until three months before treatment was begun. Classic signs of toxic diffuse goiter, including a recurrent bilateral diffuse enlargement, with a basal metabolic rate of plus 27 per cent, were present. At the end of eight weeks the basal metabolic rate was minus 20 per cent and the thyroid enlargement had almost entirely disappeared. Maintenance dosage of 0.2 Gm. daily was continued for another eight weeks and then the drug was stopped. In three days palpitation, nervousness, diarrhea and weight loss developed; 0.4 Gm. of thiouracil daily has since subdued and is now controlling the disturbance.

A third patient, a man aged 40, had had a subtotal thyroidectomy for severe toxic diffuse goiter in 1940. In June 1943 nervousness, weight loss and exophthalmos returned and he was given iodine continuously until September 1944. There was little improvement, and diffuse enlargement of the thyroid, involving mainly the isthmus, had developed. The initial basal metabolic rate was plus 16 per cent (no iodine had been taken for six weeks prior to beginning treatment with thiouracil). On the twenty-fourth day of thiouracil therapy he developed chills, fever, nausea, vomiting and epigastric distress necessitating stopping the drug for one day and resuming it at half the starting dose. There was no more trouble, and on the reduced dosage the basal metabolic rate was minus 8 per cent by the end of the seventh week, he was decidedly improved, and the goiter was much smaller.

EFFECT ON PATIENTS WITH SLIGHT INCREASE IN METABOLIC RATE

Two patients with a slight increase in the metabolic rate have been observed. One was a woman aged 26 with symptoms of five months' duration (including palpitation, tremor, nervousness and smooth bilateral thyroid enlargement but no weight loss) and a basal metabolic rate of plus 8 per cent. (Her mother and an older brother had both had toxic diffuse goiters.) Improvement in symptoms and a drop in the basal metabolic rate to 0 followed after three weeks' treatment. Five months after beginning treatment she had a barely palpable gland and was symptom free on a maintenance dose of 0.1 Gm. of thiouracil daily.

The second patient, a man aged 39, had had nervousness and tremor for at least ten years. In April 1944 he suffered a nervous breakdown from which he had not fully recovered. There was no tachycardia or weight loss, but there was nervousness, fine tremor, warm, moist palms, and a small nodule in the thyroid isthmus. The initial basal metabolic rate was plus 5 per cent. Four weeks after starting thiouracil he reported definite improvement. He was less tired and

nervous, the tremor was diminished, and the weight had increased 2½ pounds (1 Kg.). The basal metabolic rate was minus 4 per cent and the adenoma was somewhat smaller.

While the experience with these 2 patients is too limited, it does indicate the importance of paying attention to slight increases in the rate of metabolism (the accepted normal standards of plus 10 or 15 per cent and minus 10 per cent might well be revised to plus 5 per cent and minus 20 per cent) and demonstrates the therapeutic and diagnostic value of treating such patients with thiouracil.

MYXEDEMA

Only 1 patient in the series developed myxedema in the course of treatment. A man aged 44 had a toxic diffuse goiter of two months' standing with an initial metabolism of plus 42 per cent. This had dropped to plus 18 per cent after four days of iodine administration. The response to thiouracil during the subsequent six weeks' treatment (0.8 Gm. daily) was quite satisfactory. All symptoms had improved, the thyroid enlargement had receded, there was a weight gain of 12 pounds (5.4 Kg.) and the basal metabolic rate was minus 12 per cent. Thiouracil was reduced to 0.6 Gm. daily for the next two weeks and then to 0.4 Gm. daily for three more weeks. Eleven weeks after treatment was started the basal metabolic rate was minus 17 per cent, and the weight had increased a total of 16 pounds (7.3 Kg.). At this time there was noted puffiness about the eyes, pallor of the skin, sluggish movements and speech and a slow pulse. The patient also complained of being "slowed up." Thiouracil was reduced to 0.2 Gm. daily for the next two weeks, at the end of which there was some improvement, with a weight loss of 10 pounds (4.5 Kg.) and a drop in the basal metabolic rate to minus 10 per cent. The drug was then dropped for one week and resumed at 0.1 Gm. daily for the following three weeks, when the weight had dropped another 9 pounds (4 Kg.) the basal metabolic rate was 0, and all signs of myxedema had disappeared. Thiouracil was then stopped, but in three weeks' time there was return of tachycardia and nervousness and the basal metabolic rate was plus 10 per cent. The patient has since been under satisfactory control on 0.2 Gm. daily.

FIBRILLATION

Two women, one aged 66 with a toxic diffuse goiter, the other aged 76 with a toxic adenoma, had fibrillation with decompensation. Compensation with normal sinus rhythm was restored after six weeks and eight weeks respectively of thiouracil therapy.

RESISTANCE

Only 1 patient failed to respond to treatment. A man aged 40 with diabetes mellitus and an active toxic ademona of eight years' standing showed control of diabetes and partial control of hyperthyroidism by iodization over a period of six years. In August 1943 thiouracil 0.8 Gm. daily was substituted for the iodine. The initial basal metabolic rate was plus 13 per cent. No change in weight, drop in basal metabolic rate, decrease in symptoms or diminution in the daily 40 unit requirement of insulin occurred. At the end of eight months the basal metabolic rate was plus 18 per cent. Thiouracil was increased to 1 Gm. daily for two weeks and with no change in basal metabolic rate was raised to 1.2 Gm. daily for the following three weeks. At this point the basal metabolic rate was plus 31 per cent and the drug was discontinued after nine months' continuous administration. This was early in May 1944. Observations at monthly intervals showed no change in his condition, with basal metabolic readings of plus 29, plus 20 and plus 25 per cent. Then for the first time in seven years the basal metabolic rate was plus 5 per cent, then minus 3 per cent, plus 3 per cent and plus 20 per cent (Nov. 7, 1944). He had been free from nervousness, tremor and tachycardia during the three months of lowered metabolism (with no change in the status of the diabetes), but these symptoms recurred coincident with the rise in the basal metabolic rate to plus 20 per cent; 0.4 Gm. of thiouracil daily was started, but after two weeks the basal metabolic rate was plus 34 per cent with no change in symptoms. At present (December 1944) he is still taking 0.6 Gm. of thiouracil daily. The reason for this unusual failure to respond is not clear.

SUMMARY

In summarizing the clinical experience in the treatment of 32 patients, the following points appear significant:

An initial daily dose of 0.6 Gm. in three doses of 0.2 Gm. each appears adequate for all ordinary purposes. As clinical improvement sets in and the basal metabolic rate falls, the dose may be reduced to 0.2 Gm. twice daily (twelve hours apart). When the basal metabolic rate is stabilized between plus 5 per cent and minus 10 per cent, a maintenance dose of 0.1 to 0.3 Gm. is sufficient to keep the patient in remission. Observations should be made every two weeks at first and then every four weeks. Patients may be ambulatory.

Improvement occurred on an average in three weeks in patients with toxic diffuse goiters and in approximately nine weeks in those with toxic adenomas. Previous iodization delayed improvement in both types, with a more prolonged delay in those with toxic adenomas. Also in the previously iodized patients a rise in the basal metabolic rate is likely to occur during early thiouracil therapy because of loss of iodine effect.

Twenty-nine patients have responded favorably, 2 have not been treated long enough, and 1 is resistant to the drug. Of 5 patients in whom an attempt was made to stop treatment, 3 have relapsed, 1 is threatening to relapse and only 1 has remained in remission for five months. At present it is difficult to predict when and in whom to stop the drug.

Where thyroid enlargement was noted, the gland tended to increase in size and become softer in the first few weeks of treatment. Thereafter recession in size became more pronounced and occurred more rapidly in the toxic diffuse goiters than in the toxic adenomas.

Only 1 instance of drug sensitization was encountered in this series. Five patients developed nausea and epigastric distress early in therapy, and this promptly disappeared after discontinuing the drug for a few days and then resuming at a lower dosage level.

Patients who are iodine fast or resistant can be brought to remission with thiouracil. Those with recurrent hyperthyroidism (postsurgical) appear to be quite sensitive to thiouracil, responding quite promptly.

In the mild forms of hyperthyroidism or in the borderline cases, thiouracil may prove extremely useful both therapeutically and diagnostically. It would

appear preferable to adopt as the standard normal a basal metabolic rate of plus 5 per cent to minus 20 per cent.

Myxedema developed in only 1 patient in the series and was promptly controlled. Frequent observations and an awareness of this possibility should keep this risk at a low level.

Fibrillation and cardiac decompensation in the thyrocardiac may be promptly controlled with thiouracil.

An unexplained instance of resistance to thiouracil occurred in this series.

From the data presented, and from that which is rapidly accumulating, thiouracil appears to be the agent of choice in inducing and maintaining a state of remission in thyrotoxicosis.

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PROBLEMS IN THE SURGICAL TREATMENT OF CONGENITAL MEGACOLON

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The problems relating to the etiology and the proper treatment of congenital megacolon remain largely unsolved, although this uncommon condition has challenged the medical profession since Hirschsprung's report over fifty years ago. The literature on this subject is confusing and difficult to evaluate. Many articles consist in a report of a single case, the true nature of which is often doubtful, and those treated are too frequently followed only a few months.

In this communication an attempt is made to correlate our experience in the management of cases of congenital megacolon with the results of treatment of this disease in the hands of others. No attempt has been made to include reports of single cases, for any conclusions drawn from these might be misleading. The results in 11 patients on whom left lumbar sympathectomy was performed by the surgical staff at Tulane University School of Medicine and the Ochsner Clinic have been compared with results following this and other types of therapy previously reported. Likewise, a plan of management in such cases will be suggested.

CLINICAL TYPES

In conjunction with this study all cases in which a diagnosis of megacolon or questionable megacolon seen at two large general hospitals in New Orleans during the past ten years were reviewed. About 30 of these were found. In most instances the diagnosis was not established, although frequently there was radiographic evidence of colonic dilatation and the clinical findings were often confirmatory. Usually a few days of conservative treatment in the hospital sufficed. The subsequent course of these patients is not known, but it is significant that only 1 or 2 were readmitted to either hospital for a similar complaint. This would suggest that there exist mild forms of the disease which require special treatment only when unusual impaction occurs. On the other hand, the condition of the 11 patients treated by sympathectomy fulfilled all the criteria to support a diagnosis of congenital megacolon in its severe form. Operation was not performed if there was any doubt as to the nature of the disease or if it was thought that medical management would prove satisfactory.

The severe forms of megacolon vary both as to symptomatology and as to the condition of the intestine. This is evident in the 11 patients on whom sympathectomy was done. Ten of these had pronounced dilatation of the sigmoid with involvement of varying amounts of the remaining colon, whereas in 1 case (case 11) there was never any demonstrable abnormality of the descending colon, sigmoid or rectum over a period of four years. On numerous occasions radiographic studies with contrast mediums have shown this undilated colon to have a normal ability to expel material from its lumen. The remainder of this patient's colon was affected and later massive dilatation of the terminal ileum developed. These variations regarding the site and extent of involvement are confirmed by many writers. De Takats [1] believes that instead of the usual hypertrophy there are instances in which the intestinal wall is thin and the musculature defective; he points out that any type of treatment is liable to fail when this is present. There can be little doubt that the varied clinical types of megacolon have been a source of confusion in evaluating methods of treatment.

TABLE 1.—*Results of Sympathectomy and of Resection*

Sympathectomy

Author	Date	Cases	Results: Good	Improved	Failed	Mortality
Telford	1939	9	6	2	1	0
Barrington-Ward	1939	10	8	..	..	0
De Takats	1938	2	2	..	..	0
Ross	1935	29	21	7	1	0
Passler	1938	117	38	64	12	3
Authors	1944	11	7	3	1	0
Total		178	82 (46%)	76 (43%)	15 (8%)	3 (1.6%)

Resection

Author	Date	Cases	Results: Satisfactory	Failed	Mortality
Yeazell and Bell	1943	6	5	1	0
Whitehouse, Bargen and Dixon	1943	29	16	6 (Not followed)	7 (24%)
Total		35	21 (60%)	1 (2.8%)	7 (20%)

TREATMENT

Drug Therapy.—Clinical experience with selective drugs was unsatisfactory until Law [2] introduced the more stable cholines as parasympathetic stimulants. His results with mecholyl bromide, administered orally, have been promising and this undoubtedly constitutes an important milestone. It should be emphasized that drug therapy must be accompanied by a careful regimen to aid bowel function, particularly in the first few months of treatment. Details of this management are well described by Law.[3]

Beneficial effects have been reported from the use of syntropan, an atropine-like drug which acts as a parasympathetic paralyzant. Introduced by Klingman,[4] it has produced beneficial effects in some cases. The

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Dr. Alton Ochsner permitted the author to include his cases. He performed the operation in most of the cases in the series.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. de Takats, G., and Biggs, A. D.: Observations on Congenital Megacolon, J. Pediat. **13**: 819-846 (Dec.) 1938.
2. Law, J. L.: Treatment of Megacolon with Parasympathetic Drugs, J. A. M. A. **114**: 2537-2540 (June 29) 1940.
3. Law, J. L.: Treatment of Megacolon with Acetyl-B-Methylcholine Bromide, Am. J. Dis. Child. **60**: 262-282 (Aug.) 1940.
4. Klingman, W. O.: The Treatment of Neurogenic Megacolon with Selective Drugs, J. Pediat. **13**: 805-818 (Dec.) 1938.

fact that both of these compounds, which have opposite effects, have given good results supports the often expressed contention that a perversion of the autonomic system is the fundamental fault.

Therapeutic Tests.—Spinal anesthesia frequently has a dramatic effect on these patients, and indeed there have been instances in which benefits have persisted for some time. When anesthesia is obtained in this way there is usually a large evacuation of the bowel, or sometimes several, in the following twenty-four hours. This phenomenon has been regarded as proof that expulsive power exists and is therefore considered a good omen, particularly if sympathectomy is to be performed. Too little exact information is available to justify a dogmatic opinion, but the failure of spinal anesthesia to cause spontaneous evacuation can probably be associated with failures in surgical intervention. Obviously, this question requires further study. Unfortunately, in our series this test was often neglected, but in the 1 instance of failure the effect of the anesthetic was poor.

collected from the literature covering an early period in the development of sympathetic surgery. Isolated instances are reported in which death occurred in debilitated infants, but these are not always representative. The safety of lumbar sympathectomy is further attested by the low operative mortality of this procedure for other conditions.

The relief obtained by left lumbar sympathectomy compares favorably with results following more extensive operations. In our series 11 patients were thus treated, in 7 of whom highly satisfactory results were obtained. Three others were greatly improved, but occasional cathartics or enemas are still required. One was a complete failure. This was not unexpected, for this patient had involvement of both colon and ileum and a spinal anesthetic had little effect preoperatively. Nine of the patients have been followed for from one to eleven years. The other 2 were not followed for as long a period, because 1 was a complete failure and 1 child seemed entirely well for three months following the operation, when he died from nephritis.

TABLE 2.—*Author's Cases of Megacolon Treated by Left Lumbar Sympathectomy*

Case	Age, Yrs.	Sex	Preoperative Condition	Date of Operation	Results
1. W. A.	2	♂	Bowel movement only with cathartics or enemas	4/ 3/40	Normal bowel movement since operation; died 60 days after operation from bronchopneumonia and acute nephritis
2. B. B.	3	♂	Constipation; projectile vomiting.....	6/ 9/43	Bowels move 1 or 2 times daily; cathartic about every 2 weeks
3. E. D.	9	♂	Bowel movement only with enema or cathartic	12/ 1/36	Had got along well until had vomiting on 6/11/40; bowels moved normally at discharge
4. A. F.	22	♀	Two admissions for distention and vomiting; 3d in labor, vomiting	2/ 3/41	Bowels apparently moving well
5. W. H.	22 mos.	♂	Bowel movement only with enemas or cathartics	3/20/39	Bowel movement daily without cathartics; x-ray 5/23/44 revealed moderate dilatation of distal half of colon
6. G. M.	1½	♂	Bowel movement only with enemas and cathartics	3/27/33	Bowels move daily; ½ oz. olive oil instilled into rectum daily; no cathartics; enema every 1 or 2 months, occasional vomiting; x-ray 6/5/44 revealed dilatation of left colon and sigmoid
7. E. M.	52	♂	5-6 days at time without bowel movement; x-rays; megacolon	9/23/37	Died of heart disease 5 years later; bowels apparently gave no trouble
8. C. Q.	7	♂	Bowel movement rarely without cathartic or enema	12/ 3/40	Bowels move daily; takes ½ oz. or liquid petrolatum; no cathartics or enemas; x-rays 4/5/44 revealed dilatation of descending colon and sigmoid
9. E. J.	2½	♂	Enema required for bowel movement	8/ 5/43	Bowel movement daily but given enema every 2 or 3 days; x-rays 3/28/44 revealed residual dilatation of entire colon
10. D. L.	3	♀	No bowel movement without cathartics or enemas	9/23/41	Bowel movement daily with liquid petrolatum; x-rays revealed residual dilatation, less than before operation
11. H. E.	3½	♂	Bowel movement only with cathartics or enema; resection of colon	10/12/43	Sympathectomy for dilatation of ileum; no improvement

De Takats [5] rightly regards this therapeutic test as important. He believes that certain of these patients have an atrophied bowel wall and that some indication of this can usually be obtained by preoperative study. This observer advocates the administration of a barium enema, after which a spinal anesthetic or acetylcholine bromide should be given by injection. Then, forty-five minutes later, another film should be made and the extent of the evacuation noted. De Takats [5] believes that the use of the drug is easier and safer than a spinal anesthetic, especially for debilitated infants. There is every indication that such studies are extremely valuable and should be carried out in each case.

Lumbar Sympathectomy.—Left lumbar sympathectomy is the simplest operative procedure that is justifiable. The mortality is practically nil in patients over 3 years of age and the results are as good as with any other operative method, except possibly more extensive sympathetic ablations. As will be seen in table 1, in all the larger series except one no deaths were reported. Passler [6] reported three deaths in 117 cases

Thus, 90 per cent of these patients were greatly benefited. There were no deaths from the operation, although the patients' ages ranged from 18 months to 52 years. Four patients (nine months and two, three and five years after operation) have been reexamined radiographically with contrast mediums; dilatation with some sluggishness of evacuation was demonstrated in each case. Although these findings indicate that the bowel does not become normal, there was less dilatation and retention than at the time of the original radiographic studies. This observation was also made by Telford and his associates.[7]

Results of lumbar sympathectomy reported in the literature indicate that satisfactory function is obtained in the great majority of patients (table 1). It would therefore seem to be the procedure of choice in all cases in which medical treatment has been ineffective. In my opinion the only question in regard to the performance of sympathectomy is whether more radical ablations should be carried out. Bilateral lumbar sympathectomy, excision of the superior hypogastric plexus with the presacral nerve, and a combination of lumbar

5. de Takáts, G.: Acetylcholine as Diagnostic Test in Cases of Congenital Megacolon, Surg., Gynec. & Obst. **69**: 762-763 (Dec.) 1939.

6. Passler, H. W.: Megakolon und Megazystis, Leipzig, Johann Ambrosius Barth, 1938, p. 172.

7. Telford, E. D., and others, in Discussion on Megacolon, Proc. Roy. Soc. Med. **32**: 1145-1156 (July) 1939.

ganglionectomy with section of the splanchnics have all proved effective. The disadvantages of sympathetic surgery are few. Vascular changes in the lower extremity are of little moment. Sterility, however, is a distinct disadvantage of bilateral ablation, and for this reason unilateral sympathectomy should be tried before resorting to more radical procedures.

Indications and Contraindications for Left Lumbar Sympathectomy.—1. The history should be compatible with the diagnosis of congenital megacolon.

2. Mechanical obstructions must be ruled out by roentgenographic studies, therapeutic tests and other examinations.

3. Persistent dilatation of the bowel must be demonstrated by radiographic studies following the administration of a barium enema.

4. Failure or partial failure of medical treatment (including the newer drugs) must have been demonstrated. A partial failure might be arbitrarily defined as one in which more than one enema or cathartic a week is necessary in a child under proper medical regimen or in adults more than two enemas or cathartics. The presence of another unrelated disease or a condition requiring curtailment of activity should be taken into consideration when these are present.

5. Probably the therapeutic test should be positive. However, a negative result from the injection of a spinal anesthetic or parasympathetic stimulants is not known to be a definite contraindication to sympathectomy, although in some instances it has proved to be an omen of failure.

6. Sympathectomy on patients less than 2½ years of age is contraindicated unless it is felt that this might be a life-saving measure. Most patients can be treated conservatively until 2½ or 3 years of age.

Radical Sympathetic Surgery.—It should be stated frankly that no one knows exactly how much of the sympathetic system should be removed to obtain the best results. My own experience throws little light on this subject except to testify that left lumbar sympathectomy has proved highly satisfactory. It would seem logical to reserve the more radical operations for those instances in which unilateral ablation of the lumbar chain has been accompanied by some beneficial effect but not enough to be considered satisfactory. These operations lend themselves readily to staged procedures.

Resection of Intestine.—This formidable operation has been advocated by many surgeons. Two of the latest favorable articles are those by Whitehouse, Bargen and Dixon [8] and Yeazell and Bell.[9] The results reported by these authors are shown in table 1. One series of 29 cases showed a mortality of 24 per cent even though 11 were 20 years of age or older. Over 50 per cent of the patients were 15 years of age or more. This mortality rate emphasizes the hazard of resection. On the other hand, in the other series of 6 cases there were no fatalities. The ages of these patients were between 3½ and 12 years. These authors recommend resection when therapeutic tests are unsatisfactory, for in their hands sympathectomy then produced inadequate improvement. Removal of the intestine gives best results in older patients and in those with involvement of small amounts of intestine.

8. Whitehouse, F.; Bargen, J. A., and Dixon, C. F.: Congenital Megacolon; Favorable End Results of Treatment by Resection, Gastroenterology **1**: 922 (Oct.) 1943.

9. Yeazell, L. A., and Bell, H. G.: Resection in Six Cases of Hirschsprung's Disease, Surgery **13**: 941-950 (June) 1943.

COMMENT

Our meager knowledge of this disease makes any plan of treatment vulnerable to adverse criticism. Nevertheless, some plan of management is desirable and will prove useful even though it is necessarily tentative. The following seems logical in light of our present information:

The diagnosis, of course, should be supported by adequate observation and study of the patient. A therapeutic test with acetylcholine or a spinal anesthetic should be carried out in each case and surgical intervention should not be contemplated until medical management, utilizing the sympathetic stimulants, has had a trial of eight to ten weeks. Rarely, emergency operations might be indicated. It is inadvisable to subject any patient less than 2½ years of age to any surgical procedure unless it is a life-saving measure. Conservative management, even though not entirely satisfactory, is the treatment of choice in infants.

If, then, the medical regimen does not prove highly satisfactory and the age of 3 has been reached, left lumbar sympathectomy is indicated, particularly if spinal anesthesia produces a copious bowel movement. Should this fail, one has to decide whether the right lumbar chain is to be removed or the splanchnics on the right. These operations can be done in stages.

Failure to gain any improvement after left lumbar ganglionectomy might be considered as evidence that further sympathetic surgical measures are contraindicated but some improvement would warrant bilateral operation. Certainly, if no improvement followed bilateral ganglionectomy, one would hesitate to do more.

In my estimation, intestinal resection should be resorted to only after medical management and sympathetic surgical measures have failed.

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ABSTRACT OF DISCUSSION

DR. J. ARNOLD BARGEN, Rochester, Minn.: The procedure of choice seems to be a one stage extraperitoneal resection, leaving the patient with a temporary double barreled colostomy, the stoma of which can be closed at a later date. Such a surgical procedure does not seem suitable for the treatment of infants with megacolon or children under 5 years of age. It is the procedure or treatment of choice of patients who have not responded to sympathectomy or to medical treatment. The medical treatment employed has consisted in the repeated thorough emptying of the colon, the administration of mecholyl bromide, neostigmine bromide or syntropan and the use of spinal anesthesia and other parasympathetic paralyzants and sympathetic stimulants. If the megacolon does not respond to spinal anesthesia, sympathectomy will have doubtful value. Degenerative changes occur in the plexus of Auerbach, including reduction in size in the ganglion cells and fibers, vacuolation of the cells and at times absence or at least imperfect formation of the ganglion cells. Sympathectomy can at best be expected to cause improvement by a so-called flanking movement. Good bowel evacuation may follow this procedure, but a return to relative normality of the hugely hypertrophied colon can be expected in only the occasional case. I agree with the general implications of Dr. Penick's list of indications for sympathectomy. I would favor postponing any surgery of this type or resection even longer, say to the age of 5. Mention should be made of the often repeated observation that sympathectomy may result in sterility in men. This condition is vastly predominant in males in the ratio of about 5 to 1. When all these things are kept in mind, the operation will have a somewhat limited application. This is in no way meant to condemn it, but I would like to suggest that it is only one of the surgical procedures applicable in the treatment of megacolon. The results

of resection are uniformly good and permanent, as is attested by a follow-up of our series of cases from three to thirty-two years after operation. That the problem of megacolon is not generally well understood is illustrated by the fact that 1 young man of whom I know with a huge megacolon was inducted into active military service and only after convincing the officials that he had a bowel movement only every two months was he mustered out and returned to civilian life.

DR. REGINALD H. SMITHWICK, Boston: Resection of portions of the sympathetic supply to the bowel have been helpful. The results in Dr. Penick's series of 11 cases seem unusually satisfactory. They have been followed a sufficient time to be significant, but it will be important to check them repeatedly as the years go by. I am in accord with Dr. Penick's remarks regarding multiple stage procedures, starting with left lumbar sympathectomy and proceeding with a right lumbar sympathectomy, with or without splanchnicectomy later, if necessary. The retroperitoneal approach is simple and carries little risk. A unilateral lumbar sympathectomy will not interfere with ejaculation, but a bilateral sympathectomy occasionally may, even if both first lumbar ganglions are preserved. Detailed studies should be carried out before operation and between steps. These should include barium studies before and after spinal anesthesia and, when possible, paravertebral procaine block to determine the reaction of the bowel to acute sympathetic denervation. The effect of drugs which stimulate the parasympathetic supply should be studied. Unfortunately, there are no drugs which effectively inhibit sympathetic activity. I believe that routine colonimetric studies would cast further light on this problem and should be included among preoperative tests. This disease is rare, and the opportunity for any one physician to study and treat these patients does not arise very often. It will be necessary to resort to resection of various portions of the colon at times. If the diagnostic tests offer encouragement, sympathectomy should be the first maneuver. The results of resection have been marred by a high operative mortality, but the late results may be excellent. There is every reason to believe that with better preoperative preparation and with improved surgical technic the mortality of resection can be lowered.

DR. K. S. GRIMSON, Durham, N. C.: I should like to present conclusions derived from a review of 24 megacolon patients that have led to a more conservative attitude toward sympathectomy than has been presented today. The late mortality rates of megacolon reported after long term studies may be as high as 79 per cent. Sympathectomy is performed with a low immediate operative risk. The pathologic condition is, however, little altered by the sympathectomy and many patients have late difficulty. Four patients in this group were sympathectomized. Two have since died. A third required colon resection. Three varieties of megacolon were encountered among the 24 patients reviewed. One group including 12 patients presented uniform involvement of the entire colon and the rectum. Eight are now living and well, 1 died three years after a sympathectomy and 3 have moderately severe disability. A second group including 7 patients had involvement of all of the colon down to the midsigmoid region and a normal lower sigmoid colon and rectum. Four patients died. Sympathectomy failed in 2. Three treated by resection of the megacolon and ileosigmoidostomy are well. A third group including 5 patients presented enormous involvement of the sigmoid and descending colon. These 5 are responding to continued conservative treatment. The review suggests that protracted medical management may be indicated in the groups 1 and 3 varieties of megacolon. Medical management may be facilitated by the sympathectomy, but interruption of sensory pathways may later lead to difficulty. Complete megacolon resection and anastomosis between the normal ileum and the normal lower sigmoid colon seems indicated for patients with megacolon of the second variety that resists medical management.

DR. ARTHUR W. ALLEN, Boston: We do not regard lumbar sympathectomy as a difficult or serious operation in the Massachusetts General Hospital. It is done by the general surgical resident staff through a retroperitoneal incision. The patients are out of bed the next day or certainly the day after following the operation. We are indebted largely to Dr. Smithwick for working out an exposure through the loin that is simple and safe. I therefore can answer Dr. Coller and say that we do not regard it as an operation that has to be done by a trained neurosurgeon.

THE CHAIRMAN: Dr. Smithwick, do you agree to that?

DR. REGINALD H. SMITHWICK, Boston: Yes, I think that is a fair statement.

THE CHAIRMAN: In our hospital we feel the same. The operation is done by assistant residents and residents. We use the peritoneal approach and do not regard it as a major operation. The patient can be up the next day or even the same day.

DR. RAWLEY M. PENICK JR., New Orleans: We regard sympathectomy in much the same light as do Dr. Allen and Dr. Coller. The operation is performed usually by the general surgical staff rather than by the neurosurgeon. This operation can be done safely on elderly people and not necessarily for megacolon; it is also a safe procedure in young infants. One of these patients was 18 months old and there were no deaths. Its low mortality rate, simplicity and safety seem to be the chief advantages of sympathectomy. Furthermore, unilateral sympathectomy will cause so little significant change in the patient that it seems to me it should be tried in every case before a more radical procedure is contemplated. I agree with Dr. Grimson that, not infrequently, a normal segment of sigmoid is present above the pelvic floor. This permits an anastomosis after resection.

PERNICIOUS ANEMIA AND THE EARLY DIAGNOSIS OF TUMORS OF THE STOMACH

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Efforts at the recognition of carcinoma of the stomach at an early stage, when surgery would have some likelihood of success, have been pursued for many years with indifferent success. Despite the expansion of roentgen diagnosis, the more general use of gastroscopy, the refinement of the methods of examination of the gastric contents and stool, the record is a black one. The overall salvage of but 2 per cent of the patients afflicted with this disease or even the survival of 6 per cent, which is the maximum reported, gives a picture of the difficulties involved. Obviously, not all of the poor results are the consequence of late diagnosis, since many cases would not be cured regardless of the time when the diagnosis was established, but a great improvement might be achieved if the diagnosis was accomplished at an earlier stage.

The major factors in the late recognition of carcinoma of the stomach are its insidious onset, the absence of striking symptoms occurring even in advanced tumors, and the difficulties of establishing the diagnosis. While roentgen examination is generally considered the most accurate and widely applicable procedure, yet here too errors in the diagnosis of smaller tumors may well be more frequent than is now generally admitted. Statistics indicating an accuracy of 95 to 98 per cent in the roentgen diagnosis of carcinoma of the stomach have been published. On the positive side at least it must be borne in mind that they are based to a large extent

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Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.
From the Department of Radiology and Physical Therapy of the University of Minnesota and the University and Minneapolis General Hospitals (Captain Fink).

on well developed, easily recognized, symptom-producing tumors, most of which are already inoperable. What would be the overall accuracy of diagnosis if large numbers of symptomless individuals were examined so that a high percentage of small lesions would be encountered? There is no exact information on this score, although we know from various reports that such small lesions may occasionally be demonstrated.[1] To indicate this possibility, figure 1 is reproduced. Here a benign polyp about 4 mm. in diameter, occurring in a patient with pernicious anemia, is clearly demonstrated as distinct from the shadows produced by the folds of the mucous membrane. However, this small tumor was found only after it had been observed gastroscopically by Dr. Richard Varco and reexamination had been done to demonstrate it. We have observed other lesions but slightly larger than this, but in all probability many such may be overlooked.

In an effort to test out the accuracy of the roentgen method in symptomless individuals, a project was considered many years ago to examine routinely the stomachs of all men past the age of 40 at semiannual intervals. A study of the statistics on the incidence of gastric cancer in the living population over the age of 40 as has recently been reported by Collins, Gover and Dorn[2] would indicate that certainly not more than 3 persons per thousand would be likely to have the disease at any one time. Considering the expensive, painstaking, time-consuming character of the x-ray examination of the stomach, such a procedure seemed relatively unproductive. The recent report of St. John, Swenson and Harvey[3] bears out the correctness of this assumption. They found but 3 tumors in over 2,400 symptomless persons above the age of 50. It seemed more reasonable to examine a selected group of persons in whom the incidence would be likely to be much higher. There are a number of such categories, but a review of the literature seemed to indicate that patients with pernicious anemia would offer the most productive results. Accordingly, in 1939 we undertook to examine roentgenologically all our patients with pernicious anemia at semiannual intervals.

The coexistence of pernicious anemia and carcinoma of the stomach in the same person has had extensive study since it was first observed by Quincke in 1876. Numerous case reports, studies of clinical cases and a few studies of autopsy series have appeared. The literature has been adequately reviewed in recent papers.[4] That such an association exists seems well established, although there is a difference of opinion as to its frequency. It is evident that there has been an increase in the incidence of the coexistence of the two diseases, which is best illustrated by the various reports[5] from the Mayo Clinic during the last twenty years. Such a trend may in part be due to the better recognition of gastric tumors but may well be due to the increased longevity of patients with pernicious anemia resulting from the institution of liver therapy. In all the case reports there is a vast preponderance of individuals in whom gastric tumors are discovered either some time after (as long as seventeen years) or simultaneously with the discovery of the pernicious anemia.

Several possibilities exist to explain the relationship between pernicious anemia and carcinoma of the stomach. Is it an accidental association of two diseases occurring in the same age group? Or does carcinoma of the stomach produce a pernicious anemia-like picture or possibly a true pernicious anemia? Conversely, does pernicious anemia of itself produce carcinoma of the stomach? Finally, is there a common precursor for the two diseases which tends to produce either or both and thereby a close association?

The paper of Jenner[6] was perhaps the first to bring home forcefully that the association of the two diseases was not accidental. In a series of 181 living patients with well established pernicious anemia he found carcinoma of the stomach in 4.4 per cent, which he calculated to be approximately twelve times as frequent as in the rest of the living population of the same age and sex.



FIG. 1.—Spot film of the stomach of a patient with pernicious anemia demonstrating a benign polyp 4 mm. in diameter (arrow). The lesion was not seen on first examination, was found gastroscopically and was then observed on reexamination.

Other clinical studies give varying figures. The last one of Doehring and Eusterman[7] in over 1,000 cases of pernicious anemia reveals an incidence of carcinoma of the stomach in 1.6 per cent.

Autopsy studies have been unsatisfactory because of the tendency of the pathologist to discard the diagnosis of pernicious anemia when confronted by a tumor of the stomach. Nevertheless, some striking findings have been thus obtained. Kaplan and Rigler[8] have reviewed the literature on autopsy studies and reported their own investigation of 43,021 consecutive autopsies, in which approximately 293 cases of [illegible] were found in persons over the age [illegible] cases of carcinoma of the stomach were present in this group, an incidence of association of 12.3 per cent. This is over three times as great an incidence of carcinoma of the stomach as in the remainder of the same

1. Rigler, L. G.: The Roentgen Diagnosis of Small Carcinomata of the Stomach, Wisconsin M. J. **34**: 236, 1935.

2. Collins, S. D.; Gover, M., and Dorn, H. F.: Trend and Geographic Variation in Cancer Mortality and Prevalence, with Special Reference to Gastric Cancer, J. Nat. Cancer Inst. **1**: 425, 1941.

3. St. John, F. B.; Swenson, P. C., and Harvey, H. C.: An Experiment in the Early Diagnosis of Gastric Carcinoma, Ann. Surg. **119**: 225, 1944.

4. Cotti, L.: Rilievi casistico-bibliografici e contributo personale in merito alla conoscenza dei rapporti fra anemia perniciosa e carcinoma gastrico, Haematologica **19**: 939, 1938. Washburn, R. B., and Rozendaal, H. H.: Gastric Lesions Associated with Pernicious Anemia, Ann. Int. Med. **11**: 2172, 1938. Jenner.[6]

5. Conner, H. M.: The Hereditary Aspect of Achlorhydria, Proc. Staff Meet., Mayo Clin. **4**: 200, 1929. Giffin, H. Z., and Bowler, J. P.: Diseases Which May Be Associated with Pernicious Anemia, Minnesota Med **6**: 13, 1923. Washburn and Rozendaal.[4] Doehring and Eusterman.[7]

6. Jenner, A. W. F.: Perniziose anämie und Magenkarzinom, Acta med. Scandinav. **102**: 529, 1939.

7. Doehring, P. C., and Eusterman, G. B.: Association of Pernicious Anemia and Carcinoma of the Stomach, Arch. Surg. **45**: 554 (Oct.) 1942.

8. Kaplan, H. S., and Rigler, L. G.: Pernicious Anemia and Carcinoma of the Stomach: Autopsy Studies Concerning Their Interrelationship, Am. J. M. Sc. **209**: 339 (March) 1945.

age group of the autopsy series. This study seems to establish beyond peradventure that the coincidence of the two diseases is not accidental, although the underlying cause of the association is not definitely known.

With the establishment of firm criteria for the diagnosis of pernicious anemia [9] it is usually possible to distinguish sharply between the anemia of carcinoma and a true primary type. The coincidence of small tumors of the stomach with pernicious anemia makes it unreasonable to suppose that the tumor could possibly destroy all the mucosa which produces intrinsic factor. Therefore the second possibility seems excluded. The possibility that pernicious anemia may in some way cause the development of cancer of the stomach cannot be ruled out, but there is no evidence to support it.

Most investigators have concluded that there is a common precursor of the two diseases. Konjetzny [10] stressed the role of chronic gastritis as a constant accompaniment of carcinoma of the stomach. Hurst [11] and Faber [12] likewise believed that some type of chronic inflammation produced the atrophy of the gastric mucosa which is found in pernicious anemia, and Hurst [11] has felt that the latter may well be a precursor of gastric tumors. However, there is considerable evidence, especially that of Magnus and Ungley,[13] with regard to pernicious anemia, and of Guiss and Stewart [14] in regard to carcinoma, which indicates that gastritis is not an important factor.

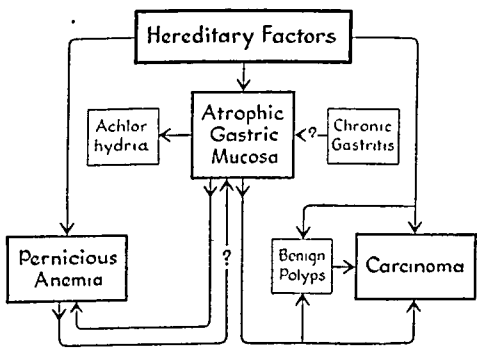


Fig. 2.—Hypothetical relationship of pernicious anemia to tumors of the stomach in schematic form. The major factor in both diseases may be hereditary, with an atrophic gastric mucosa as the immediate precursor. The atrophy may be due to chronic gastritis, but this is very doubtful. It may also follow rather than precede the pernicious anemia, but this also is questionable. Achlorhydria is related through the atrophic mucosa. Benign polyps frequently develop into carcinoma

Numerous other studies point to a hereditary or familial deficiency which predisposes to both diseases.

Figure 2 presents a hypothetical relationship between achlorhydria, pernicious anemia, benign polyps and carcinoma of the stomach. The development of any or all of these conditions from a common precursor related to atrophy of the gastric mucosa is certainly not yet established, but the diagrammatic relationship here shown expresses best our present knowledge of the subject.

There is another phase of this problem which deserves particular attention, namely the relationship of benign polypi of the stomach to pernicious anemia and also to carcinoma of the stomach. Various investigators, most notably Schindler,[15] Velde [16] and Brown,[17] have found that benign polypi are even more frequent than carcinoma in patients with pernicious anemia.

The relationship of polypi to carcinoma of the stomach has already been fully discussed by Stewart,[18] Miller, Eliason and Wright,[19] Rigler and Erickson,[20] Haring,[21] Benedict and Allen [22] and McRoberts.[23] There seems no doubt that many, although not all, benign epithelial tumors of the stomach may become cancers. Hence the discovery of a polyp of the stomach has great significance; in any effort to effect a reduction in the number of cases of carcinoma of the stomach, the radical treatment of such polyps must be given serious consideration. The possibility of the malignant degeneration of a polyp should be particularly borne in mind in cases of pernicious anemia because of the tendency of the latter to develop carcinoma.

The present report concerns itself with 211 patients with pernicious anemia on whom roentgen studies of the stomach with a barium meal were done. In approximately 20 per cent only one examination was made, usually at the time of the discovery of the anemia. In the remaining 80 per cent there were multiple examinations, usually done semiannually but often at longer intervals. In some cases as many as eight roentgen examinations of the stomach have been accomplished. Painstaking efforts have been made to reveal not only carcinoma but also benign polyps.

The diagnosis of pernicious anemia in these cases was established by the blood smears, bone marrow studies, the presence of glossitis, the findings of subacute combined sclerosis, an achlorhydria after histamine, and by the clinical and hematologic response to liver therapy. Critical review has been made in each case, and many of doubtful character have been discarded. Despite the difficulties which often attend the diagnosis of pernicious anemia, there is little doubt in our minds as to the authenticity of the diagnosis in these cases.

In many of these persons gastroscopy and in all of them careful studies of the gastric contents and of the stool have been made. Almost all of the reports of carcinoma have been confirmed by surgery or by autopsy. In a few cases there has been no such confirmation, but when the findings were doubtful the case

9. Watson, C. J.: Macrocytic Anemia, Illinois M. J. **82**: 195, 1942.

10. Konjetzny, G.: Ueber die Beziehungen der chronischen Gastritis mit ihrer Folgeerscheinungen und des chronischen Magenulcus zur Entwicklung des Magenkrebses, Beitr. z. klin. Chir. **85**: 455, 1913; Die Entzündung des Magens, in Henke, F., and Lubarsch, O.: Handbuch der speziellen pathologischen Anatomie und Histologie des Auge, Berlin, Julius Springer, 1928, vol. 4, pt. 2, Clinical Aspects of Gastroduodenitis, Med. Klin. **32**: 473, 1936.

11. Hurst, A. F.: Achlorhydria and Achylia Gastrica and Their Connection with Addison's Anemia, Subacute Combined Degeneration Syndrome and Simple (Nonaddisonian) Achlorhydric Anemia, Quart. J. Med. **1**: 157, 1932; Precursors of Gastric Cancer, Lancet **2**: 1023, 1929; Gastritis, Guy's Hosp. Gaz. **50**: 227, 1936.

12. Faber, K.: Gastritis und Anazidität, Zentralbl. f. inn. Med. **53**: 1016, 1932; Gastritis and Its Consequences, London, Oxford University Press, 1935, p. 119.

13. Magnus, H. A., and Ungley, C. C.: The Gastric Lesion in Pernicious Anemia, Lancet **1**: 420, 1938.

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15. Schindler, R.: Chronic Gastritis, Bull. New York Acad. Med. **15**: 322, 1939, Early Diagnosis of Cancer of the Stomach: Gastroscopy and Gastric Biopsies, Gastrophotography, and X-Rays, J. Nat. Cancer Inst. **1**: 451, 1941. Schindler, R., and Serby, A. M.: Gastroscopic Observations in Pernicious Anemia, Arch. Int. Med. **63**: 334 (Feb.) 1939.

16. Velde, G.: The Relation Between Pernicious Anemia, Gastric Polyps and Gastric Carcinoma, Ztschr. f. klin. Med. **134**: 653, 1938.

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19. Miller, T. G.; Eliason, E. L., and Wright, V. W. M.: Carcinomatous Degeneration of Polyp of Stomach: Report of Eight Personal Cases with Review of Twenty Four Recorded by Others, Arch. Int. Med. **46**: 841 (Nov.) 1930.

20. Rigler, L. G., and Erickson, L. G.: Benign Gastric Polyps: Incidence and Malignant Degeneration, Radiology **26**: 6, 1936.

21. Haring, W.: Gastric Polypi and the Pernicious Anemia Syndrome, Fortschr. a. d. Geb. d. Röntgenstrahlen **45**: 521, 1932.

22. Benedict, E. B., and Allen, S. W.: Adenomatous Polypi of the Stomach with Special Reference to Malignant Degeneration, Surg., Gynec. & Obst. **58**: 79, 1934.

23. McRoberts, J. W.: Gastric Polyps, Proc. Staff Meet., Mayo Clin. **8**: 685, 1933.

has been discarded. Many of the benign tumor cases have likewise been confirmed, although in these the possibilities of error are somewhat greater. It is our considered opinion, based on these various confirmatory data, that the diagnoses of gastric tumors are at least 90 per cent correct; more likely the error is much less. On the other hand there may well be a number of gastric tumors which we have so far failed to detect.

The results of the study are given in the accompanying table. It is obvious that the incidence shown is far higher than any heretofore published; it may be compared with the recent study of Doehring and Eusterman,[7] who found carcinoma of the stomach in 1.6 per cent of 1,014 cases of pernicious anemia. The striking difference between our finding and that of approximately 0.1 per cent found in a routine study of men over 50 without pernicious anemia [3] gives some idea of the vast difference between the frequency of gastric carcinoma in patients with pernicious anemia and of the remainder of the living population. Reference should again be made to the statistics of Collins, Gover and Dorn,[2] who estimated that 0.3 per cent of the living population over the age of 45 would have carcinoma of the stomach.

There are several explanations for this high incidence. The series is relatively small, so that the figures may be somewhat lower when more cases are seen, but it is not likely that the percentage will change to a significant degree.

Results of the Study

Total Cases of Pernicious Anemia Examined	Carcinoma of Stomach Found		Benign Tumors of Stomach Found		Total Tumors of Stomach Found	
211	17	8.0%	15	7.1%	32	15.1%

Unusually careful attention has been paid to the detection of small tumors which may have contributed to this high incidence. As might be expected, several positive errors have resulted. In 1 instance a most unusual calcification of the vessels of the cardiac end of the stomach produced a simulation of carcinoma. In another a diffuse antral spasm which persisted on several examinations was mistaken for carcinoma. These are cited to indicate that error in the positive roentgen diagnosis of carcinoma will result if an effort is made to diagnose small lesions in symptomless persons.

Most important of all in the attainment of so high an incidence are the repeated examinations to which this group of patients has been subjected. In many instances the lesion was not discovered on the first or even the second examination. It is obvious that if it were possible to reexamine all persons frequently until their decease, the incidence of carcinoma clinically observed would eventually approach closely the actual incidence found at autopsy. Thus, if 1,000 persons selected at random, all 50 years of age, were examined at any one time, they would show a relatively small incidence of carcinoma of the stomach. If the examinations were repeated semiannually until the decease of all of them, a final figure of approximately 4 per cent would be attained if the examinations were at all accurate. In the same way in pernicious anemia patients, if the examinations are persisted in long enough an incidence of at least 12 per cent should eventually be found.

Certain outstanding features characterized the findings in the series. The change from an apparently benign to a malignant tumor is well illustrated in a number of instances and is demonstrated in the following case report:

W. S., a man aged 68, gave a history of anemia for many years. In 1934 he was first admitted to the University Hospital, where the diagnosis of pernicious anemia was established. The blood findings were characteristic, and the presence of glossitis and other changes established the diagnosis unequivocally. There was an achlorhydria. Roentgen examination of the stomach was done, and it appeared to be entirely negative. He was given therapy with liver and improved.

He came to the Minneapolis General Hospital on April 14, 1941, at which time he appeared to be having a relapse. Sternal aspiration biopsy revealed a characteristic megaloblastic bone marrow. He had no gastrointestinal complaints except for poor appetite, which had been present for a great many years. Roentgen examination was done as a matter of routine. On the first examination some enlargement of the folds of mucous membrane in the antrum of the stomach were found (fig. 3 *a*). Reexamination a month later demonstrated a large polyp on the posterior wall of the middle third of the stomach (fig. 3 *b*).

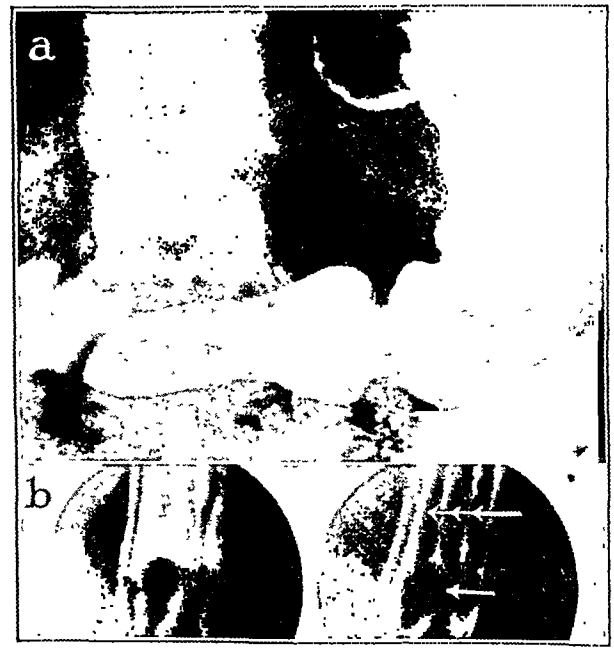


Fig. 3 (W. S.).—Stomach of a patient with pernicious anemia: *a*, filled stomach showing normal contours and peristalsis; *b*, spot films made one month later showing rounded, sharply defined filling defect (lower arrow) in middle third of stomach distinct from normal mucous membrane folds (arrows), characteristic of benign polyp.

The defect was rounded, sharply defined and very readily movable. The gastric wall showed flexibility and good peristalsis throughout the whole area. Gastroscopy was done three weeks later and revealed a single polyp in the middle third of the stomach, which appeared to have all the characteristics of a benign lesion. Surgery was advised at this time but was refused, and the patient left the hospital. He returned thirteen months later, complaining of loss of weight and appetite. This had commenced in January, that is about eight months after the discovery of the polyp, and he had noted black stools in the interim. The anemia had become much more severe. Reexamination at this time (fig. 4) showed an extensive carcinoma involving most of the stomach. He went rapidly down hill and died June 1, 1942, with extensive metastases.

The progression from pernicious anemia through gastric polyps to a full-blown gastric carcinoma is well illustrated in this instance. The outcome was most unfortunate, possibly owing to the refusal of the patient to accept operation when the polyp was first discovered. It is of coursse impossible to exclude some malignant

degeneration at that time, but the whole appearance, both roentgenologically and gastroscopically, was that of a benign noninfiltrating lesion. What the result would have been if he had submitted to operation, as advised originally, no one can accurately predict. We do know that the roentgen examination of the stomach, despite the absence of symptoms, permitted the early diagnosis of a gastric tumor at what appeared to be a curable stage.

A number of other cases have exhibited this same finding of a lesion which appeared to be benign and later became malignant. In such instances the microscopic examination of the stomach removed at operation may show mixtures of benign and malignant lesions, as illustrated in figure 5. Sections from two portions of the same gastric polyp, removed surgically from a patient with pernicious anemia, show a typical benign papilloma in one portion (fig. 5 *A*) and a typical invasive carcinoma in another portion (fig. 5 *B*).

The presence of a moderate or even large carcinoma of the stomach in a patient without any gastric symptoms whatever has been a common experience. The salvage of such cases by surgery, as a result of the discovery of the tumor because of this routine procedure in patients with pernicious anemia, has been strikingly illustrated in a number of instances and is a gratifying result of this study. A case in point follows:

M. F., a woman aged 57, was first seen on May 15, 1936 complaining of numbness of the extremities and weakness. Hemoglobin was 76 per cent, the red blood cell count was 3,200,000 and there was complete achlorhydria after histamine.



Fig. 4 (W. S.).—Appearance thirteen months after figure 3 *b*, showing extensive carcinoma of stomach which was found to be inoperable

The blood smears were somewhat atypical for pernicious anemia. Liver therapy was instituted and she gave a good response. The numbness persisted. Later examination of the blood established unequivocally the diagnosis of pernicious anemia.

Roentgen examination of the stomach was done in 1936 as a routine procedure and was found to be negative. The patient was not reexamined until her return, after the institution of the repeated examination program previously described. She was again examined Sept. 9, 1940, although she had absolutely no gastric symptoms. Three large defects were found in the stomach (fig. 6), two of which appeared closely connected. They were sharply defined but not entirely movable, and there was some invasion of the greater curvature, indicating that these were polypoid lesions which had undergone malignant



Fig. 5.—Sections of a tumor of the stomach removed surgically from a patient with pernicious anemia, to indicate malignant degeneration of a benign papilloma: *a*, section of a portion of tumor showing typical benign papilloma with hyperplasia of glands; *b*, section of another portion of same tumor showing anaplasia, loss of gland formation and invasion of muscularis, characteristic of carcinoma. The sections are slightly reduced from photomicrographs with magnifications *a* of 65 and *b* of 100 diameters

degeneration. It is notable that the defects are not seen at all in the filled stomach (fig. 6 *a*) but only in films with pressure applied (fig. 6 *b*).

Gastroscopy was done September 18 and showed some questionable infiltration. The polyps themselves were not clearly visualized. September 23 subtotal gastrectomy was done by Dr. O. H. Wangensteen, and the tumors were found in the middle portion of the stomach as described.

Examination of the excised specimen by Dr. Robert Hebbel revealed that external evidences of cancer were entirely lacking; near the greater curvature on the posterior wall were found two polypoid masses. One, immediately adjacent to the greater curvature, measured 2 by 2 by 1 cm. and was suspended on a relatively narrow pedicle, while the second measured 6 by 3 cm. and was proximal to the smaller mass. The tumors were soft and papillary and their surface was partially hemorrhagic. Between the polypoid masses there was an indurated, opaque, gelatinous thickening of the mucosa extending over

an area of about 1.5 cm. in diameter. No gross involvement of the submucosa was found microscopically. The polypoid masses showed papillary processes of various sizes and shapes. The tumors were not far removed from the structure of a benign polyp, but there was some histologic evidence of malignant change. The various sections were similar to those shown in figure 5. The conclusions were superficial polypoid adenocarcinoma of the stomach The patient recovered, and at the present time she is still well She has gained 5 pounds (2.3 Kg.) since the operation, but her pernicious anemia appears to be in much the same situation. Further liver extract has been given, and on last report her hemoglobin was 14 2 Gm. and the red cell count was 4,600,000

It is notable that this patient had no gastric symptoms whatever. Further questioning after the discovery of the x-ray findings elicited no complaints referable to the stomach. This is characteristic of patients with benign polyps, and the lesions found were certainly benign in origin, although malignant degeneration had already occurred.

The sequence of events here, namely atrophic gastric mucous membrane with pernicious anemia to benign polyp to adenocarcinoma, is strikingly brought out in this case. The tumors were easily diagnosed roentgenologically. They were in a relatively early stage and might well have continued on to an extensive cancer if the examination had been delayed until gastric symptoms appeared. It should be noted that gastroscopy failed to demonstrate these lesions. It is cases of this type which give some hope for the cure of carcinoma of the stomach. Such a case found on routine examination thoroughly justifies the numerous negative examinations which attend such a routine procedure.

A rather unfortunate outcome of the failure to repeat routine examination has occurred in a number of these patients. Because of the difficulties of any outpatient clinic, especially the lack of cooperation on the part of the patient, many of these persons have not returned for semiannual examinations, as previously indicated. Furthermore, physicians may be reluctant to accept minor lesions in patients who have no symptoms and are likely to fail to press the necessity for repeated examination. The following case illustrates this point:

G. R., a man aged 70, was first seen on Aug. 5, 1943 complaining of edema of the ankles, weakness and dyspnea. The gastrointestinal history was negative. On neurologic examination he had evidences of subacute combined degeneration. The hemoglobin was 36 per cent, with a red count of 1,350,000 and 6,300 leukocytes. The reticulocyte count was found to be 2 per cent. Gastric expression showed complete achlorhydria after histamine. Clear evidences of pernicious anemia were obtained, and liver therapy was instituted with a prompt and satisfactory result. The hemoglobin rose to 83 per cent and was maintained there constantly. On August 12 roentgen examination of the stomach and duodenum was done as a routine procedure and was negative.



Fig. 6 (M. R.).—Stomach of a patient with pernicious anemia without gastric symptoms: *a*, barium filled stomach without pressure; the tumor defects can scarcely be seen; *b*, pressure applied reveals three large filling defects (arrows) with some evidences of infiltration. Benign polypi with malignant changes were found at surgery

Reexamination was made on Feb. 5, 1940 (fig. 7 *a*). There were some changes found on the lesser curvature in the middle third of the stomach, minimal in extent, suggesting the possibility of carcinoma or polyp The findings were not sufficiently definite to justify surgery. Gastroscopy was done February 28 and reported as negative. It was repeated April 16 and again found negative except for atrophy of the gastric mucosa. An increase in the amount of liver resulted in a rise in the hemoglobin to 88 per cent, which was maintained.

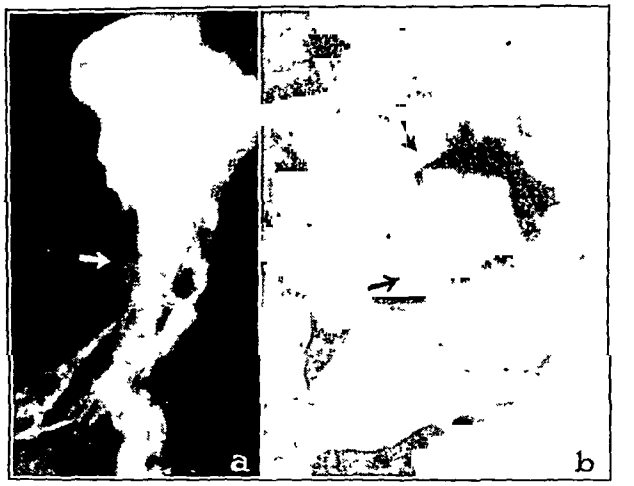


Fig. 7 (G. R.).—Stomach of a patient with pernicious anemia, showing early and late stages of carcinoma: *a*, examination Feb. 5, 1940, showing minimal defect on lesser curvature; *b*, stomach two years later, with extensive polypoid carcinoma, later found to be inoperable.

Unfortunately, this patient did not return for reexamination semiannually. He was seen again Nov. 27, 1941, complaining of gastric distress, but the physician was not impressed and no roentgen examination was undertaken.

He had some indigestion in January 1942, but it was so minor that it did not attract his attention at the time. January 27, almost two years after the previous study, he was reexamined roengenologically as a routine procedure. An extensive polypoid carcinoma of the stomach was found (fig. 7 *b*) at the site of the previous changes (fig. 7 *a*). Surgery was undertaken, but extensive metastases were found The tumor of the stomach was of the bulky type and measured 10 cm. in length. He died in August of 1942.

Reexamination at six month intervals would likely have resulted in the discovery of this tumor some eighteen months earlier, at which time surgery might well have been successful. No doubt the first stages of the lesion were present in February of 1940. Unfortunately the two negative gastroscopies and the improvement after liver therapy, together with the uncertainty of the roentgen diagnosis, led to a false sense of security. The relative absence of gastric symptoms even later when the tumor was already inoperable should be noted.

In the entire group the lack of symptoms was outstanding. In 1 patient who looked the picture of health and had not a symptom, whose hemoglobin was 90 per cent and whose red blood cell count was normal, a lesion with extensive metastases was found. Only the demonstration of the tumors in the roentgenogram led to the diagnosis.

The tendency for the patient with pernicious anemia to develop a bulky or polypoid type of gastric tumor was notable. This corresponds well with the finding of a high incidence of polypi in such patients and with

the well known tendency for achlorhydria to occur in patients with benign polyps or polypoid types of gastric carcinoma.

The discovery, in patients with pernicious anemia, of so many small tumors of the stomach, both benign and malignant, indicates the possibilities of the roentgen examination of the stomach even as a survey method. During the study the positive errors in diagnosis, which had been exceedingly low before, showed a distinct increase, but the total results justified the increased risk. It is our opinion that only a thorough roentgen examination of the stomach, using fluoroscopy, spot films and routine roentgenograms, will achieve the results here reported.

While it is evident that the routine semiannual roentgen examination of the stomach in patients with pernicious anemia is a highly productive procedure, it does not penetrate very deeply into the problem of the early recognition of carcinoma of the stomach, since, at most, 5 per cent of the patients who develop cancer of the stomach will have pernicious anemia. The results achieved in this study, however, point the way toward a more general utilization of the roentgen examination of the stomach in larger groups of individuals who might be likely to develop carcinoma. For example, if all those with achlorhydria were examined routinely and repeatedly, a larger salvage might be accomplished. It may not be too bold to predict that eventually we may conduct survey examinations of the stomach as we now do of the lungs.

SUMMARY AND CONCLUSIONS

In a roentgen study of 211 pernicious anemia patients on whom examinations of the stomach were made on one or more occasions carcinoma of the stomach was found in 8 per cent and benign polyps in 7.1 per cent of the cases.

In an autopsy study, reported elsewhere, 12.3 per cent of patients with pernicious anemia were found also to have carcinoma of the stomach.

The data presented indicate clearly an etiologic rather than an accidental relationship between pernicious anemia and tumors of the stomach.

The routine roentgen examination of the stomachs of patients with pernicious anemia has proved to be a valuable procedure resulting in some salvage of cancer cases which might otherwise not have been obtained.

Cases were observed illustrating the rapid change from a benign polyp to a cancer, the presence of both benign and malignant tumors side by side, the absence of symptoms in the presence of large tumors, and the development from a small, barely detectable lesion to an extensive inoperable carcinoma.

ABSTRACT OF DISCUSSION

DR. HARRY M. WEBER, Rochester, Minn.: Pernicious anemia is a disease of the gastric mucous membrane plus a disorder of the hematologic and neurologic systems. Other findings are described pathologically in association with pernicious anemia, particularly the findings that are loosely described under the words "gastritis, atrophic and hypertrophic." We make attempts roentgenologically to distinguish a stomach that is affected with one of these conditions from the normal stomach. It is a difficult distinction to make in many instances. In the early stages of the inflammatory conditions that are found with pernicious anemia, just as in the early stages of the neoplastic changes that are found with pernicious anemia, the x-ray detection of these processes becomes difficult. The word "precancerous" probably is well used with regard to the stomach, as it is elsewhere in the gastrointestinal tract. Any polypoid lesion occurring anywhere in the gastrointestinal tract may be a potentially malignant lesion, and many of them are found to be so. All of them have to be considered so until microscopic examination proves them to be otherwise. I do not think we have the right to permit a patient, on the basis of our examinations, to believe that he has a benign lesion. Once the word "neoplasm" comes into the x-ray report, the malignant aspect of the neoplastic process has to be given primary consideration, and the patient has to have the benefit of histologic proof.

DR. PAUL SWENSON, New York: Drs. St. John, Harvey and I attempted a mass survey of the gastrointestinal tract particularly in the age group above 50 with no other idea than to study the statistical incidence of carcinoma. We studied 2,400 persons, repeating the examination in 1,000 of them. On the first thousand we used films as a check. After that we got a little more confident about our findings and did a rapid examination. We found 3 instances of carcinoma in persons who had never been to a doctor before for any gastrointestinal disorder. One of these cases was far advanced, the second a relatively early carcinoma and the third a lymphoblastoma. Our third case was such an early infiltration that we saw motor abnormalities alone, a spasm in apparently inflexible areas. We examined the abdomen and found what we thought was a normal stomach. Six months later the patient was back with a far advanced lesion. The indication is that sometimes by x-ray we can pick up a lesion which is infiltrating intramurally and yet feel normal to the fingers of the surgeon. Dr. Rigler's work is commendable, particularly his emphasis on the repeated examinations and watching for these supposed lesions to develop.

DR. P. RAMOS CASELLAS, San Juan, Puerto Rico: I have been practicing in Puerto Rico for the last five years, where the incidence of primary anemia is quite high. As a matter of fact, the incidence of all anemias is high there. The secondaries we attribute to dietetic deficiencies resulting from poverty. That may explain the fact that I have seen in Puerto Rico much more cancer of the gastrointestinal tract than I saw in twenty-five previous years in different sections of the United States.

DR. LEO G. RIGLER, Minneapolis: I wish to emphasize the fact, which Dr. Weber brought out, that polyps of the stomach are precancerous lesions, and in many instances it is impossible to determine definitely whether they are benign or malignant. The problem of how to handle the individual case is a difficult one. It is much harder to answer the surgeon's question about a specific case "Do you think I ought to resect this stomach?" than to make a general statement about the treatment of such lesions. The end result usually is that one must make up one's mind on the basis of the individual case rather than on any general rule. For instance, in a patient with a small gastric polyp, about 4 mm. in diameter, the program has been one of watchful waiting. In cases with larger tumors we have advocated resection, even though they appear to be perfectly benign. When one is examining patients who have no symptoms and is looking for small tumors, the percentage of positive errors is going to rise. This is a most unhappy consequence of this type of effort. Whereas prior to this time in our department the percentage of positive errors, that is, the diagnosis of a carcinoma when none is actually present, was almost nil, we now have several cases staring us in the face in which the surgeon has explored and found nothing. One more word about the matter of mass surveys in the examination of the stomach: A good many years ago we contemplated doing exactly what Drs. Swenson, St. John and Harvey did. When we investigated the statistical data on the incidence of carcinoma of the stomach in living persons we found that the largest number of cases of carcinoma which we would be likely to discover, even by restricting the examinations to men over the age of 45, would be about 3 per thousand. If one is to do a thousand examinations and do them carefully (and I think a study of the stomach properly done is a time consuming, painstaking and expensive procedure), the return of 3 per thousand is rather small. Perhaps we should undertake such a program, nevertheless, because the salvage of 1 case would well repay all that effort. Because, however, of the minimal return from the general group of cases, we picked pernicious anemia patients for this trial, because there we had hopes of getting a much more productive series. These hopes have been borne out.

EXPERIMENTS IN THE TREATMENT OF DEMENTIA PARALYTICA WITH PENICILLIN

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CHICAGO

The modern treatment of dementia paralytica requires a long time and a great deal of effort. The newly developed method of administering massive doses of penicillin in early syphilis led us to believe that a similar rapid clinical result might be achieved in late syphilis of the central nervous system. We have not arrived at definite conclusions. We are presenting 5 cases. Primarily, we shall discuss the mode of treatment and the dosage; secondarily, the present clinical results.

ADMINISTRATION AND DOSAGE

It is known that no penicillin passes the hematoencephalic barrier after 10,000 or 20,000 Oxford units is injected intravenously or intramuscularly.[1]

In order to achieve therapeutic results, it seemed necessary to suffuse the brain and the meninges with penicillin. This might be possible by overcoming the barrier or by applying the drug directly to the surface of the brain.

In our first experiments, massive doses up to 1,000,000 Oxford units of the sodium salt of penicillin dissolved in 1,000 cc. of 5 per cent dextrose solution were given intravenously during a three hour interval. The spinal fluid specimen obtained immediately afterward did not reveal the presence of penicillin. The Oxford cup plate method [2] was used for purposes of assay. Another patient received a total dose of 3,100,000 units intramuscularly during an eight day period. This was repeated. The clinical picture and the spinal fluid findings remained unchanged. No penicillin was found in the spinal fluid.

A second attempt to breach the barrier was also of no avail. The patient received 10 cc. of a 20 per cent sodium dehydrocholate solution intravenously. This was followed by the intravenous injection of 300,000 units of penicillin dissolved in 1,000 cc. of 5 per cent dextrose solution containing, in addition, 20 cc. of a 20 per cent sodium dehydrocholate solution. This drug is credited with increasing the permeability of tissues and capillaries.[3] The dosage we used exceeds the customarily administered amount of sodium dihydrocholate. As already stated, no penicillin was found in the cerebrospinal fluid by biologic assay.

Next we treated a patient with penicillin and artificial fever. During the first febrile period 400,000 and then during the second period 500,000 units of the drug was administered by intravenous drip. The body temperature ranged near 105.8 F. for four hours. The fever cabinet described by Neymann and Holmquest [4] was used. In both instances the spinal fluid showed no trace of penicillin immediately after treatment. Therefore we concluded that the hematoencephalic barrier cannot be overwhelmed by massive or long continued or intramuscular or intravenous doses of penicillin. Neither does it yield to combined treatment of penicillin and bile salts nor to penicillin and artificial fever.

Finally, we experimented with subarachnoid administration. The dosage was of prime importance. No definite criteria existed. The direct intracisternal route was chosen. Single applications of 30,000 units were found to be tolerated without any untoward effects except occasional vomiting lasting a few hours after the injection. This dosage was administered daily to 3 patients for two weeks. The penicillin titers in the spinal fluid ranged between 0.7 and 11.6 units per cubic centimeter. No penicillin was present if more than thirty-six hours elapsed after the last injection. Simultaneous intramuscular injections of 350,000 units given daily for a week to the same patients failed to raise the spinal fluid penicillin titer. It did not prevent the disappearance of the drug from the spinal fluid after thirty-six hours.

Penicillin is toxic when it comes in direct contact with the surface of the brain. This toxicity may be due to impurities. The present commercial drug is either 40 or 25 per cent pure. The former seems less toxic than the latter. After repeated daily injections the patients complain of headache. Then they become tense. This state is followed by generalized muscular twitchings and finally by severe convulsions.

It is necessary to distinguish between acute and chronic reactions. A patient was given the very high dose of 100,000 units intracisternally. Three hours later he became tense. Generalized muscular twitchings and finally continuous convulsions with cyanosis followed. His life was saved by placing him in an oxygen tent and treating him with sodium amytal intravenously and spinal drainage. Similar reactions were observed after 50,000 and 40,000 units. This corresponds to the reactions described by Walker and Johnson [5] in experimental studies on animals.

The chronic effects of the drug are shown by meningeal irritation, rigidity of the neck and occasional positive Kernig and Brudzinski signs. Generally the latter signs were noted as after-effects of the convulsive states, but sometimes they followed prolonged administration of the drug without convulsive seizures. The spinal fluid showed an increase of cellular elements. Lymphocytes and polymorphonuclears as well as red blood corpuscles were found. The globulin and albumin increased correspondingly. Sometimes the temperature rose to 103 F., at others it dropped to 95 F. Two of our patients lapsed into a coma and died ten days after the last intracisternal injection.

CLINICAL AND SEROLOGIC RESULTS

Five patients suffering from chronic dementia paralytica were chosen for treatment. Mental symptoms in all of them had been present for from one to ten years. As stated, 2 of these died in a state of coma, from chronic penicillin encephalopathy. Another patient died as the result of exhaustion two weeks after treatment ceased. He showed no clinical improvement. Only 1 patient has improved.

Eight different modes of treatment were used, as shown in the table. The intramuscular, intravenous, intravenous with sodium dehydrocholate and intravenous with fever methods did not produce favorable clinical

The Commercial Solvents Corporation supplied penicillin and gave help and cooperation.

From Northwestern University Medical School, University of Illinois Medical School and the Chicago State Hospital.

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2. Recommended by the Federal Food and Drug Administration.
3. Grodins, F. S.; Osborne, S. L.; Ivy, A. C., and Goldman, L.: The Effect of Bile Acids on Hepatic Blood Flow, Am. J. Physiol. **132**: 375 (March) 1941.
4. Neymann, C. A., and Holmquest, H. J.: A New Apparatus for the Production and Maintenance of Artificial Fever, M. Rec. **145**: 327 (April 21) 1937.
5. Johnson, H. C.; Walker, A. E., and Case, T. J.: A Convulsive Factor in Commercial Penicillin: Effect of Penicillin on the Central Nervous System, read before the Chicago Neurological Society, Nov. 14, 1944.

results. After intrathecal injections the serologic reaction changed in 2 of the cases, becoming practically negative. The colloidal gold reaction changed from a paretic to a negative curve. The cell count after the initial rise decreased to normal and in 1 patient the spinal fluid Wassermann reaction became negative. Both of the patients are alive. One remains as demented as he was in the beginning; the other is decidedly improved.

The blood Wassermann reaction of all 5 patients remained positive.

In order to give a better insight into the method of treatment, we will append the history of 1 patient:

M. F., a woman aged 42, was reported as having been restless and overanxious for the past four years. In July 1944 she became confused and unable to recognize people. Consequently she was hospitalized. The patient was treated with artificial fever and chemotherapy before she was admitted to the Chicago State Hospital. A day before penicillin treatment, the examination disclosed pupils fixed to light and in accommodation, exaggerated knee and ankle jerks, shuffling and staggering gait, partial disorientation, pronounced confusion, irrelevant and incoherent speech and positive blood and spinal fluid findings.

After one intracisternal injection of 20,000 units, the colloidal gold curve showed a normal reaction, 0000012100. Another two injections of 20,000 units each and one injection of 30,000 units produced a decided change in the patient's mental condition. Her stream of talk became much more relevant and coherent.

Modes of Treatment

1. Intramuscular.
2. Intravenous.
3. Intravenous with sodium dehydrocholate.
4. Intravenous with fever.
5. Intracisternal alone.
6. Intracisternal and intramuscular.
7. Intracisternal plus artificial fever plus intravenous.
8. Intracisternal plus intramuscular plus phenarsone sulfoxylate

This amelioration of mental symptoms became more pronounced during the next three weeks; during this time the patient received another course of fourteen intracisternal injections of 30,000 units each. The last ten were given daily. The colloidal gold curve remained flat during this period. There was no reversal of the 4 plus Wassermann reaction. An additional course of eleven intracisternal injections of 30,000 units each, given daily in conjunction with 350,000 units intramuscularly, rendered the spinal fluid Wassermann reaction negative.

At the conclusion of the penicillin treatment the patient's mental condition was approximately normal except for a mild euphoria. Her gait improved, but the reflexes were unchanged. Since this time her spinal fluid Wassermann reaction has shown a tendency to return to positive. She is being treated with tryparsamide and bismuth.

CONCLUSIONS

At present we conclude that:

1. The intravenous and intramuscular injection of penicillin is ineffective because the hematoencephalic barrier cannot be breached.

2. The intracisternal route is dangerous if more than 30,000 Oxford units is injected.

3. The daily injection of this dose prolonged for more than five days is also hazardous.

4. The chronic pachymeningitis and leptomeningitis are probably favorably influenced by the drug.

5. The syphilitic involvement of the parenchyma in the depths of the cortex probably remains unchanged.

It is our intention to follow up this study by the use of pure crystalline penicillin and the simultaneous treatment with phenarsone sulfoxylate, tryparsamide and heavy metals.

THE DIAGNOSIS OF ACUTE SURGICAL DISEASES OF FEMALE PELVIS AND LOWER ABDOMEN

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In the hope of emending the accuracy of preoperative diagnoses in acute surgical lesions of the pelvis and abdomen in women, at least in the Atlantic City Hospital, a study of inaccuracies and errors in that institution was begun in 1936. At the end of five years a preliminary report was made to the Medical Society of New Jersey. This was to be compared with anticipated improvement during the next five year period. But the plan was interrupted by the war. This paper is based on the results of the original five year period together with those of the following year. After the war the apocryphal results will be compared with those of a similar period. Improvement is a consummation devoutly to be wished.

Diagnosis is based on the recognition of signs and symptoms. It is often necessary to wait for them to develop before an exact diagnosis can be made. In abdominal catastrophes one cannot wait. Some mistakes are pardonable. The unpardonable sin is to wait until error is impossible. That would mean the sacrifice of human life on the altar of statistical perfection.

Sudden intolerable abdominal pain accompanied by unmistakable rigidity is a surgical green light regardless of exact diagnosis. Wangensteen's decompression and parenteral fluids give extra time for greater accuracy, but, even with these, delay may spell disaster.

It is embarrassing to operate for appendicitis and find the mesenteric adenitis of what turns out to be measles. What a booby trap it is! Once in a while pain, McBurney tenderness, rigidity, fever and leukocytosis antedate the rash. When the surgeon is called to see such a case he knows that appendicitis in childhood demands early operation because nature makes no effort to wall off the infection. He operates in good faith. Give him sympathy. He will blush for himself.

Many authors state that females are less susceptible to appendicitis than males in the ratio of 2 to 3 or even 2 to 5. Atlantic City Hospital records would seem to confirm this. There are fewer cases in women's surgery than in men's surgery; but if those treated in the gynecologic department are added there is little difference in the two sexes.

A generation ago surgeons were taught that the ovarian artery had an appendicular branch which furnished extra blood and hence relative immunity to the female. Today modern textbooks state that the blood supply of the appendix is the same in the two sexes. So much for the history. What about the clinical findings?

CLINICAL OBSERVATIONS

1. With regard to posture, if the patient lies on either side there is no peritonitis. If she lies with her right thigh flexed she may have phlebitis, but she is more apt to have appendicitis. This position does not relieve the pain of adnexitis or of lesions of the urinary tract. It is therefore of real diagnostic value. In perforation of a viscus the patient lies immobile, stiff as a mummy. In ruptured ectopic pregnancy she is restless, tossing from side to side, begging for water. In streptococcic

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cellulitis she is bright, flushed and talkative. Her euphoria may confuse the unwary.

2. Temperature, pulse and respirations are not very helpful. In appendicitis and adnexitis there is moderate elevation. In cellulitis the temperature is pump handle. In pyelitis, pyelonephritis and pyonephrosis there may be also wide fluctuations. When an ectopic pregnancy ruptures, the temperature drops. Later there is fever due to absorption of fibrin ferment. A lower abdominal emergency without fever or leukocytosis is apt to be the sudden twist of the pedicle of a solid or cystic tumor. If torsion is neglected, particularly if the cyst is a dermoid, peritonitis quickly follows, with fever and leukocytosis.

The pulse varies with the amount of shock and hemorrhage. It is more rapid in cellulitis. In perforation there are pallid face, staring eyes and sweated brow, but the pulse is surprisingly tranquil.

Respirations are accelerated in all abdominal catastrophes, but air hunger is the distress signal of internal bleeding.

3. The localization of tenderness is of the utmost importance. The patient will point out the area of greatest tenderness. In appendicitis it finally settles near McBurney's point. In salpingitis it is lower and is apt to be on both sides. Morris's points have not been very helpful. In urinary tract lesions the tenderness is over the bladder or flanks. In pelvic cellulitis there is little or no tenderness unless peritonitis develops.

In pregnancy the ovaries, tubes and appendix are lifted up. While pregnancy does not appear to increase the liability of primary attacks of appendicitis, recurrences are all too common. Increased blood supply, constipation and elevation of the cecum with pull on old adhesions combine to relight previous trouble. Perforation and abscess are much more dangerous in pregnant women. Abortion or premature labor is the rule, and when the uterus empties itself it pulls away and disseminates the infection.

4. Cutaneous hyperesthesia, tested by pinching the skin, may reveal hypersensitiveness over the appendix. The sensory nerves of the skin in that area come from the same segment of the cord supplying the appendix with its sympathetic nerve fibers. One should not place too much reliance on this sign, because it requires a subjective response.

5. Muscle spasm is of prime importance but can be elicited only by gentle manipulation. The intensity of rigidity depends on the proximity of the appendix to the parietal peritoneum. In salpingitis, rigidity is less and bilateral because heavy inflamed tubes prolapse in the cul-de-sac. In ruptured ectopic pregnancy, rigidity is generalized. In pelvic cellulitis and torsion there is no rigidity until peritonitis sets in.

Muscle spasm is not pronounced in typhoid perforation, because this accident occurs in the third week. By this time Zenker's degeneration in a fifth column sort of way has rendered the rectus muscle incapable of resistance.

Rebound tenderness indicates peritoneal involvement, but it excites undue pain and apprehension and may actually spread infection.

6. A readily palpable, rounded mass low in an acutely inflamed abdomen suggests a solid or cystic tumor with a twisted pedicle. In early appendicitis the omentum wraps itself around the appendix like a scarf around a sore throat, to form a tender, indefinite mass. An appendical abscess which takes some days to form may be felt in the lower right quadrant, in the flank or in the pelvis. I once opened, in my office, what appeared to be a large fluctuating femoral gland abscess which pointed below Poupart's ligament. Imagine my surprise when a gangrenous appendix floated out in the pus.

7. Abdominal auscultation is too often neglected. In obstruction, peristalsis is tumultuous, and long gurgling, guttural rolls are characteristic. In peritonitis there is stony and ominous silence, broken now and then by a reverberating drip like water falling in the silence of a resonant cave. In hemorrhage there is said to be crepitus.

8. A distinguished author suggests that "if the history and abdominal findings are inconclusive, a careful yet gentle pelvic examination assumes great importance." Let me emphasize that a medical officer in the Army had better not let General Kirk catch him if he ever fails to do a rectopelvic examination in any abdominal case, high up or low down. In reviewing mistakes made in the 1,932 cases reviewed in writing this paper the most vivid impression gained was that more errors were committed by neglecting the pelvic examination than by omitting all other diagnostic procedures combined. Let us therefore without fail do pelvic examinations through the vagina or through the rectum not only when the history and abdominal findings appear to be inconclusive but in all cases.

An intact hymen rules out salpingitis almost certainly, but a palpable Bartholin's gland, purulent skenitis or urethral discharge is strong circumstantial evidence, and cervicitis in a nullipara is more than gossip.

Tenderness of the adnexa is best demonstrated by a maneuver not described in textbooks. The examining finger pushes the cervix to the left. The uterus acts as a lever and puts the right adnexa on the stretch.

Female Patients with Pelvic and Lower Abdominal Emergencies at the Atlantic City Hospital, Jan. 1, 1936 to Dec. 31, 1941

Final Diagnosis	Total	Tentative Diagnosis Correct	Accuracy
Acute appendicitis, including purulent appendicitis, abscess, gangrene, perforation and peritonitis	959	778	80%
Acute adnexitis, including hot tubes, acute salpingitis, pyosalpinx, tubo-ovarian abscess and acute gonorrheal peritonitis	505	392	77%
Acute lesions of the urinary tract, including cystitis, interstitial cystitis, pyelitis, stones, pyelonephritis, pyonephrosis, ptosis of the kidney and stricture of the ureter	176	158	90%
Endometriosis	77	12	16%
Hernia, strangulated or incarcerated; two of these were intra-abdominal	53	50	96%
Ruptured cysts, graafian follicle, corpus luteum, dermoid, pseudomucinous and papillary cysts	51	31	60%
Ruptured ectopic pregnancy, including ruptured tubal pregnancy and tubal abortion	49	28	57%
Torsion of tumors, solid or cystic	15	7	47%
Pelvic cellulitis, including postabortive and early and late puerperal sepsis; the two missed diagnoses were in women who denied abortion	14	12	86%
Mesenteric adenitis due to measles, scarlet fever, "glandular fever"	8	0	0%
Tuberculous peritonitis	9	2	22%
Mittelschmerz	8	0	0%
Diverticulitis	7	2	28%
Torsion of omentum	4	0	0%
Mesenteric thrombosis	3	0	0%
Regional ileitis	2	0	0%
Ruptured typhoid ulcer	1	0	0%

Tenderness elicited by this simple maneuver marks the spot in the right broad ligament.

Induration of acute salpingitis may be demonstrable only when the patient is relaxed. With the patient and the operating room prepared for appendectomy, if the relaxation of the anesthesia permits a correct diagnosis it is sound judgment to postpone operation until the tube "cools off."

Pelvic examination is important in suspected ectopic pregnancy. The uterus is enlarged, the cervix is soft and there is slight bleeding. The pregnant tube "rides high" and forward, whereas pus tubes are heavy and fall back into the depths of the cul-de-sac.

Large pelvic abscesses of recent origin are almost certainly appendical. These collections of pus cannot be palpated through the abdomen but only through the vagina or rectum. They should be drained through the cul-de-sac, because they are closed off above by coils of intestine.

A small pelvic abscess may be appendical where the appendix hangs over the brim of the pelvis. But this abscess is high, whereas a tubo-ovarian abscess is low in the cul-de-sac. Moreover, tubal masses are sausage shaped and bilateral. Unilateral pyosalpinx is due to pyogenic cocci and not to gonococci.

Appendicitis secondary to tubo-ovarian disease is not alarming because the inflammation involves the peritoneal coat and not the lumen of the appendix. It is safe to allow the case to subside even though it is certain that the appendix is involved.

If pelvic examination reveals a retroflexed uterus with "frozen" adnexa and a "shotty feel" along the uterine ligaments, the diagnosis of endometriosis is probable. If speculum examination reveals small chocolate cysts or their little stellate scars in the vault of the vagina, endometriosis is certain.

The pelvic mass may be a solid or cystic tumor. Torsion of such a tumor is one of the causes of acute conditions in the lower part of the abdomen. Cysts that twist are of medium size. Sometimes the twisted pedicle can be palpated. If such a patient develops early peritonitis one should suspect a dermoid cyst, because its contents are particularly irritating.

Crepitus means clots of blood and hence ruptured ectopic pregnancy or ruptured cysts with internal bleeding.

LABORATORY AID

The help that urinalysis has to offer is so well known that comment is unnecessary. A single specimen may show neither blood nor pus if the ureter is temporarily blocked in pyelitis, pyelonephritis or pyonephrosis. On the other hand, blood and pus may appear in the urine when there is no real urinary tract infection but when there is extension from a retrocecal appendix or a tubo-ovarian abscess.

The leukocyte picture depends on the nature of the infection, the tissue involved and the factors that promote absorption. Other things being equal, staphylococci, gonococci and Escherichia coli excite leukocytosis less than streptococci. The tissue invaded influences the count. Thus tuberculosis and typhoid which invade the lymphoid tissue show a low count, whereas infection of the peritoneum causes enormous polymorphonuclear increase. Moreover, a small amount of pus under pressure, as an abscess confined to the appendix, will produce a higher count than a large abscess that is draining.

In bleeding ectopic pregnancy, leukocytes continue to rise but drop quickly when hemorrhage ceases.

With the history and physical signs of appendicitis and leukocytosis of 15,000 the appendix may be expected to be merely inflamed. When the count approaches 20,000 there is usually pus; but do not put all your money on it even if you know who makes the blood count. If there are colicky pains and a count of less than 12,000 there may be obstructive appendicitis followed by rupture. This sequence of events causes 90 per cent of appendical deaths. In this group an increasing shift to the left is an urgent indication for early operation. Finally it should be remembered that leukocytosis occurs in uremia, acidosis, intestinal obstruction, coronary thrombosis and even alcoholism.

In ruptured ectopic pregnancy the first blood count may show an actual increase in red cells due to the blood concentration of shock. The sphygmomanometer is a more reliable witness. However, evidences of anemia soon appear. Because cells regenerate more rapidly than hemoglobin, ghost cells are seen and the color index is low.

Hemoglobin is not an accurate indicator of internal hemorrhage. It does not reach its highest level until forty-eight to seventy-two hours of bleeding. That is why a high level of hemoglobin does not rule out ruptured ectopic pregnancy. Falling blood pressure is more valuable than falling hemoglobin in the diagnosis of hidden hemorrhage. According to Farrar, a complete blood count every two hours will indicate when bleeding starts and stops, and this observation has been confirmed time over and again.

The sedimentation rate varies with extent and severity of the infection. It tells more than leukocytosis about the end stages of disease. When the rate is rapid in pelvic inflammatory disease, operation is risky and followed by stormy convalescence. The rate in appendicitis is slower than in pelvic inflammatory disease or in pelvic cellulitis. In differentiating between ectopic pregnancy and pelvic inflammation a slow rate points toward ectopic pregnancy. However, sedimentation is valueless as a diagnostic aid after the third month of pregnancy, because it is always rapid from the third month until two weeks after delivery even in the absence of inflammation.

Blood cultures, the Friedman test and the complement fixation test for gonorrhea do not help solve acute diagnostic problems. Special diagnostic procedures are rarely useful. These are cystoscopy, x-ray examination and the Rubin test. The Bastedo procedure of eliciting pain and McBurney tenderness by inflating the colon with air pumped in through a rectal tube may be helpful in diagnosing that will of the wisp chronic appendicitis, but it has no place in acute appendicitis.

The cases of regional ileitis were mistaken for acute appendicitis. The abdomen was closed when the regional thickening and adenopathy were discovered. Little is known of the etiology of regional ileitis. Out of the mist and fog which surround this much discussed condition two facts emerge crystal clear. Do not operate in the acute stage and, if operation is performed because acute appendicitis is suspected, do not remove a normal appendix to salve one's conscience. Get out and close up.

It is embarrassing to miss the diagnosis in ruptured ectopic pregnancy. Fifty-seven per cent of accuracy is not too good. In typical cases the ambulance driver can take one look and do better than that. But not all are typical. Some years ago I had a series of ectopic pregnancies with regular menstruation and moderate

hemorrhage which promptly ceased spontaneously. I missed so many that I was tempted to write on the preoperative chart of doubtful cases the exact opposite of what I really thought. It would have been almost as accurate.

THE CASE HISTORY

The impression from a review of these 1,932 cases is inescapable that many mistakes could have been avoided if clues in the histories had been followed. Sign-posts which pointed the way were disregarded.

If the onset occurs at the time of menstruation, the reproductive organs may or may not be the site of the lesion. Appendicitis, acute or chronic, occurs more frequently when there is pelvic congestion. There is delayed or missed menstruation in 85 per cent of ectopic pregnancies. Fever and chills following childbirth or abortion suggest pelvic cellulitis. Dysmenorrhea which begins late in menstrual life in the third decade, which becomes more distressing each month, which is seen in women in the upper walks of life who have used contraceptives and vaginal tampons is usually due to endometriosis. Had these facts been elicited by careful histories, we should not have missed 65 out of 77 cases.

The sequence of events is important. If there are sudden pain in the periumbilical region shifting to the right lower quadrant, nausea and vomiting, tenderness, rigidity, fever and leukocytosis in that order, the diagnosis could hardly be plainer if flashed in neon lights. The trouble is that many things break up the sequence, such as pelvic appendix or failure of the cecum to rotate. However, nausea and vomiting are the clues to follow. The first symptom of appendicitis is pain, always pain, never anything else. If some other symptom is first, the appendix is blameless. The site and severity of the pain are inconstant, but pain comes first. A history of "cold in the bladder," leukorrhea or bartholinitis directs attention to the adnexa. If gastrointestinal symptoms are absent, if the pain is deep in the pelvis and constant rather than paroxysmal, the diagnosis of adnexitis is fairly certain.

In appendicitis and strangulated hernia the constipation is more absolute, but 15 per cent of appendicitis patients have diarrhea, and most of these die. If food, fluid or physic is given a patient with appendicitis, the pain becomes intolerable and recovery difficult and doubtful. Appendicitis is bad enough, but its axis partners—food, fluid and physic—are worse. They bring peristalsis, perforation and peritonitis.

Colpotomy is useful in ectopic pregnancy with slow bleeding. I have no desire to possess a peritoneoscope, having seen it used elsewhere. It is brutal and futile. The shock of inflating the peritoneal cavity with air and the danger of perforating the intestine are too great and the keyhole view is unsatisfactory even for the most ardent peeping Tom.

SUMMARY

During a six year period 1,932 women with surgical emergencies of the pelvis and lower part of the abdomen were admitted to the Atlantic City Hospital, a class A institution with a closed surgical staff in a community of 66,000. Accurate preoperative diagnoses were made in 71 per cent of these women. In 29 per cent the diagnosis was correct only in part or wholly in error. In a certain number immediate operation was necessary to save life. There was no time for refined differentiation. By and large errors were due to incomplete histories and the failure to utilize, not gadgets, but the tactus eruditus.

Clinical Notes, Suggestions and New Instruments

DERMATITIS OF THE LIDS FROM PENICILLIN EYE DROPS

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Various untoward reactions from penicillin have been reported in the literature. Urticaria has been observed from the systemic administration of the drug and skin rashes from direct contact with the substance and the solution of penicillin. In some instances the reaction was thought to be the result of contaminants rather than of the drug itself.

Binkley and Brockmole,[1] as well as Silvers,[2] describe a case of dermatitis of other parts of the body associated with involvement of the lids. The only case so far described, to my knowledge, in which a dermatitis of the lids followed the instillation of penicillin solution into the conjunctival sac is that of Keyes.[3] In that case one drop of 1:1,000 penicillin sodium solution was instilled into the conjunctival sac at hourly intervals for four doses. Before the last drop was administered the conjunctivas and lids became red and swollen. The redness and swelling of the lids increased considerably and the conjunctivas became quite congested. In addition to this the mucous membranes of the nose and throat became dry, painful and glossy. The patient also developed a temperature of 100 F. and complained of general malaise. Patch tests were negative and the penicillin used in this case gave negative results when used on another patient and on a rabbit. The patient gave a history of sensitivity to a number of substances.

The subject of the present report is a white man aged 53 who had been receiving treatment for a bilateral chronic conjunctivitis for about a year. Cultures from the conjunctival sacs were negative. Various drugs, including sulfonamides and tyrothricin, failed to clear up the conjunctivitis.

On March 24, 1945 a solution of penicillin sodium, 250 Oxford units per cubic centimeter in isotonic solution of sodium chloride, was prescribed, with instruction to instil one drop in each eye every two hours. The patient used this solution for four days, when he returned to the office because there was no improvement in the conjunctivitis. He thought that a more concentrated solution might be more effective. Although at that time the skin of the upper lids seemed slightly edematous and somewhat shiny in appearance, this was not accepted as an early sign of a contact dermatitis as it would have been if other medication had been used. A solution containing 500 Oxford units per cubic centimeter was prescribed. The following day the patient returned to the office with a typical picture of a contact dermatitis. The skin of the lower lids was thickened, red and shiny in appearance. The redness of the lids was particularly pronounced along the side of the nose where the excess of the solution had trickled down over the cheeks. The skin of the upper lids, especially near the inner canthi, was edematous but not red. The conjunctivas showed no reaction, and the corneas, examined with a slit lamp, were also free from reaction. A patch test gave negative results. No history of urticaria, hay fever or other allergic manifestations could be elicited. The dermatitis cleared up five days after penicillin was discontinued.

The noteworthy features of this case are the absence of any conjunctival irritation in spite of the rather pronounced dermatitis of the lids and the occurrence of the dermatitis in an individual apparently not subject to allergic disturbances.

Incidentally the results of penicillin therapy in 3 cases of acute and in 9 cases of chronic catarrhal conjunctivitis were no better than those with the older therapeutic agents.

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Since this case report was submitted for publication, the writer has had a second case of penicillin dermatitis from topical application of penicillin solution.

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CERVICOFACIAL ACTINOMYCOSIS SUCCESSFULLY TREATED BY PENICILLIN WITHOUT SURGICAL DRAINAGE

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Two cases of proved cervicofacial actinomycosis treated successfully by penicillin without the employment of surgical drainage are herewith presented.

CASE 1.—A housewife aged 27, admitted to the University Hospital July 28, 1944, had begun six weeks previously to have toothache, limitation of motion of the jaw and swelling in the region of the left lower molars. A week later spontaneous drainage into the mouth of what was apparently an alveolar abscess occurred, with subsequent temporary slight diminution in the swelling. Roentgenograms on July 17 showed caries of the crowns of the second and third left lower molars and an abscess around the root of the third. Two days later these teeth were extracted. Hot compresses were used, but there was no improvement in either the size of the mass or the motion of the mandible.

On admission the temperature was 37.5 C. (99.6 F.). Over the angle of the left mandible was an ovoid mass measuring 7 by 6.5 by 3 cm. The overlying skin was a little red and there was increased heat and tenderness. The mass was uniformly firm and seemingly attached to the mandible. The submaxillary and anterior cervical lymph nodes were swollen and tender. With difficulty the mouth was opened 1 cm. to expose dirty and carious teeth, and a small sinus tract at the site of the recently extracted third molar.

The white blood cell count was 10,000. The blood Wassermann reaction was negative. X-ray examination revealed no abnormalities in the mandible. Three cc. of pus aspirated through the cheek contained large numbers of sulfur granules. Wet preparations and gram stains were positive for actinomycetes, and Actinomyces bovis was cultured from the material.

One hundred thousand Oxford units of penicillin was given every twenty-four hours by continuous 1,500 cc. intravenous drip of 5 per cent glucose in isotonic solution of sodium chloride for a total of 460,000 units in four and one-half days. Early in the course of treatment 10,000 units in 2 cc. of isotonic solution of sodium chloride was twice injected directly into the mass after a small quantity of pus had been aspirated. Following the intravenous medication 120,000 units of penicillin was given daily by intramuscular injections of 15,000 units every three hours for a total of 660,000 units. The dose was then increased to 160,000 units in twenty-four hours until 860,000 units was given at this rate. The course of treatment lasted sixteen days, and a total of 2,000,000 units of penicillin was administered. Hot wet compresses were applied to the jaw during most of this time.

Within forty-eight hours after the initial dose of penicillin there was a decrease in the local tenderness and induration. By the fourth day the swelling was noticeably smaller, and on the ninth day the mass measured 5 by 4.5 cm. The highest temperature attained was 38 C. (100.4 F.) and after the sixth day the patient was afebrile. At discharge on the eighteenth day a localized area of nontender induration measuring 3 by 2 cm. and a minimal limitation of motion of the mandible remained.

Three weeks after leaving the hospital a firm anterior cervical lymph node persisted below the angle of the jaw. The patient was seen six months later. She had remained asymptomatic, and examination revealed no evidence of previous disease.

CASE 2.—A white man, aged 63, a farmer, admitted to the hospital Sept. 18, 1944, had had an aching left lower molar tooth extracted seven weeks previously, and shortly afterward pain, swelling and limitation of motion of the jaw had developed. He was intensively treated with sulfonamides by his local physician. Dental films on September 15 showed at the site of extraction of the lower left third molar a small sequestrum lying just above the alveolar margin with a small area of soft tissue density around it. The day before entering the hospital the abscess drained spontaneously through a small opening in the neck. During the illness he had lost 20 pounds (9 Kg.).

On admission the patient's temperature was 37 C. (98.6 F.). Just below the angle of the left mandible was a firm fixed ovoid mass measuring 6 by 6 by 2.5 cm. In the central portion was a small opening from which a few drops of sanguinopurulent material drained. There was no increase in heat, but moderate tenderness was present. Dirty and carious teeth were seen in front, but the mouth could not be opened enough to view the molar regions.

The white blood cell count was 5,200. The blood Wassermann reaction was negative. Pus expressed from the sinus contained sulfur granules of Actinomyces.[1]

One hundred thousand Oxford units of penicillin was given every twenty-four hours by continuous 1,500 cc. intravenous drip of isotonic solution of sodium chloride for a total of 400,000 units in four days. Thereafter 120,000 units was given daily by intramuscular administration of 15,000 units every three hours for a total of 600,000 units. The dosage was then decreased to 80,000 units in twenty-four hours, and 500,000 units was given at this rate. The course of treatment lasted fifteen days, and a total of 1,500,000 units of penicillin was administered. The patient also received 6 Gm. of sulfadiazine daily during the first six days of treatment.

Four days after the initial dose of penicillin the mass was less indurated and tender. By the end of the second week the drainage had ceased, and the remaining nontender mass measured 2 by 2 cm.

A month after leaving the hospital the localized induration persisted almost unchanged. However, at the end of four months the patient was asymptomatic and the only evidence of previous disease was a well healed scar less than 0.5 cm. in diameter beneath the angle of the mandible.

COMMENT

Actinomycosis is a disease which has no uniformly satisfactory method of treatment. Inconsistent results with penicillin have been recorded in brief notes from various workers.[2] Garrod[3] found that different strains of Actinomyces differ greatly in their sensitivity to penicillin and demonstrated an apparent correlation in 4 cases between the in vitro and in vivo reaction to the drug.

The history of the treatment of actinomycosis includes the employment of substances which have been believed from time to time to have a specific action on the actinomycete. The most widely used, before the availability of the sulfonamides and penicillin, have been the iodides and thymol. Whatever drug is used, however, it has been the consistent opinion of surgeons that no beneficial results are to be expected in the absence of wide surgical drainage.[4] In cases cured by these methods, prolonged healing of open wounds and conspicuous scars are the uniform accompaniment.

These 2 cases are presented to indicate that certainly in some instances actinomycosis may yield to penicillin without the necessity for painful and deforming surgical procedure. We believe that the diagnosis of actinomycosis should be attempted by aspiration of fluctuant areas in a suspected lesion rather than by open drainage, since there is a possibility that the latter procedure may be unnecessary. It is suggested that all proved cases of actinomycosis receive intensive penicillin therapy without immediate surgical drainage. If the organism is found insensitive to penicillin, either by laboratory demonstration or by clinical response or both, then and only then is the standard surgical attack justified. Delay in surgical drainage for the clinical test of penicillin response should not alter the prognosis to any important degree, since the infection is of slow development in any event.

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Council on Foods and Nutrition

SPECIAL ARTICLE

This is the seventh of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication.

GEORGE K. ANDERSON, M.D., *Secretary.*

THE CLINICAL DETECTION OF PROTEIN DEFICIENCY

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Protein deficiency occurs from a variety of causes: as a result of a deficient intake, a failure of absorption or utilization, abnormal destruction, or an abnormal loss from the body as in burns or nephrosis. It can occur in an acute or a subacute form, as in hemorrhage or burns, or as a chronic disease. Diagnosis of the deficiency will depend somewhat on the cause of the deficiency, mainly in respect to the evidence contributed by the history and physical findings. For the most part, however, the diagnosis of all forms will be similar to that of the nutritional deficiency type, which will serve as the example in most of the present discussion.

When considering the diagnosis of protein deficiency, distinction must be made between a deficiency of protein in the diet and the physical state of a deficiency of protein in the body. They are not the same and, although a history of a dietary deficiency may be helpful in the diagnosis of protein deficiency disease, unless the dietary has been inadequate greatly enough and long enough to exhaust the reserve stores such inadequacy is not of itself sufficient for a diagnosis of protein deficiency.

Distinction must also be made between a deficiency of protein as protein and a deficiency of amino acids. Some ten of the many amino acids found in protein have essential specific functions yet cannot be synthesized by the body. Hence there may occur specific amino acid deficiencies. A deficiency of protein is often accompanied by a deficiency of specific amino acids, but there can be and often is a deficiency of protein as protein distinct from any deficiency of specific amino acids.

Finally a distinction is to be made between the diagnosis of protein deficiency in individuals and in populations, because the methods which are suitable in the one instance may not be satisfactory in the other.

Aside from the diet record the history in the usual case of nutritional protein deficiency is of relatively little assistance except for the symptoms of edema, a rather late manifestation of the deficiency. In cases of protein deficiency resulting from failure of absorption or utilization, abnormal destruction or loss from the body as in nephrosis or burns, the history and symptoms of the conditions causing the deficiency will be suggestive and helpful.

The history and study of the diet, though not diagnostic, is very useful, and knowledge of a possibly inadequate intake should always suggest that protein deficiency exists. Inquiry into the diet should be made with some care because even small deficits existing over a long time can cause a deficiency state in the end. In many cases it will be advisable to obtain a record of the amounts and kinds of food eaten over a period of a week or more. From this the dietary intake can be calculated and an estimate made of the probable intake over a longer period. The calculated intake should be compared with known requirements of different individuals under various conditions. For example, children require relatively more protein than adults, because of growth. Certain illness and injuries, for example burns, are now known to increase the requirements greatly.

Of almost greater importance in some cases than the actual amounts of protein is the caloric intake. This is because protein is burned for heat (calories) in the absence of sufficient fat and carbohydrates to supply energy requirements. Actually, healthy adults, if given sufficient fat and carbohydrates to supply all energy needs, require only small amounts of protein.[1] With the usual dietary and its excess of protein, some protein is burned for heat. However, when the amount of protein in the diet is near minimal the use of some of it for fuel may make the supply inadequate, and amounts which appear adequate may actually be insufficient. Actually most diets deficient in protein are only relatively deficient.

Finally, inquiry should be made as to the biologic quality of the protein. So-called first class protein, animal protein, is more complete and richer in essential amino acids than most other proteins. Though an adequate intake of protein can be secured with vegetable protein, it ordinarily requires a greater variety of food and larger amounts. The production of a negative nitrogen balance, by a deficiency of essential amino acids, despite the intake of adequate amounts of protein per se, emphasizes the necessity for a sufficient supply of first class protein.

Although a deficiency of protein interferes with growth and development, strength and energy, the production of immune bodies and such physiologic functions as pregnancy and lactation, those disturbances have so many causes and are the result of so many factors that it is difficult clinically to identify them with a deficiency of protein. Similarly, with the exception of disturbances in growth of hair and in fertility as possible manifestations of amino acid deficiencies (cystine and arginine), specific or even suggestive symptoms of amino acid deficiency are lacking.

The edema, although not the earliest result of protein deficiency, in our present state of knowledge is about the first clinical sign of the deficiency. One of the characteristics of the edema is its lack of association with symptoms suggesting other causes of edema, notably heart and kidney disease. Although in severe cases of nutritional (protein deficiency) edema there may be a history of shortness of breath and palpitation, these are usually lacking. The edema is strikingly dependent on posture, confined to or greatest in dependent parts and, especially in the mild or early stages, shifting from part to part with posture, present in the hands and face in the morning and in the legs at night. In the mild cases, because it is greatly affected by other secondary factors such as environmental temperature and salt and water intake, it is inconstant and may appear and disappear. It is usually painless, bilateral though perhaps greater on one side, and usually develops gradually and

1. The usual diet, however, should contain liberal amounts of protein.

insidiously, though occasionally the onset is sudden, following unusual exercise or excessive salt and fluid intake. With the more acute onset there may be a tight feeling in the legs and slight to moderate pain and tenderness.

There may be noted a rather sudden increase in weight, often with weakness and lassitude. Loss of weight is usually masked by the edema. Polyuria, especially nocturia, may occur, but there may be some oliguria at the onset of the edema. In simple undernutrition cases mild mental depression is common. When accompanied by other disease the symptoms of the latter are apt to overshadow those of the protein deficiency, and uncomplicated cases often show few symptoms. Only in severe protein deficiency is there an accompanying ascites and hydrothorax.

The same diagnostic limitations that affect the history apply to the physical examination. Almost the only characteristic or sufficiently significant finding is the edema, and, in advanced cases, fluid in the serous cavities. This edema, as already pointed out, differs in no essential way from some other forms of edema and must be distinguished from them on the basis of other evidence. It is, however, a positive finding of importance, and it must be remembered that the edema of protein deficiency may and often does accompany and complicate other forms of edema.

The dropsy is usually of the soft, pitting variety, rarely becoming hard and indurated unless complicated by other kinds of edema. Ordinarily it is greatest in the feet and legs, where it is usually noted first, or as a slight swelling of the face and hands, to which it shifts during recumbency to be noted on arising. Occasionally, when developing suddenly, it may be accompanied by some redness and tenderness. As it increases in severity it extends higher, becomes greater and in the most severe cases becomes a true anasarca. In the milder cases disappearing completely with a few days of bed rest, when more severe it persists or even develops with the patient in this position.

Other physical findings either are the secondary manifestations of the edema or are the result of associated abnormalities, which often accompany the protein deficiency and hypoproteinemia. Pallor commonly present is caused by the overlying edema, accompanies a decreased blood volume or reflects an actual anemia, which may be related to the protein deficiency or to other causes. Actual anemia is not common in uncomplicated cases, though hemoconcentration may mask an anemia of mild degree. Loss of weight is often obscured by the retention of water, as is muscle atrophy, both being revealed in their true aspect only when diuresis occurs. Dyspnea and tachycardia, of effort, not of posture, reflect several causes—the physical effect of edema and fluid in serous cavities, the lessened blood volume and the actual atrophy and loss of substance of muscles and that muscular organ the heart. Weakness of skeletal muscles has the same causes. Bradycardia at rest is observed in severer cases and, with hypothermia, hypotension and lowered basal metabolic rate, reflect a state of undernutrition.

The most significant and most useful clinical test of protein deficiency is the laboratory test, the measurement of the concentration of the plasma or serum protein. Because of an apparent balance between reserve stores of protein and the essential protein of the various tissues and organs, a disappearance of the reserve protein and an encroachment on the structural and functional protein of tissues and organs appears to be reflected in a decrease in the protein, clinically detectable, of the plasma or serum.

The concentration of protein in the serum (or plasma) can be determined by several methods, but the most generally used at present is the microkjeldahl procedure, with a separation of the two fractions, albumin and globulin either by Howe's method, the modification of Robinson, Price and Hodgen [2] or the sodium sulfite method of Campbell and Hanna.[3] If only the total protein is to be determined, the new copper sulfate method of Phillips, Van Slyke and their collaborators offers an extremely simple, rapid and reliable procedure. Unfortunately albumin, the most significant fraction of the serum protein in respect to protein deficiency, may in mild and early cases be lowered significantly while the total protein remains within the normal range. In a recent study of some 1,100 subjects, 89 per cent of those with a hypoalbuminemia had normal total serum protein.[5] Furthermore, in the study of patients it is desirable to know the concentration of both albumin and globulin in relation to each other, particularly because hypoproteinemia may occur from causes other than protein deficiency and be characterized by alterations in the amounts and relative proportion of the protein fractions. Therefore, although the copper sulfate test is a very useful method for the detection of grosser changes and is particularly useful as a screening test in mass examinations, it is less well suited for the more careful study of individual patients.

Additional procedures are other adaptations of the specific gravity method [6] and the biuret (colorimetric) test.[7] The biuret colorimetric test, though simple and rapid, seems to lack reliability in the presence of other disease.

Satisfactory normal standards for the concentration of serum or plasma protein [8] of adults are those of Peters and Eisenman [9] and for children those of Dodd and Minot.[10] According to these, the normal range of total protein is from 6.0 to 8.0 Gm. per hundred cubic centimeters, for albumin 4.0 to 5.5 Gm. per hundred cubic centimeters and for globulin 1.4 to 3.0 Gm. per hundred cubic centimeters. Children above 2 years of age have the same concentration as adults.

Emphasis should be given to the significance of values but slightly below the arbitrary lower level of normal.

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Physicians generally are too much influenced by the low levels of serum protein (albumin especially) encountered in hospital patients with severe disease. Relatively low concentrations do occur, without edema because the conditions (bed rest, dehydration, diuretics, restricted salt and fluid intake) are those which allow considerable hypoproteinemia without edema. But in less ill patients, in ambulatory patients and particularly in relation to nutritional protein deficiency a concentration of serum protein, especially albumin, though but slightly below the lower normal range, is apt to be significant. Furthermore, the effect of secondary factors on the relation of serum protein concentration to edema must not be forgotten; posture, salt and fluid intake and environmental temperature may operate to hinder the production of edema in the presence of even severe hypoproteinemia and under other circumstances may operate to produce it when there is only slight hypoproteinemia. These facts are mentioned because of the tendency of many to interpret protein levels on the basis of the presence or absence of edema alone.

In addition to the concentration of serum protein and protein fractions considerable significance, often too much, is attached to the albumin-globulin ratio. While alterations in this ratio are significant, the actual concentrations of albumin and of globulin are much more significant. A reversal of the ratio with serum albumin of 4.5 and serum globulin of 6.0 Gm. per hundred cubic centimeters, as in lymphopathia venereum, has a much different meaning than a reversal with the albumin 1.5 and the globulin 3.0 Gm. Too great emphasis on the reversal of the albumin-globulin ratio with neglect of the actual concentration of each fraction is incorrect.

Hypoproteinemia is by no means caused only by protein deficiency, and the mere finding of hypoproteinemia is not of itself sufficient for such a diagnosis. Fortunately, most other kinds of hypoproteinemia are characterized by abnormalities either in the blood proteins themselves or elsewhere which will help to distinguish them. The hypoproteinemia of protein deficiency is usually a proportionate decrease in both albumin and globulin, though in mild cases the globulin may remain at the usual level or rise to a high normal or even slightly above normal. Also the concentration of globulin is influenced by various infections, and it tends to respond more quickly to an increased protein intake. In cases of uncomplicated nutritional protein deficiency, severe edema does not occur except with a rather severe hypoproteinemia. In nephrosis (and nephritis), which may superficially closely resemble nutritional protein deficiency, the urinary findings are sufficient for differentiation. The edema and hypoproteinemia of an uncomplicated nutritional protein deficiency are without urinary changes or evidence of circulatory failure or venous or lymphatic obstruction. Alterations in serum proteins associated with the anemias, hepatic disease, neoplasms and various infections are apt to be characterized by a hypoalbuminemia and a hyperglobulinemia. It must not be forgotten, however, that an actual protein deficiency may accompany these and many other diseases.

The ordinary tests for serum plasma proteins measure only the concentration in the blood. Variations in blood volume can affect the concentration so that changes in total circulating protein may occur without being recognized by such tests. This fact, of great importance in acute changes in plasma protein accompanying hemorrhage, shock and some other conditions, is often lost sight of in the slower changes of nutritional protein deficiency. There is some reason to believe, however, that with a nutritional protein deficiency there may be in the early stages a significant reduction in blood volume and a decrease in total circulating blood protein. Evans [11] recently found a reduction in plasma volume in 30 per cent of a group of general hospital patients; these patients had lower than normal values for total serum protein and for serum albumin when calculations were made per kilogram of body weight, though the concentration of serum protein was normal except in a few instances.

Such a decrease in circulating blood protein could be considered an atrophy of the plasma, an atrophy such as occurs in the muscles and certain parenchymatous organs in protein deficiency. This reduction in blood volume might be the cause of some of the symptoms observed in these patients. Later the changes in blood volume are modified by the edema. As yet, however, the occurrence and clinical significance of such a possible decrease in blood volume is undetermined. If it occurs, it is apparent that a determination of blood volume as well as the concentration of serum protein will be necessary for the early diagnosis of protein deficiency.

Decrease in the serum protein concentration and particularly the relation of such a decrease to the edema may be determined by a measurement of the osmotic (oncotic) pressure of the serum or plasma. However, methods which are not well suited to clinical use such as this test are not commonly used. It is often useful, however, to calculate the osmotic pressure of the plasma (or serum), particularly in relation to the occurrence (or nonoccurrence) of edema and especially because of the greater effect of albumin than globulin on osmotic pressure. This can be done with formulas and nomograms such as those of Wells, Youmans and Miller.[12]

As yet no suitable and reliable laboratory methods exist for the detection of specific amino acid deficiency.

The physician thus has recourse to a number of procedures for determining the nutritional status with respect to protein sufficiency. The dietary history is all important. The significance of the protein content, quality and utilization, as well as other factors of the diet, should be considered. Dependent edema of a constant or transitory nature is usually the first clinical sign, and other findings of pallor, anemia and weakness sometimes appear later as associated abnormalities. Determination of the plasma or serum protein concentration is the most generally useful clinical test for the demonstration of protein deficiency. The results of this test should be scrutinized carefully when protein deficiency is suspected, however, because of the significance in ambulatory subjects of values only slightly below the lower level of normal. A knowledge of the actual values of serum albumin and globulin is of more importance than the albumin-globulin ratio. When possible the blood volume should be measured, since this may be reduced and obscure the changes occurring in the total content of body protein. The use of all diagnostic means at hand is often necessary to demonstrate the existence of early deficiency or suboptimal states of protein nutrition.

11. Personal communication to the author

12. Wells, H. S.; Youmans, J. B., and Miller, D. G.: A Formula and Nomogram for the Estimation of the Osmotic Pressure of Colloids from the Albumin and Total Protein Concentration of Human Blood Sera, J. Clin. Investigation 12: 1103, 1933.

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SATURDAY, JUNE 9, 1945

GAMMA GLOBULINS

The war caused an increased demand for blood and blood substitutes to combat battle wounds and shock. At first whole blood, because of its instability and type characteristics, did not seem to meet the requirements necessary for most efficient military application. Dried plasma was evolved; a purified concentrated solution of the albumin fraction of plasma was developed by Cohn [1] and his co-workers. Blood plasma was fractionated into several purified components by physicochemical means. Plasma proteins consist of two albumins and three globulins—alpha, beta and gamma—in addition to fractions contributing to blood coagulation and blood typing. The albumins are the proteins which are responsible for the maintenance of plasma volume and thus are important in the treatment of shock, hypoproteinemia and edema. Of the globulins, the gamma fraction is concerned with the phenomenon of immunity, for in this fraction of normal and convalescent plasma are found the substances which give high antibody titer.

The albumins are formed in the liver, but until recently the origin of the globulins remained uncertain. Dougherty, Chase and White [2] have discovered that antibodies are found in the lymphocytes and believe that the lymphoid tissue is the site of antibody formation. Many attempts have been made to separate the antibody portion of the plasma from the gamma globulins, but all have proved unsuccessful. Kass [3] has shown that the antibodies are specific modifications of the gamma globulins and that these occur in the lymphocytes, with the antigen serving as the stimulus for the modification of the gamma globulin. Thus it appears that the gamma globulins are formed in the lymphoid tissue.

The administration of either the adrenotropic hormone or the adrenal cortex steroids causes an increase in the amount of total protein of the blood. In the case of the rabbit it was found that this increase is due almost entirely to globulins. By electrophoretic means the protein present in lysed rabbit lymphocytes has been found identical to the gamma globulins of the plasma. White and Dougherty [4] believe that the pituitary-adrenal mechanism is the normal means of controlling the release of serum globulin from the reticuloendothelial cells.

As a result of the foregoing observations the origin of the plasma proteins has now been further elucidated. The albumins are known to be formed in the liver; various degrees of liver damage cause a reduction of the plasma albumin. The globulins are now believed to originate in the lymphoid tissue, and it is believed that the gamma globulins may there be modified to give rise to the various antibodies. The role of gamma globulins in medical practice promises to be increasingly important, depending on the isolation and production of purified preparations.

1. Cohn, E. J.: Science **101**: 31 (Jan. 19) 1945.
2. Dougherty, T. F.; Chase, J. H., and White, A.: Proc. Soc. Exper. Biol. & Med. **57**: 295, 1945.
3. Kass, E. H.: Science **101**: 337 (March 30) 1945.
4. White, A., and Dougherty, T. F.: Endocrinology **36**: 207 (March) 1945.

FLIES, FOOD AND POLIOMYELITIS

Sabin and Ward,[1] in a study of the natural history of human poliomyelitis, published in 1941, demonstrated that the human alimentary tract, from the mouth and pharynx to the colon, may be a port of entry for the virus to the body and particularly to the central nervous system. Their work was soon confirmed. The virus has also been found in human stools,[2] in sewage [3] and in flies.[4] These results, repeatedly verified by various laboratory investigators, have led to renewed studies of the transmission of the virus by flies from human stools or sewage to an uninfected person. Ward, Melnick and Horstmann [5] have now supplied direct evidence that fecal material, sewage or contact with flies by the individual, his food or fomites may actually constitute a link in the chain of infection with poliomyelitis.

Evidence with regard to the transmission by food must include proof that food merely exposed to flies in an epidemic area is infective when ingested. Such proof was obtained when food was exposed in several epidemic areas in the summer of 1944 in contact with flies in and about homes where poliomyelitis had developed within a week. The food and fly bait, exposed for

1. Sabin, A. B., and Ward, Robert: Natural History of Human Poliomyelitis: I. Distribution of Virus in Nervous and Non-Nervous Tissues, J. Exper. Med. **73**: 771 (June) 1941.
2. Trask, J. D.; Vignec, A. J., and Paul, J. R.: Poliomyelitis Virus in Human Stools, J. A. M. A. **111**: 6 (July 2) 1938.
3. Paul, J. R.; Trask, J. D., and Gard, Sven: Poliomyelitis Virus in Urban Sewage, J. Exper. Med. **71**: 765 (June) 1940.
4. Paul, J. R.; Trask, J. D.; Bishop, M. B.; Melnick, J. L., and Casey, A. E.: Detection of Poliomyelitis Virus in Flies, Science **91**: 393 (Oct. 24) 1941.
5. Ward, Robert; Melnick, J. L., and Horstmann, D. L.: Poliomyelitis Virus in Fly Contaminated Food Collected at an Epidemic, Science **101**: 491 (May 11) 1945.

twelve and twenty-four hours, was fed to chimpanzees, care being taken to prevent cross contamination. Of the 2 animals used, neither, at any time, showed evidence of paralytic poliomyelitis but both showed virus in their stools. This virus caused typical poliomyelitis lesions in the cord and medulla of test monkeys. The virus was passed from 2 monkeys to 2 additional monkeys. The chimpanzees eliminated virus for one or two months. Neither had shown virus in the stools prior to eating the test food.

These experiments indicate that food exposed to flies at the homes of poliomyelitis patients in an epidemic area may acquire a quantity of poliomyelitis virus sufficient to produce in chimpanzees, by oral administration, a nonparalytic infection or asymptomatic carrier state. Ward and his associates believe that their conclusions may serve as additional evidence to support a working hypothesis which may be tentatively adopted to guide further investigations along similar lines. The next step might well be a control experimental study on the effect of reducing the number of flies during epidemics of poliomyelitis. As the evidence already accumulated this year indicates that poliomyelitis may be as widespread as in 1944, such a study might be carried out this summer. The efficiency of DDT in controlling flies may demand its use on a large scale when an epidemic of infantile paralysis threatens.

A NEW VECTOR FOR EQUINE ENCEPHALOMYELITIS

In a survey for the presence of type specific antibodies in the human and animal populations of the St. Louis area, Margaret Smith and her associates [1] of Washington University School of Medicine learned that few persons who had come into St. Louis County since the 1937 epidemic of encephalitis showed neutralizing antibodies specific for this virus. A large percentage of the local domestic fowls approximately 1 year of age, however, were carriers of this specific antibody. This led to the belief that some insect vector that does not bite man was mainly responsible for the spread of St. Louis encephalitis virus among domestic fowls.

Blattner [2] had shown that certain ticks (Dermacentor variabilis) become infected with this virus and transmit it by bite to susceptible animals. Infected ticks transmit the virus to their offspring for innumerable generations. Smith therefore turned her attention to the common chick mite, which belongs to the same order of Arachnida as the tick. Mites were collected from coops in which there were 2 or more chickens whose serums contained specific neutralizing antibodies for the St. Louis virus. The mites were stored in test tubes for seven to thirty days without feeding. At the end of this time 60 mites were triturated in an agate mortar in tryptose broth, and 0.1 cc. of the supernatant fluid was inoculated intraperitoneally into 11 to 19 day old Swiss mice.

Several members of each inoculated group developed typical symptoms of encephalitis. The bacteriologically sterile brains of these mice were used for the inoculation of other mice. Neutralization tests with specific antiserums showed that the virus thus propagated is qualitatively identical with the standard laboratory strain of St. Louis encephalitis virus originally isolated from a human case. Assuming that hereditary transmission of the virus takes place in infected mites, Smith concluded that infected mites may well account for the permanence of the viral infection of domestic fowls in the St. Louis area. Sporadic human cases were presumably due to an occasional mosquito borne infection from these infected domestic fowls.

Adopting a similar technic, Sulkin [3] of the Department of Bacteriology, Southwestern Medical College, collected chicken mites (Dermanyssus gallinae), fowl ticks (Argus persicus) and serums from barnyard fowls in nine ranches and farms in Dallas County, the center of the 1944 epidemic of equine encephalomyelitis. The mites and ticks were kept in test tubes for several days without feeding and then used for inoculation of both mice and guinea pigs. In a typical test a pool of approximately 100 mites was triturated in broth in an agate mortar and centrifuged at 5,000 revolutions per minute for ten minutes. The supernatant fluid was inoculated intraperitoneally into 10 to 12 day old Swiss mice or 250 gram guinea pigs.

All guinea pigs and half of the mice thus inoculated showed typical symptoms of encephalitis by the fourth to the fifth day. The bacteriologically sterile brains of these animals were used for subsequent intracerebral inoculations of other animals. Filtration experiments and neutralization tests showed that the infectious agent thus transmitted was a typical Western type strain of equine encephalomyelitis virus. Experiments are now in progress to determine whether or not hereditary transmission of this strain takes places in infected chicken mites.

Sulkin's demonstration that chicken mites presumably form a permanent depot for equine encephalomyelitis virus in Dallas County from which hens may be directly infected and man and horses infected indirectly by other insect vectors (mosquitoes) is highly significant. Practical measures to protect horses from this infection might greatly reduce the incidence of several virus diseases in man.

1. Smith, Margaret G.; Blattner, Russell J., and Heys, Florence M.: Science **100**: 362 (Oct. 20) 1944.
2. Blattner, R. J., and Heys, Florence M.: J. Exper. Med. **79**: 439 (April) 1944.
3. Sulkin, S. Edward: Science **101**: 381 (April 13) 1945.

Current Comment

SENATOR WAGNER COMMENTS ON HIS BILL

Under Correspondence in this issue of THE JOURNAL appears a letter sent by Senator Robert F. Wagner of New York to the Editor of THE JOURNAL with the request that it be printed. In the letter Senator Wagner states unequivocally that he is opposed to state medicine or socialized medicine. He does not, however, state his definitions of state medicine and of socialized medicine. Regardless of these definitions, physicians will need to be convinced that a compulsory sickness insurance system centralized in Washington, with payments of all funds for medical and hospital care by a central agency, is neither state medicine nor socialized medicine.

IMMUNITY TO SHIGELLA PARADYSENTERIAE

The prophylactic immunization of man against bacillary dysentery has proved to be a difficult problem. At the Rockefeller Institute for Medical Research 19 healthy volunteers were divided into three groups, each of which received stated doses of a specific antigen or polysaccharide isolated from an acetone killed culture of a strain of Shigella paradysenteriae (Flexner) type V obtained from the collection of the Army Medical Center. According to Perlman,[1] all the volunteers developed a local reaction following the administration of the antigen. The reaction consisted of erythema, swelling and tenderness, which appeared in about four hours, reached a maximum in eighteen hours and completely subsided in thirty-six hours. The maximum response as measured in terms of agglutinins occurred two to three weeks after the last injection. The serum of each volunteer was tested also for agglutinins against the heterologous types of Flexner organisms. The results indicated that the antiserum evoked by the type V specific antigen agglutinates not only the homologous organisms but those of heterologous strains as well. The results indicate that the pooled serum of the immunized subjects possesses a tenfold increase in mouse protective antibodies for the homologous strain. The capacity of pooled serums to protect mice against infection with the heterologous organisms was likewise determined. This indicated a twofold increase in heterologous type Z mouse protective antibodies in the serums of the inoculated individuals. The agglutinin titer of the immunized persons fell moderately after a period of six months, but a good response was obtained with a small recall dose of antigen. Two of a group of 10 subjects inoculated with the specific polysaccharide obtained from type V organisms developed increased bacterial agglutinins. The possibility of developing a more active preparation of nontoxic nature for use in immunizing human beings to bacterial dysentery seems to be approaching.

1. Perlman, Ely; Binkley, Francis, and Goebel, Walther F.: Studies on the Flexner Group of Dysentery Bacilli: III. Antibody Response in Man Following the Administration of the Specific Antigen of Type V Shigella Paradysenteriae (Flexner), J. Exper. Med. 81: 349 (April) 1945.

TOLERANCE TO HEAT AND HUMIDITY AFTER ACCLIMATIZATION

Recent experience and recent experimental studies have thrown considerable light on the ability of the human body to work in hot dry or hot humid climates. Eichna and his colleagues [1] report an interesting study based on 13 volunteer white men who were subjected to varied environmental temperatures and humidity after acclimatization to dry and humid heat. The 13 men worked simultaneously, marching in single file around a 77 foot track at 3 miles per hour. Each man carried a 20 pound pack. This work rate was previously determined to amount to a total energy expenditure of 250 to 300 calories per hour. The standard work consisted of four hours of continuous marching without rest and without leaving the hot environment. At hourly intervals the men halted and stood for two to three minutes while their heart rates, rectal temperatures and respiratory rates were determined. In the more severe environments the men first worked for two hours in the morning and two hours in the afternoon before attempting the standard four hours of continuous effort. Records were kept of the symptoms, complaints and general appearance of the men during work. While in the hot environment all water drunk, urine voided and gastric contents vomited were carefully measured and recorded. The skin temperatures of six areas of the body were determined with a radiometer immediately on completion of the work. Whenever disability forced a man to discontinue marching before the standard time, the final observations were made immediately and the time was recorded. The conclusions drawn from these studies apply only to upper environmental limits determined under the conditions of the study and for environments in which the dry bulb temperature ranges between 93 and 121 F. and the wet bulb temperature between 90 and 96 F. At the upper environmental limits a narrow range of wet bulb temperature, 4 to 5 degrees F., separates environments in which work is relatively easy from those in which work is impossible. When the wet bulb temperature is below 91 F. men work easily and efficiently and suffer only mild physiologic changes. Between 91 and 94 F. wet bulb temperatures, prolonged moderately hard work is possible but efficiency is lost and the men work with difficulty, lose vigor and alertness and suffer undesirable physiologic effects. Total disability occurs in most men from moderately hard work at wet bulb temperatures of 94 F. and higher. Men who work longer than one hour at these temperatures show greatly decreased tolerance. At a dry bulb temperature of 120 F. sweating is extremely profuse, in most men averaging 2 to 3 liters per hour. This is considered the upper environmental limit for the dry bulb temperature. Above the upper environmental limits stated, acclimatized men develop severe physiologic changes and undesirable, frequently disabling symptoms similar to those sustained by unacclimatized men when first working in the heat.

1. Eichna, Ludwig. W., and others: The Upper Limits of Environmental Heat and Humidity Tolerated by Acclimatized Men Working in Hot Environments, J. Indust Hyg. & Toxicol. 27: 59 (March) 1945

MEDICINE AND THE WAR

ARMY

SURGEON GENERAL OUTLINES PERSONNEL RELEASE POLICY

Substantial releases of Army Medical Department personnel will not take place before the latter part of this year, Surg. Gen. Norman T. Kirk said in announcing a policy on discharges in conformity with War Department procedures. This is due to the fact that the peak of the Medical Department's activities will not be reached until fall.

In formulating the policy, consideration was given to civilian needs for professional medical, dental and veterinary care without weakening military needs. Other factors considered were the length of time necessary for personnel to complete their work in the Mediterranean and European theaters and return to the United States; replacement of Medical Department personnel in active theaters by those who have not had overseas duty; necessity for the maintenance of a high standard of medical care; the heavy load of patients in the United States; evacuation of the sick and wounded from Europe in the next ninety days, and continuing medical service in the Pacific.

The policy applies with equal effect to Army medical officers assigned to the Veterans Administration and other agencies.

It reads:

Medical Corps

(*a*) Officers whose services are essential to military necessity will not be separated from the service.

(*b*) Officers above 50 years of age whose specialist qualifications are not needed within the Army will receive a high preferential priority for release from active duty.

(*c*) Adjusted service ratings will be utilized as a definite guide to determining those who are to be separated.

Medical Administrative Corps

(*a*) Officers whose services are essential to military necessity will not be separated.

(*b*) Officers who express a desire to stay on duty shall be allowed to do so if vacancies exist. In the event there are more wishing to stay than there are vacancies, those with the highest efficiency index will be retained.

(*c*) Those who wish to be released will be selected on the basis of adjusted service scores.

Dental Corps

(*a*) Officers whose services are essential to military necessity will not be separated from the service.

(*b*) Officers above 50 years of age whose specialist qualifications are not needed within the Army will receive high preferential priority for release from active duty.

(*c*) Adjusted service ratings will be utilized as a definite guide in determining those who are to be separated.

Army Nurse Corps

(*a*) All nurses whose husbands have been released from active duty will be discharged on request when release of husband is proved.

(*b*) No officer will be separated whose services are essential.

(*c*) Officers with children under 18 years of age who wish to be released will receive a high preferential priority for selection.

(*d*) Adjusted service scores will govern other cases.

Medical Department Dietitians and Physical Therapists

(*a*) All Medical Department dietitians and Medical Department physical therapists whose husbands have been released from active duty will be discharged on request when release of husband is proved.

(*b*) Military necessity will govern all others. Since there is a shortage of these officers, it is not contemplated that others will be released from the service except in *a*.

Veterinary Corps

(*a*) Since there are insufficient officers to meet the present requirements, it is not contemplated that any officers will be released from the service.

Sanitary Corps

(*a*) Officers whose services are needed will not be separated.

(*b*) Officers who express a desire to stay on duty shall be allowed to do so if vacancies exist. In the event there are more wishing to stay than there are vacancies, those with the highest efficiency index will be retained.

(*c*) Those who wish to be released will be selected on the basis of adjusted service scores.

PENICILLIN SHORTENS CONVALESCENT PERIOD

According to a recent release from the U. S. Army General Hospital at Camp Pickett, Va., penicillin shortens by three to six months the average convalescence of American soldiers with limbs shattered by shrapnel or bullets in World War II. Lieut. Col. J. S. Norman, chief of the orthopedic service at Camp Pickett, stated that several million units of penicillin is administered during every twenty-four hour cycle to from 300 to 500 soldier patients. In many cases the penicillin treatment had begun immediately after a soldier was carried from the battlefield. From then on, at base hospitals overseas and on through treatment of the soldiers at army general hospitals in the United States, expert administering of penicillin continues. Almost without exception, infection is vanquished. Thus, surgery to mend shattered bones is rendered much easier and final healing itself is expedited.

Colonel Norman also stressed the improvement of other technics concerning treatment of smashed bones. In addition to the steady advance of hospital science as a whole picture, he pointed out that rapid development of traction devices and scientifically designed orthopedic braces play indispensable roles in the knitting back to normal of our fighting men's shattered limbs.

ARMY ENROLLS FULL QUOTA OF OCCUPATIONAL THERAPISTS

Mrs. W. C. Kahmann, chief of the Occupational Therapy Branch of the Army Medical Department, recently announced that occupational therapists' emergency training courses will be terminated as soon as those courses scheduled for June and July have been completed. The courses were initiated last July to overcome a serious shortage of occupational therapists in army hospitals. The full quota of students has now been enrolled, and no further application will be considered. Under this emergency training program 700 college women were enrolled and on completion of their schooling will assist in the reconditioning of army sick and wounded soldiers.

CAPTURE LARGEST NAZI MEDICAL SUPPLY DEPOT

In a recent release from the Office of the Surgeon General, it was stated that Germany's largest military medical supply depot at Ihringhausen fell into American hands recently when the 80th Infantry Division captured Kassel. According to the division surgeon, Lieut. Col. Harold J. Hallock, Winamac, Ind., it contained $100,000 worth of new surgical instruments of excellent quality, vast stores of pharmaceutical supplies and complete facilities for the production of pills, medical capsules, vials and precision instruments. Nearly 4,200 gallons of wood alcohol was found buried there.

The first army medical officer to enter the depot, Capt. Henry J. Meyer, Minneapolis, said that in strict observance of the Geneva Convention the German medical personnel left the plant and all medical supplies undamaged. All bacteriologic cultures and disease inoculated animals in the adjoining experimental laboratories had been destroyed prior to capture.

The plant and supplies will be used by the Army Medical Department to ease the drain on our own supplies by captured German military and civilian hospitals.

BRITISH GRATEFUL FOR "DEVOTED CARE"

Surg. Gen. Norman T. Kirk has received a copy of a formal letter of appreciation written by Lieut. Gen. G. N. MacReady of the British Joint Staff Mission on the liberation of British prisoners of war in the Philippines. Gen. Sir Ronald S. Adam, Adjutant General to the forces, is quoted in the letter as stating that all British prisoners liberated from Cabanatuan and Bilibid "speak in glowing terms of the devoted care given to them by American troops after their release, as well as of the excellent administrative and medical arrangements made in the Southwest Pacific area and in the United States for their homecoming." The letter conveys "the deep appreciation and warm thanks" of the British Army Council to all concerned.

ARMY AWARDS AND COMMENDATIONS

Captain Logan B. Hull

Capt. Logan B. Hull, formerly of Altoona, Pa., was recently awarded a special commendation for the magnificent way he and medical units under his command performed their duties handling heavy American casualties in September and October near Andelst, Holland. The citation read "It is recommended that Capt. Logan B. Hull, M. C., Capt. Samuel C. Feiler, D. C., 1st Lieut. Everett C. Vogt, M. A. C., the enlisted men of the regimental headquarters section, medical detachment, this regiment (the 506th parachute infantry) and the men attached to this section from the 326th medical company, be cited in orders or receive a letter of commendation for the prompt and efficient treatment and evacuation of over 700 United States and Allied casualties from Sept. 17, 1944 to Oct. 11, 1944. Over 200 of these casualties were treated between Oct. 5 and 7, 1945 in the vicinity of Andelst, Holland, during which period all personnel worked for over thirty-six hours without sleep and under intermittent fire, one 210 mm. shell passing through the roof of the aid station and exploding in the front courtyard. This service, though within the call of duty, was carried out so efficiently and faithfully throughout this period of time that the early recovery of many was assured and the lives of some of our soldiers were saved by the meritorious actions of Captain Hull and those under his command." Dr. Hull graduated from the University of Pittsburgh School of Medicine in 1939 and entered the service Feb. 1, 1941.

Lieutenant Colonel J. Roy Theriot Jr.

The Bronze Star was recently awarded to Lieut Col. J. Roy Theriot Jr., formerly of Houston, Texas, for his untiring efforts in reducing the sickness rate and number of lost man hours, and improving the general health of the 8th Air Force Service Command. He received the Presidential Unit Citation when with the 95th Bomb Group before his assignment to the 8th Air Force Service Command. Dr. Theriot graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1930 and entered the service May 14, 1942.

Captain Merwin E. Buchwald

The Bronze Star was recently awarded to Capt. Merwin E. Buchwald, formerly of Brooklyn, for heroic achievement in action on the Fifth Army front in northern Italy. He is serving with the 178th Field Artillery Battalion, attached to the second corps. Dr. Buchwald graduated from Duke University School of Medicine, Durham, in 1941 and entered the service March 27, 1943.

Captain Milton M. Sisson

Capt. Milton M. Sisson, formerly of Greenfield, Mass., was recently awarded the Bronze Star for meritorious service in combat from May 6, 1944 to October 1944 in Italy. The citation accompanying the award read "On Sept. 27, 1944, Company C collecting station was located one mile south of Caestel del Rio, Italy, when the rain washed out a by-pass, blocking the route of evacuation to the rear. As a result, 44 casualties accumulated at the station. By his foresight Captain Sisson had a sufficient stock of food, dry clothes and medical supplies to care for the great influx of patients during the emergency. During the night the area was subjected to an intense enemy artillery barrage, scoring two direct hits on the station. Throughout the barrage Captain Sisson coolly made his rounds, reassuring the patients and comforting them to prevent panic. Captain Sisson showed his continuous initiative by devising a rubber stamp form for the supplemental medical record of the emergency medical tag. This stamp was accepted as a standard for all companies of the medical battalion. His inspirational leadership, calm manner, mature medical judgment and constant devotion to duty has resulted in establishing the highest ideals for medical service." Dr. Sisson graduated from Tufts College Medical School, Boston, in 1932 and entered the service in October 1943.

Major Evan L. Garrett

The Bronze Medal and citation was recently awarded to Major Evan L. Garrett, formerly of Murray, Ky., "for meritorious service in connection with military operations against an enemy of the United States from Aug. 19, 1944 to Feb. 19, 1945. Major Garrett, chief of the surgical service, Sixth Convalescent Hospital, distinguished himself by his outstanding performance of duty. The exceptional professional skill he displayed was an important contribution to the high standards of efficiency achieved and maintained by his organization; his accomplishments and loyal, untiring devotion to duty reflect great credit on himself and on the military service." Dr. Garrett graduated from the College of Medical Evangelists, Los Angeles, in 1936 and entered the service April 22, 1941.

Captain Adrian Z. Leon

Capt. Adrian Z. Leon, formerly of New York, was recently awarded the Bronze Star "for meritorious service in action. During the period Nov. 30 to Dec. 1, 1944 in the vicinity of Dambache-la-Ville, France, Lieutenant Leon tirelessly and diligently treated the wounded under the most trying conditions. Working night and day, he taxed his professional skill to its utmost, enabling many of the lighter casualties to return to the line. Taking no heed of personal physical exhaustion, he was always available when conditions necessitated his presence. His superb ability and untiring efforts served as an inspiration to all." Dr. Leon graduated from the University of Montpellier Faculty of Medicine, France, in 1936 and entered the service early in 1944.

Major Anthony A. Nardone

Major Anthony A. Nardone, formerly of Philadelphia, was recently awarded the Bronze Star for meritorious service in Germany from Nov. 16, 1944 to Feb. 1, 1945 in connection with military operations against the enemy. As regimental surgeon Major Nardone performed his duties in an outstanding manner. Because of his tireless efforts he achieved a highly efficient system in his detachment which contributed greatly to saving the lives of wounded men. His devotion to duty and consistent effort reflect great credit on himself and on the military service. Dr. Nardone graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1929 and entered the service March 1, 1941.

Lieutenant Colonel Joseph H. Clevenger

The Bronze Star was recently presented to Lieut. Col. Joseph H. Clevenger, formerly of Muncie, Ind., for meritorious service. Dr. Clevenger, who has been commanding officer in charge of a field hospital, left his unit in Belgium recently because of injuries and has been returned to this country for treatment. The field hospital of which he was in command also has been awarded the meritorious service unit plaque. Dr. Clevenger graduated from Northwestern University Medical School, Chicago, in 1927 and entered the service Aug. 13, 1942.

Captain Shepard G. Aronson

The Bronze Star was recently bestowed on Capt. Shepard G. Aronson, formerly of Brooklyn, "for meritorious achievement in connection with military operations against the enemy at . . . from . . . to . . . Captain Aronson personally directed the officers and enlisted personnel of a surgical operating room in addition to performing surgery himself, giving life saving service to liberated civilian internees, military personnel and Filipino guerillas at a site which was receiving enemy artillery fire. He continued his heroic leadership through a time when three shells struck the front of the building and numerous others fell in the adjacent frontal area. One burst was so close that flying glass, plaster and shell fragments caused casualties in the operating room. Twice, when shells were falling most frequently, it was suggested by the commanding officer of the hospital that he temporarily seek safety, but Captain Aronson elected to continue. He had about ten hours' rest during the five day period. Through his tireless, skilful and creditable behavior not only lives and limbs were saved but hundreds of people were influenced with a spirit of order at a time and place threatened by chaos." Dr. Aronson graduated from Cornell University Medical College, New York, in 1937 and entered the service Oct. 12, 1942.

Captain Herman F. Van Ark

The Silver Star was recently awarded to Capt. Herman F. Van Ark, formerly of Hartford, Wis., for gallantry in action. The citation was for rescuing two wounded American soldiers under heavy fire in France. Dr. Van Ark graduated from Marquette University School of Medicine, Milwaukee, in 1942 and entered the service Feb. 22, 1943.

Colonel Neville M. McNerney

The Bronze Star was recently awarded to Col. Neville M. McNerney, formerly of Cleveland Heights, Ohio. He has been serving as a commanding officer of a hospital center in England and he also acts as an inspector for a group of army hospitals. Dr. McNerney graduated from the Cleveland-Pulte Medical College in 1913 and entered the service Oct. 15, 1940.

MISCELLANEOUS

RED CROSS HOSPITAL PROGRAM NEEDS 3,000 WORKERS

The American Red Cross needs 750 trained social workers at once for supervisory, administrative and staff positions in military hospitals, largely in the United States. The wounded and disabled returned to this country for further treatment need the skilled help of trained and experienced social workers. New and higher salary schedules, ranging from $170 to $350 monthly, depending on education, experience and job assignment, have been adopted by the Red Cross, as have also annual increments and promotions. Quarters are provided and, if not available at the hospital, an additional allowance is made. Free uniforms are also issued.

In addition 1,650 untrained and partially trained workers are needed by the Red Cross to serve in the area of social case work under professional guidance. Salaries range from $140 to $200 monthly. The hospital program also calls for 600 recreation workers at monthly salaries of $150 to $325.

The project for which these 3,000 hospital workers are being recruited will continue for many years. Despite this, however, employment will be offered by the Red Cross to any qualified workers willing to serve a minimum of one year. Applications should be filed at the nearest Red Cross area office: North Atlantic Area, 300 Fourth Avenue, New York 10; Eastern Area, 615 N. St. Asaph Street, Alexandria, Va.; Southeastern Area, 230 Spring Street N.W., Atlanta 3, Ga.; Midwest Area, 1709 Washington Avenue, St. Louis 3, and Pacific Area, Civic Auditorium, Larkin and Grove streets, San Francisco 1.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Station Hospital, Chico Army Air Field: The Pneumonias, Dr. Henry D. Brainerd, June 24.

Station Hospital, Stockton Army Air Base: Experiences with Infectious Diseases in Army Camps in England, Dr. Gordon E. Hein, June 27.

Birmingham General Hospital, Van Nuys: Observations on the Management of Burns and Their Plastic Repair, Capt. Harold L. D. Kirkham, June 27.

A. A. F. Regional Hospital, March Field, Riverside: Peritoneoscopy, Capt. John Ruddock, June 19.

U. S. Naval Hospital, Long Beach: Pathogenesis of Rheumatic Fever, Lieut. Comdr. Robert W. Huntington Jr., June 20.

U. S. Naval Hospital, Corona: Surgical Conditions of the Liver and Its Ducts, Capt. E. E. Larson, June 28.

Station Hospital, Camp Cook, Lompoc: Cardiac Pain, Capt. Arthur Twiss, June 20.

Hoff General Hospital, Santa Barbara: Cardiac Pain, Capt. Arthur Twiss, June 20.

A. A. F. Regional and Convalescent Hospital, Santa Ana Army Air Base; Differential Diagnosis of Hysterias, Dr. John Neilson, June 19.

U. S. Naval Hospital, Santa Margarita Ranch, Oceanside: Injuries of the Ureter, Lieut. Comdr. C. P. Rusche, June 14; Selection of Proper Agent and Method in War Surgery, Lieut. L. E. Trotter, June 28.

Indiana

Billings General Hospital, Fort Benjamin Harrison: Psychosomatic Medicine, Dr. David Slight, June 13; Wound Healing and Tendon Surgery, Dr. Sumner Koch and Lieut. Col. Preston, June 20; Mental Hygiene and the Prevention of Neuroses in War, Col. William J. Bleckwenn, June 27.

Wakeman General Hospital, Camp Atterbury: Mental Hygiene and the Prevention of Neuroses in War, Col. William J. Bleckwenn, June 13; Thrombosis, Thrombophlebitis and Anticoagulants in Less Common Peripheral Vascular Diseases, Major Reed and Dr. Robert McVandivier, June 20; Peptic Ulcer, Gallbladder and Liver Diseases, Drs. Lester Dragstedt and W. D. Gatch, June 27.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, May 26, page 295)

ILLINOIS

Lutheran Deaconess Home and Hospital, Chicago. Capacity, 218; admissions, 6,265. Mr. E. E. Hanson, Superintendent (2 interns, October 1).

MICHIGAN

City of Detroit Receiving Hospital, Detroit. Capacity, 640; admissions, 17,540. Dr. R. R. Piper, Medical Superintendent (assistant resident—otolaryngology, July 1).

MISSOURI

Alexian Brothers Hospital, St. Louis. Capacity, 176; admissions, 2,163. Brother Athanasius, R.N., Superintendent (resident—mixed service, July 1).

Christian Hospital, St. Louis. Capacity, 135; admissions, 2,925. Miss Mildred Morris, R.N., Superintendent (interns).

NEW YORK

Goldwater Memorial Hospital, New York City. Capacity, 1,660; admissions, 1,676. Dr. C. G. Scherf, Medical Superintendent (6 interns, July 1).

Lincoln Hospital, New York City. Capacity, 469; admissions, 9,546. Dr. Herman E. Bauer, Medical Superintendent (resident—medicine, assistant resident—medicine, July 1).

St. Agnes Hospital, White Plains. Capacity, 177; admissions, 2,695. Sister M. Madeline, R.N., Superintendent (interns).

SOUTH CAROLINA

Greenville General Hospital, Greenville. Capacity, 355; admissions, 8,515. Mr. J. B. Norman, Superintendent (interns).

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

June 4, 1945.

Congress Favors Bill to Create Veterans Medical Department

Both sides of the House are favorably disposed toward the proposed Veterans Administration reorganization which would establish a bureau of medicine and surgery within the agency, having independent status similar to the Army and Navy Medical Corps. In fact, both Republicans and Democrats claim credit for the idea. Democratic Representative Rankin, who introduced a bill which Representative Rogers, Republican of Massachusetts, said she "had been working on for months," said the measure would give the Veterans Administration power to replace "undesirable" members of its present medical and nursing staffs.

Veterans Administrator Hines has submitted for approval of the Federal Board of Hospitalization what he describes as "the greatest hospital construction program ever undertaken by the administration." He said that it contemplates either construction of or additions to seventy-three facilities located in all parts of the United States and will provide 26,772 beds, of which 15,333 are for general medical and surgical, 2,413 for tuberculous and 8,137 for neuropsychiatric patients, and the other 889 for domiciliary members. The cost of the program is estimated at $180,000,000. In addition to the new beds already provided, General Hines said that the Veterans Administration is now constructing new facilities or additions to existing facilities that will provide 13,525 beds. Other construction being developed will provide 16,442 more. He explains that plans are already launched to provide a total of 133,075 hospital beds, which compares with 61,845 at the time of Pearl Harbor. Of these projected beds 90,073 will be ready for occupancy this year and 105,762 will be completed in 1946. These figures do not include the 14,079 domiciliary beds in existence at present.

Chemical Manufacturers Standardize Labeling

The Manufacturing Chemists Association announces that the "first comprehensive effort" to systematize and standardize the labeling of hazardous chemicals has been completed after a year's work and results are being published. A manual titled "A Guide for the Preparation of Warning Labels for Hazardous Chemicals" has been prepared by a special labels and precautionary information committee of the association. The principal objective is to discourage dependence on code labels which leave the user with no information about the product. The manual outlines the principles that should govern preparation of precautionary labels, with emphasis on protecting the users, handlers, repackers, jobbers and distributors of chemical products and others who may be less familiar with them than the manufacturers. Basic considerations in preparation of precautionary labels are regarded as (1) determination of hazards present in the particular chemical, (2) selection of appropriate statements for each hazard and (3) arrangements of statements in order of emphasis desired.

Labor Secretary Perkins to Testify Before Committee

Secretary of Labor Frances M. Perkins will testify June 6 before the House subcommittee investigating aid to the physically handicapped in what will be one of her last official appearances on Capitol Hill before she resigns July 1 to be succeeded by Judge Schwellenbach. Secretary Perkins will describe the accident program sponsored by the Bureau of Labor Standards. Chairman Augustine B. Kelley, Democrat of Pennsylvania, has asked her for recommendations which might be followed by the government to reduce accidents in industry.

Scheduled also to testify are William H. Ivey and Lewis E. McBrayne of the National Committee for the Conservation of Manpower in Industry. To be heard June 7 are John W. Gibson, president of the Michigan C. I. O. Council and former Michigan state commissioner of labor, J. A. Haller of the Maryland State Industrial Accident Commission and Fred C. Thomas, director of the District of Columbia Industrial Safety Division.

Criticism of Navy Promotions by Civilian Dentists

Navy dental officers have "no chance for advancement," charged Dr. Sterling V. Mead, president of the American Dental Association, in testimony before the Senate Naval Affairs Committee, on a bill to separate the Navy medical and dental departments. Vice Admiral Ross T. McIntire, head of the departments and formerly personal physician to President Roosevelt, has opposed the bill, declaring that to separate the two departments would lessen morale and affect medical attention to personnel aboard a ship. The dental officials pointed out that the highest rank a dental officer in the fleet or the Marine Corps field service can get is lieutenant commander. Dental officials accuse the Navy of resorting to "reprisals and insincerity" in treatment of dental officers and personnel.

Extension of Policy on Providing Prosthetic Appliances

Veterans Administrator Hines has announced in a letter to all agency stations that the policy has been extended on provision of supplementary or emergency limbs to include braces and other types of prosthetic appliances. How many veterans will be affected cannot now be estimated. The Army alone has reported 8,470 leg amputations and 2,530 arm amputations. The Navy has not issued comparative figures. The number of veterans who will require other types of prostheses or artificial limbs is said to be entirely "problematic."

Appeal Opposed in Vitamin D Patent Suits

Claiming a misleading presentation of facts, Vitamin Technologists, Inc., of Los Angeles, has opposed the appeal of the Wisconsin Alumni Research Foundation for a Supreme Court hearing of the suit. The vitamin corporation, in a brief urging the court to refuse to hear the case, complained that the foundation had raised questions pertaining to a misuse of the patents which could not be presented "because the Ninth Circuit Court of Appeals does not base its decision on that ground." Patents cover the use of vitamin D in the treatment of rickets and are based on discoveries of Dr. Harry Steenbock, Wisconsin University professor, in producing vitamin D in foods and medicines by exposure to ultraviolet rays.

Election of Dr. William P. Herbst Jr.

Dr. William P. Herbst Jr. has been chosen president-elect of the Medical Society of the District of Columbia, with Dr. Fred A. J. Geier first vice president, Dr. Dorothy S. Jaeger second vice president, Dr. William M. Ballinger member of executive board, Dr. Coursen B. Conklin delegate to the American Medical Association, Dr. Arch L. Riddick alternate and Dr. Harry F. Dowling member of the board of censors. Dr. William Earl Clark, who was named president-elect last year, will take over as president of the society on July 1.

Lieut. Col. James N. Greear Jr., this year's president, was ordered overseas several months ago, and on his departure Dr. William N. Ballinger was appointed acting president and will serve until Dr. Clark is installed. The board of censors has recommended to the society "the desirability of amending the society's constitution and by-laws so that applicants will be accepted for a probationary period of one year and be elected by the excutive board rather than by the society's membership. Reasons are that (1) it is difficult to determine in

advance the desirability of a physician as a member and (2) only a few members take an active part in the election of new members.

Well received was the address by Dr. Joseph S. Lawrence, executive director of the Council on Medical Service and Public Relations, head of the Council's Washington office, who discussed "Public Opinion will Determine Medicine's Future."

Secretary Theodore Wiprud, secretary of the society, reported a steady increase in membership from 1,118 in 1941 to 1,?25 in 1945.

Meeting of Regional Civil Service Commission Doctors

The responsibility of the Civil Service Commission in the medical field was explained when chiefs of regional medical divisions met here. Placement of the physically handicapped and problems relating to various regions were discussed. Speakers included Dr. Schoul Levison, Boston; Dr. Maurice Klein, Cincinnati; Dr. Frank Patterson, St. Louis; Dr. F. J. Fanning, Seattle, and Dr. Francis Quinn, San Francisco.

One Adult in Seven Dies of Cancer, Dr. Adair States

Guests at a luncheon of the District of Columbia cancer campaign included members of scientific, legislative, business and welfare groups of Washington. Dr. Frank Adair explained that the present United States cancer mortality rate is so high that one adult in seven can expect to die of the disease.

Capital Notes

The Senate passed and sent to the House a bill amending the District of Columbia code so that either before trial or after conviction a defendant in a criminal case may be sent by judges of the local courts to Gallinger Municipal Hospital for mental examination.

Employee preventive health services made possible the employment of persons with diabetes, hitherto lost to industry, in air line "ground positions" during the manpower shortage, Dr. L. G. Lederer, medical director of Pennsylvania-Central Airlines, states.

Long the medical guardians of the late President Roosevelt, Bethesda civilian and naval personnel are wondering whether President Truman, as an Army man, will go to Walter Reed hospital if he needs medical attention.

The Navy needs 4,000 additional reserve officers in its Medical Corps, and physicians who are interested should get in touch either with the Naval Officer Procurement Branch in Washington or with their local procurement and assignment service.

Need to coordinate Washington's psychiatric diagnostic services with other community public services was stressed at meetings of the Committee on National Conference of Social Work.

The District commissioners were asked to lend support to construction of a $557,000 home in the country for rehabilitation of Washington alcoholic addicts.

Dr. Janvier W. Lindsay, aged 64, was none the worse after the experience of being kidnapped by three men while hurrying to the bedside of a young patient with life saving plasma. He is pathologist and staff physician at the Episcopal Eye, Ear, Nose and Throat Hospital.

Six tons of protein hydrolysates, the largest consignment of drugs ever to leave this country, was shipped to a Dutch port to help save the lives of thousands of starving Hollanders.

Infantile paralysis is increasing in New England and in the Middle and South Atlantic states this year, but only 2 cases have been reported in Washington this year, according to Dr. James E. Cumming, chief of the Bureau of Communicable Diseases.

Bureau of Information

COMPLETE REPORTS FROM ARIZONA, LOUISIANA, NEVADA, WISCONSIN AND THE DISTRICT OF COLUMBIA

Completed county summary sheets have been received from Dr. Frank J. Milloy, Dr. P. T. Talbot, Dr. M. J. Thorpe and Mr. C. H. Crownhart, secretaries of the State Medical Societies of Arizona, Louisiana, Nevada and Wisconsin respectively and from Mr. Theodore Wiprud, secretary of the Medical Society of the District of Columbia.

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Arizona					
Apache		23,345	4	5,836	178
Coconino		18,043	2	9,025	23
	Flagstaff	*5,050*			
	Williams	2,622			
Navajo		28,521	4	7,130	39
	Winslow	4,577			
Santa Cruz		8,357	8	1,045	17
	Nogales	5,135			
Yuma		34,987	5	6,997	32
	Yuma	5,325			
Louisiana					
Avoyelles		34,289	7	4,898	67
	Bunkie	3,575			
Catahoula		12,252	2	6,126	161
De Soto		25,803	6	4,300	43
	Mansfield	4,065			
Orleans		545,041	432	1,262	6
	New Orleans	494,537			
Terrebonpe		35,334	7	5,048	30
	Houma	9,052			
Nevada					
Clark		36,508	14	2,608	48
	Las Vegas	8,422			
Douglas		1,603	2	802	5
Elko		9,722	6	1,620	14
	Elko	4,004			
Humboldt		4,317	2	2,158	12
Nye		4,693	2	2,346	26
Wisconsin					
Crawford		15,148	9	1,683	8
	Prairie du Chien	4,622			
Douglas		45,772	19	2,409	8
	Superior	35,136			
Manitowoc		62,851	28	2,245	8
	Manitowoc	24,404			
	Two Rivers	10,302			
Marinette		31,145	15	2,076	13
	Marinette	14,183			
Wood		41,789	18	2,322	6
	Wisconsin Rapids	11,416			
	Marshfield	10,359			
District of Columbia					
District of Columbia	Washington	816,982	794	1,029	6

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

The accompanying table gives data from counties in each of these states. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. They are not included in computing physician population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the sta-

and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Social Security Act

On May 24 Senator Wagner, New York, for himself and Senator Murray, Montana, introduced his revised bill purporting to provide for the national security, health and public welfare, S. 1050. Representative Dingell, Michigan, introduced the companion bill in the House, H. R. 3293. An analysis of a part of this bill was published in THE JOURNAL, June 2. Other analyses will be published in early issues of THE JOURNAL.

A bill introduced by Representative Stewart, Oklahoma, S. 1021, contemplates an amendment to the Social Security Act to enable self-employed individuals to secure coverage under its old age and survivors' insurance provisions.

Veterans Administration

Representative Rankin, Mississippi, introduced on May 25 a bill to establish a Department or Bureau of Medicine and Surgery in the Veterans Administration, H. R. 3310. Representative Rogers, Massachusetts, introduced a similar bill, H. R. 3317, and a companion bill was introduced in the Senate by Senator Johnson, Colorado, S. 1079.

In addition to proposing a reorganization of the medical facilities of the Veterans Administration, these bills provide that any personnel needs of the several corps to be created in the Veterans Administration, including a Medical Corps, may be filled by assignment of selected or drafted persons and that commissioned, appointed or enlisted medical personnel of the Army or Navy may be detailed for service with the Veterans Administration when such detail, in the judgment of the heads of the agencies concerned, or of the President, will promote the public interests without impairing the efficiency of the service or services involved. Preliminary consideration was given to this legislation by the House Committee on World War Veterans' Legislation, May 29, and further consideration was postponed to a later date.

Representative Cannon, Florida, has introduced H. R. 3200 to provide that veterans shall not be denied care or treatment in Veterans Administration facilities for mental or nervous disorders because they have not been adjudged mentally incompetent.

Another bill introduced by Representative Barry, New York, H. R. 3332, would eliminate financial inability to defray expenses of hospital treatment or domiciliary care as a condition precedent to obtaining such treatment or care in a Veterans Administration facility.

Two bills, S. 977, introduced by Senator Morse, Oregon, for himself and Senator Cordon, Oregon, and H. R. 3337, introduced by Representative Harless, Arizona, propose aid in providing housing for veterans attending educational institutions under the G. I. Bill of Rights.

Brigadier General Hines has recommended to the Federal Board of Hospitalization, according to newspaper accounts, a $180,000,000 Veterans Administration hospital building program.

Selective Training and Service Act

Representative Judd, Minnesota, has introduced in the House of Representatives H. R. 3350, a bill to authorize the release of persons from active military service, and the deferment of persons from military service, in order to aid in making possible the education and training of physicians and dentists to meet essential needs. This bill, referred to the House Committee on Military Affairs, is substantially the same as the measure introduced by Senator Ellender, S. 637.

Industrial Health

The House Committee on Labor has reported, with amendments, the bill introduced by Representative Norton to provide for cooperation with state agencies administering labor laws in establishing and maintaining safe and proper working conditions in industry and in the preparation, promulgation enforcement of regulations to control industrial health haza One amendment would provide that in the operation of st plans the services and facilities of public health services in field of industrial hygiene shall be utilized to the extent t such services may be made available to the labor departme of the several states.

Physically Handicapped Persons

The House Committee on the Judiciary has reported H. Res. 23 with amendments, designating the first week in Octob of each year as National Employ the Physically Handicappe Week.

A bill introduced by Senator Myers, Pennsylvania, S. 98 seeks to prevent discrimination against blind persons and person with impaired visual acuity in the administration of the civ service laws and rules.

Health Education

Representative Landis, Indiana, has introduced H. R. 3055 to provide funds to assist the several states and territories in making adequate provisions, through the public schools, for physical education, educational health service, wider recreational use of school facilities and vocational guidance. This bill proposes an appropriation of $40,820,000 for each fiscal year. The sum of $92,000 will be allotted to each state for each Congressional district, $46,000 to be used in connection with programs of physical education and $46,000 to be used in connection with programs of vocational guidance. The provisions of this bill will be administered on a federal level by the United States Commissioner of Education.

Miscellaneous

The President has submitted a supplemental estimate in the amount of $2,300,000 for use in connection with the EMIC program for the fiscal year ending June 30 next.

S. 1037, introduced by Senator Barkley, Kentucky, would provide for water pollution activities by the United States Public Health Service.

A bill introduced by Senator Langer, North Dakota, S. 836, would authorize the appropriation of additional funds to assist the states and territories in promoting and financing vocatio and other training.

District of Columbia

Two bills would remove the restrictions to the appointme of retired officers of the United States Public Health Servi as superintendent of Gallinger Municipal Hospital in the Distri of Columbia, S. 1067, introduced by Senator Bilbo, Mississipp and H. R. 3257, introduced by Representative Randolph, Wes Virginia.

Two other bills, S. 1008, introduced by Senator Bilbo Mississippi, and H. R. 3236, introduced by Representativ McMillan, South Carolina, would enlarge the authority of th commissioners of the District of Columbia to make regulation to prevent and control the spread of communicable and pre ventable diseases.

Official Notes

COMMITTEE VISITS PRESIDENT TO URGE DEFERMENT OF PREMEDICAL AND MEDICAL STUDENTS

On May 31 a committee, including Dr. Evarts Graham, St. Louis, Dr. Victor Johnson, Secretary, Council on Medical Education and Hospitals, Chicago, Dr. Harvey Stone, member of the Board, Procurement and Assignment Service, Baltimore, and Dr. Fred C. Zapffe, Secretary of the Association of American Medical Colleges, Chicago, representing the Committee on Postwar Medical Service, called on the President of the United States in order to present to him a memorandum dealing with the supply of premedical and medical students, and physicians. Attention was called to the increased need of physicians by the civilian population, the Veterans Administration and the armed forces in the years to come. Within the next year the number of admissions of freshmen to medical schools will be reduced by about 5,000 because of the existing policies, and a corresponding reduction in the available physicians will follow. A complete memorandum is being forwarded directly to the President at his request in order to place all of the facts before him.

ELECTRICAL TRANSCRIPTIONS: KEEP COOL

In the good old summertime health problems exist just as at other times of the year, but they are very special health problems and many of them more nuisance than actual menace. Yet they do tend to spoil the vacation and detract from summer sports and relaxation. With this in mind the American Medical Association through the Bureau of Health Education offers to county medical societies a new series of twelve transcriptions under the title Keep Cool:

1. Suntan
2. Sunstroke and Heat Exhaustion
3. Exercise in the Summer
4. Health in Swimming
5. Water Safety
6. Light Summer Meals
7. Bugs
8. Poison Ivy
9. Keeping Cool
10. Hiking and Biking
11. Picnic Lunch
12. Hay Fever Time

These platters are twelve interviews with Dr. W. W. Bauer, interviewed by June Merrill of the staff of radio station WJJD, Chicago. These extremely informal conversations are recorded on ten minute platters, leaving four minutes and thirty seconds of the usual quarter hour of radio time for local use. Recommendations for such use are:

1. That the local medical society or health department designate a speaker to add local "angles" to the transcribed program.

2. That the radio stations be requested to fill in the time with recorded music.

3. That the transcription be "teamed" or bracketed with a five minute news summary, preferably with the news summary first followed by the transcription.

As with most transcriptions made available by the American Medical Association, these may be borrowed without charge by local medical societies or reputable local agencies when the loan is approved by the local medical society. The only expense to local groups is the nominal express charge for returning the records.

With the announcement of this series the Bureau of Health Education now offers a well rounded program of electrical transcriptions including Before the Doctor Comes (sixteen programs), Medicine Serves America (ten programs), Dodging Contagious Diseases (twelve programs), Live and Like It (twelve programs dramatized), More Life for You (thirteen programs) and the series announced herewith.

A separate series, Health Heroes, for use in elementary schools is also available but by purchase only.

Descriptive circulars will be sent on application. Address the Bureau of Health Education, American Medical Association, Chicago 10.

DOCTORS LOOK AHEAD

The current series of network broadcasts by the National Broadcasting Company and the American Medical Association will terminate with the program scheduled for June 30. Plans for a 1946 series will be announced in THE JOURNAL when ready.

Doctors Look Ahead is broadcast each Saturday at 4:30 p. m. Eastern War Time (3:30 p. m. Central War Time, 2:30 p. m. Mountain War Time and 1:30 p. m. Pacific War Time) except in Chicago, where each week's program as broadcast on the network will be heard on the next Saturday afternoon at 3 o'clock Central War Time.

The programs remaining to be broadcast are as follows:

June 9. They Shall Hear Again: A program devoted to the needs of the hard of hearing and indicating new opportunities for them through the use of hearing aids, lip reading, medical treatment and occasionally surgery. Guest speaker Howard A. Carter, B.S. in M. E., Secretary of the American Medical Association Council on Physical Medicine.

June 16. Home Was Never Like This: A program devoted to the possibilities of the American health resort or spa in the treatment of disease. Guest speaker Dr. Walter S. McClellan, chairman of the American Medical Association Committee on Health Resorts, speaking from New York.

June 23. Postwar Doctor: Problems in medical education and their influence on the public health. Guest speaker Dr. Victor Johnson, Secretary of the American Medical Association Council on Medical Education and Hospitals.

June 30. Health in Schools: A program devoted to health education and related topics in our schools, where doctors look ahead to greater progress in the next decade. Speaker Dr. Charles C. Wilson, Teachers College, Columbia University, speaking from New York.

Woman's Auxiliary

South Carolina

Col. Howard J. Hutter, post surgeon at Camp Croft Station Hospital, was guest speaker at the meeting of the Woman's Auxiliary to the Spartanburg County Medical Society recently. Colonel Hutter, an army medical officer in charge of the medical setup in the North African area, told of the work involved in choosing hospital sites, caring for the evacuation of the sick and wounded, maintaining medical supplies and establishing sanitation in North Africa. Stereopticon pictures of the hospital and supply depots in Oran and Sidi-bel-abbes were also shown.

Texas

The Neuces County auxiliary is compiling a list of names of blood donors to be made available to all physicians and hospitals in Corpus Christi as their first wartime project. The file will be kept at the Physicians Exchange.

Wyoming

The Woman's Auxiliary to the Sweetwater County Medical Society was organized last December. This is the first county to organize itself since the state auxiliary reorganized last year. Sweetwater County has done exceptional work in the Cadet Nurse project. Twenty-eight of its young women are now serving in hospitals throughout the state.

Medical Economic Abstracts

MICHIGAN MEDICAL SERVICE LIBERALIZES BENEFITS

Because of its financial experience, Michigan Medical Service has liberalized its benefits without increasing its rates. Effective April 1, the Medical Service removed the previous limit of $150 for surgical services provided under its schedule of benefits and performed at the same time or for the same condition, shortened the maternity waiting period from ten to nine months, removed entirely the waiting period on other obstetric conditions and provided for emergency surgical services for doctors in hospital outpatient departments. Nearly 800,000 subscribers were affected by the liberalization.

According to Dr. R. L. Novy, Michigan Medical Service president, group requests for enrolment in the Medical Service have risen to a new peak.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Gift to Alabama Medical College.—The Alabama Division of the Field Army of the American Cancer Society has presented to the Medical College of Alabama a set of 100 microscopic slides for study of cancer and other tumors. The slides were purchased from the Central Bureau for the Study of Tumors in Philadelphia.

Allied Health Council Organized.—The Allied Health Council of Alabama was recently organized to coordinate the activities of various health groups and to conduct an educational campaign to increase interest in the state's public health work. C. B. Bray, president of the Alabama Dental Association, and Mrs. Thelma M. Coburn, executive secretary of the Alabama Pharmaceutical Association, were named president and secretary treasurer respectively. The executive board consists of B. F. Sapienza, representing the Alabama Dental Association, Mrs. Walter Bragg Smith, representing the state nurses' association, Elbert W. Gibbs, representing the Alabama Pharmaceutical Association, Clyde L. Sibley, representing the Alabama Hospital Association, and Dr. Burton F. Austin, Montgomery, state health officer, representing the state health department.

CALIFORNIA

Howard Karsner Lectures.—Dr. Howard T. Karsner, professor of pathology and director of the Institute of Pathology, Western Reserve University School of Medicine, Cleveland, addressed the Los Angeles Academy of Medicine, May 11, on "Tumors of the Endocrine Glands."

County Society Opens New Offices.—The Alameda County Medical Association has rented the entire fifth floor of the Income Securities Building, 364 Fourteenth Street, Oakland, for its business office. The new executive secretary of the association is Mr. Rollen Waterson, who formerly held a similar position with the Lake County Medical Society, Hammond, Ind. (THE JOURNAL, March 31, p. 865). The Alameda County Medical Association has also chosen an attorney, Mr. Harold Huovinen, to advise in organizational business and tax problems.

Lectures on Psychoanalysis.—The San Francisco Psychoanalytic Society opened a course of lectures for physicians on "Introduction into Psychoanalysis" May 23. Dr. Jacob S. Kasanin, San Francisco, gave the first lecture, on "Psychoanalysis as a Medical Science." Other lecturers in the series include:

Siegfried Bernfeld, Ph.D., San Francisco, The Method of Psychoanalysis, May 30.
Dr. Erik H. Erikson, Berkeley, Etiolc [illegible] 6.
Dr. Bernhard Berliner, San Francisco, June 13.
Dr. Donald A. Macfarlane, Berkeley, erence in Medical Practice, June 20.
Dr. Emanuel Windholz, San Francisco, Psychosomatic Medicine, June 27.

CONNECTICUT

Grant for Work on Visual Functions.—The American Optical Company has given Yale University, New Haven, an additional grant in further support of the research program of the clinic of child development of the school of medicine. The grant covers the three year period 1945-1948 and finances investigations of the development of visual functions in the first ten years of life. The research work is being conducted on a cooperative basis by a medical and psychologic staff under the direction of Dr. Arnold L. Gesell, professor of child hygiene and director of the clinic of child development. Chief emphasis is being placed on problems of early diagnosis and of preventive control.

DISTRICT OF COLUMBIA

Seek Ban on Counter Sale of Sulfonamide Drugs.—The Medical Society of the District of Columbia on May 12 asked Dr. George C. Ruhland, health officer of the District, to ban all "over the counter sale" of sulfonamide preparations unless they are prescribed by a physician. The request came from the society's committee on public health, the chairman of which is Dr. Edward J. Stieglitz, and pointed out that "indiscriminate use of sulfa drugs sensitizes some individuals to an extent that they cannot later be benefited by use such drugs when they are badly needed," according to the Washington *Star*.

Lecture Named for Senator Sumner.—On May 24 the Medico-Chirurgical Society of the District of Columbia inaugurated the first annual Charles Sumner Lecture of the Medico-Chirurgical Society with a talk by Edmund V. Cowdry, Ph.D., professor and head of the department of anatomy, Washington University School of Medicine, St. Louis, on "The Present Status of the Problem of Cancer." The lecture will be given annually in honor of U. S. Senator Charles Sumner, who in 1869 was a champion of "equal rights and opportunities" for medical practitioners in the District of Columbia "without distinction of color." The Medico-Chirurgical Society was organized in 1884. Dr. W. Montague Cobb, professor of anatomy, Howard University College of Medicine, is president.

GEORGIA

Russell Oppenheimer Resigns as Dean.—Dr. Russell H. Oppenheimer has resigned as dean of Emory University School of Medicine, Atlanta, effective June 1, after holding the position for twenty years. After a leave of absence for rest, he will return to Emory to carry on his work as professor of clinical medicine. Dr. Eugene A. Stead Jr. will serve as acting dean in addition to his activities as professor of medicine and chairman of the department.

ILLINOIS

Abbott Science Club Affiliates with Sigma Xi.—On May 21 the Abbott Laboratories, North Chicago, Science Club became the first research group in the pharmaceutical industry to qualify for and be granted affiliation with the Society of the Sigma Xi, national honorary scientific society. Special ceremonies were held at the Georgian Hotel, Evanston, at which Michael Heidelberger, Ph.D., professor of biochemistry, Columbia University College of Physicians and Surgeons, New York, spoke on "Blood Complement."

Chicago

Dr. J. Gordon Wilson Retires.—Dr. John Gordon Wilson, professor and chairman of the department of otolaryngology, Northwestern University Medical School, since 1908, retired in April. Dr. Howard C. Ballenger, associate professor in the department, is now acting chairman.

Personal.—Comdr. James Roscoe Miller (MC), dean of Northwestern University Medical School, currently in charge of the section on internal medicine, professional division of the Bureau of Medicine and Surgery, Washington, D. C., has been appointed medical director of the Chicago and Northwestern Railway system, effective on his release from service and in addition to his activities as dean.

Alumni Banquet.—The annual banquet of the University of Chicago School of Medicine in honor of the graduating seniors is to be held at the Hotel Windermere, June 13. A scientific program preceding the alumni banquet will be held in the afternoon at Billings Hospital. Among the speakers will be:

Dr. Thomas F. Thornton Jr., The Mechanism of Citrate Intoxication.
Dr. William W. Scott, Urinary 17-Ketosteroids in the Diagnosis of Adrenal Cortical Carcinoma.
Dr. Francis B. Gordon, Studies in the Psittacosis Group of Viruses.
Dr. Peter P. H. DeBruyn, Locomotion Characteristics of White Cells.
Dr. Charles W. Eisele, Some Problems in the Diagnosis of Brucellosis.
Drs. James S. Clarke and Hilger P. Jenkins, "Gelatin Sponge"—A New Absorbable Hemostatic Agent.
William Burrows, Ph.D., Excretion of Antibodies in Feces of Immunized Animals.
Dr. Paul W. Schafer, Observations on the Etiology and Treatment of Polycythemia Rubra Vera.
Dr. Chauncey C. Maher, Significance of Presence of Q_3 and T_3 in Clinical Cardiography.
Dr. Morris E. Davis, Experimental Studies of Pigmentation of Endocrine Origin.
Drs. William E. Ricketts and Walter L. Palmer, Treatment of Generalized Peritonitis Complicating Ulcerative Colitis.
Dr. Henry T. Ricketts, Diabetes in a Totally Depancreatized Man.

INDIANA

State Council for Mental Health.—Governor Ralph E. Gates recently appointed five members to the Indiana Council for Mental Health, a group set up under 1945 legislation to develop the construction of a mental hospital and clinic on the campus of the Indiana University Medical Center in Indianapolis. Members of the council are Dr. LaRue D. Carter, professor of neurology; Dr. Thurman B. Rice, chairman of the department of bacteriology and public health and acting secretary of the state board of health, ex officio; Dr. Norman M. Beatty, Indianapolis; Judge John H. Morris, New

Castle, and Otto Walls, director of the state department of public welfare, ex officio. The 1945 general assembly appropriated $250,000 for the project and earmarked an additional $75,000 if needed. The hospital will be made available for instruction of medical students, student nurses, interns and resident physicians under the supervision of the medical school faculty. The council will have the authority to transfer psychiatric patients in state hospitals from one institution to another or to the so-called screening hospital on the Indiana University Medical Center Campus, admission to which will be open to voluntary applications on recommendation of attending physicians.

KANSAS

State Medical Election.—Dr. William M. Mills, Topeka, was chosen president-elect of the Kansas Medical Society at its meeting in Topeka, May 6, and Dr. William P. Callahan, Wichita, was inducted into the presidency. Other officers include Drs. Laurence S. Nelson, Salina, and Oscar W. Davidson, Kansas City, vice presidents; Franklin R. Croson, Clay Center, secretary; John L. Lattimore, Topeka, treasurer, and Forrest L. Loveland, Topeka, delegate to the American Medical Association.

Kansas Physicians' Service.—The Kansas Physicians' Service was formed in Topeka, May 5. Temporary officers chosen include Dr. Barrett A. Nelson, Manhattan, president; Dr. John L. Lattimore, Topeka, vice president; Dr. William M. Mills, Topeka, secretary-treasurer, and Mr. Oliver E. Ebel, Topeka, executive vice president. Within sixty days a permanent board of directors will be elected, after which the final preparations will be made and the sale of the benefits of the medical service plan will be started through the Blue Cross.

NEW YORK

Chiropractors Urge Passage of Murdock Bill.—The executive committee of the New York State Chiropractic Society at a meeting in Binghamton, May 20, passed a resolution favoring the passing by congress of the Murdock bill, which would amend the U. S. Compensation Act and which calls for the inclusion of the services of chiropractors when desired by federal employees injured in the line of duty, according to the Rochester *Democrat and Chronicle.*

Personal.—Dr. Donald M. Morrill, Malden, Mass., has been appointed chief administrative officer of the Mount Vernon Hospital, Mount Vernon, effective April 1.——Dr. George Y. McClure has been appointed director of the Westchester Department of Laboratories and Research, succeeding Dr. Gilbert Dalldorf, who took over a similar position for the state department of health (THE JOURNAL, April 28, p. 1139). Dr. McClure has also been named pathologist at Grasslands Hospital, Valhalla, where he has been serving as assistant pathologist.——Dr. William J. Carr, Newburgh, recently completed fifty years in the practice of medicine. From 1897 to 1904 he was health officer of Newburgh.——Dr. John G. Ellis, Albion, has been appointed coroner of Orleans County, succeeding the late Dr. Paul H. Mahany, Albion.——Dr. Robert C. Towse, White Plains, has been appointed medical director of the Rensselaer plant of the Winthrop Chemical Company.

New York City

Gustave Meyer Dies.—Gustave M. Meyer, D.Sc., associate chemist on the staff of the Rockefeller Institute for Medical Research, died near Saranac Lake, May 9, aged 69. Dr. Meyer had been associated with the Rockefeller Institute from 1909 to 1941, when he retired.

Squires Prize Goes to Army Physician.—Capt. George Rosen, M. C., Brooklyn, has been awarded the Grant Squires Prize for his book "The History of Miners' Diseases: A Medical and Social Interpretation." The prize is given every five years to a graduate of Columbia University for original investigation of a sociological nature. The presentation was to be made at Columbia's commencement exercises June 5.

Teachers Union Condemns Protest on Tuberculosis Tests.—The teachers' union on May 24 issued a statement condemning the Joint Committee of Teachers Organizations for its recent action in sponsoring a lawsuit against the board of education regulation requiring the teachers to take chest x-ray examinations for tuberculosis (THE JOURNAL, June 2, p. 378). The statement in addition urged extension of the examination to all pupils as well, according to the New York *Times.*

City Cooperates in Proposed Tropical Medicine Center.—A tentative agreement was signed by Mayor Fiorello La Guardia May 14 committing the city to share in the $5,390,000 hospital and health center for the study and treatment of tropical and communicable diseases to be built on land conveyed without cost to the city by Columbia University and Presbyterian Hospital. According to the New York *World-Telegram* the site extends 800 feet along the west side of Riverside Drive between 165th and 168th streets. The proposed center includes a 300 bed hospital and a research building which will house a diagnostic laboratory of the health department, a research center for the city sponsored Public Health Research Institute (THE JOURNAL, July 12, 1941, p. 128) and a specialized branch operated by the Columbia University College of Physicians and Surgeons.

OHIO

Cleveland Hearing and Speech Center.—The Cleveland Hearing Center and Speech Clinic at Western Reserve University have formed the Cleveland Hearing and Speech Center, Inc., and will establish quarters at 11206 Euclid Avenue on the university campus in the fall or as soon as the release of material and labor for remodeling permit. The new organization will greatly augment the present care for Cleveland men, women and children with speech and hearing difficulties. The name "Garfield House" will be retained for the new unit, carrying on the project established in 1924 by the late Mrs. Garfield, wife of James R. Garfield, who is chairman of the board of the new center and president of Garfield House, 8917 Euclid Avenue, where the hearing center is now situated. The new center will absorb all the activities of Garfield House, social, educational, recreational, preventive and guidance, and will expand the work of the speech clinic in treatment, in training of teachers and therapists and in research. Lowell C. Ruch, executive director of Garfield House for the past ten years, will be the director of the new hearing and speech center. A chief of services for the center will be announced later. He will hold this position and that of professor on the faculty of Western Reserve University and be in charge of the new appliance laboratory to be established at the center. The new quarters, consisting of twenty-five rooms on three floors and a basement, will be remodeled completely and contain classrooms, examination rooms, cubicles for individual hearing and speech therapy, appliance laboratory, research laboratory, library, club rooms and recreation rooms for children. Members of the staff will include:

Miss Amy Bishop, director of the speech clinic at Western Reserve, assistant to the chief of services.

Miss Genevieve Garrison, senior therapist, clinical director of speech service.

Miss Ruth Lundin, therapist and director of the speech treatment of the Cleveland Rehabilitation Center, director of the student's laboratory.

Dr. Julius W. McCall, demonstrator in anatomy, Western Reserve University School of Medicine, in charge of the laryngectomy work.

Mrs. Florence Fross, assistant to Dr. McCall at the speech clinic, who will give speech instruction to persons who have had their larynxes removed.

C. A. Buchholz, who will give additional instruction in speech to stutterers.

Miss Virda L. Stewart, president of the Women's City Club of Cleveland and instructor in English and speech at Cleveland College, who will give speech instruction to those with foreign accents.

Clifford Mohan and Miss Dorothy Kester of the Alexander Graham Bell School of Cleveland, who will serve as part time specialists in lip reading.

PENNSYLVANIA

County Society Observes One Hundredth Anniversary.—The Schuylkill County Medical Society observed its one hundredth anniversary in Pottsville, June 6, with a special program in conjunction with the annual meeting of the third, fourth and twelfth councilor districts. Among the speakers were:

Capt. William M. Webb, M. C., Recent Diagnostic Problems in the Tropics.

Mr. Lester H. Perry, Harrisburg, executive secretary, state medical society, Medical Service Association of Pennsylvania.

Dr. James Stratton Carpenter, Pottsville, The One Hundredth Anniversary of the Schuylkill County Medical Society.

Dr. John J. Walsh, Pottsville, Recent Trends in Our Knowledge of Coronary Sclerosis and Their Influence on the Clinical Management of These Patients.

Dr. Walter F. Donaldson, Pittsburgh, secretary-treasurer, state medical society, Welcome Home, Soldier!

Dr. Chauncey L. Palmer, Pittsburgh, Highlights of the 1945 Legislature.

A feature of the meeting was the presentation of fifty year testimonials by Dr. William L. Estes Jr., Bethlehem, president-elect, state medical society, to Drs. Arthur J. Bird, New Albany; William G. Berryhill, Orangeville; Allan C. Brooks, Wilkes-Barre; Clinton J. Kistler, Lehighton; J. Warren Knedler, Moscow; Herbert B. Gibby, Wilkes-Barre, and Edward S. Rosenberry, Stone Church.

Philadelphia

Portrait of Dr. Bauer.—Dr. Edward L. Bauer, professor of diseases of the child, Jefferson Medical College of Philadelphia, was honored recently by the senior class when a portrait of him was presented to the medical school. The program was in charge of Mr. James H. Lee Jr., president of the senior class, and speakers included Robert C. Puff, senior, Dr. Norman M. MacNeill, who made the presentation speech, and Dr. William Harvey Perkins, dean, who gave the speech of acceptance. Dr. Bauer also spoke.

Survey of Psychiatric Clinics.—Under a grant from the Seybert Institution, the Philadelphia Council of Social Agencies is engaged in surveying the psychiatric clinics of Metropolitan Philadelphia with a view to planning for postwar expansion of such services. A committee representative of the clinics and organizations interested in psychiatric services for children is supervising the study, which is being conducted by several psychiatric social workers under the direction of Helen L. Witmer, Ph.D., of the Smith College School for Social Work, according to *Philadelphia Medicine*.

Pittsburgh

The Mellon Lecture.—John R. Murlin, Ph.D., professor of physiology and director of the department of vital economics at the University of Rochester School of Medicine and Dentistry, gave the twenty-eighth Mellon Lecture of the Society of Biological Research of the University of Pittsburgh School of Medicine, May 16. His subject was "Biologic Value of Proteins in Relation to the Essential Amino Acids."

TEXAS

Personal.—Dr. John N. Thomas, Mansfield, was recently guest of honor at a dinner celebrating his eighty-eighth birthday and fifty-sixth year of service in Mansfield and the surrounding area. In 1943 Dr. Thomas was honored by the Business and Professional Women's Club of Mansfield as the outstanding citizen of the community.——Dr. William W. Coulter, acting superintendent of the Jefferson Davis Hospital, Houston, has been named medical director of the hospital. The action marks a departure in the administrative setup. A. S. Reeves, Quanah, has been designated superintendent.

Medical Library Banquet.—On May 18 a banquet was held at the Adolphus Hotel to provide additional funds for the library of Southwestern Medical College. The affair was known as the "Medical Library Banquet" and was sponsored jointly by the Dallas County Medical Society, the Dallas County Dental Society, Dallas County Pharmaceutical Association, Medical Service Society of Dallas, District Number 4 Texas Graduate Nurses Association, Dallas County Dental Assistants, the Dallas Hospital Council and the women's auxiliaries of the respective organizations. It is hoped to make the affair annual.

Control of State Psychopathic Hospital Transferred.—The legislature of the state of Texas has unanimously authorized the transfer of the Galveston State Psychopathic Hospital from the State Board of Control to the Board of Regents of the University of Texas to be operated as a part of the Medical Branch. Formerly accommodating approximately 80 patients, the institution will be reequipped to handle about 120 mental patients for rapid diagnosis and rapid treatment. Special facilities will be provided for postgraduate training in neuropsychiatry and for psychiatric nurse training. The director is Dr. Jack R. Ewalt, associate professor of neuropsychiatry, University of Texas School of Medicine. The hospital will not be ready to receive patients until refurnishing and reorganization have been completed.

WEST VIRGINIA

Changes in Health Officers.—Dr. James A. Dolce, Fairmont, has resigned as health officer of Marion County, effective April 23. Dr. Claude A. Thomas, who has been serving as health officer of district number 4, comprising the counties of Lewis, Calhoun, Gilmer and Upshur, during the absence because of illness of Dr. Walter J. Riley, Weston, has been transferred to Romney, where he will be in charge of district number five including the counties of Hardy, Grant, Hampshire, Mineral and Morgan. Dr. Riley has returned to his activities in district number 4.

Decrease in Cancer Deaths.—Deaths from cancer in West Virginia in 1944 totaled 1,525, according to provisional figures compiled by the division of vital statistics of the state department of health. The totals represent a decrease of 97 in deaths from the disease as compared with the figure for 1943, when the total was 1,622. The estimated death rate in West Virginia from cancer per hundred thousand of population in 1944 was 88.9, compared with 92.4 in 1943. Using the basis of 4 living persons with cancer for every death, there are approximately 6,100 cases of cancer in West Virginia at the present time. The services of the division of cancer control have been extended to 560 cancer patients needing assistance in financing treatment and care.

WISCONSIN

Public Park Named for Physician.—Dr. Thomas G. Torpy, Minocqua, was honored May 30, when a public park in the town was dedicated to him and which in the future will be known as the Doctor Torpy Park. Dr. Torpy graduated at Rush Medical College in 1895, and the recent honor was in recognition of his completion of fifty years in the practice of medicine, most of which have been spent in Minocqua. Among the speakers at a testimonial dinner were Gerald Boileau, Wausau, formerly national representative to congress, and Dr. Edward L. Jenkinson, Chicago. Dr. Torpy was chairman of the board of supervisors for a number of years. Grade school children presented Dr. Torpy with a bond and the people of the community with a purse of $2,000.

Program Honors Retiring Professors.—The faculty of the University of Wisconsin Medical School, Madison, held a special program May 15-16 to mark the retirement of Drs. Charles H. Bunting, professor of pathology, and Joseph S. Evans, professor of medicine, University of Wisconsin Medical School. Dr. Bunting was the first professor of pathology at the medical school, joining the university in 1908; he is also chairman of the department. Dr. Evans, who began his affiliation in 1909, was the school's first professor of medicine. He is also chairman of the department. As a special feature of the program, Dr. Eugene L. Opie of the Rockefeller Institute for Medical Research, New York, spoke on "Production Tumors, with Special Reference to Hepatic Tumors Produced by Feeding Azo Compounds" and "Significant Questions Concerning Transmission and Epidemiology of Tuberculosis."

GENERAL

College of Radiology Moves.—The American College of Radiology has moved its headquarters from 540 North Michigan Avenue to 20 North Wacker Drive, Chicago 6.

Examinations in Pediatrics.—The American Board of Pediatrics announces that its fall written examination will be held locally under a monitor, October 19. The oral examination will be held in New York, December 7 or 8. Dr. C. Anderson Aldrich, 115½ First Avenue S.W., Rochester, Minn., is secretary of the board.

Home Study Courses.—The Home Study Courses sponsored by the American Academy of Ophthalmology and Otolaryngology, in the basic sciences of those two specialties, will be given again in the year 1945-1946. Registrations must be completed before August 15. For information apply to Dr. William L. Benedict, executive secretary, 100 First Avenue Building, Rochester, Minn.

Charles Stephenson Succeeds Clarence Little.—Rear Admiral Charles S. Stephenson (MC), U. S. Navy, retired, has been appointed acting managing director of the American Cancer Society. He will succeed Clarence C. Little, Sc.D., Bar Harbor, Maine, who will direct studies of genetic factors of intelligence and emotional variations in mammals under a Rockefeller Foundation grant (THE JOURNAL, June 2, p. 379). Admiral Stephenson was named some months ago as secretary of the research division of the cancer society (THE JOURNAL, April 7, p. 936). Dr. Little will continue as a member of the society's board of directors.

Prevalence of Poliomyelitis.—The National Foundation for Infantile Paralysis announced June 1 that the number of poliomyelitis cases in the country is running about 50 per cent ahead of a year ago. As of mid-May, the number of new cases this year were 642 as compared with 424 cases for the same period in 1944. Sharp increases have been reported in the New England states, Middle Atlantic states, South Atlantic area and the East South Central states. In the Pacific Coast and West South Central areas, which have been hard hit during the past two years, there has been a noticeable drop in the number of new cases. In the remainder of the country there are about the same number as last year. While a fact that there are 50 per cent more cases in the country this year than in the same period in 1944, "this is not an alarming situation but it should be watched carefully," it was stated.

The foundation has available a bulletin entitled "When Polio Strikes" which includes many helpful hints for parents and contains a series of simple precautions to be taken during the summer months.

Examination in Obstetrics and Gynecology.—The general oral and pathology examinations of the American Board of Obstetrics and Gynecology (part II) for all candidates will be conducted at the Shelburne Hotel, Atlantic City, N. J., by the entire board June 13-19. Hotel reservations may be made by writing directly to the hotel. The Office of the Surgeon General of the U. S. Army has issued instructions that men in service, eligible for board examinations, be encouraged to apply and that they may request orders to detached duty for the purpose of taking these examinations whenever possible. Candidates in military or naval service are requested to keep the secretary's office informed of any change in address. Deferment without time penalty under a waiver of published regulations applying to civilian candidates will be granted if a candidate in service finds it impossible to proceed with the examinations of the board. Applications are now being received for the 1946 examinations. For further information and application blanks address Dr. Paul Titus, secretary of the board, 1015 Highland Building, Pittsburgh 6.

PUERTO RICO

Survey of Schistosoma Infections in Snails.—The School of Tropical Medicine, San Juan, has instituted a study of current percentages of Schistosoma infections in snails under the direction of Dr. Pablo Morales Otero, San Juan. According to an announcement, schistosomiasis was diagnosed in 12.4 per cent of the population in Puerto Rico in 1934, and snails removed from the Barranquitas River in that year were 28 per cent infected with the disease. Today, says the announcement, the infection index is 80 per cent and there is every reason to believe that the incidence in the population in general is much higher. The army would not accept any man from Puerto Rico who has a history of schistosomiasis. It is believed that the study of the School of Tropical Medicine will serve to incite programs to control the disease.

Actions by the Governor.—Governor Rexford G. Tugwell signed a bill passed by the legislative assembly of Puerto Rico appropriating the sum of $500,000 from insular funds to continue the construction, extension and repair of the Insular Hospital of Psychiatry. The governor also signed a bill appropriating the sum of $315,000 from insular funds to construct and equip an Insular Home for Girls in the city of San German, which will function under the auspices of the department of health of Puerto Rico. An application made by Laboratories Terrier, Inc., of Hato Rey, San Juan, for tax exemption was denied by the governor. This firm makes ampules for hypodermic injections. Tax exemption for this company, granted by the public service commission of Puerto Rico for three years by a resolution passed June 7, 1944, was disapproved by the governor.

LATIN AMERICA

Health Activities in Latin America.—*Radio Scripts on Health.*—The medical section of the Health and Sanitation Division of the Office of the Coordinator of Inter-American Affairs has started the preparation of radio scripts on disease and health as a contribution to the programs of health education by radio. According to the *Newsletter* of the Health and Sanitation Division this radio material so far has been sent out by the radio division on microfilm and in Spanish and Portuguese but is available in typewritten form in English. The scripts are produced for the health and sanitation field parties, the coordination committees and any other groups that wish to use them. They need not, of course, be restricted to the radio but may be brought out as pamphlets or put to other uses. The first six scripts prepared under this project dealt with the health of the baby and young child and covered the topics of cleanliness, nutrition, feeding habits and immunization against diphtheria, smallpox and whooping cough. A series of five scripts on tuberculosis has just been completed. These are written as a family drama, but each is a unit in itself so that a person hearing only one would gain information on the transmission of tuberculosis and his personal defense against it. The five scripts on tuberculosis are entitled "The Symptoms," "The Health Center," "The Nursing Visit," "The Contacts" and "The Sanatorium." In some countries it will be possible to use these scripts without any modifications. In other countries, characterizations and scenes may need revision to satisfy local needs.

Treatment of the Lepros.—Children born of leprous patients in the Palo Seco Leper Colony on the west back of the Pacific entrance to the Panama Canal are free of leprosy, the health department of the Panama Canal reports. Progenitorship, however, ends with birth. Forfeiture of parental possession becomes effective immediately after parturition. Parents are forbidden to touch the offspring. The infants are promptly removed from the leprous environment of their birth. Permanent separation from leprous parents is achieved through adoption into the homes of relatives. To date, according to the health department, not a single case of leprosy has occurred among the adopted children. Communication of infection from husband to wife or wife to husband is uncommon. Though housed in different buildings, men and women patients are free to associate during the day. The resultant romances are not obstructed by the colony management. When these courtships develop into matrimonial aspirations, official consent of marriage is rarely withheld. The routine offers of sterilization are usually rejected on religious grounds. Two room apartments with kitchen, toilet and bathing facilities are provided for married couples. Established in 1907, the Palo Seco colony covers a 500 acre tract chosen by the late Col. William C. Gorgas. The colony's housing facilities consist of eight modern two story structures built in a quadrangle near the beach.

Visitors to the United States.—Dr. Luiz Mendonca e Silva, who was employed in the office of health education in the state health department in Rio de Janeiro, is studying currently at the DeLamar Institute of Public Health, Columbia University, New York. On conclusion of the course he will spend some time at the headquarters of the American Medical Association, Chicago.——Dr. Rodolfo Mascarenhas, São Paulo, Brazil, assistant to the director of the state health department, who has been studying public health administration as a guest of the state department, visited the American Medical Association, May 7.——Dr. Henrique de Rocha Lima, director of the biologic research institute of São Paulo, Brazil, is in the United States as the guest of the department of state to confer with scientists and technicians specialized in agricultural, microbiologic and pathologic research. Dr. Rocha Lima was once professor of tropical medicine at the University of Hamburg, Germany.

Cancer Stamp.—Commemorating the fight for the conquest of cancer, four million one cent postage stamps bearing the picture of the late Pierre and Madam Marie Curie will be issued by the government of Panama, the minister of government and justice announced.

Hospital News.—A maternity hospital for nonpaying patients has been opened by the government of Barbados, British West Indies, at Bank Hall. The Colonial Development and Welfare contributed $115,200 toward the project.

Government Services

New Regional Director for Children's Bureau

Dr. John F. Belz, Portland, director of the maternal and child health division of the Oregon State Board of Health, has joined the staff of the division of health services, Children's Bureau, U. S. Department of Labor, to serve as regional medical director in the Rocky Mountain area, comprising the states of Colorado, Wyoming, Montana, Idaho and Utah. For the present the offices will be located at 1505 Humboldt Bank Building, 785 Market Street, San Francisco 3.

National Institute of Health Research Fellowships

The Public Health Service announces the creation of National Institute of Health research fellowships, available after July 1. The junior research fellowships will be to those holding masters degrees in the sciences (such as physics, chemistry and entomology) allied to public health from an institution of recognized standing. The stipend will be $2,400 a year. The senior research fellowships will be available to those holding a doctorate degree in one of the sciences allied to public health. The stipend will be $3,000 a year. These fellowships will offer an opportunity for study and research in association with highly trained specialists in the candidates' chosen field at the institute or some other institution of higher learning. Letters of inquiry should be addressed to the director, National Institute of Health, Bethesda 14, Md.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 5, 1945.

Resettlement Camps for Homecoming Prisoners of War

The army is establishing all over the country voluntary camps for homecoming prisoners of war discharged or released from the service. These will be centers where men may acclimatize themselves to social surroundings, which, after long absence and the constraints of life in prison camps, may well at first be strange. The camps will be known as civil resettlement units and will be situated in pleasant surroundings near to towns, with their industries and their social services, and a man who chooses to go will naturally select one near his home. The camps will be a starting off point for a return to the civilian life from which the men have long been estranged. Run like a leave camp, they will be free from "training" in the military sense, and there will be only one parade—the pay parade. The means for putting the men in touch with civilian life again include films and talks on what has been going on in their absence, visits to places of importance to those anxious to regain their footing in the ordinary ways of life, and advice by qualified persons on future employment, pay, health, and personal and family affairs.

A man's only duty will be to keep his bed and his belongings tidy. There will be no reveille, no guards, no fatigues. A man will more or less arrange his own day, choosing between a visit to a factory or technical school, an office or a training center or spending part of his time in a workshop rehandling tools or attending a discussion. During these working hours he will wear a uniform but afterward, whether he remains in the camp or goes out, he can change to civilian clothes. There will be leave every week end for those who want it. To vary the day's events there will be light physical exercises and optional games.

A pamphlet is given to all homecoming prisoners of war telling them that "changes have taken place in 'civvy street.' There are ration cards and wartime regulations. You have changed too. You have seen new countries and different people. You have a new outlook on civilian life and possibly a better one. But you will need time to find your feet again." In deciding on a new job, the man will receive specialist advice.

Cholera Epidemic in Calcutta

An unusually severe epidemic of cholera in Calcutta is causing concern to the army command in India. Most of the sufferers are civilians, but there are some suspected cases among soldiers. During the week ended April 21 there were two hundred deaths in the city from cholera. The seriousness of the situation lies in the fact that, besides being important as a military base, both British and American, Calcutta is perhaps the greatest transit and leave center for troops of the allied land forces in southeastern Asia. The severity of the epidemic is attributed to the general overcrowding, the filthy living conditions in the slums and the absence of a decent standard of cleanliness in any part of the city. Administration by the elected corporation of Calcutta has been slack for years, with the result that a situation has developed which it cannot remedy with the equipment and men available. There were occasions when the Bengal ministry seemed to be on the point of dismissing the corporation, but this would not now remedy the lack of equipment. The important Indian newspaper the *Statesman* says that the immediate needs are drastic administrative control of dirty markets, abolition of the exposure of fruit for sale and its sprinkling with foul water, control of the use of ice in beverages, prevention of the display of eatables on curb side stalls and clearance of beggars from the streets. To the might be added regular and thorough emptying of garbage can and the removal of cattle from the streets.

The High Cost of Industrial Accidents

High estimates of the cost of industrial accidents were give by Mr. Bevin, minister of labor, and Sir Wilfred Garret chief inspector of factories, to a largely attended conference o industrial accidents held in London. Mr. Bevin said that th cost of workmen's compensation was $87,500,000 a year, bu this was computed to be only a fifth of the total loss to th community. When they took into account the hidden costs i the form of loss of production, loss of time of other employee: when an accident disturbed the smooth working of the shop damage to machinery and plant, loss of material and the like they could see how the estimate would grow to a total cost o something like $350,000,000 a year. Referring to the human loss, it was impossible to measure what the accidents repre sented in broken lives. Much assistance would be given by the government's new scheme of rehabilitation, but better than rehabilitation was prevention. Training in all directions—training of accident prevention officers and training of a works safety committee. The following figures were given by the chief inspector of factories. Every year 1,000 workers are killed in factories, 800 in mines and between 6,000 and 7,000 on the roads. In addition there is all the loss due to nonfatal accidents.

Victoria Cross for Member of the Army Medical Corps

The Victoria Cross is the most coveted award in the British army and is gained only by the most conspicuous bravery, often at the cost of life, so that it has to be posthumously given to a relative. The king has approved the posthumous award to Lance Corporal Henry Eric Harden, Royal Army Medical Corps. In northwestern Europe on January 23 the leading section of a Royal Marine commando troop was pinned to the ground by intense enemy machine gun fire from well concealed positions and was ordered to take cover. But 4 wounded men were lying in the open. Harden at once went forward under a hail of machine gun and rifle fire directed from four positions, all within 300 yards. With the greatest coolness and bravery he remained in the open while attending the casualties. After dressing the wounds of 3 he carried 1 man back to cover. He was ordered not to go forward again but did so with a volunteer stretcher party and brought back another badly wounded man. He went a third time with a stretcher party and was bringing back a wounded officer when he was killed by heavy enemy fire. His courage saved the lives of the wounded brought in and was an inspiration to the others. In Parliament Sir James Grigg, secretary of state for war, said "I do not remember ever reading anything more heroic."

Successful Transport by Air of the Wounded

It is now possible to give figures of the transport by air of the wounded in Normandy, Arnhem and the Rhine crossing. This was performed by the Transport Command group of the Royal Air Force responsible for carrying supplies from Britain to the continent of Europe. Since D day it has carried to the continent a monthly average of 1,600 tons of freight and brought back 241 tons of mail, besides an average of about 1,000 passengers. In that period it also brought back to England 70,000 casualties and transferred 22,000 more from advanced landing strips to base hospitals in liberated territory. Not one "hospital" aircraft has met with a mishap. When the fighting was in France and Belgium it was common for men wounded in the morning to be operated on in an English hospital the same evening.

PARIS

(From Our Regular Correspondent)

April 17, 1945.

The Definition of Medicine

French medicine is in a state of crisis and is to be developed along the patterns furnished by foreign countries, especially the United States and Russia. The traditional boundaries of the profession seem too narrow; under the name of social medicine there is a universal desire for an extension of the activity of the physician and his domain, corresponding to the ever widening sphere which medicine plays in the collective life. Medicine of tomorrow will come out of its restricted scientific limits to assume a broader purpose and penetrate more intimately into human institutions. That is the ambition of most physicians and of practically all sociologists.

A symbol of this desired extension of the medical art is the fusion under the direction of Charles Claoué, well known for his work on esthetic surgery, of two independent institutions which complete the education of the physician and that of the sociologist: the Institut de sociologie and the Ecole libre des sciences médicales. According to Claoué, medicine will be, in the last analysis, the study of relations between man and animal (veterinary medicine), man and plants (botanic medicine), between man and the external or internal environments in which he lives (human medicine), in all the cases in which the desirable harmony of interrelations is disturbed. Many other professions besides that of the physician are charged with the improvement of these relationships, but they cannot accomplish their mission in working alone, and all have need to know and to collaborate with one another. A psychologist is a physician who must know man in sickness as well as in health. A legislator is concerned with the possibilities and impossibilities of social life; a pedagogue cannot ignore the limits of health and the growth of the child, an architect must build only sanitary houses, an economist has the chief aim of furnishing man with wholesome food.

According to the principles proposed by Claoué, the free school of medical sciences has the program to define medicine and its new duties, to furnish to all the professions which have medical aspects the knowledge which they need. The Ecole libre des sciences médicales has the aim to complete the education of the physician as well as to furnish to the different professions the indispensable supplementary medical education.

Medical Research in France

In a recent conference which was published in the *Médecin français*, Raoul Kourilsky of Paris exposed the shortcomings and difficulties of medical research in France. Kourilsky believes that the clinical level of French medicine has been maintained but that its scientific level has not ceased to decline for the last twenty years. He believes that the decay or stagnation is due to the fact that the present organization of research does not permit the investigator to give his full effort at a time when the conditions of work are more difficult than they have ever been. It is by research that a nation maintains its intellectual influence; to limit oneself to utilize the discoveries of others means, to quote Jolliot-Curie, "to be resigned to become the equivalent of a colony."

There are two types of research: scientific research with medical applications and direct medical research. The scientific researches with medical applications are pursued without initial medical aim, but they end by finding so much reverberation and so much application in medicine that they become a part of it. Kourilsky cites two essentially French discoveries: the anatoxins (toxoids) and the isolation of paraminophenylsulfamide, which are not strictly medical but which have become so. They show what could be achieved in France, if France had more investigators and more laboratories and especially if these laboratories worked in better and organized cooperation and not in occasional and incidental collaboration with the medical centers where their discoveries are applied.

As regards the specific medical investigations generally carried out by physicians in contact with patients, they should not be confused with the many verifications which are required every day in the practice of medicine and which, moreover, are difficult to obtain in a regular and exact manner even in the faculty cities. These verifications apply most of the time to isolated cases. They can serve research, but, as Kourilsky says, they do not represent that "first time."

If French medicine is to recover its prestige, it is necessary to create a framework for it, to open a career to the scientist, which assures a satisfactory budget for the workers. It is necessary that life in the hospital becomes a habit. The individual laboratories must be juxtaposed with the great scientific research centers. A certain number of physicians must be able to live with the sole preoccupation of the advancement of science. These truths were good to repeat to the French, who only have to turn their attention toward their neighbors to know why France has been surpassed in the glory of discovery and what must be done to recover the lost position.

Duodenal Aspiration

In a report presented before the Société de chirurgie de Lille Decloux analyzed 59 cases in which duodenal aspiration was employed for the treatment of intestinal obstruction. Twenty-seven of these cases involved primary obstruction, developing either in a subject already operated on (late postoperative obstruction by adhesions, angulations and the like) or in a new subject. It is necessary to consider that aspiration can only have slight action in obstructions of the large intestine, which are easy to diagnose from roentgenologic and clinical signs. But it is less easy to differentiate between simple obstruction by tumor, biliary ileus and adhesions, in which aspiration does wonders, and the strangulation by volvulus, internal constriction and so on, where it is dangerous for the intestinal vitality. In general, duodenal aspiration will be advisable when strangulation is probable; this menace will be indicated by a very acute onset, by the continued, nonintermittent character of the pains, recalling the syndrome of Koernig, by moderate distention and especially by x-ray examination, which will show an isolated loop completely dilated. In the other cases the rapid deflation of the abdomen, verified immediately by roentgenologic control, after the putting in place of the aspirating tube, facilitates greatly diagnosis and surgical intervention, and as a result the operative mortality will be greatly reduced.

Marriages

GORDON JEROME STREWLER, Racine, Wis., to Miss Effie Elizabeth Pressly of Chester, S. C., at Louisville, Ky., April 27.

HOWARD CARRINGTON, Onarga, Ill., to Miss Lucy Jane Hooker of Lebanon, Mo., in Camp Anza, Calif., recently.

MARION F. ARNOLD Jr., New Palestine, Ind., to Miss Kathryn Costellow of Beech Grove in Indianapolis, March 21.

ARTHUR HERRMANN DOWNING, Des Moines, to Miss Mary Elizabeth Sayre at Fort Snelling, Minn., recently.

DAVID RICHARD PICKENS JR., Nashville, Tenn., to Miss Harriet Palmer of Montclair, N. J., May 12.

OSCAR DAVIS RATNOFF, New York, to Miss Marian Foreman in San Antonio, Texas, March 31.

JOE D. COMBS to Miss Fay Meshew, both of Muncie, Ind., in Lewisburg, Ohio, March 1.

WENDELL A. JOHNSON, Iowa City, to Miss Joan Chance of Redfield, April 21.

PAUL L. LONG to Miss Helen Stahlsmith, both of Anderson, Ind., February 26.

Deaths

James Thomas Nix ⊕ New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1910; clinical professor of surgery at the Louisiana State University School of Medicine; served as dean, director, professor and head of the department of surgery at the Louisiana State University Graduate School of Medicine; for many years professor of general surgery at the Loyola University School of Dentistry; professor of surgery at the Loyola University Post-Graduate School of Medicine from 1916 to 1918; in 1930 received the Medical Records Prize of the American College of Surgeons; fellow of the Southeastern Surgical Congress; member and for many years medical adviser, Catholic Hospital Association; member of the National Gastroenterological Association, Southern Medical Association, New Orleans Post-Graduate Medical Assembly and the Société Internationale de Gastro-Enterologie; in 1939 member of the International Cancer Congress; past president of the Catholic Physicians Guild of New Orleans, served as first and second vice president of the Louisiana State Medical Society, vice president and president of the Orleans Parish Medical Society; honorary member of the Illinois Clinical Club, the Seventh District Medical Society and Lafourche Valley Medical Society; first lieutenant, medical reserve corps, U. S. Army, 1918-1919; served at various times as director of the J. T. Nix Clinic, senior surgeon, and director of the Oscar Allen Tumor Clinic, Charity Hospital and senior surgeon, and president of the Hotel Dieu; in 1936 first exhibitor selected for Hall of Science for his subject on cancer; since 1942 medical director of the Higgins Industries and Higgins Corporation; in 1937 chairman of the honorary advisory committee of the Louisiana State Hospital Board and in 1938 chairman of the health committee of the eighth National Eucharistic Congress; in 1929 decorated Knight of St. Gregory and in 1930 Knight Commander of Holy Sepulchre; member of the founders group of the American Board of Surgery; in 1924 received the honorary degree of doctor of laws from Loyola University; author of "The Unborn," "A Surgeon Reflects" and two books of poems; died May 17, aged 57.

Edgar Garrison Ballenger ⊕ Atlanta, Ga.; University of Maryland School of Medicine, Baltimore, 1901; member of the House of Delegates of the American Medical Association in 1912; president of the Southern Medical Association, serving as member of the council from 1934 to 1939; served as president of the Fulton County Medical Society in 1911; made president of the Southeastern section of the American Urological Association in 1934-1935 and president of the association in 1938-1939; in 1930 first president of the Southeastern Surgical Congress, which he was instrumental in organizing; fellow of the American College of Surgeons; specialist certified by the American Board of Urology, Inc.; during World War I served in France with the rank of captain and with the Emory Base Hospital unit; later transferred to the 26th Division as urologist and remained with this division for eight months; promoted to major and remained in Germany two and one half months with the Army of Occupation; formerly associate professor of surgery (genitourinary) at the Emory University School of Medicine and lecturer on genitourinary diseases and syphilis at the Atlanta School of Medicine; consulting urologist at the Grady Hospital and urologist at the Crawford W. Long Memorial Hospital; author of "Genito-Urinary Diseases and Syphilis" and contributor to section on diseases of the urethra for the Oxford Loose Leaf Surgery; at one time associate editor and assistant manager of the *Atlanta-Journal Record of Medicine* and on the advisory editorial board of the *Southern Surgeon;* died June 1, aged 67, of injuries received in a seven floor fall to the mezzanine of the hotel where he had been residing.

William Worthington Herrick ⊕ New York; Yale University School of Medicine, New Haven, Conn., 1905; professor of clinical medicine at the Columbia University College of Physicians and Surgeons; specialist certified by the American Board of Internal Medicine; president of the New York Academy of Medicine; member of the Association of American Physicians; fellow of the American College of Physicians, of which he had formerly been regent; a major in the medical corps of the U. S. Army during World War I, serving for two years as chief of service and medical consultant at the Army Base Hospital in Columbia, S. C.; internist, medical advisory board of the Selective Service; attending physician at the Presbyterian Hospital and Sloane Hospital for Women; consulting physician, Beekman Street, Women's and Babies hospitals, all in New York, Mary McClellan Hospital, Cambridge, N. Y., Vassar Brothers Hospital, Poughkeepsie, Elizabeth A. Horton Memorial Hospital, Middletown, N. Y., Mount Vernon (N. Y.) Hospital, Goshen (N. Y.) Hospital, St. Agnes and White Plains hospitals, both in White Plains, N. Y., Stamford (Conn.) Hospital, Sharon (Conn.) Hospital, Greenwich (Conn.) Hospital and Nassau Hospital in Mineola, N. Y., and New York Infirmary for Women and Children; member, board of trustees, Trudeau Sanatorium, Trudeau, N. Y.; editor-in-chief, Nelson New Loose-Leaf Medicine; found dead June 1, aged 66.

Charles Terrell Porter ⊕ Boston; University of Virginia Department of Medicine, Charlottesville, 1912; lecturer on otology at the Harvard Medical School; specialist certified by the American Board of Otolaryngology; member and formerly vice president of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological Association; member of the American Laryngological, Rhinological and Otological Society, American Otological Society, Inc., and the New England Otological and Laryngological Society; fellow of the American College of Surgeons; served with the Harvard medical unit attached to the British army in France during World War I; chief of the otolaryngology and rhinology staff, Waltham (Mass.) Hospital; consulting otolaryngologist, Cambridge (Mass.) Hospital and the Emerson Hospital, Concord; otolaryngologist, Burbank Hospital, Fitchburg; surgeon to the Massachusetts Eye and Ear Infirmary and the Massachusetts General Hospital; chief otolaryngologist to the Robert Breck Brigham Hospital and the Massachusetts Women's Hospital, where he died April 19, aged 56, of coronary thrombosis.

William Presley Dingle ⊕ Colonel, U. S. Army, retired, Mission, Texas; Illinois Medical College, Chicago, 1908; completed the courses at the Army Medical School and Medical Field Service School; appointed a lieutenant in the medical reserve corps of the U. S. Army and assigned to duty Nov. 1, 1918; commissioned in the medical corps of the regular army on July 1, 1920 in the same grade; promoted through the various grades to that of colonel; retired in February 1943 for physical disability; in June 1941 was assigned as commanding officer of the 12th Station Hospital at Camp Forrest, Tenn., and later sent to Camp Callan, Calif.; specialist certified by the American Board of Otolaryngology; member of the Association of the Military Surgeons of the United States; died in the Army Air Forces Hospital March 2, aged 60, of coronary occlusion.

Frank A. Nobiletti ⊕ Forest Hills, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1936; specialist certified by the American Board of Orthopaedic Surgery, Inc.; fellow of the American College of Surgeons; instructor in orthopedics and fractures, and surgeon to the athletic teams at his alma mater; interned and later served a residency in orthopedics at the Bellevue Hospital; served a residency in the department of fractures at the Presbyterian Hospital; a member of the attending orthopedic staffs at the Jamaica Hospital, Mary Immaculate Hospital, Queens General Hospital, Triboro Hospital in Jamaica, Lutheran Hospital, Seton Hospital and the Presbyterian Hospital in New York, where he died April 21, aged 34, of a pulmonary embolism following atypical pneumonia.

Carl Thorburn Harris ⊕ Rochester, N. Y.; Harvard Medical School, Boston, 1916; assistant professor of orthopedic surgery at the University of Rochester School of Medicine and Dentistry; specialist certified by the American Board of Orthopedic Surgery, Inc.; member of the American Orthopedic Association and the American Academy of Orthopaedic Surgeons; interned at the Boston City Hospital; served overseas with Base Hospital number 7 as an orthopedic surgeon during World War I; teaching fellow, surgical pathology, at his alma mater, 1919-1920; chief of the orthopedic service, Genesee Hospital; attending orthopedic surgeon, Highland Hospital; associate visiting surgeon, Rochester General Hospital; died at his home in Honeoye Falls April 17, aged 54, of coronary occlusion.

Solomon J. Appelbaum, Rochester, N. Y.; Johns Hopkins University School of Medicine, Baltimore, 1908; member of the American Medical Association and the Rochester Academy of Medicine; past president of the Medical Society of the County of Monroe and the Rochester Pathological Society; served as director of the Monroe County Tuberculosis and Health Association and the city welfare medical bureau; consultant in medicine at the University of Rochester School of Medicine and Dentistry; on the staffs of the Strong Memorial, Rochester General, Park Avenue, Monroe County and the Rochester State hospitals; past president of the Jewish Social Service Bureau; died in Miami Beach, Fla., April 10, aged 63, of coronary thrombosis.

Thomas Dempsey McKinney, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1913; since 1936 associate professor of clinical surgery at his alma mater and since 1939 clinical professor of neurosurgery at the Meharry Medical College; at one time president of the Middle Tennessee Medical Society; served seventeen months overseas with the Vanderbilt Medical Unit during World War I, attaining the rank of captain; on the staffs of the Vanderbilt University Hospital, Protestant Hospital, Nashville General Hospital and St. Thomas Hospital, where he died April 12, aged 57, of arteriosclerotic heart disease.

Emil Frederick Baur, Milwaukee; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900; formerly on the faculty as associate clinical professor of laryngology, rhinology and otology at the Marquette University School of Medicine; served during World War I; on the consulting staff, eye, ear, nose and throat department, Mount Sinai Hospital, where he died April 4, aged 65, of cerebral thrombosis.

Joseph Selic Bendetson ⊕ Brooklyn; University and Bellevue Hospital Medical College, New York, 1920; on the staff of the Jewish Hospital; died March 6, aged 53, of coronary thrombosis.

Frederick O. Blattner, St. Louis; American Medical College, St. Louis, 1901; died in the Desloge Hospital March 12, aged 71, of heart disease.

James Alfred Boyer, Carmi, Ill.; Barnes Medical College, St. Louis, 1899; served during World War I; for twenty years coroner of White County; for many years medical examiner for the Prudential Life Insurance Company; served on the staff of the Veterans Administration Facility in Dayton, Ohio; died March 22, aged 72, of coronary thrombosis.

Mackall R. Bruin ⊕ Los Angeles; University of Maryland School of Medicine, Baltimore, 1895; served as chief consultant in surgery and later as honorary chief consultant at the Methodist Hospital; died March 10, aged 77, of chronic myocarditis and pernicious anemia.

William Herbert Carrigan ⊕ Summerton, S. C.; Medical College of the State of South Carolina, Charleston, 1911; served on the staff of the Roper Hospital in Charleston; member of the county draft board; died in April, aged 59, of coronary occlusion.

Marvin A. Cowden, Shannon, Miss.; Memphis (Tenn.) Hospital Medical College, 1904; member of the American Medical Association; member of the board of aldermen; died April 5, aged 65, of coronary thrombosis.

John Benjamin Frank, Lexington, Ky.; Kentucky School of Medicine, Louisville, 1898; veteran of the Spanish-American War and World War I; died in the Veterans Administration Facility April 8, aged 69, of carcinoma of the lung.

Jeremiah Augustine Greene, Cambridge, Mass.; Harvard Medical School, Boston, 1913; member of the American Medical Association; medical examiner of Middlesex County; on the staff of the Cambridge Hospital; vice president of the University Trust Company and North Cambridge Cooperative Bank; died April 5, aged 59, of angina pectoris.

George C. Grimes, Aspen Hill, Tenn.; University of Tennessee Medical Department, Nashville, 1901; member of the American Medical Association; past president of the Giles County Medical Society; died April 6, aged 79, of heart disease.

John Peter Guilfoyle, Evansville, Wis.; Northwestern University Medical School, Chicago, 1904; member of the American Medical Association; examining physician for the Rock County Selective Service Board number 2; a member of the American Association of Railway Surgeons, serving as local physician for the Chicago and Northwestern System; died in a hospital at Madison, April 13, aged 62, of cerebral hemorrhage, heart disease and tumor of the kidney.

Mathias Grove-Hagen ⊕ Richmond, Va.; Medical College of Virginia, Richmond, 1910; served during World War I; formerly instructor in medicine at his alma mater; member of the Richmond Academy of Medicine; served as physician to St. Joseph's Orphanage for many years; died April 2, aged 65, of hypertensive cardiovascular disease.

John Dunlop Hamill, Brooklyn; Cornell University Medical College, New York, 1901; formerly on the staff of the Misericordia Hospital, New York, where he died April 14, aged 66, of cirrhosis of the liver.

Milton Bruce Hansen ⊕ Moline, Ill.; the School of Medicine of the Division of the Biological Sciences, University of Chicago, 1936; secretary of the Rock Island County Medical Society; past president of the staff of Moline Public Hospital, where he died April 15, aged 40, of cerebral hemorrhage.

Samuel Hirschberg, Newark, N. J.; University and Bellevue Hospital Medical College, New York, 1905; died in April, aged 60, of coronary occlusion.

Samuel Edward Hughes ⊕ Danville, Va.; College of Physicians and Surgeons, Baltimore, 1891; served as vice president of the Society of Chest Physicians of Virginia; resigned in 1940 as medical director of the Hilltop Sanatorium, of which he had been the co-founder; served several terms on the city council; president of the Piedmont Hardware Company; died April 9, aged 80, of myocarditis.

Louis Cornelius Jurgens, Midland Park, N. J.; the Hahnemann Medical College and Hospital, Chicago, 1901; died April 12, aged 75, of carcinoma of the pancreas.

Chad Johnson Kelso, Orlando, Fla.; University of Louisville School of Medicine, 1940; formerly on the staff of the H. F. Long Hospital in Stateville, N. C.; served a residency at the Central Prison Hospital in Raleigh, N. C.; interned at the St. Elizabeth Hospital in LaFayette, Ind., and the Orange General Hospital, where he died April 1, aged 30, of coronary occlusion.

William C. King ⊕ Helena, Ark.; Memphis (Tenn.) Hospital Medical College, 1901; member of the staff of Helena Hospital; died March 27, aged 68.

Junius P. Kinsey, Pinetta, Fla.; St. Louis College of Physicians and Surgeons, 1901; died in the Little-Griffin Hospital, Valdosta, Ga., April 1, aged 72, of brain injury and fracture of the skull sustained in an automobile accident.

Pearl Elizabeth Koch, San Francisco; Washington University School of Medicine, St. Louis, 1938; member of the American Medical Association; served on the staff of the Children's Hospital, where she died April 7, aged 37.

William L. Lancaster, Trenton, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1908; died April 8, aged 66, of heart disease.

Walter Harrison Loomis, Willoughby, Ohio; Cleveland Homeopathic Medical College, 1904; veteran of the Spanish-American War; died in the Huron Road Hospital, East Cleveland, April 17, aged 71, of congestive heart disease and bronchopneumonia.

Hugh Robert Miller, Lamont, Miss.; University of Tennessee Medical Department, Nashville, 1891; served as a captain in the medical corps of the U. S. Army during World War I; died in the King's Daughters' Hospital at Greenville, April 19, aged 73, following an operation for acute pancreatitis and gallbladder infection.

Robert Fisher Monteith ⊕ Redwood City, Calif.; Rush Medical College, Chicago, 1930; past president of the San Mateo County Medical Society; member of the San Mateo County Sanity Commission; operated the Monteith Clinic since 1941; after serving an internship at the Southern Pacific General Hospital in San Francisco became a resident physician at the Mills Memorial Hospital in San Mateo, where he was later a member of the regular staff and where he died April 10, aged 42, of leukemia.

Harold William Pankow, Wauwatosa, Wis.; Marquette University School of Medicine, Milwaukee, 1938; member of the American Medical Association; found dead in bed April 4, aged 31, of chronic endocarditis and myocarditis.

Harry Parsons, Chicago; the Hahnemann Medical College and Hospital, Chicago, 1880; died April 27, aged 86.

Louis Petruska, Philadelphia; Medico-Chirurgical College of Philadelphia, 1903; member of the American Medical Association; died April 5, aged 73, of carcinoma of the stomach.

Robert McNair Purdie ⊕ Houston, Texas; Northwestern University Medical School, Chicago, 1923; fellow of the American College of Physicians; on the staffs of St. Joseph's Infirmary and the Hermann and Memorial hospitals; died April 9, aged 46, of subarachnoid hemorrhage.

Ida B. Putnam, Chicago; Hering Medical College, Chicago, 1897; died April 11, aged 80, of chronic myocarditis.

John Bruce Ramsey, Forest, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1891; member of the American Medical Association; died in the Nan Travis Hospital, Jacksonville, February 12, aged 78, of meningitis, typhus and bronchitis.

Joseph Spangler Rardin ⊕ Portsmouth, Ohio; Starling Medical College, Columbus, 1890; fellow of the American College of Surgeons; president of the Ohio State Medical Association in 1923; medical officer in the U. S. Army during World War I; member of the staff and for many years instructor of nurses at the Portsmouth General Hospital; surgeon for the Norfolk and Western Railway Company; died March 7, aged 82, of coronary occlusion.

James Henry Rawlings, Lynchburg, Va.; University of Virginia Department of Medicine, Charlottesville, 1898; member of the American Medical Association; on the staffs of the Baptist Hospital and the Memorial Hospital, where he died April 3, aged 74, of cerebral hemorrhage.

Erich Theodor Richter ⊕ Spokane, Wash.; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1890; past president of the Spokane County Medical Society; died March 12, aged 78, of congestive heart disease and mitral insufficiency.

Charles Alton Rutherford, Seattle; McGill University Faculty of Medicine, Montreal, Que., Canada, 1901; member of the American Medical Association; died March 20, aged 69, of carcinoma.

William John Ryan ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1911; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons and the Philadelphia College of Physicians; on the courtesy staffs of the Germantown and Chestnut Hill hospitals; on the staffs of St. Vincent's Hospital for Women and Children, St. Agnes Hospital and St. Mary's Hospital, where he died April 19, aged 58, of popliteal and mesenteric thrombosis.

Albert F. E. Schierbaum, Mount Angel, Ore.; Washington University School of Medicine, St. Louis, 1894; on the staff of the Silverton Hospital, Silverton; died March 28, aged 72, of chronic myocarditis.

George S. Self, Paragould, Ark. (licensed in Arkansas in 1903); formerly county judge; on the staff of the Dickson Memorial Sanitarium; died March 18, aged 68, of heart disease.

John Francis Sheedy ⊕ Lawrence, Mass.; Baltimore University School of Medicine, 1898; died April 2, aged 73, of coronary thrombosis.

Lillian Shields ⊕ Piedmont, Calif.; Cooper Medical College, San Francisco, 1902; died March 22, aged 71, of carcinoma.

Richard Oliver Simmons ⊕ Alexandria, La.; Louisville (Ky.) Medical College, 1892; president of the Louisiana State Medical Society in 1912; past president of the Rapides Parish Medical Society; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; for many years health officer of Rapides Parish; on the staff of the Baptist Hospital, where he died April 10, aged 76, of heart disease.

Charles Edward Simpson, Cedar Rapids, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; died March 14, aged 71, of uremia and nephritis.

Vergil Rex Sink, Winston-Salem, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1928; member of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; on the staffs of the North Carolina Baptist Hospital and the City Memorial Hospital, where he died March 28, aged 45, of coronary thrombosis.

Thomas Martin Smith, Jeffersonville, Ind.; Hospital College of Medicine, Louisville, Ky., 1906; served during World War I; died March 29, aged 62, of cerebral hemorrhage and uremia.

Robert Rice Snively, Chicago; University of Illinois College of Medicine, Chicago, 1940; member of the American Medical Association; interned at the Research and Educational Hospitals; served a residency at the St. Francis Hospital in Blue Island, Ill.; on the courtesy staff of Wesley Memorial Hospital, where he died April 19, aged 32, of thrombosis of the inferior and superior vena cava.

Walter C. Sooy, Woodcrest, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1890; formerly police surgeon; died March 30, aged 75, of nephritis, diabetes mellitus and osteomyelitis of the left tibia.

William James Sweeney, Weehawken, N. J.; Albany Medical College, Albany, N. Y., 1911; fellow of the American College of Surgeons; past president of the board of education; attending surgeon, Christ Hospital, Jersey City; member of the courtesy staff of the Holy Name Hospital, Teaneck; for many years a physician for the New York Central Railroad; died April 22, aged 62, of heart disease.

Robert Campbell Tarbell, Columbus, Ohio; Medical College of Ohio, Cincinnati, 1897; past president of the Columbus Academy of Medicine; died in the Grant Hospital, Columbus, April 15, aged 74, of myocarditis.

William Bibb Thornhill, Lynchburg, Va., Hospital College of Medicine, Louisville, Ky., 1886; member of the American Medical Association; served on the city board of health for many years; on the staffs of the Virginia Baptist and Lynchburg General hospitals; died April 3, aged 82, of embolism.

Speare Owen Turner, Jackson, La.; University of the South Medical Department, Sewanee, Tenn., 1909; Memphis (Tenn.) Hospital Medical College, 1910; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; formerly Beauregard parish coroner and health officer; for many years a member of the staff of the East Louisiana State Hospital; died April 13, aged 60, of arteriosclerotic heart disease.

Joseph Atwood Van Arsdall, Nicholasville, Ky.; University of Louisville Medical Department, Louisville, 1891; member of the American Medical Association; president of the high school board and vice president of the Farmers Bank; died April 14, aged 76, of carcinoma of the prostate with metastases.

Ernest Davis Vanderburgh, West Fulton, N. Y.; University of the City of New York Medical Department, New York, 1894; for many years a medical missionary in China; formerly affiliated with the Asheville (N. C.) Farm School; died in Gilbertsville April 21, aged 74, of subarachnoid hemorrhage.

William Claybourne White ⊕ Louisville, Ky.; Atlanta College of Physicians and Surgeons, Atlanta, Ga., 1905; fellow of the American College of Surgeons; served in the medical corps of the U. S. Army during World War I; died in St. Joseph Infirmary April 6, aged 73, of coronary thrombosis.

Thomas Alfred Whitfield ⊕ Nashville, Tenn.; University of Nashville Medical Department, 1908; a first lieutenant in the medical corps of the U. S. Army during World War I; member, Selective Service Board, during World War II; captain in the Civil Air Patrol; formerly on the staffs of St. Thomas, Protestant and Nashville General hospitals; member of the Middle Tennessee Medical Association, Southern Medical Association and the Nashville Academy of Medicine; died April 8, aged 58, of coronary occlusion.

Hugh Williams ⊕ Boston; Harvard Medical School, Boston, 1898; member of the American Surgical Association and the New England Surgical Society; fellow of the American College of Surgeons; consulting surgeon, Massachusetts General Hospital; served for many years on the staffs of hospitals in Natick, Gardner and Peabody, Mass., and Brattleboro, Vt.; died February 22, aged 72, of terminal bronchopneumonia.

DIED WHILE IN MILITARY SERVICE

Roger Sherman Downs ⊕ *Lieutenant (MC),* U. S. Navy, Litchfield, Conn.; Harvard Medical School, Boston, 1936; served an internship and residency at the Strong Memorial and Rochester Municipal Hospitals in Rochester, N. Y.; served a residency at the Peter Bent Brigham Hospital in Boston; began active duty as a lieutenant (jg) in the medical corps of the U. S. Navy in October 1942; later promoted to lieutenant; for the past two years has been on duty in North Africa, Sicily and Italy; recently assigned to duty with the Third Naval District Headquarters, New York; found dead in bed in New York February 6, aged 34, of arteriosclerosis of the coronary arteries and shock.

Robert Charles Gavin, Fond du Lac, Wis.; University of Wisconsin Medical School, Madison, 1943; interned at the Cincinnati General Hospital; entered the medical corps of the U. S. Naval Reserve as a lieutenant (jg) on March 20, 1943; began active duty on Jan. 10, 1944; medical officer aboard the U. S. S. *Monaghan,* a 1,300 ton destroyer assigned to Admiral Halsey's Third Fleet; drowned in the Asiatic area Dec. 18, 1944, aged 26, when the *Monaghan* and two other ships capsized in a typhoon that struck the carrier task force to which the three ships were assigned.

James Donal O'Connor, Peoria, Ill.; St. Louis University School of Medicine, 1930; member of the American Medical Association; interned at De Paul, Missouri Pacific and Barnard Free Skin and Cancer hospitals, all in St. Louis; commissioned a captain in the medical corps, Army of the United States, Aug. 31, 1942; began active duty on Oct. 2, 1942; assistant chief of medical service at the Air Force Base Hospital at Eglin Field, Fla.; died in Coral Gables, Fla., February 24, aged 39, of increased intracranial pressure caused by brain tumor of the right temporal lobe.

Correspondence

THE WAGNER-MURRAY-DINGELL BILL

To the Editor:—On Thursday, May 24, I introduced with Senator Murray a bill, S. 1050, entitled "The Social Security Amendments of 1945." The bill provides for "the national security, health and public welfare." Representative Dingell of Michigan introduced a companion bill (H. R. 3293) in the House at the same time.

I particularly invite your earnest study of the provisions of the bill relating to health. There is absolutely no intention on the part of the authors to "socialize" medicine, nor does the bill do so. We are opposed to socialized medicine or to state medicine. The health insurance provisions of the bill are intended simply to provide a method of paying medical costs in advance and in small convenient amounts.

During the formulation of this bill, we have benefited greatly from the constructive advice and suggestions of practicing physicians, and of physicians in clinical and teaching positions. Their constructive suggestions have resulted in changes in the bill which we presented in the last Congress. Undoubtedly other changes will be made before this bill is enacted into law. We wish to have it known that we invite constructive suggestions from the medical profession.

In addition, members of the medical profession will be given *full* opportunity to voice their opinions in open hearings when the bill is considered in committee.

I hope that you will print this letter in THE JOURNAL and that you will join me in urging the medical profession to undertake an earnest study of the actual provisions of the bill. In this way you can help immeasurably in avoiding misunderstanding and misinterpretation of the legislation and in stimulating physicians and medical and hospital organizations to come forward with constructive suggestions and advice.

ROBERT F. WAGNER,
United States Senate,
Washington, D. C.

THE DISCOVERY OF ANTIBIOTICS IN GENERAL AND PENICILLIN IN PARTICULAR

To the Editor:—Two main stages characterize the development of penicillin studies: (1) the discovery of the antagonism between certain micro-organisms including molds and (2) the sequence of attempts to concentrate and isolate antibiotics. During the first stage, observations were accumulated on the bacteriostatic, bactericidal and lytic effects of various molds. The discovery of the antibiotic action of molds on bacteria was by no means necessarily linked to observations on penicillin alone. True, Fleming showed that within the group of Penicillium the *notatum strain singularizes itself* with regard to the secretion of penicillin. However, Fleming's casual observation in 1929, which happened to deal with the particular strain of Penicillium notatum, did not represent the beginning of the aforementioned period. Several years before him, in 1924 and 1925, Gratia described at length very closely related phenomena regarding the lytic effect determined by the action of molds on bacteria. He was handling at the time various species and according to his indications it may well be that Penicillium notatum was included *in some of his* experiments. In 1921 Lieske described similar findings, as recalled by Gratia himself.

What is entirely *personal to Fleming* is his early observation in 1922 on what he called lysozyme, a principle which he considers an enzyme and which he *identified in* tears. It was described as having a bactericidal effect on saprophytes of the air and it apparently was *considered to be* an endogenous property of lacrimal secretions. Lysozyme has also been identified in egg white by Fleming.

Only when the second stage of research on antibiotics was given a start in 1932, when Raistrick began to produce penicillin and when Florey and Chain followed in 1936, did the science of antibiotics develop considerably. This period, which is characterized by the attempts to isolate and concentrate antibiotics, is a result of four years of painstaking work accomplished by Florey, Chain and others. With this purpose in mind, the choice of penicillin as the most suitable antibiotic to work with was relevant. The outstanding merit of these workers was to have foreseen the possible use in the future of antibiotics as new therapeutic agents against certain infections, to have selected Penicillium notatum as the most appropriate material to start with and finally to have succeeded in extracting penicillin.

The main object of this note is to put into proper perspective the work of A. Gratia in the sequence of observations of antibiotic action of molds on pathogenic bacteria.

Synopsis of Observations Enumerated by Fleming as Compared to Gratia's

Fleming	Gratia
1. Staphylococcus colonies became transparent and were obviously undergoing lysis under the action of a contaminating mold (1929)	1. Remarkable clarification of a staphylococcic medium by a "small white fungus bearing the characteristics of streptothrix" (1924)
2. The fungus filtrates proved to be strongly inhibitory against pyogenic cocci and diphtheric bacilli but were inefficient where some other bacteria were concerned	2. (*a*) The active principle separated from the fungus by filtration *is capable* of dissolving a new emulsion of staphylococci (1924) (*b*) These antibiotics obtained *from mold* cultures produce the lysis of several germs, including gonococci (1925 *)
3. Penicillin may be an effective antiseptic for applications to, or injection into, areas infected with *penicillin sensitive* microbes	3. (*a*) Such antibiotics can be injected parenterally into animals and into men in large quantities without ill effects † (*b*) Patients suffering from the staphylococcic infections have been cured with such antibiotics

* A. Gratia and S. Dath (1925): "In an ampule of *contaminated* enterovaccine we have found a variety of streptothrix very active against the dysenteric typhoidal and paratyphoidal species. From a culture containing contaminated carbuncular bacillus, completely *clarified*, we extracted a variety of Penicillium glaucum which dissolves carbuncular bacterium."

† 1931, in collaboration with Alexander and Jaumain.

Gratia and his associates as early as 1924 stipulate in the most explicit way that they had prepared mycolysates bearing antibacterial potency. This was five years before Fleming's work.

Clearly, as shown in the accompanying synopsis comparing the observations of Fleming and of Gratia, Fleming's observations are much in agreement with Gratia's earlier discoveries. This is especially true when the latter mentions having used the mycelium steep liquor after having crushed the hyphae. The facts cited by the two investigators are almost identical, but the species of molds they used may have been different. With regard to therapeutic applications, however, Fleming and Gratia had different ideas in mind. The former mentioned the therapeutic value of the antibacterial effect of the mold itself, as a prognostication, whereas Gratia's line of thought was polarized toward vaccination. The injecting material used by Gratia was in every instance a mixture of mother liquor from the fungi, i. e. the lytic agent and disintegrated bacteria. He was primarily concerned with the antigenic substances contained in his mixtures, which derived from the dissolved bacteria but not with the bactericidal principle of his mixtures which derived from this mold.

The facts of outstanding and also of practical value on which all the emphasis should be laid belong to the Oxford scientists, who under the leadership of Chain and Florey have found:

1. A method for increasing the yield of penicillin preparations and greater reliability in measuring their antibacterial power (1940).

2. The original method for large scale production (1941).

3. The proof that purified penicillin preparations lack toxicity even in very high doses.

4. Outstanding clinical results obtained in a great many infectious diseases and in some cases in which sulfonamide compounds have failed.

E. J. Bigwood, M.D.

Adviser to the Belgian Government; Professor at the University of Brussels.

L. J. De Merre, Ph.D.

Washington, D. C.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Failure to Keep Records of Narcotics Dispensed as Crime Involving Moral Turpitude.—Brainard, who was licensed to practice medicine in California, was charged with violating section 11225 of the Health and Safety Code, California, Statutes 1939, page 761, in failing to keep records of narcotics dispensed. He pleaded guilty and was given a suspended sentence of one day. Later proceedings to revoke his license were instituted before the board of medical examiners, charging that he was guilty of unprofessional conduct and alleging that the conviction just referred to constituted a conviction for a crime involving moral turpitude, which under the applicable California statutes is unprofessional conduct. After a hearing the board revoked his license and he filed with the superior court, Los Angeles County, a petition for a writ of mandate to require the board to restore his license. From a judgment in favor of the board, he appealed to the district court of appeal, second district, division 2, California.

Brainard contended that the evidence adduced before the board was insufficient to justify the revocation of his license. He argued that the offense of which he was convicted was not a crime involving moral turpitude and he pointed to the fact that after that conviction on his plea of guilty he was given a suspended sentence of one day. The board of medical examiners, said the appellate court, has authority to revoke the certificate of a physician who is found guilty of unprofessional conduct and it is expressly provided by statute that conviction of any offense involving moral turpitude constitutes unprofessional conduct. Business and Professions Code, sec. 2383. The section of the Health and Safety Code, for the violation of which Brainard was sentenced, makes it a public offense for any one to administer or dispense narcotics without making a record of the transaction, which record is open to inspection by specified state officers. True, that offense is not a felony; but the section of the Business and Professions Code just referred to does not require the offense of which the holder of a license is convicted to be a felony. It is merely required that the conviction be "of any offense involving moral turpitude." Whether or not the offense committed did in fact involve moral turpitude depends on all of the surrounding circumstances. The board of medical examiners was not limited by the sentence imposed by the court by which Brainard was convicted of the offense. The board was justified in hearing evidence concerning all of the circumstances surrounding the offense for the purpose of determining if indeed moral turpitude was involved, and the same rule was applicable when Brainard filed his application for a writ of mandate in the lower court. The record before this court, continued the court, contains ample evidence to sustain the board's finding that Brainard was guilty of an offense involving moral turpitude. An inspector for the Division of Narcotic Enforcement testified that on a certain day he and another inspector gave marked money to a narcotic addict, who then entered Brainard's office and returned with narcotics. According to the testimony, the same procedure was followed two days later and the marked money was recovered from Brainard. When confronted by the inspectors Brainard asserted that although he had read the state narcotic act he did not know that he had to keep records and that the addict in question was a sick man. An examination of Brainard's records and of his stock disclosed a shortage in his supply of narcotics. The markings on the arm of the addict and his general physical appearance indicated quite clearly that he was a narcotic addict. The court accordingly concluded that the evidence referred to was sufficient to sustain the board's finding that Brainard was guilty of an offense involving moral turpitude.

Brainard next contended that he was deprived of his license without due process of law, basing his assertion on the fact that he was charged in the complaint filed with the board of medical examiners with the commission of a misdemeanor. But, answered the court, in the charge before the board it was set forth that Brainard had been convicted of a crime involving moral turpitude, and although it was specifically set forth that he was guilty of violating section 11225 of the Health and Safety Code, the language of the charge was such that Brainard was notified that he would be called on to meet the accusation that the circumstances surrounding the commission of the offense involved moral turpitude. He was given an opportunity to meet this charge at the hearing which was accorded him. It is not claimed that a charge of unprofessional conduct may not be based on the furnishing of narcotics to an addict.

The order of the board revoking his license to practice medicine, in effect, was affirmed.—*Brainard v. Board of Medical Examiners of California, 157 P. (2d) 7 (Calif., 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in The Journal, June 2, page 385.

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Parts I and II, July 16-18. Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

American Board of Internal Medicine: *Oral.* Chicago, June 27-29, San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. *Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer.* Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

American Board of Obstetrics & Gynecology: *Part II. Oral.* Atlantic City, June 13-19. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

American Board of Ophthalmology: New York, June 13-16; Chicago, Oct. 4-6; *and Los Angeles, January.* Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

American Board of Orthopaedic Surgery: *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. *Final date for filing application is August 1.* Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

American Board of Otolaryngology: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

American Board of Pediatrics: *Written. Locally, Oct. 19. Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

American Board of Radiology: *Oral.* Fall, 1945. Final date for filing application is Aug. 1. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

American Board of Surgery: *Written.* Various centers, October 24. Final date for filing application is Aug. 1. Sec., J. S. Rodman, 225 S. 15th St., Philadelphia 2.

American Board of Urology: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

29:281-418 (March) 1945

Potential Variations of Thorax and Esophagus in Anomalous Atrioventricular Excitation (Wolff-Parkinson-White Syndrome). F. F. Rosenbaum, H. H. Hecht, F. N. Wilson and F. D. Johnston.—p. 281.
Pulmonary Roentgenographic Changes Due to Mitral Stenosis Simulating Those Due to Silicosis. H. W. Ryder and H. G. Reineke. —p. 327.
Incidence of Heart Disease in Puerto Rico: Statistical Analysis of 1,081 Cases. R. M. Suárez.—p. 339.
Effect of Lanatoside C on Physiologic State of Organically Diseased Hearts Before Symptoms and Signs of Heart Failure Appear. E. W. Erickson and G. E. Fahr.—p. 348.
Validity of Einthoven Triangle Hypothesis. E. Goldberger.—p. 369.
Effect of Atropine on Prolongation of PR Interval Found in Acute Rheumatic Fever and Certain Vagotonic Persons. R. W. Robinson. —p. 378.
*Effect of Experimental Coronary Artery Ligation on Coenzyme I and Cocarboxylase Content of Myocardium of Dog. W. M. Govier. —p. 384.
Effect of Diathermy on Coronary Flow: Experimental Study on Dogs. J. A. Mart and J. R. Miller.—p. 390.
Sugar Tolerance in Neurocirculatory Asthenia. R. A. Steven.—p. 396.
Paroxysmal Auricular Tachycardia Due to Reciprocal Rhythm. M. Naim.—p. 398.
*Apparent Arrest of Staphylococcal Endocarditis. W. J. MacNeal, C. A. Poindexter and F. N. Marty.—p. 403.

Effect of Coronary Artery Ligation.—Govier estimated cocarboxylase and coenzyme I in normal and ischemic heart muscle, with and without the administration of nicotinamide, riboflavin and succinate. He found that coenzyme I is destroyed to the extent of 70 to 83 per cent of normal in cardiac muscle rendered ischemic by coronary artery ligation. Nicotinamide, nicotinamide and riboflavin, and succinate, when administered intravenously before coronary ligation, protect to a great extent against such breakdown of coenzyme I. Nicotinamide and succinate are only fairly efficient in remedying this destruction when injected after the occlusion has been established. No significant change in tissue cocarboxylase occurs after coronary ligation.

Apparent Arrest of Staphylococcic Endocarditis.—A man aged 36 with rheumatic heart disease, aortic and mitral insufficiency, Staphylococcus aureus bacteremia and bacterial endocarditis was treated with sulfadiazine. The treatment had to be discontinued because of renal irritation. Later he was treated with staphylococcus bacteriophage and thiobismol and after that with penicillin. Blood cultures, which had been consistently positive, became negative. MacNeal and his associates recognize that a diagnosis of staphylococcic mitral endocarditis may be disputed in the absence of an anatomic and cultural study of the cardiac valves themselves but believe that this patient actually suffered from bacterial mitral endocarditis caused by infection with Staphylococcus aureus and that the disease is now in a stage of arrest which may be permanent.

American Journal of Diseases of Children, Chicago

69:141-202 (March) 1945

Celiac Syndrome: I. Determination of Fat in Feces; Reliability of Two Chemical Methods and of Microscopic Estimate; Excretion of Feces and of Fecal Fat in Normal Children. Dorothy H. Andersen. —p. 141.
Place of Contact and Radial Spread of Epidemic Poliomyelitis. A. E. Casey.—p. 152.
Ascorbic Acid, Riboflavin and Thiamine Content of Chocolate Milk. A. D. Holmes, C. P. Jones, Anne W. Wertz and W. S. Mueller. —p. 157.
Gastric and Duodenal Ulcers in Infancy and in Childhood. E. J. Donovan and T. V. Santulli.—p. 176.

American Journal of Hygiene, Baltimore

41:137-242 (March) 1945

Incidence of Protective Antibodies Against Influenza Viruses A and B Among Cubillo Indians of Vaupés, Territory, Colombia. J. M. Weir.—p. 137.
*Studies on Incidence and Transmission of Filaria Wuchereria Bancrofti in Belem, Brazil. O. R. Causey, M. P. Deane, O. da Costa and L. M. Deane.—p. 143.
Relationship Between Glycogen Depletion in Nematode Ascaridia Galli (Schrank) and Elimination of Parasite by Host. W. M. Reid. —p. 150.
Sedimentation in Water and Specific Gravity of Cysts of Entamoeba Histolytica. Shih Lu Chang.—p. 156.
*Studies of Distribution of Poliomyelitis Virus: I. In Environment of Sporadic Cases. H. E. Pearson and R. C. Rendtorff.—p. 164.
*Id.: II. In a Small Town. H. E. Pearson and R. C. Rendtorff.—p. 179.
*Id.: III. In an Urban Area During an Epidemic. H. E. Pearson, G. C. Brown, R. C. Rendtorff, G. M. Ridenour and T. Francis Jr. —p. 188.
Isolation of Hemolytic Streptococci from Throat Swabs: Experiments with Sodium Azide and Crystal Violet in Enrichment Broth. R. M. Pike.—p. 211.
Parasitemia and Length of Survival of Mice Infected with Trypanosoma Equiperdum. G. Chen, E. M. K. Geiling and R. M. MacHatton. —p. 221.
Epidemiology of Acute Respiratory Infections Conditioned by Sulfonamides: V. Carrier Epidemics of Sulfonamide Resistant Pneumococci. M. Siegel, H. V. Kaye and L. A. Julianelle.—p. 228.

Incidence and Transmission of Filaria.—According to Causey and his associates, filariasis has long been known to be endemic in Belem (state of Pará), Brazil. Studies on random samples of the human and mosquito population of Belem were made from November 1942 to December 1943 to investigate the current incidence and distribution of filariasis and the prevalence of infected mosquitoes. Both by the morphology of the embryo and also by the periodicity in the human host the filaria was recognized as Wuchereria bancrofti. Fourteen parasitized persons were hospitalized to provide material for a study of periodicity. Blood samples of 20 cubic millimeters taken at three hour intervals from 8 patients over a twenty-four hour period showed nocturnal periodicity of microfilariae. All patients were negative at 3 p. m., 1 was positive at 6 p. m., 5 were positive at 9 p. m., 7 were positive at midnight and all were positive at 3 a. m. At 6 a. m. 7 were positive, at 9 a. m. 6 were positive and by noon only 3 remained positive. Collectors visited houses in various sections of the city, made thick blood films from all persons encountered in each house and recorded all cases of elephantiasis observed. The examination of thick blood films from 5,000 persons revealed that 541 (10.8 per cent) of this sample harbored microfilariae. Elephantiasis was observed in 1.3 per cent of the persons examined. If the cases of elephantiasis not showing microfilariae are included as true cases of filariasis the incidence rate of filariasis for the total sample of 5,000 persons is 12 per cent. An analysis by age groups showed an increasing incidence of microfilariae with age. The youngest person with microfilariae in the blood was a boy aged 2 years and the youngest person with elephantiasis was a boy aged 11 years. The principal vector was found to be Culex fatigans. Among 1,014 dissections, 118 specimens were positive for filaria larvae. Anopheles darlingi and Anopheles aquasalis also were found naturally infected.

Distribution of Poliomyelitis Virus.—Pearson and Rendtorff's first study of the distribution of poliomyelitis virus was concerned with the environment of sporadic cases. Testing stool specimens from almost the entire population of a village where poliomyelitis occurred in an adult, they recovered virus only from the 6 year old son of the patient. Pools of specimens from 127 persons in 39 families were uniformly negative. Of 30 persons associated with a poliomyelitis patient in a small town, virus was recovered only from the stools of a sibling aged 5 years and from 2 playmates aged 7 and 5 years of another family. No virus was detected in the stools of the associates of 2 patients on farms or of 2 patients in a small town. Virus was not recovered from fecal specimens from farm animals or from flies, mosquitoes or the brains and intestines of rats or mice from the environment of these sporadic cases. In the second study stool samples from nearly all the children under 16 years of age were tested for the presence of virus after the occurrence of 2 cases of poliomyelitis in a small town. Members of the families of the patients also were tested. Of 282 persons in 146 families, virus was recovered

from the brother and a group of 3 cousins of 1 patient and from children of 8 other families; 5 of these children were 2 years of age. From the degree of association of those found to harbor the virus, it was concluded that personal association was the principal factor involved in the spread of infection within the community. The third study concerned the distribution of virus in a selected district of Fort Worth during the 1943 epidemic of poliomyelitis Stools from 524 persons were tested for virus by inoculation into monkeys. Six of 8 households, representing 27 familial contacts, were positive for virus, as were 8 of 45 households containing 80 nonfamilial contacts and 2 of 127 households representing 374 noncontacts Virus was harbored by adults in 5 of the 6 positive households of familial contacts Virus was not recovered from specimens of water, sewage, flies, ants, cockroaches or droppings of domestic animals. An agent that produced paralysis in mice and cotton rats was obtained from a pool of brains and intestines from 22 rats from the city dump. No virus was recovered from several batches of mice and rats collected in various other parts of the city.

American Journal of Physiology, Baltimore

143:325-461 (March) 1945. **Partial Index**

Nervous Mechanisms of Muscularis Mucosae. C. E King and M H. Robinson —p 325
Comparison of Nutritive Value of Dextrose and Sucrose and of Effects Produced on their Utilization by Thiamine Hydrochloride. C P. Richter and Katherine K Rice —p 336
Self Selection Studies on Coprophagy as Source of Vitamin B Complex C P. Richter and Katherine K Rice —p 344
Effect of Calcium Concentration on Prothrombin Time of Dogs Treated with Dicumarol L. B. Jacques and A. P Dunlop —p 355.
Comparison in Intestine and Leg of Reflex Vascular Response to Carotid Aortic Chemoreceptor Stimulation T. Bernthal and I. J Schwind —p 361
Effects of Temperature Change on Water Balance in Man C. L Conley and J. L Nickerson —p 373
Response of Rats to Boron Supplements when Fed Rations Low in Potassium J T. Skinner and J S McHargue —p 385
Cardiac Response to Stimulation of Stellate Ganglia and Cardiac Nerves. R E Shipley and D E Gregg —p. 396
Local Nature of Acquired Resistance to Trauma S M Rosenthal, H. Tabor and R. D. Lillie —p 402
Evidence of Peripheral Action of Vitamin D from X Ray Diffraction Studies C. I Reed and B P. Reed —p 413
Influence of Aging in Man on His Capacity for Physical Work and on His Cardiovascular Responses to Exercise. P M. Dawson and I. A Hellebrandt —p 420.
Seasonal Changes in Food Consumption and Rate of Growth of Albino Rat H L Campbell —p 428

Annals of Surgery, Philadelphia

121:257-384 (March) 1945

Report on Immersion Foot Casualties from the Battle of Attu. A Lesser —p 257
Transthoracic Resection of Esophagus and Stomach for Carcinoma. Analysis of Postoperative Complications, Causes of Death and Late Results of Operation R. H. Sweet —p 272
Selection of Time for Grafting of Skin to Extensive Defects Resulting from Deep Thermal Burns H J. McCorkle and H. Silvani —p 285
*Influence of Local Treatment of Burns on Liver Function. H. Saltonstall, J. Walker Jr., J. E. Rhoads and W E Lee —p 291
*Studies on Toxemia Syndrome After Burns: II Central Nervous System Changes as Cause of Death. J Walker Jr and H. Shenkin —p 301.
Problem of Thrombophlebitis D R Jensen —p 314
*Wheal Fluorescence: New Method of Evaluating Peripheral Vascular Diseases, Preliminary Report J L Neller and E R. Schmidt —p 328
Pooled Human Serum E. B Self, W. Thalhimer and J. Scudder. —p 338.
Plasma Volume, "Available (Thiocyanate) Volume" and Total Circulating Plasma Proteins in Normal Adults G. E Griffin, W. E Abbott, M P. Pride, E Muntwyler, F. R Mautz and Lois Griffith —p 352
Malignant Granular Cell Myoblastoma Involving Urinary Bladder. A Ravich, A P. Stout and R A Ravich —p 361.
Treatment of Actinomycosis with Penicillin J M Walker and J. W Hamilton —p 373

Burns and Liver Function.—Saltonstall and his associates studied liver function of patients with burns admitted to eleven hospitals in the Philadelphia area. Most of the patients were treated locally with petrolatum gauze and pressure dressings. A combination of the van den Bergh test, the sulfobromophthalein retention, the hippuric acid conjunction test and the cephalin flocculation test gave an index that was fairly well correlated with the results of the van den Bergh test. Of a series of 38 patients studied prior to 1943, 34 were treated with tanning methods. The 47 cases treated in 1943 and have been treated by open methods. The authors found tannic acid impairs liver function following burns In patients treated with petrolatum gauze and pressure dressings the liver function is likewise impaired, but the impairment is usually mild The abandonment of tannic acid in the local treatment of burns has not resulted in a decrease in mortality. It seems unlikely that the increase in liver damage observed when tannic acid is used is of great significance in the mortality among burn patients. Hepatic damage is probably not the primary cause of death in burn toxemia.

Central Nervous System Changes as a Cause of Death in Burns.—Of 6 patients 5 died in sudden respiratory failure when the renal and hepatic damage associated with burn toxemia was decreasing in severity. The sixth patient had two episodes of apnea during the toxemic period but survived to die sixty two days later of a pulmonary embolus The brain in this case showed evidence of damage of the same type but of lesser degree than was seen in the other 5 patients. Gross examination of the brain revealed evidence of increased intracranial pressure with herniation of the cerebellar tonsils through the foramen magnum compressing the medulla. Photomicrographs showed severe interstitial edema and ganglion cell changes, which were most noticeable in the hypothalamus. Walker and Shenkin suggest that the central nervous system changes are an important factor in the sudden deaths occurring in the toxemic phase of burns

Wheal Fluorescence: Method of Evaluating Peripheral Vascular Diseases.—Neller and Schmidt suggest a test which reveals the extent and degree of peripheral vascular insufficiency The patient is placed in a room which can be darkened, and the inner or outer aspect of the entire leg and foot on both sides is prepared by washing with alcohol. A series of superficial scratches are made at 2 inch intervals down the legs in comparable places The lowest scratch mark can be made at the base of the toes on the dorsum of the foot The scratches are made by repeatedly (five to ten times) stroking the skin in the same spot with a hypodermic needle. As soon as the marks are completed, 5 cc. of a 20 per cent sodium fluorescein solution is injected intravenously. The room is darkened, and filtered ultraviolet light is played on the scratched areas. The test can be read within one to two minutes, which is just about the time necessary to darken the room and allow ultraviolet light to reach its peak intensity. The test remains readable for over an hour. The major fact to observe is the level at which the marks cease to be fluorescent. This change is abrupt and easily seen. Results indicate that scratch fluorescence gives reliable factual data regarding the degree and extent of vascular impairment.

Archives of Dermatology and Syphilology, Chicago

51:163-228 (March) 1945

Cutaneous Diseases in the Tropics Clinical Study Based on Observations in Malaya P. Fasal —p 163
Penicillin in Dermatologic Therapy: Report of Results in 100 Cases T. M Cohen and R. O. Pfaff —p 172
Favus Acquired in Service Overseas: Report of Involvement of Tinea Nails O Canizares —p 178
Control of Pediculosis H. A. Shelanski, H. I. Smyth, A M Clark C A Zeller, W. L Pious, J. H Frank and I. H Kramer —p 179
Poikiloderma as Initial Stage of Mycosis Fungoides A Dostrovsky and F Sagher —p 182
Gastric Secretion in Infantile Eczema A. Strickler, A. Herman and Helen Grumach Fabian —p 189
Sensitivity to Sulfadiazine Resembling Acute Disseminted Lupus Erythematosus B J. Hoffman —p 190
Cutaneous Leishmaniasis (Oriental Sore): V. Experimental Canine Cutaneous Leishmaniasis D. A Berberian —p 193.
Endocrine Influence on Radiosensitivity of Skin and Thyroid F Ellinger.—p. 198.
Rapid Treatment of Early Syphilis with Small Doses of Penicillin: Observations in 159 Cases G W Binkley, R L Kile and others —p 200
Treatment of Pityriasis Rosea with Trichophyton Extract Preliminary Report L Vass —p 203
*Local Application of Penicillin for Pyogenic Dermatoses H J. Templeton, C E Clifton and V. P. Seeberg —p 205

Local Penicillin for Pyogenic Dermatoses.—Templeton and his associates found that penicillin, whether used as peritrol lium gauze, as a solution of the crude penicillin or as purified penicillin in ointment bases, is a valuable therapeutic agent in

the local treatment of the pyogenic infections of the skin. They gained the impression that it works well only for superficial diseases solely or largely due to pyogenic infection. When the infection is deep in the skin, as in sycosis vulgaris or erysipelas, surface applications of penicillin are of questionable value.

Archives of Otolaryngology, Chicago

41:161-246 (March) 1945

*Treatment of Sinusitis with Penicillin. I. J. Hauser and W. P. Work.—p. 161
Proper Uses of Nasal Plastic Operations in Military Practice. G. V. Webster.—p. 170.
Treatment of Acute Laryngotracheobronchitis. H. L. Baum.—p. 175.
Infection in Nasal Accessory Sinuses and Ears in Old Age. H. Rosenwasser.—p. 182.
Comparison of Improvement in Hearing Following Fenestration Operation with That Obtained by Wearing Hearing Aid. G. E. Shambaugh.—p. 189.
*Aerosinusitis. R. W. Wright and H. M. E. Boyd.—p. 193.
Primary Infection of Maxillary Sinus by Actinomyces Necrophorus. J. H. Hersh.—p. 204.
Vitamin Therapy in Otolaryngology. C. C. Cody.—p. 208.
Procedure for Elevation of Nasal Dorsum by Transposition of Lateral Cartilages. J. W. Maliniac.—p. 214.

Treatment of Sinusitis with Penicillin.—Hauser and Work used penicillin in the treatment of 46 cases of sinusitis. Eleven were treated by irrigation of the maxillary antrums with solutions of penicillin, and 35 were treated by intramuscular injection of penicillin alone or in conjunction with radical surgical opening of the sinuses. When penicillin was used in conjunction with adequate surgical treatment of the sinuses, results were far better than before penicillin was available. It is not advisable to abandon surgical procedures, as was proved in 3 cases of intracranial complication of sinus disease in which penicillin was utilized over long periods and in adequate amounts before surgical intervention was attempted. In these cases operation revealed that the penicillin alone had not cured the sinusitis; following adequate surgical treatment, the sinusitis was rapidly cured. The authors at first gave penicillin weeks after operation in an attempt to reduce the amount of exudate in the nose. Noting the rapid cessation of discharge resulting from the use of penicillin, they began to give it immediately after operation. The results were gratifying in that the discharge disappeared rapidly. In the most recent cases they began the administration of penicillin forty-eight hours before operating on the sinuses. The postoperative reactions were minimal, and rapid and uneventful recovery followed. At present every patient who is to have radical surgical treatment for sinusitis receives penicillin intramuscularly every three hours for two days prior to operation, and its administration is continued postoperatively until maximum benefit has been obtained.

Aerosinusitis.—Aerosinusitis is an acute or a chronic inflammation caused by trauma to the mucous membrane of a sinus which occurs during airplane flights. Changes in barometric pressure are the immediate cause of aerosinusitis. Obstructing tissue is the predisposing cause. The rate of change in barometric pressure is of utmost importance. A slow change will give air of different densities opportunity to equalize through even a restricted sinus opening. A rapid change of pressure may force redundant tissue into the openings so quickly and build up differential pressure so rapidly that no aeration is possible. The symptoms occur chiefly on descent. Pain, the predominant symptom, is present only for a short time. The most severe physical effect on the sinuses produced by change in barometric pressure was observed in an aviation cadet who entered the hospital seven days after he had been on a routine flight in the low pressure chamber to 38,000 feet (11,580 meters) for three hours. On descent he experienced a severe pain in the left side of his face. The following day he complained of pain and numbness on the left side of his face. On the second day there was a discharge of blood from the left nostril. After a few days he showed improvement and was dismissed, but he returned because the pain and numbness had become intensified. The left antrum was opened. The Caldwell-Luc procedure was carried out. The periosteum of the canine fossa was bound down by fibrous reaction. The bone was thin and easily removed. When the sinus was opened a bluish membrane bulged out under pressure. Incision of the membrane revealed the cavity filled with many blood clots. It seems justified to assume that the hemorrhage in the submucosa was caused by relative negative pressure which pulled the mucosal layers apart, thus rupturing the blood vessels. This is what happens to the layers of the drum membrane in aero-otitis media with resulting hemorrhage between the layers. It is impossible to say whether or not a candidate with a certain nasal apparatus can fly without difficulty. A large number of candidates have been seen with severe pathologic nasal changes who have had no symptoms on repeated flights. Many with repeated difficulty showed much less pathologic change on examination than nonsymptomatic candidates. The treatment attempts to equalize the differential pressure.

Arkansas Medical Society Journal, Fort Smith

51:211-228 (March) 1945

Newer Methods of Treating the Mentally Ill. N. T. Hollis.—p. 211.
Modern Concepts of Cardiovascular Disease: Essential Hypertension. Part. II. C. T. Chamberlain.—p. 212.

51:229-244 (April) 1945

Cancer Control, a Doctor's Program. E. G. Zimmerer.—p. 229.
Modern Concepts of Cardiovascular Disease. C. T. Chamberlain.—p. 234.

Bulletin of Johns Hopkins Hospital, Baltimore

76:61-92 (Feb.) 1945

Amphetamine (Benzedrine) Sulfate on Higher Nervous Activity Compared with Alcohol: II. Human Experiments. N. Finkelstein, E. B. Alpern and W. H. Gantt.—p. 61.
Clinical and Pathologic Findings in Aortic Atresia or Marked Hypoplasia of Aorta at Its Base. Helen B. Taussig.—p. 75.
Methylation of Nicotinamide: Simple and Practical Test for Liver Function. V. A. Najjar, Rowena S. Hall and Carolyn C. Deal.—p. 83.

Cancer Research, Baltimore

5:193-256 (April) 1945

Incidence of Adrenal Cortical Carcinoma in Gonadectomized Female Mice of Extreme Dilution Strain: I. Observations on Adrenal Cortex. G. W. Woolley and C. C. Little.—p. 193.
Id.: II. Observations on Accessory Sex Organs. G. W. Woolley and C. C. Little.—p. 203.
Incidence of Adrenal Cortical Carcinoma in Gonadectomized Male Mice of Extreme Dilution Strain. G. W. Woolley and C. C. Little.—p. 211.
Histologic Study of Adrenal Cortical Tumors in Gonadectomized Mice of ce Strain. Elizabeth Fekete and C. C. Little.—p. 220.
Carcinogenicity of Certain Azo Dyes Related to p-Dimethylaminoazobenzene. J. A. Miller and C. A. Baumann.—p. 227.
Observations on Rats Fed with Compounds Related to Dimethylaminoazobenzene. K. Sugiura, C. R. Halter, C. J. Kensler and C. P. Rhoads.—p. 235.
Effect of Insoluble Radiophosphorus (Chromium Phosphate) When Applied Interstitially in Treatment of Adenocarcinoma of Mamma in Mice. H. Allen, L. H. Hempelmann Jr. and N. A. Womack.—p. 239.

Connecticut State Medical Journal, Hartford

9:255-330 (April) 1945

*Venous Thrombosis and Pulmonary Embolism: Review of 202 Patients Treated by Femoral Vein Interruption. R. R. Linton.—p. 255.
Present Trends in Treatment of Varicose Veins. K. W. Thompson.—p. 262.
*Intravenous Clotting. L. G. Simon.—p. 270.
Measurement and Treatment of Strabismus in Children. M. C. Wheeler.—p. 273.
Metallic Fixation of Fractures by Use of More Recent Methods and Appliances: Special Reference to Kirschner Wire, Vitallium Screws, Tantalum Foil and Plates. R. M. Yergason.—p. 276.
What Is the Matter with the Patient Who Is Always Tired? W. C. Alvarez.—p. 280.

Venous Thrombosis and Pulmonary Embolism.—According to Linton, bilateral femoral vein interruption is a safe procedure which will prevent massive fatal pulmonary embolism in patients with deep venous thrombosis of the lower extremities. The operation should be carried out on patients who have developed nonfatal pulmonary embolism, even though no positive signs of venous thrombosis in the legs can be detected, and on any patient who develops deep phlebitis of the lower extremities. Interruption of the femoral vein should be done on both sides even if the venous thrombosis is diagnosed on only one side, because patients with unilateral femoral vein interruption have died from a massive pulmonary embolus which arose from the unligated side. Thrombectomy by aspiration in cases of femoral iliac thrombosis has been demonstrated to be a safe procedure. It should be done as early as possible after the thrombosis has been diagnosed. It reduces the pain and

swelling in the leg and hastens the recovery, in addition to preventing massive fatal pulmonary embolism. No deaths have occurred in 202 cases as the result of femoral vein interruption. The morbidity of thromboembolic disease is tremendously reduced by this operation. Interruption of the inferior vena cava distal to the renal veins is the operation of choice in cases of long standing thrombophlebitis with pulmonary embolism.

Intravenous Clotting.—Simon points out that the syndrome formerly referred to as thrombophlebitis is now differentiated into thrombophlebitis and phlebothrombosis. Clotting in thrombophlebitis is the result of injury to the vascular endothelium from mechanical trauma, bacterial invasion or chemical injury, whereas in phlebothrombosis the thrombus is a result of venous stasis and alterations in the clotting tendency of the blood. There is also difference in the prognosis: in thrombophlebitis the clot is firmly adherent to the vein wall and is not likely to become detached as an embolus, while in phlebothrombosis the clot is loosely attached to the vessel wall and is likely to cause embolism. The clinical manifestations of the two types of clotting are quite different. In thrombophlebitis there is usually fever. The patient also has pain and swelling in the region of the involved vein. Patients with phlebothrombosis may have no symptoms at all. They frequently have a feeling of impending disaster but no pain, no fever and usually no swelling. It is in this type of patient that on the eighth to the tenth day postoperatively, when preparing to get out of bed or while straining at stool, the dramatic syndrome of pulmonary embolism occurs. Phlebothrombosis should be suspected in a patient who shows unusually rapid pulse and tenderness of the feet or calves. When the diagnosis of phlebothrombosis is made, aspiration of the thrombus and division of the vein should be done, while thrombophlebitis responds dramatically to sympathetic ganglion block.

Florida Medical Association Journal, Jacksonville

31:396-444 (March) 1945

Acute Thyroiditis E. Jelks.—p. 419
Aplastic Anemia Treated with Sulfadiazine. R. H. Nichau.—p. 421.

Illinois Medical Journal, Chicago

87:113-164 (March) 1945

A Step in Cancer Control. Review of First 600 Cases Examined by Cancer Prevention Clinic. A. Webster, Evangeline Stenhouse and others.—p. 119
Pathologic Basis for Clinical Manifestations in Nephritis. J. P. Simonds.—p. 126
Certain Aspects of Newer Insulins. H. T. Ricketts.—p. 133.
Statistical Study of Obstetric Activities in Illinois Hospitals During 1943. C. Newberger.—p. 136
Treatment of Chronic Suppurative Otitis Media with Positive Fistula Symptoms. M. Tamari and L. Hirsch.—p. 144
Gas Gangrene Treated by Penicillin. W. S. Wood, S. Holtzman, A. F. Goodyear and C. Rich.—p. 145.
Bacteriologic Aids in Treatment of Acute Gonorrhea. I. Pilot.—p. 147.
Acute Osteomyelitis Treated with Penicillin. C. M. Jack.—p. 148.

Journal of Allergy, St. Louis

16:61-120 (March) 1945

Relationship of Allergy to Medicine. D. P. Barr.—p. 61
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Nutritional Aspects of Globulin Metabolism. P. R. Cannon.—p. 78
Treatment of Urticaria with Synthetic Vitamin K. J. H. Black.—p. 83.
Moisture Characteristics of Pollen. A. B. Berresford and R. A. Cooke.—p. 87
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Air Borne Fungi in Allergic Disease: I. A New Method of Preparation of Mold Extracts; Incidence of Skin Reactions with Mold Extracts; Preliminary Report. S. F. Hampton and E. P. Lowe.—p. 101.

Journal Industrial Hygiene & Toxicology, Baltimore

27:59-94 (March) 1945

Upper Limits of Environmental Heat and Humidity Tolerated by Acclimatized Men Working in Hot Environments. L. W. Eichna, W. F. Ashe, W. B. Bean and W. B. Shelley.—p. 59.
The Occurrence of Heinz Bodies in Trinitrotoluene Workers. B. L. Horecker.—p. 85.
Lead Fume Sampling Apparatus. O. D. Bayrer and W. A. Hough.—p. 89.
Toxicity of Ethylene Chlorhydrin by Skin Absorption. H. F. Smyth Jr. and C. P. Carpenter.—p. 93

Journal-Lancet, Minneapolis

65:37-94 (Feb.) 1945

Recent Advances in Control of Insect Borne Diseases. J. S. Simmons.—p. 38.
Achievements in Environmental Sanitation. H. A. Whittaker.—p. 41
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Preventive Geriatric Medicine. E. J. Stieglitz.—p. 60
Maternal and Child Health. Ruth E. Boynton.—p. 63.
Improvement of Health Through Better Nutrition. F. J. Stare.—p.
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Changing Attitudes Toward Industrial Hygiene. L. W. Foker.—p.
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Seventy-Five Years of Medical Journalism in the Northwest. H. Diehl.—p. 82.

65:93-132 (March) 1945

Penicillin in Surgery. W. A. Altemeier.—p. 93.
Present Day Status of Contraception. A. Stone and Harriet F. P.—p. 101
Neurotic Problems in Student Practice. C. I. Wyler.—p. 104
Health Education by Doctor. W. W. Bauer.—p. 106
Specific Types of Alpha Streptococci and Streptococcal Precipitinogen Air in Relation to Epidemic Infections of Respiratory Tract Nervous System. E. C. Rosenow.—p. 108

Journal of Nat. Cancer Inst., Washington, D. C.

5:233-310 (Feb.) 1945. Partial Index

Experimental Roentgen Injury: V. Effects on Hemopoietic Reserve and Regenerative Capacity. P. S. Henshaw, Jean W. Thompson and H. L. Meyer.—p. 233.
Degradation of Cystine Peptides by Tissues: III. Absence of Exocystine Desulfurase and Dehydropeptidase in Tumors. Jesse P. Greenstein and Florence M. Leuthardt.—p. 249.
Induction of Hepatomas in Mice by Repeated Oral Administration of Chloroform with Observations on Sex Differences. A. B. Eschenbrenner and Eliza Miller.—p. 251.
Multiple Tray for Embedding Tissues in Paraffin. A. M. Kessel.—p. 25
Source of Tumor Proteins. I. Effect of Low Nitrogen Diet on Establishment and Growth of Transplanted Tumor. Florence R. White and M. Belkin.—p. 261
Id: II. Nitrogen Balance Studies of Tumor Bearing Mice Fed Low Nitrogen Diet. Florence R. White.—p. 265.
Technic for Studying Epithelization of Paired Skin Wounds in Rat with Observations on Influence of Dietary Protein. H. P. Morris and Thelma B. Dunn.—p. 271.
*Behavior of Thymus Tissue Transplanted to Skin Wound. Thelma B. Dunn.—p. 285
Gene Milk Agent Relationship in Mammary Tumor Development. W. E. Heston, Margaret K. Deringer and H. B. Andervont.—p. 289

Thymus Tissue Transplanted to Wound.—Because it has been suggested that the small lymphocyte may have a function in the formation of fibrocytes and collagen fibers, thymus tissue, in which this cell is abundant, was taken from rats 3 to 6 weeks old and applied to the surface of open wounds made on adult rats of the same strain. A stratified squamous epithelium was developed on the surface of skin wounds. This epithelium was derived from the thymus reticulum cells. Such a change in the thymus tissue is not surprising when other evidence of the potentialities of the thymus reticular cell is reviewed.

Journal of Neurosurgery, Springfield, Ill.

2:79-180 (March) 1945

*Failure of Whole Fresh Homogenous Nerve Grafts in Man. R. G. Spurling, W. R. Lyons, B. B. Whitcomb and B. Woodhall.—p. 79
*Combined Use of Fibrin Film and Clot in End to End Union of Nerves: Experimental Study. M. Singer.—p. 102
Unusual Size and Extension of Pituitary Adenoma: Case Report of Chromophobe Tumor with Unusually Extensive Compression of Base of Brain and Review of Literature of Pathways of Extension of These Tumors. J. C. White and S. Warren.—p. 126.
Depressed Fractures of Skull: Their Surgery, Sequelae and Disability. M. A. Glaser and F. P. Shafer.—p. 140
Electroencephalographic Studies in Head Injuries. R. S. Dow, G. Ulett and J. Raaf.—p. 154
"Delayed Recovery" in Peripheral Nerve Lesions Caused by High Velocity Projectile Wounding. W. K. Livingston, E. W. Davis and K. E. Livingston.—p. 170

Failure of Homogenous Nerve Grafts.—Spurling and his associates analyze the histologic changes in a number of whole fresh homogenous nerve grafts placed in peripheral nerve defects in man subsequent to extensive gunshot wounds of the upper and lower extremities. There was no clinical evidence of nerve regeneration after an appropriate time interval had elapsed following transplantation of the neural tissue. When failure was manifest, the engrafted segment, including adjacent proximal and distal nerve areas, was excised and was replaced with a

nerve graft of a different character. Clinical records of 2 patients illustrate the salient results of this study. The proximal and distal nerve ends must be prepared through normal appearing tissue. This basic principle applies to the scarred, often edematous, nerve trunk, which may lie just central to the neuroma, and to the distal nerve end, which may be extensively fibrosed. Tantalum wire, 0.003 inch in diameter, was used as an interrupted suture, and every effort was made to keep it within the epineurium. The application of tantalum foil cuffs appears highly significant. The nerve ends and segments of grafts protected by the foils were relatively normal in appearance where the unprotected segments were ensheathed by constricting adhesions. In 1 case in which foil was placed around the proximal junction and a protein film about the distal anastomosis, the beneficial effect of the former is well illustrated. The entire graft may need mechanical protection from the adverse influence of the graft bed tissues. One of the main points of difference between successful animal homografts and human failures may lie in the girth of the engrafted tissue. Blood vessels, fat, epineurium and a considerable amount of interfascicular tissue may be removed from the neural tissue of a large human nerve trunk. No attention was paid to the blood groups, and it was found that a patient receiving a graft from within the same blood group fared no better than an O recipient obtaining a graft from an A donor. In all of the proximal stumps and grafts studied, areas exhibiting good nerve growth were always well vascularized; but it seemed that a rich blood supply to the tubules within a graft fascicle did not guarantee their neuromotization. The actual bridging of the gap between regenerating fibers and the distal nerve may be achieved by the summation of a multitude of technical and biologic refinements.

Combined Use of Fibrin Film and Clot in Union of Nerves.—Singer describes a method of uniting nerve stump without the use of thread sutures. The technic, designated as the fibrin adhesive method, involves the use of a thin smooth film of fibrin prepared from products of fractionation of human blood plasma. The film is impregnated with thrombin, surfaced with fibrinogen and then applied to the apposed nerve stumps by one of several methods. The fibrinogen as it clots binds the film to the surface of the nerve and thus serves to transmit the stress of retraction of the stumps to the film. In addition to maintaining apposition of the stumps, the film serves as an envelop enclosing the nerve stumps and nerve wound in a continuous channel. The fibrin adhesive method of nerve splicing has the advantages of simplicity of application and of introducing no extraneous materials or obstacles to growth into the nerve trunks themselves or between the stumps. The film is transparent and consequently allows for continued observation of the nerve stumps throughout the operation.

North Carolina Medical Journal, Winston-Salem

6:61-116 (Feb.) 1945

Compensation of Renal Metabolic Dysfunction: Treatment of Kidney Disease and Hypertensive Vascular Disease with Rice Diet. III. W. Kempner.—p. 61.
Treatment of Fractures of Humerus with Hanging Cast. R. B. Raney. —p. 88.
Simple Method of Fracture Fixation with Kirschner Wire. D. B. Cobb.—p. 92.
Narcolepsy: With Report of 4 Cases. F. T. Harper.—p. 96.

6:117-184 (March) 1945

Compensation of Renal Metabolic Dysfunction: Treatment of Kidney Disease and Hypertensive Vascular Disease with Rice Diet, III. W. Kempner.—p. 117.
Education of Child Handicapped by Loss of Hearing. C. E. Rankin. —p. 162.

Public Health Reports, Washington, D. C.

60:229-260 (March 2) 1945

Federal Program of Public Health and Medical Services for Migratory Farm Workers. F. D. Mott and M. I. Roemer.—p. 229.

60:261-288 (March 9) 1945

Studies of Acute Diarrheal Diseases: XIII. Cultural Surveys of Normal Population Groups. J. Watt and A. V. Hardy.—p. 261.

60:289-316 (March 16) 1945

Further Studies on Pharmacologic Action of 2,2 Bis (P-Chlorophenyl) 1,1,1 Trichlorethane (DDT). M. I. Smith and E. F. Stohlman.—p. 289.

Rocky Mountain Medical Journal, Denver

42:81-152 (Feb.) 1945

Variables Concerned in Recovery or Death in Acute Coronary Occlusion. F. A. Willius.—p. 97.
Osgood-Schlatter's Disease. J. R. Bunch.—p. 102.
Place of Temporary Diaphragmatic Paralysis in Treatment of Pulmonary Tuberculosis. C. J. Kaufman.—p. 104.

42:167-239 (March) 1945

Carcinoma of the Colon. W. H. Cole.—p. 169.
Psychiatric Problems in Induction Service. G. Ashley—p. 178.
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Endometriosis. V. S. Counseller and F. S. Sluder.—p. 189.

Surgery, Gynecology and Obstetrics, Chicago

80:337-448 (April) 1945

Calcification of Tendon Cuff of Shoulder. M. B. Howorth.—p. 337.
Functional Pathology of Experimental Frostbite and Prevention of Subsequent Gangrene. K. Lange and L. J. Boyd.—p. 346.
Acute Putrid Abscess of Lung. H. Neuhof.—p. 351.
Gastric Resection for Duodenal Ulcer. R. Lewisohn.—p. 355.
Active Motion by Means of Occupational Therapy in Treatment of Fractures. L. Breidenbach and Elizabeth Jamison.—p. 361.
Surgical Treatment of Urinary Obstruction in Army General Hospitals. L. W. Riba and C. J. Schmidlapp.—p. 368.
*Anatomic and Surgical Restudy of Denonvilliers' Fascia. C. E. Tobin and J. A. Benjamin.—p. 373.
Function of Patella and Effects of Its Excision. H. Haxton.—p. 389.
Roentgen Therapy as Adjunct in Management of Acute Postpartum Mastitis. R. A. Harvey, H. A. Spindler and A. H. Dowdy.—p. 396.
Suspension of Uterus Using Pfannenstiel Incision. T. C. Gilbert and B. L. Aronoff.—p. 404.
Adding More Safety to Gastrointestinal Sutures. H. J. Fournier. —p. 407.
Acute Peptic Ulcers Following Distant Operations. P. A. Herbut. —p. 410.
Internal Epicondylar Epiphysis and Elbow Injuries. A. A. Schmier. —p. 416.
Reparative Plastic Surgery of Secondary Cleft Lip and Nasal Deformities. E. S. Lamont.—p. 422.
Evaluation of Clinical Significance of Serum Amylase and Lipase Determinations. M. L. McCall and J. G. Reinhold.—p. 435.

Denonvilliers' Fascia.—Tobin and Benjamin describe studies on human embryos and on specimens from adults. The tissue known as Denonvilliers' fascia was observed to be derived embryologically from two sources of connective tissue (mesenchyme): (1) a layer surrounding the developing prostate and seminal vesicles and another layer around the rectum and (2) connective tissue (mesenchyme) adjacent to the mesothelium of the pelvic cul-de-sac of peritoneum. The authors suggest that the fascia around the rectal musculature be designated the posterior layer and that the fibrous membrane which is derived from the pelvic cul-de-sac of peritoneum be designated the anterior layer of Denonvilliers' fascia. In the perineal approach to the prostate, three potential fascial spaces could be developed between the rectum and prostate: (1) between the rectal musculature and rectal fascia (posterior layer of Denonvilliers' fascia), (2) between the rectal fascia and anterior layer of Denonvilliers' fascia and (3) between the anterior layer of Denonvilliers' fascia and the fibromuscular covering of the prostate and seminal vesicles. Since the anterior layer of Denonvilliers' fascia and the fibromuscular covering of the prostate are whitish in appearance and close together or adherent, either or both of these layers may constitute the glistening layer encountered in the perineal exposure of the prostate. If the fibromuscular covering of the prostate should be perforated by cancer or abscess, the fibrous membrane (anterior layer of Denonvilliers' fascia) might prevent direct spread of the malignant growth posteriorly to the rectum and might limit the spread of extravasated pus or urine. In the specimens studied by the authors the fascial spaces between the rectum, prostate and seminal vesicles were separated more readily if they were not compressed by instrumentation through the urethram or rectum in the first stages of the perineal approach.

Yale Journal of Biology and Medicine, New Haven

17:503-582 (March) 1945

Serologic and Immunochemical Studies on Gonadotropic Hormones. J. H. Chase.—p. 517.
Localization of Ventricular Extrasystoles. L. H. Nahum and H. E. Hoff.—p. 539.
Health Services for Hospital Personnel: II. Purposes, Scope and Philosophy. A. J. Geiger.—p. 555.
Occurrence of Perineal Hernias in Untreated Male Mice of C Black Strain. H. Burrows.—p. 567.
Time Factors in Electric Convulsive Therapy. W. T. Liberson.—p. 57[illegible]

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

1:199-230 (Feb. 17) 1945

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*Human Transmission of Infective Hepatitis by Oral Route. W. P. Havens, J. R. Paul and C. E. Van Rooyen.—p. 202.
Penicillin by Mouth. C. J. H. Little and G. Lumb.—p. 203.
Amebic Dysentery in Eastern India. A. M. M. Payne.—p. 206.
Return of Blood to Heart: Criticism of Orthodox View. F. Roberts. —p. 209.
Penicillin in Weil's Disease. R. M. Cross.—p. 211.

1:231-262 (Feb. 24) 1945

Aviation Medicine. H. Whittingham. M. B. Glasg.—p. 231.
Treatment of Compound Fractures by Early Wound Suture and Penicillin. F. H. Bentley, J. A. Key, S. Thomson, A. K. Bingham and M. H. Wostenholm.—p. 232.
*Compound Fractures of Femur Treated with Aid of Penicillin. B. H. Burns and R. H. Young.—p. 236.
Artificial Respiration by Rib Traction. R. Viswanathan.—p. 238.
High Blood Pressure After Battle. J. D. P. Graham.—p. 239.
Excoriation Around Fistulas: Control by Buffered Gels. C. E. Selous and P. W. Perryman.—p. 240.

Human Transmission of Infective Hepatitis by Oral Route.—Infective hepatitis can be transmitted to man by a number of routes. The etiologic agent (probably a virus) is in the blood stream before the onset of and during jaundice; it is present in feces during acute stages of the disease and probably also in nasal washings. Newer (unpublished) experiments by one of the authors establish that the agent of infective hepatitis can be carried in serial passage in man (two passages), thus indicating the infectious nature of the disease. Like the agent of serum jaundice (with which it may be identical) it is filtrable and heat stable, withstanding 56 C. for half an hour. More recent observations indicate that in cases of infective hepatitis the virus or icterogenic agent is in the feces and that the disease can be produced in man by feeding such material in capsules or by spraying it into the nasal and pharyngeal passages. Similarly the disease can be produced by feeding serum from cases of infective hepatitis. In the feeding cases the incubation periods have on the average been about twenty-eight days, being shorter than the incubation periods of typical serum jaundice. There is justification for suspecting that the intestinal-oral circuit is part of the natural route of spreading infective hepatitis.

Compound Fractures of Femur Treated with Penicillin.—Burns and Young say that when a débridement has been done some days previously the use of penicillin makes it possible to sew up infected and purulent wounds. Penicillin does not have so dramatic an effect on local sepsis as it does on the prevention of its spread, but that prevention is absolute. There were no deaths, no amputations and no septicemia in the 70 cases of fracture of the femur treated by the authors since D day, June 6, 1944. The great majority of patients reached their hospital between the third and the tenth day after wounding. All came in Tobruk plasters, having had débridement of the wound, the wound being left open. Nearly all the patients had had some penicillin before arrival, but the doses in transit varied within wide limits. After twenty-four hours' rest the plasters were removed under anesthesia and the wounds were inspected. Nearly all had a sulfonamide petrolatum gauze pack. Pus in varying degrees was present in most of the wounds. In some the pack had become a plug and was damming up the pus. Complete closure of the skin gave the best chance of early healing and avoidance of bone infection, and whenever possible the wound was thereafter sewed up completely, regardless of the amount of infection present. The suturing was not determined by bacteriologic findings but on anatomic grounds alone. Of 48 cases completely sutured, 40 healed in a month; 4 more healed at three months; 4 failed and had a sinus at three months. Of 17 which could be only partially closed, 11 were healed and 6 had a sinus at three months. Of 5 cases which had to be left completely unsutured 2 were healed and 3 had a sinus at three months. Thus only 4 of the 48 completely sutured had a sinus at three months against 9 of the 22 incompletely closed. Union of these compound fractures ceeds as quickly as in closed fractures or even more qui Penicillin has justified itself in the treatment of comp fractures of the femur. It is expected that from 40 to 50 eventually show no disability from the fractured femur.

Medical Journal of Australia, Sydney

32:49-76 (Jan. 20) 1945

Psychiatric Casualties as Repatriation Problem. W. A. Dibden—p
*Postmortem Changes in Scrub Typhus. J. D. Hicks.—p. 57.
"Crude Penicillin" Therapy. D. F. Gray and J. V. Duhig.—p 60.

Postmortem Changes in Tsutsugamushi Fever.—account of the postmortem observations in tsutsugamushi f presented by Hicks is based on twenty-four necropsies formed by him and on reports of a further eleven de occurring at his hospital. Many organs were examined mi scopically. The main changes following fatal infection with disease were a proliferation of reticuloendothelial tissues the production of large numbers of mononuclear cells, large small lymphocytes and macrophages, and some plasma c Most organs were infiltrated by these cells, which were fo mainly in the interstitial or connective tissues. The heart lungs appeared to be most affected by this infiltration. Sepa tion of individual muscle fibers was pronounced in some hea The pulmonary congestion and capillary damage with co quent hemorrhage and production of "heart failure" cells w associated with consolidation. Acute bronchopneumonia sometimes superimposed on this. The liver was congested, little fatty degeneration was present. Toxic changes were p nounced in the kidneys, where tubular damage was a featu The cellular proliferation throughout the splenic pulp cau consistent enlargement of the organ. Vasculitis was promine in the spleen. There was a general swelling of the capilla endothelium throughout the body. There was little eviden that failure of the vital centers of the brain was the immedi cause of death.

1:77-100 (Jan. 27) 1945

*Report on an Outbreak of Epidemic Diarrhea of the Newborn. Kate Campbell.—p. 79.

Epidemic Diarrhea of the Newborn.—Campbell repo an epidemic of diarrhea of the newborn in Melbourne duri 1943. Three attacks occurred, the first in the premature babi ward at the Women's Hospital, the second among the pr mature and full time babies at the Queen Victoria Hospit and the third in the premature ward at the Women's Hospit The season was late fall and winter. The first outbreak w well established before it was recognized, and 9 of the 11 pr mature infants died. In the second outbreak, in which both fu time and premature infants were affected, the full time infan were not as seriously affected as the premature infants. T treatment consisted of initial starvation, free fluids orally, flui given by the parenteral route and sweetened condensed milk The results in this series were much better. Of 8 prematur infants, 2 died. The 20 full time babies all recovered. Sulfa thiazole had no influence on the course of the disease. In th third outbreak sulfaguanidine was used and appeared to pro vide a means to control the disease. Eight of 10 premature infants in this group recovered. The control measure consiste in maintaining three nurseries with separate staffs: (1) th isolation ward into which all babies suffering from diarrhe were placed, (2) the original nursery, where the infants presen at the outbreak were kept till their discharge from hospital and (3) the "clean" nursery, in which all babies born subse quent to the outbreak were placed. Making this disease notifi able would be a safeguard to the newborn infant, provided th typical character of the stool was appreciated; otherwise the reporting of all cases in which loose stools were passed would create an impossible situation.

Practitioner, London

154:129-192 (March) 1945

Functions of Pituitary Gland (Anterior Lobe). F. G. Young—p. 1
"Harmless" Goiter. J. W. Linnell.—p. 138.
Diseases of Suprarenal Glands. D. M. Dunlop.—p. 143.
Male Sex Hormones. T. N. Morgan.—p. 149.
Materia Medica of Endocrinology. R. Greene.—p. 157.
Acute Epidemic Bronchitis. E. Wellisch.—p. 161.
Vitamin Dosage. C. Asher.—p. 163.

Archiv für klinische Chirurgie, Berlin

205:163-320 (Dec. 16) 1943. Partial Index

Recent Deep Ulcer of Stomach and Duodenum. V. Hoffmann.—p. 163.
*Hepatorenal Syndrome in Trauma of Liver. E. Fenster.—p. 179.
Bone Formation in Operative Scars. H. Waschulewski.—p. 190.
Relief from Pain by Sympathectomy in Chronically Contracted Bladder and in Tumors of Pelvis. K. Uhlenbroock.—p. 194.
Changes in Vertebrae and Spinal Column in Osteogenesis Imperfecta Tarda. K. Bornebusch.—p. 218.

Hepatorenal Syndrome in Trauma of Liver.—Fenster reports 4 instances of subcutaneous rupture of the liver in men between the ages of 18 and 42 who were admitted to the surgical clinic of the University of Giessen. A pronounced increase in the nitrogen of the blood and the presence of abnormal constituents in the urine were observed in all 4 cases, but a condition resembling that of hyposthenuria was found in only 1 case. A constant increase in the specific gravity of the urine or considerable variations in the specific gravity of single specimens or of daily values were demonstrated in the 3 other cases. Clinical and experimental studies revealed that renal parenchymal lesions may result from trauma to the liver parenchyma. These renal changes were somewhat different from those present in diseases of the liver or gallbladder. They resembled lesions seen after intraperitoneal transplantation of liver tissue or after administration of suspensions of liver cells or of liver autolysates. This may be explained by the disintegration of liver tissue which results from the rupture of the liver due to traumatic force or in gunshot injuries of the liver. The high mortality rate of injuries of the liver cannot be reduced by improved surgical methods or by blood transfusions. An unfavorable postoperative course may be prevented by early diagnosis of the renal disorder. Treatment with insulin and glucose, combined with venesection and blood transfusion, proved satisfactory. Subphrenic abscess frequently occurs; early diagnosis, incision and drainage and blood transfusions are indicated.

Khirurgiya, Moscow

5:1-96, 1944. Partial Index

Role of Hypoproteinuria in Pathogenesis of Wound Phthisis. S. Kaplansky, N. Bondyreva and N. Berezovskaya.—p. 3.
Effect of Procaine Block on Vasomotor Nerves and Collateral and Capillary Circulation During Operations on Blood Vessels. I. V. Shimelev.—p. 9.
Stimulation of Wound Healing. L. Goldberg.—p. 16.
Pantocrine in the Treatment of Thermic and Chemical Burns. S. M. Pavlenko.—p. 19.
Secondary Suture of Wounds of Soft Tissues in Evacuation Hospital. N. V. Antelava.—p. 22.
Clinical Significance of Bacilluria in Gas Gangrene. I. L. Tsimrhes.—p. 26.
*Intra-Arterial Injection of Sulfonamide Preparations in Craniocerebral Injuries. V. V. Kovanov.—p. 29.

Intra-Arterial Injection of Sulfanilamide in Craniocerebral Injuries.—Kovanov demonstrated the permeability of capillaries and the direct action of sulfanilamide on inflammatory foci in the brain by injecting into the carotid artery a sulfanilamide solution together with 0.5 per cent solution of methylene blue. The side of the face and the head became discolored. This was particularly pronounced in the sclera, the mucosa of the tongue and the discharge from the cerebral wound. Smears from the brain lesion taken at five, ten and thirty minute and one hour intervals showed discoloration of the brain tissue. The author injected from 30 to 40 cc. of 1 per cent sulfanilamide solution into the carotid artery in an upward direction in 20 patients with penetrating craniocerebral wounds. From six to eight injections every other day were given as prophylaxis against infection in craniocerebral injuries. The usual surgical principles of treatment of cerebral wounds were adhered to. This prophylaxis prevented the development of a grave infection in almost all of the cases. There was noted a rapid drop of fever, improvement in the general condition and return of appetite and of normal sleep. Focal signs such as paresis and pathologic reflexes regressed or completely disappeared. No instance of the meningeal syndrome was observed. The author treated a group of 30 patients with craniocerebral injury complicated by meningeal symptoms and signs of lesions of the brain. After proper surgical treatment of the wound, these patients were likewise treated by intra-arterial injection of sulfanilamide solution. In the majority of the cases the meningeal process was arrested and signs of focal infection regressed. Five patients in this group died despite this combination therapy. These were severe cases with considerable destruction of brain tissue. Death was caused by a diffuse leptomeningitis in 2, by basal meningitis in another 2 cases and by brain abscess in 1. The author believes that the intra-arterial method of administering sulfanilamide is superior to the intravenous or intramuscular.

Klinicheskaya Meditsina, Moscow

22:1-80, 1944. Partial Index

Problem of Wound Sepsis. I. G. Rufanov.—p. 5.
Wound Toxemia. M. N. Mogilnitsky.—p. 12.
*Effect of Combined Vitamin Therapy on Altered Liver Function in Sepsis. I. G. Rufanov and E. P. Stepanyan.—p. 16.
Reaction of Active Connective Tissue in So-Called Wound Cachexia: Preliminary Report. A. V. Goryaeva and M. F. Ivanitskaya.—p. 25.
Neurologic Symptoms in Wound Sepsis. M. B. Eidinova.—p. 28.

Combined Vitamin Therapy and Liver Function in Sepsis.—Rufanov and Stepanyan observed the effect of polyvitamin therapy on the liver function of 150 patients, 80 of whom presented sepsis or cachexia from wounds while 70 presented local suppurative processes or frostbite. The functional studies included Quick's determination of hippuric acid in the urine, determination of albumin and of the albumin coefficient in the blood serum, determination of the prothrombin in plasma and the glycemic curve. Patients with sepsis in the hyperergic phase showed alteration in the detoxifying function of the liver as expressed by diminished elimination of hippuric acid, namely 21.1 to 35.7 per cent instead of the normal 70 to 80 per cent. The blood prothrombin content amounted to 35 to 45 per cent instead of the normal 70 to 80 per cent. The serum albumin was diminished by 25 to 40 per cent. The albumin-globulin ratio was altered, with an increase in the globulin and diminution of the albumin coefficient. The glycemic curve was distinctly pathologic in the majority of cases, with a rapid rise and a failure to return to the initial level after two and one-half hours. None of the tests displayed a specificity for any of the clinical states. Thirty-two control patients not given vitamin therapy and corresponding in every respect to the vitamin treated group were subjected to the same tests. Comparison of the results obtained suggests that the improvement as demonstrated by the various tests was due to the polyvitamin therapy. Microscopic studies on 25 necropsies, of which 12 were of the control group, supported the biochemical studies of liver functions. Apparently the methods employed are specific for liver function. The authors now perform the test for the detoxifying function of the liver before subjecting a patient to a major operation, except in emergencies.

Sovetskaya Meditsina

6:1-32, 1944. Partial Index

Wartime Problems of Municipal Hospitals. S. A. Kolesnikov.—p. 1.
Combined Method of Administration of Akrichin in Malaria. E. M. Tareev, A. P. Butyagina and A. D. Polumordvinov.—p. 9.
Dosage, Method of Administration and Contraindications to Akrichin Therapy in Malaria. P. I. Budarin.—p. 11.
Intravenous Drip Infusion of Akrichin in Therapy of Malaria. N. P. Pyatnitskiy.—p. 12.
Comatose Malaria. S. M. Gusman.—p. 13.
Research in Field of Antibacterial Therapy: Antagonism Between p-Aminobenzoic Acid and Sulfonamides. L. M. Model.—p. 14.
*Changes of Nervous System in Tularemia. I. R. Dobrinsky.—p. 15.

Alterations of the Nervous System in Tularemia.—Tularemia is manifested in its acute stage by persistent headaches and by pains in the muscles, joints, bones, the back and not infrequently along the course of nerve trunks. The patients as a rule are apathetic and not infrequently somnolent. A number of complications on the part of the central, peripheral and vegetative nervous systems take place. The more frequent of these are radiculitis, neuralgias, neuritides, acute infectious polyneuritis, meningitis, myelitis, encephalitis and trophic lesions of the skin. Meningitis was usually observed in the course of the first week of the sickness, myelitis during the second to fourth weeks, while polyneuritis developed in the late stage of the disease, in the second month or later. Tularemic meningitis had a rapid and rather mild course. Myelitis, neuritis and polyneuritis were characterized by a prolonged course. Dobrinsky did not succeed in a single instance of tularemic meningitis in demonstrating the causative agent in the cerebrospinal fluid. Postmortem studies confirmed the existence of tularemic encephalitis, meningitis and myelitis.

Acta Medica Scandinavica, Stockholm

114:1-126 (April 29) 1943

Singular Effect of Nicotinic Acid (Periarticular Hyperemia). E. Ask-Upmark.—p. 1.
Frequency and Duration of Subjective Effect and of Untoward Reaction of Amphetamine and of d-Desoxyephedrine on Excessive Fatigue. N. Alwall.—p. 6.
Investigation on the Effect of Amphetamine and of d-Desoxyephedrine on Physical and Psychic Functional Capacity of Men in the State of Excessive Fatigue. N. Alwall.—p. 33.
Serumcholinesterase in Disease. M. Faber.—p. 59.
The Relationship Between Serumcholinesterase and Serum Albumin. M. Faber.—p. 72.
Experience with Intravenous Heparin Treatment by the Vein Seeker in the Treatment and Prevention of Thrombosis and in Treating Endocarditis Lenta. W. J. Kolff.—p. 92.
*Investigation on the Passage of Sulfathiazole Through the Blood-Spinal Fluid Barrier in Various Forms of Meningitis. A. H. Andersen and M. H. Simesen.—p. 103.

Blood-Spinal Fluid Permeability Quotient of Sulfathiazole in Meningitis.—It has been previously suggested that the ratio between the concentration of sulfathiazole in the cerebrospinal fluid and in the blood may be a means of distinguishing between a tuberculous and a serous meningitis. Experiments carried out on patients with mild infectious diseases, predominantly measles, and on normal persons revealed that the blood-spinal fluid permeability quotient after the ingestion of sulfathiazole ranged from 0.12 to 0.22, with a mean value of 0.17. The quotient was the same for adults and for children. On examination of 10 patients suffering from tuberculous meningitis an increase in the quotient averaging 0.42 was found in all cases, ranging from 0.32 to 0.55. In 9 patients suffering from secondary lymphocytic meningitis a normal quotient was found (mean value 0.18, varying between 0.14 and 0.23). In 9 cases of primary lymphocytic meningitis a moderate increase was found in 2 severe cases. The increased quotient, however, dropped to normal in the 2 cases kept under observation until recovery. The remaining cases showed a normal quotient. In 4 patients with polyradiculitis a slight increase was found and there was a slight or no increase in 5 patients with poliomyelitis. In 8 patients with purulent meningitis there was a considerable increase in the blood-fluid permeability quotient. But the changes in permeability with a mean value of 0.33 were not so radical here as in the more severe type of meningitis, the tuberculous meningitis which showed a mean quotient of 0.42. It appears that in patients suffering from lymphocytic meningitis an essential and protracted increase in the quotient (above 0.30) is a strong indication that the meningitis is of a tuberculous nature.

115:199-311 (Oct. 19) 1943

Case of Hyperparathyroidism. A. Schrumpf.—p. 199.
Tuberculin and Environment Investigation of Schoolchildren. E. Berle. —p. 219.
*Recovery from Diabetes Mellitus. H. K. Goadby.—p. 247.
Function of Spleen and Blood. C. D. de Langen.—p. 271.
Determination of Urinary 17-Ketosteroids and Its Clinical Significance. R. Luft.—p. 277.
Continued Investigations on Histamine in Feces. G. Myhrman.—p. 300.

Recovery from Diabetes Mellitus.—Goadby's criteria of recovery from diabetes mellitus are that on a normal unrestricted diet and without receiving insulin the patients are free from symptoms and have a normal carbohydrate metabolism. The latter is proved by absence of glycosuria and by a blood sugar which, regardless of the carbohydrate intake, at no time of the day rises above 180 mg. per hundred cubic centimeters and shows a normal sugar tolerance curve. Eight patients at the diabetic clinic of St. Thomas's Hospital in London, each of whom had one or more acute attacks of severe diabetes mellitus, presented the complete syndrome of thirst, polyuria, loss of weight and strength, with hyperglycemia, glycosuria and acetonuria. Only three of the attacks were precipitated by a known infection; in the rest a thorough clinical examination failed to reveal any inflammatory or endocrine disturbance, nor did any evidence of such lesions appear later. Recovery from the disease to normal was observed in all these cases. This suggests that there may be many more cases of temporary diabetes than is realized, because the continued good health and satisfactory chemical tests in patients having insulin and/or controlled carbohydrate diet may mask the fact that they have really recovered from their disease. Evidence of the dissociability of the symptoms of diabetes from the metabolic disturbance is afforded by the fact that in elderly patients hyperglycemia and glycosuria need not be associated with symptoms; in a few such cases there may even be ketonuria. Further evidence of dissociations of the symptom complex from the metabolic disorder may be seen in a second series of 9 cases reported by the author. In the patients between the ages from 52 to 64 with persistent symptomless hyperglycemia and glycosuria the classic symptoms of severe diabetes mellitus came and went without apparent change in the carbohydrate tolerance. The symptoms disappeared while the abnormal sugar metabolism persisted. In some of these cases most of the symptoms had disappeared before treatment was begun. Although it is not the author's intention to advocate that diabetes in patients over the age of 50 should not be treated, these cases serve to emphasize the difficulty in assessing the results of treatment.

115:537-610 (Dec. 9) 1943

*Effect of Dialyzed Serum Proteins and Serum Dialysates on Shock. M. Volkert and T. Astrup.—p. 537.
Studies on Serum Bilirubin: Analytic Methods and Normal Values. T. K. With.—p. 542.
Case of Coronary Thrombosis: Contribution to "Silent" Electrocardiogram. K. Liedholm.—p. 554.
Statistical Note on Swedish Epidemics of Poliomyelitis. H. Wold. —p. 560.
Treatment for Chronic Polyarthritis with Adenosine Triphosphoric Acid. B. Carlström and O. Lövgren.—p. 568.
*Mode of Action of Sulfathiazole and Its Relation to Reticuloendothelial System. U. Borell and L. Troell.—p. 587.

Plasma Proteins and Serum Dialysates in Shock Therapy.—Volkert and Astrup produced shock in rabbits by bleeding the animals from the femoral artery. Dialysates were prepared from ox serum. The animal was first given a transfusion with homologous plasma. There was an abrupt rise of blood pressure from 40 mm. to 90 mm. of mercury followed by a slow, gradual rise to about 110 mm. The blood pressure remained constant at this level for several hours. Rapid injections of dialysates of serum or plasma likewise produced an abrupt rise of blood pressure up to 80 mm. of mercury, but here the effect was brief, the rise being followed within a few minutes by a fall, reaching the initial level in about forty minutes. A solution which contained only proteins of citrated rabbit plasma, while all the low molecular substances have been removed by precipitation and dialysis, was used in additional transfusion experiments on rabbits. It was found to have almost the same effect as that of ordinary plasma transfusion, producing a high constant blood pressure of about 100 mm. Serum dialysates are ineffective in shock. A good effect may be obtained from the administration of the isolated and purified plasma proteins.

Sulfathiazole and Reticuloendothelial System.—Borell and Troell studied the mode of action of sulfathiazole and its relation to the reticuloendothelial system in guinea pigs. Trypan blue was used to demonstrate the phagocytic power of the drug. Animals were given a single dose of trypan blue after having been subjected for some time to injections of sulfathiazole. Only trypan blue injections were given to control animals. In a second experiment pieces of liver and omentum were removed from guinea pigs four days after the injection of trypan blue. Twenty days later, when the trypan blue solution could be expected to have been eliminated, the animals were injected intraperitoneally with sulfathiazole in large doses daily for ten days. Both control and test animals were killed four days after a repeated injection of trypan blue. In the third experiment sulfathiazole was injected subcutaneously into the abdominal region of the animals in order to produce a strong local effect on the reticuloendothelial system. Trypan blue was injected in the same places a few days later. Only trypan blue was administered to the control animals. Results were as follows: Sulfathiazole administered intraperitoneally increased the amount of trypan blue granules in the macrophages of the omentum. In other organs of the reticuloendothelial system, the liver, spleen, bone marrow, lymphatic glands and thyroid gland, sulfathiazole did not produce any pronounced or uniform change in the quantity of absorbed color. The experiments proved that sulfathiazole cannot "block" the reticuloendothelial system.

Book Notices

A Manual of Tropical Medicine Prepared Under the Auspices of the Division of Medical Sciences of the National Research Council. By Colonel Thomas T. Mackie, M. C., A. U. S., Executive Officer, Tropical and Military Medicine, Army Medical School, Major George W. Hunter, III, Sn. C., A. U. S., and Captain C. Brooke Worth, M. C., A. U. S. Cloth. Price, $6. Pp. 727, with 287 illustrations. Philadelphia & London: W. B. Saunders Company, 1945.

This book is the product of wide collaboration by military authorities in the field of tropical medicine and was prepared under the auspices of the division of medical sciences of the National Research Council. Although it was designed primarily for the use of medical officers of the armed forces in the field, it should find wide usefulness in the laboratories and schools and serve as a convenient summary of up to date information for physicians and other public health workers.

During the past few years, when the exigencies of universal war have brought about the movement of large masses of men into tropical zones, the health problems arising from it have been prodigious. A considerable amount of enlightenment and definite changes of concept have resulted. We can no longer consider diseases formerly classified as "tropical" to be alien to our temperate zones, for literally millions of returning men will be placing them squarely on our doorsteps. The geographic barriers of exotic diseases will continue to be infiltrated by stepped-up commerce to the end that we shall encounter these hitherto unusual problems with greater and greater frequency.

The need for improvement in our general understanding of tropical medicine and the need for added stress of the subject in our medical schools are great. The authors have made an important contribution. The book is divided into eleven sections, on the viruses, rickettsial diseases, spirochetal diseases, bacterial diseases, mycotic diseases, protozoal diseases, helminthic diseases, nutritional diseases, miscellaneous conditions, medically important arthropods and laboratory diagnostic methods. Each section is treated in outline form, and the individual diseases are discussed under the headings of synonyms, definition, distribution, etiology, epidemiology, pathology, clinical characteristics, diagnosis, treatment and prophylaxis.

The text is concise but more generous than one encounters in most manuals or compendiums. There is a gratifying profusion of illustrations which have been nicely reproduced from photographs, photomicrographs, drawings and charts. The section on malaria which is, quite understandably, in considerable length and detail, contains six color reproductions of drawings of malarial parasites. Wherever possible, epidemiology has been clearly pictorialized by figure diagrams.

The section on laboratory diagnostic methods is particularly excellent in its clear and simple presentation of procedures designed for employment in the field, small laboratory or office. As a whole the manual is an admirable, authoritative, up to date working book and a timely companion volume for the standard textbooks on the subject. The omission of bibliographic references from the text may seem regrettable but was deemed advisable by the authors in order to conserve space and paper. The book is sturdily bound in cloth and well printed on durable glazed paper. The index, which is frequently omitted from books thus designed and organized, is complete and leaves little to be desired for rapid reference.

Essentials of Oral Surgery. By Vilray Papin Blair, A.M., M.D., F.A.C.S., and Robert Henry Ivy, M.D., D.D.S., F.A.C.S., Professor of Maxillo-Facial Surgery in the Graduate School of Medicine, University of Pennsylvania, Philadelphia. With the collaboration of James Barrett Brown, M.D., F.A.C.S., Associate Professor of Clinical Surgery in the School of Medicine, Washington University, St. Louis. Third edition. Cloth. Price, $6.50. Pp. 624, with 467 illustrations. St. Louis: C. V. Mosby Company, 1944.

It is well to remember that this book is intended chiefly as a guide in surgery to the dental student. The book admirably fulfils its primary object. Of necessity, much of the text is elementary. It seems advisable to include under surgical precautions that no patient should be operated on unless there has been a complete and thorough history and examination to eliminate possibility of cardiorenal disease, blood dyscrasias and diabetes because such conditions require special preparations for surgery. Too few dentists take this precaution. The section on fractures of the jaws is by far one of the best features of the book. It contains the most essential elements and principles of treatment of injuries of the maxillofacial bones. The illustrations are excellent, but the reproductions of the roentgenograms are not as clear as they might be. The authors are to be commended for including the subject of "snapping jaws" or chronic recurrent subluxation. This condition has been the bane of most men engaged in this work. Its treatment is difficult, but solution of the problem cannot be accomplished by avoiding it.

Whereas the value of dental root resection has been questioned by a number of men, this procedure has nevertheless proved of decided benefit in many cases. If the procedure as described here is followed carefully, more beneficial results should be obtained. The section on surgical preparation of the mouth for artificial dentures is exceptionally well done, with excellent illustrations, and should prove of tremendous value to the dental practitioner. For the dental student there might be added to the section on tumors a clinical classification in addition to the excellent cellular classification of Mallory. This chapter may well be read with much value by all surgeons engaged in this field. In the section on congenital facial and palatal clefts the archaic term "harelip" should be eliminated and the descriptive term "cleft lip" substituted. The subject and technic of sialography should be included in the discussion on disorders of the salivary glands and ducts. There is sufficient proof that this procedure is definitely beneficial as a diagnostic procedure and has therapeutic value in nonspecific inflammatory lesions. The beneficial effects of roentgen rays in the treatment of certain types of inflammation is also a proved fact. In the discussion on carcinoma of the lip a most significant statement is made; to wit, "We have no right to assume that because the lymph nodes are not palpable they are not infected."

This is an excellent textbook for dental students.

The Abortion Problem. Proceedings of the Conference Held Under the Auspices of the National Committee on Maternal Health, Inc., at the New York Academy of Medicine, June 19th and 20th, 1942. Howard C. Taylor Jr., M.D., Conference Chairman. Editorial Committee: Nicholson J. Eastman, M.D., Earl T. Engle, Ph.D., and Raymond Squier, M.D. Cloth. Price, $2.50. Pp. 182, with 3 illustrations. Baltimore: Published for National Committee on Maternal Health, Inc., by Williams & Wilkins Company, 1944.

It augurs well for medical and social thinking that physicians, jurists and social workers foregathered in a two day conference to discuss the problem of abortion. The calling of such a conference would have been tabooed in 1920. The conference occupied itself with both voluntary and involuntary abortion. New light was not shed on the etiology and treatment of this condition, with the exception of Dr. Philip Levine's discussion of the Rh factor as a possible cause in spontaneous abortion. The reports on frequency of abortion by P. K. Whelpton in the Indianapolis survey and the statistical study by Halbert A. Dunn are illuminating. Their estimate of the number of abortions in the United States is probably too low. Surely the ratio of one abortion to every five confinements even in the rural districts is too low an estimate. Taussig's calculation of 734,000 abortions in 1940 is also an underestimate, as indicated by Kopp's studies that in some instances the ratio is one abortion to 2.5 confinements.

The atmosphere of the conference apparently was highly charged when the problem of criminal abortion was discussed. Jurists accused the medical profession of failing to assume leadership, and this was bluntly pointed out by Magistrate Anna Kross when she said "it is fallacious to look to the courts or the legislature for the solution of this abortion problem." The interprofessional relationship concerning criminal abortion was well summed up by Dr. Sophie Kleegman in discussing Mr. Black's paper, when she said "the doctor says it is the lawyer's fault and the jurist maintains that it is up to the medical profession to state the indications for abortion. The doctors, on the other hand, say that they cannot get their bill passed by the legislature, whereupon the lawyers say it is the fault of the church."

The conference apparently was so absorbed with the social and moral aspects of the abortion problem that it failed to give due consideration to some of the eugenic phases of criminal

abortion, such as pregnancy induced through incest, pregnancy in the imbecile and defective and pregnancy induced by rape of young girls. Surely some constructive suggestions, how to deal with these cases, should have emanated from such an important conference. Even the problem of illegitimate pregnancy was lightly touched.

While one cannot agree with F. W. Stella Browne that "woman's right to abortion is an absolute right—abortion should be available for any woman without insolent inquisitions or ruinous financial charges, for our bodies are our own," or the other extreme, the religious concept that the induction of abortion is not justified under any circumstances, still one gets the impression from reading the proceedings of the conference that it had not been stripped of the supernatural taboos surrounding the problem of abortion, that it did not reach a high intellectual level in at least making some definite suggestions in connection with pregnancies which occur as a result of abnormal sex behavior or violence.

In that respect it is disheartening to learn how little new the social workers have contributed to the conference proceedings. Probably Algernon D. Black was correct when he stated that "the situation with regard to abortion is a humiliating one" and therefore it is cautiously dealt with. That attitude was further substantiated by Dr. Robert L. Dickinson's query "With all the research material available, we talk statistics, speculate on theology and morals, and we do not get down to brass tacks; when are we going to do it?"

Physicians, lawyers and social workers will find some interesting facts and statistical data in connection with the abortion problem, and the proceedings should be read by those who are interested in progressive and social problems affecting the well being of the nation.

Mass Miniature Radiography of Civilians for the Detection of Pulmonary Tuberculosis (Guide to Administration and Technique with a Mobile Apparatus Using 35-mm. Film: and Results of a Survey). By Kathleen C. Clark, P. D'Arcy Hart, Peter Kerley and Brian C. Thompson. Medical Research Council Special Report Series No. 251. Paper. Price, 90 cents; 3s. Pp. 135, with illustrations. New York: British Information Service; London: His Majesty's Stationery Office. 1945.

This is a report of the findings of miniature x-ray inspection of the chests of approximately 23,000 persons from two factories, a large office group and a hospital for the mentally ill, all located in Greater London. Section one of the first part contains a discussion of the various methods employed in mass radiography. Those who have used photographic paper extensively in this country will probably disagree with most of the disadvantages listed for this method. On the other hand, those who have found the 35 by 35 mm. photofluorogram the least satisfactory method will disagree with most of the advantages offered for this method in adopting it as the one of choice. The x-ray inspection of the chest was on a voluntary basis. In one factory (A) 90 per cent of the total employees available during the inquiry responded, in the other factory (B) 39 per cent, among the office workers of fifteen government departments in London 62 per cent. In a hospital for the mentally ill, 89 per cent of all the patients and 43 per cent of the total resident and nonresident staff had x-ray inspection.

Among factory and office workers it was found that hospital or sanatorium capacity would be required for three or four per thousand, and dispensary supervision only for ten per thousand. Obviously this procedure is good, since one is dealing with a contagious disease. However, it has definite limitations. 1. Even if 95 per cent of any large office or factory group responded there could still be in the remaining 5 per cent many persons who suspected or actually knew that they had tuberculosis but who avoided having it become known to their employers or health authorities. 2. Among those who responded, a vast majority had no evidence of pulmonary disease of any kind. A considerable number of these persons may have lesions evolving which have not yet reached macroscopic proportions. While this is understood by the physician, the fact that no abnormality is found on the x-ray film is likely to result in a false sense of security, and such individuals are not likely to appear for many annual inspections. If all these persons were to receive the tuberculin test there would be a good basis on which to convince the reactors that they should have x-ray inspection of the chest at least annually. 3. In parts of the world where the incidence of tuberculous infection is low the number of cases found by mass radiography is too small to sustain the interest even of those doing the work. In such places it is far more profitable to inspect with x-rays annually or more often only the chests of the adult reactors to tuberculin, where practically all of the cases of clinical tuberculosis develop.

The authors have done a large volume of work and have made worthwhile observations. Their material is well presented, and the book will be found of great value in places with a high incidence of the disease where mass radiography is applicable.

Approved Laboratory Technic: Clinical Pathological, Bacteriological, Mycological, Virological, Parasitological, Serological, Biochemical and Histological. By John A. Kolmer, M.S., M.D., Dr.P.H., Professor of Medicine in the School of Medicine and the School of Dentistry, Temple University, Philadelphia, and Fred Boerner, V.M.D., Associate Professor of Clinical Bacteriology, Graduate School of Medicine, University of Pennsylvania, Philadelphia. Fourth edition. Cloth. Price, $10. Pp. 1,017, with 346 illustrations. New York & London: D. Appleton-Century Company, Inc., 1945.

A new edition of this manual of laboratory methods as usual arouses interest and favorable comment. The collaborators now number thirty in addition to the two authors. This wartime edition, brought out in compliance with government directives limiting the bulk of paper, has resulted in a new format which nevertheless compares favorably with previous editions. There is an excellent index of fifty-eight pages, though too much space has been given to the table of contents at the beginning of the book. An innovation, not entirely pleasing if not actually disconcerting, has been the omission of numbered sections and chapters. The illustrations are good for the most part, and although they number twenty-four less than in the preceding edition the omission of several obsolete cuts has permitted the addition of many new instructive figures and plates. In the new section on the examination of feces more care should have been given to the legends, in which the nomenclature does not always conform to that found in the text. Among the new methods included are those for the examinations for hormones and for vitamins in blood and urine. Also considerable space is given to interesting material on mycologic and virologic methods. Clinical pathologists and medical technologists will find this a useful laboratory aid, dedicated as formerly "to those who have advanced the science of clinical pathology and in memory of Ward Burdick, M.D., founder of the American Society of Clinical Pathologists."

Textbook of Surgical Treatment Including Operative Surgery. Edited by C. F. W. Illingworth, M.D., Ch.M., F.R.C.S.E., Regius Professor of Surgery, University of Glasgow. Compiled by nineteen contributors. Second edition. Cloth. Price, $9. Pp. 564, with 230 illustrations. Baltimore: William Wood & Company, 1944.

The appearance of the second edition of this work less than eighteen months after the first, particularly during a war period, must be indicative of the demand for and the popularity of the book. As its title indicates, it is truly a textbook of surgical treatment and not only of operative surgery. In addition to descriptions of operative technic, it covers all other forms of surgical care, including radiotherapy. Special attention is devoted to the choice of treatment, to the indications for and against operation and to the dangers and complications which may arise. An enormous amount of material and information is included in the book, which is divided into thirty-seven chapters. The entire field of surgery, including neurosurgery, orthopedics and urology, is covered quite well, though rather briefly at times. It is the work of nineteen contributors, who represent the schools of Glasgow, Edinburgh and Aberdeen. Their views are up to date and correspond well with those accepted in this country. The author deserves credit for the simplicity and clarity of style as well as for the large number and variety of topics included. The illustrations are well selected, appropriately placed and well reproduced. They enhance the value of the text. The physical makeup of the book is also excellent for this period, and the publishers are to be congratulated on the high quality of production. The book, which is intended for senior students, may also prove to be of value to instructors and may be recommended unhesitatingly to those for whom it has been prepared.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT OF AGRANULOCYTOSIS

To the Editor:—Is there anything new in the treatment of agranulocytosis? The patient has had large doses of pentnucleotide, reticulogen and yellow bone marrow intramuscularly. L. S. Pederson, M.D., Manhattan, Ill.

ANSWER.—The usually accepted treatment for agranulocytosis includes the use of multiple whole blood transfusions, particularly if the patient has any degree of anemia; large doses of pentose nucleotide intramuscularly; liver extract intramuscularly, and yellow bone marrow by mouth. Most patients with the disease have been treated by one or more of these four agents. More recently there have been reports of the successful treatment of the disease by one of the sulfonamide compounds or by penicillin, particularly in patients who show clinical evidence of sepsis. This treatment is based on the concept that the infectious state that usually accompanies or follows the disease is a more important therapeutic problem than the bone marrow suppression per se. One of the most important measures of treatment is the establishment of the cause of the disease, if possible, and the taking of precautions that the patient does not come in contact with the causative agent. If the causative agent should be one of the sulfonamide drugs, then other sulfonamide drugs can be used in treatment. The question indicates that the patient has had a thorough trial with pentose nucleotide, liver extract and bone marrow. Since typical agranulocytosis is usually a disease of short duration, it should be clearly established that the patient does not have another leukopenic disorder, such as leukemia in an aleukemic phase.

SCHEMM TREATMENT OF CARDIAC EDEMA

To the Editor:—There is in this locality a great deal of argument, pro and con, as to the merits or demerits of the so-called Schemm treatment of chronic heart failure with edema. This therapy is referred to in the *Annals of Internal Medicine* (17: 952 [Dec.] 1942) and in the *Archives of Internal Medicine* (73: 138 [Feb.] 1944). These reports of great numbers of patients with cardiac edemas successfully treated by high fluid intakes appear quite convincing. I would like to have a critical estimate of its value and to know whether or not its acceptance is increasing.

M.D., Illinois.

ANSWER.—The Schemm diet, introduced in the treatment of congestive heart failure with edema, is proving to be an important contribution to our therapeutic armamentarium. Although used in many cases and for quite a few years by Schemm himself and by a few others for a short time, it has been slow in trial and adoption by the larger clinics—a situation that is common in medical practice partly because of a state of inertia based on classic tradition and partly because of the distraction of interest and opportunity by the current war. In one form or another this method, however, has been in use in several clinics like that especially of Newburgh at Ann Arbor, Mich., and of Ellis at the Boston City Hospital, but it has been little publicized. A series of cases is at present being treated promisingly at the Massachusetts General Hospital and will be reported later.

The treatment consists, in brief, in the use of a diet that has a neutral or acid and not alkaline ash, very low in content of sodium chloride but with ample fluid intake; in fact, Schemm has advised forcing fluids even to the amount of 4 liters or more a day, which is apparently unnecessary in most cases, 2 to 3 liters sufficing to establish an adequate diuresis and a relief of the intense thirst so often a distressing symptom in patients with anasarca who have been very limited in fluid intake (e. g. 1 liter in twenty-four hours). An important part of the therapy includes the administration of considerable ammonium chloride (3 to 9 Gm. daily) and even of hydrochloric acid (which is, however, less effective). For many cases the diet is unpalatable and difficult to take, but most patients become used to it and prefer it to the distressing thirst and edema. It is the production of an acidosis that leads to the diuresis, and the limitations of such a state, in renal insufficiency for example, have not yet been adequately explored. The Schemm diet has, in some patients at least, obviated the need of vigorous mercurial diuretics and therefore in this particular too has been gratefully adopted by edematous cardiac patients. For details of the diet itself the reader is referred to Schemm's papers.

ADAMS-STOKES SYNDROME

To the Editor:—A woman aged 58 has suffered attacks of Adams-Stokes syndrome for the last six years. The attacks are sometimes preceded by pain over the heart radiating into the left arm, characteristic of angina pectoris, and sometimes by a slow and irregular heartbeat; sometimes they come on without any premonitory symptoms. Four months ago the patient had a severe attack preceded by pain over the heart; bradycardia followed for ten days, during which time Adams-Stokes attacks with complete cessation of the heartbeat and unconsciousness occurred about five times a day. The physical examination, blood count and blood chemistry revealed nothing significant. The size of the heart is normal; there are no murmurs. Blood pressure is 110/70 between attacks. The Wassermann reaction is negative. The electrocardiogram shows a complete auriculoventricular block 3 to 1 during the attacks. Between attacks the electrocardiogram reveals left bundle branch block and first degree auriculoventricular block (PR 0.22 second). Treatment has been aminophylline 0.24 Gm. intravenously or by rectum every six to twelve hours, belladonna tincture up to tolerance, which is 15 drops three times a day, and estrone 2,000 units daily. During the attacks she receives papaverine 1 grain (0.06 Gm.) intravenously, atropine sulfate 1/150 grain (0.0004 Gm.) subcutaneously and glyceryl trinitrate if the attack is preceded by angina pectoris, and as a last means, when her condition is desperate, epinephrine or ephedrine. Barium chloride was used for only a few days because it seemed to aggravate her condition. At present her condition is fairly good, as she suffers from Adams-Stokes attacks only once a month. However, the heart rate is liable to drop to around 40 every morning, and especially after meals in spite of atropine administration before and during meals, bed rest and excellent care of three trained nurses. Naturally she is very much discouraged by the outlook; to lead the rest of her life with the continuous dread of another attack. Has the section of one vagus nerve ever been tried for this condition? If not, would it be theoretically justified to try it for the first time in my patient? If so, which vagus nerve should be severed? What other treatment is suggested?

M.D., Maryland.

ANSWER.—Adams-Stokes attacks produced by ventricular standstill in high grade auriculoventricular block are generally the result of coronary heart disease and should apparently be so considered in this patient. The presence of the left bundle branch block supports this interpretation, because in cases of coronary heart disease bundle branch block and auriculoventricular block are not infrequently associated. The PR interval of the electrocardiogram between syncopal attacks is sometimes not much prolonged (as noted in this case it is only 0.22 of a second); it is indeed possible to have the Adams-Stokes syndrome due to high degrees of periodic auriculoventricular block with a normal PR interval time between the attacks. Local anoxia or infarction dependent on coronary obstruction is the cause of the defect, often producing no other symptoms or signs; but occasionally clinical myocardial infarction of a major sort, especially that occurring in the posterior wall of the left ventricle, may be attended by temporary and less commonly by permanent or recurrent auriculoventricular block. Rheumatism, syphilis, diphtheria and congenital defects are uncommonly causes of chronic or recurrent heart block of high degree. Complete heart block is not viewed as synonymous with 3 to 1 block, as indicated in the description given, although the ratio of auricular to ventricular heart rates may be approximately 3 to 1; 3 to 1 block should be referred to only when there is a direct auriculoventricular association.

The prognosis of Adams-Stokes attacks must always be regarded with considerable uncertainty. In other words, it must be guarded over the period, which may extend for months or even years, during which the Adams-Stokes attacks occur. In a good many cases the block finally becomes stabilized at a complete auriculoventricular block level with idioventricular rhythm; in fact, that is much more likely than the permanent restoration of normal rhythm. Once this complete auriculoventricular block is well established, the prognosis may be good for years to come without any therapy at all. Some patients do, of course, die from cardiac standstill or complications during the period of recurrent Adams-Stokes attacks. This period is unusually long in the case referred to in the query.

Treatment of Adams-Stokes attacks, particularly in the way of preventing attacks, is unsatisfactory except through the use of epinephrine (0.5 to 1 cc. of 1: 1,000 epinephrine hydrochloride subcutaneously every few hours, as needed; a more prolonged effect is obtained if given in oil, in which case only one or two injections a day may be necessary). As a rule various other drugs, which include atropine and belladonna, aminophylline, papaverine, the nitrites, thyroid and barium chloride, are unsatisfactory, although on occasion atropine, aminophylline and the nitrites have decreased the grade of block in the case of lesser grades of heart block secondary to coronary insufficiency. Vagotonia is not, in most cases, an important factor, although it may be a superimposed influence of some significance. In general, since experience with atropine has shown disappointing results, vagal section would probably not be helpful. Ephedrine and similar preparations are fairly good substitutes for epinephrine when the attacks are not severe, but they are less effective in emergency. They have the advantage, however, of being suitable for administration by mouth.

FREQUENCY OF PERFORATION OF DUODENAL ULCER

To the Editor:—Recently a man aged 30 applied to a medical examiner of the Administrator of Civil Aeronautics for a medical certificate required incidental to the issuance of a student pilot certificate. The examination disclosed the presence of duodenal ulcers. Because of this the administrator refused to issue a medical certificate. A hearing was accorded the applicant for the purpose of reconsidering the refusal of the administrator to issue the medical certificate. From the evidence adduced at the hearing it was established that duodenal ulcers may result in a perforation; that the occurrence of a perforation is utterly unpredictable, it being possible for one to occur tomorrow or perhaps not for years or perhaps never; and that when a perforation does occur it suddenly and completely incapacitates its victim. Should such an occurrence take place while one was piloting an aircraft, its potentialities for disaster are obvious. In studying this problem I should like to obtain the best statistics or information available in answer to the question In how many cases of duodenal ulcers do perforations result? If, for instance, it was ascertained from a study of this disease that perforations result in 1 out of 5 cases, that might well be considered a dangerous proportion, but if a perforation was known to result in only 1 out of 500 cases that would be quite another thing.

John H. Woodworth, Examiner, Safety Section,
Civil Aeronautics Board,
Washington 25, D. C.

ANSWER.—A definite figure of the incidence of perforation in duodenal ulcer cannot be given as the number is dependent on two variable factors, namely the activity of the ulcer and the period of time under consideration. The number of perforations in any given group would depend on the proportions of active, healing and healed ulcers and the duration of the period of observation. Hurst and Stewart (Gastric and Duodenal Ulcer, New York, Oxford University Press, 1929) state that the total incidence of perforation is small and cite a report by Nielson in 1922 of 182 patients diagnosed as having ulcer between 1897 and 1917, 42 of whom had undergone some operation between one and twenty years later but none for perforation. Sixteen of the remaining 140 had died between two and a half and twenty years after leaving the hospital, but none from perforation. Hurst and Stewart report also that, in the cases of duodenal ulcer seen by them between 1921 and 1927, 2 out of 130 gave a history of perforation and 1 perforated one year after being in the clinic. Perforation also occurred in 1 other patient in whom no previous signs of ulcer had been found. The Criles (Indications for and End Results of Surgery in the Treatment of Duodenal Ulcer, *Am. J. Surg.* **40**: 123 [April] 1938) report perforation in 8 per cent of 100 ulcer patients treated surgically. Surgical treatment was utilized in 5 per cent of all the cases of ulcer observed in their clinic during the period covered by their report. This is a ratio of 1 perforation to every 250 ulcer cases in their series. Perforation is always possible in ulcer in the phase of active ulceration. Even after the ulcer has healed there is a predisposition to recurrence of the ulcer, so that the possibility of perforation is still present, though more remote. Also perforation may occur without premonitory symptoms, as is strikingly demonstrated by the fact that 25 per cent of the cases that perforate do not show preceding symptoms of ulcer. The possibility of perforation can be reduced to a minimum by adequate treatment of the ulcer until it is healed and continuation of an ulcer regimen to prevent recurrence accompanied by roentgenologic examination at regular intervals for evidence of recurrence.

CAUSES OF NUMBNESS IN ARMS

To the Editor:—A man aged about 30, well developed and healthy, has been complaining of his arms "going to sleep" while working at his trade of tinsmith and also at night. He has to rub them for a while. The numb feelings, which are transient, extend into the hands. Blood pressure is 110/90. General physical examination, including test of the motor reflexes of the arms, revealed no abnormalities.

E. C. McCulloch, M.D., Staten Island, N. Y.

ANSWER.—This numbness probably is unrelated to the occupation of tinsmithing, but examinations should be made for other characteristics of lead and arsenic poisoning, both of which may arise from solder. Other possibilities are alcoholism, anemia and avitaminosis. More remote causes might be influenza or other infections, arthritis or cervical ribs. In recent months Dr. Frederick Slobe of Chicago has associated this general type of manifestation with fibromyositis in the upper back regions lateral to the spinal column. Search should be made for small areas or points of tenderness in the back regions mentioned. Local anesthetics at such sites might effect relief. Other causes of numbness are discussed in the following books:

Barton, W. M., and Yater, W. M.: Symptom Diagnosis: Regional and General, ed. 2, New York, D. Appleton-Century Company, Inc., 1933.

French, Herbert: An Index of Differential Diagnosis of Main Symptoms, ed. 4, New York, William Wood & Co., 1928.

CAUSE OF TARNISH ON SILVERWARE FROM HANDLING

To the Editor:—An apparently normal girl aged 18 complains that any silverware which she handles will, unless cleaned within fifteen minutes to a half hour, turn black in the areas touched. Can you suggest the possible cause and the treatment of this condition? M.D., New York.

ANSWER.—The tarnishing of silver exposed to air is not due to oxidation but probably to small quantities of hydrogen sulfide in the atmosphere. Silver coins may blacken when carried in the pockets of persons who are using sulfur applications. It is possible that this young woman comes in contact with sulfur and uses it without realizing that she does so. Many patients willing to cooperate fully are unable to give correct history of their use of medicines. It would be interesting to determine the hydrogen ion concentration on her fingers and hands. One would anticipate a greater acidity of skin surface than that found in most persons. The silver could be dissolved by the acid, form silver lactate by reacting with the lactic acid in sweat and then be precipitated by the sodium chloride also in the perspiration. Finally, exposure to light would reduce the silver chloride to a dark metallic deposit. Polishing of the silver, of course, would interrupt this chain of events. It is suggested that a search be made for an association with or the presence of sulfur on this young woman. Silver coins carried about her person but not in contact with the skin may be a clue.

Perhaps qualitative chemical tests appropriately devised as with lead acetate solution, which darkens in the presence of sulfide, might prove useful. The patient may be able to circumvent her peculiar reaction on silver by washing the hands with soap prior to handling such metallic articles; the soap would temporarily reduce the intensity of the acid on her skin and would wash away such possible intermediates to the blackened deposits as the lactic acid and sodium chloride in the sweat.

TREATMENT OF ACHONDROPLASIA

To the Editor:—Can any suggestions be offered for treatment of achondroplasia in an 8 year old girl? Other physicians have made diagnoses of mongolism and cretinism, in turn. Administration of thyroid did nothing except speed up an already normal pulse. Would an anterior pituitary growth complex be worth trying?

Alan A. Bassett, M.D., Little Current, Ont.

ANSWER.—To date there have not been any encouraging reports regarding the treatment of achondroplasia. Almost all patients with this condition have received thyroid and a great number have received pituitary fractions of one type or another. Unfortunately, the results continue to be discouraging.

IMMUNIZATION WITH MULTIPLE ANTIGENS

At the request of the Office of the Surgeon General, U. S. Army, the following comment is published on the answer (The Journal, May 5, 1945, p. 63) to the question of Major, M. C., A. U. S., on the advisability of using improvised mixtures of vaccines:

While there is little or no objection on theoretical grounds to the mixing of vaccines, such mixtures are not provided for use in the Army because it is frequently necessary to give an injection or a complete series of a single immunizing agent to an individual or to a large group. The distribution of mixed vaccines would add a number of additional products to the stock at each installation where immunizations are done and would involve considerable wastage.

There are at least three objections to making mixtures of vaccines in the field. One is that errors may occur in the mixing of the agents so that the wrong proportions are obtained. The second is the possibility of bacterial contamination in the process, and the third is the danger that incompatible combinations will be made; e. g., that yellow fever vaccine might be mixed with tetanus toxoid, which would entirely inactivate the yellow fever virus.

In preparing vaccine mixtures there are two alternative procedures: either to utilize the entire contents of the original vials of vaccines or to withdraw measured quantities less than a complete vial. Typhoid, typhus and cholera vaccines as used in the Army are packaged in 30 cc., 20 cc. and 20 cc. vials respectively; hence the minimum amount of the mixture suitable for stimulating doses of each agent that could be made using the entire contents of one typhoid vaccine vial is 250 cc.; and if the mixture was to be used as the first dose of cholera vaccine but a stimulating dose of the other agents, 400 cc. would have to be prepared. The danger of incomplete mixing of the vaccines is obvious. On the other hand, if quantities less than one vial were mixed, considerable sterile glassware would be needed for measuring purposes.

The use of improvised vaccine mixtures requires injection of larger quantities of material in one site than if separate injections were made; e. g., in the mixture of cholera, typhus and typhoid vaccines cited, a volume of 2.5 cc. was required. This volume given subcutaneously in the arm would cause more than the usual degree of trauma and might increase the danger of abscess formation.

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THE FLUID AND NUTRITIONAL THERAPY OF BURNS

MEMORANDUM PREPARED BY A COMMITTEE APPOINTED BY DR. ALFRED BLALOCK, CHAIRMAN OF THE SUBCOMMITTEE ON SHOCK:

HENRY N. HARKINS, M.D., CHAIRMAN, BALTIMORE

OLIVER COPE, M.D., BOSTON

EVERETT I. EVANS, M.D., RICHMOND, VA.

LIEUTENANT COMMANDER R. A. PHILLIPS (MC), U.S.N.R. NEW YORK

DICKINSON W. RICHARDS JR., M.D., NEW YORK

The National Research Council and the Office of Scientific Research and Development have authorized the release of this memorandum containing suggestions for the use of oral and parenteral fluids and food in the treatment of burns. To the medical officer who has had experience with the treatment of burned patients it will be evident that the suggested outline is somewhat dogmatic. However, the main purpose of the outline is to aid the medical officer with little or no experience in the management of such cases. It is hoped that the discussion of the rationale for giving the suggested fluids will be helpful as a guide to the recommended therapy. Coincident with this fluid and nutritional therapy, local burn treatment in conjunction with parenteral penicillin and oral sulfonamide therapy should be directed toward the prevention and control of burn sepsis, but the latter items are not dealt with in this discussion, important as they may be.

CATEGORY OF PATIENTS WHO SHOULD BE GIVEN SPECIAL FLUIDS AND FOOD ACCORDING TO THIS OUTLINE

Following damage to the skin by a burn there is a loss of extracellular fluid, including salts and plasma proteins, both into the burned area itself and as a discharge from any denuded surface. With this fluid loss there will be dehydration, a decrease in the circulating plasma volume and hemoconcentration (i. e. apparent increase in the number of red cells in the whole blood).

In mild burns spontaneous ingestion of fluids and food according to the desires of the patient is usually adequate, but in more severe injuries special methods of therapy are necessary to aid convalescence and to save lives. It is generally agreed that in burns which involve less than 10 per cent of the body surface there is not sufficient loss of extracellular fluid to warrant intensive fluid therapy.

Hence this discussion is directed to those patients with more than 10 per cent of the body surface involved by second degree (blistered) or third degree (coagulated or charred) burns. Roughly, then, this outline would be followed in patients with a severe burn of at least one of the following areas: (1) face and neck, (2) dorsal or ventral surface of chest, (3) dorsal or ventral surface of abdomen, (4) one upper extremity, (5) dorsal or ventral surface of one lower extremity. If there is any question as to whether the patient should be included in this category, he should be. Patients with burns involving less than 10 per cent of the body surface and with, in addition, any other injury, particularly wounds or fractures, should be treated as though they were in this category. Exceptions to this statement are (1) head injuries, (2) perforating wounds of the chest and (3) burns of the pharynx, larynx or lower air passages (a face burn should make one suspicious of such respiratory involvement). In these instances excessive fluid administration may bring on pulmonary edema. If many burn casualties are seen, it is often advisable to treat energetically those patients with a large surface area involved (30 to 40 per cent) and then treat the less seriously burned patients as time is allowed; further, in patients with burns weeping much plasma, it must be remembered that they will need internal infusions more regularly than will those patients with burns showing little or no seepage.

The course of the severe and inadequately treated burn patient can be divided into three dangerous phases:

1. *The Period of Shock* (to forty-eight hours after the burn).—The signs of burn shock are often very misleading until just before collapse occurs. Thus, shock is often present when a patient looks and acts quite well. Generalized vasoconstriction may keep the blood pressure at satisfactory levels even though cardiac output is greatly diminished. Therefore in the early hours the presence of shock is to be assumed in all severely burned patients despite a satisfactory clinical appearance. If one waits for cold extremities, cyanosis and collapsed veins, therapy is apt to be ineffective. This period of shock (to forty-eight hours after burn) is also essentially the period of vigorous fluid therapy. Subsequently adequate fluid therapy and vigorous food therapy may be indicated, but in a case treated sufficiently during the first two days there is no routine indication for extensive forcing of fluids after that time.

2. *The Period of Toxemia* (from forty-eight to one hundred and twenty hours, occasionally as late as the third week).—Fever, jaundice, anuria, stupor and delirium and circulatory collapse despite adequate fluid therapy are often associated with this syndrome. With full realization of the inadequate state of our present knowledge of the cause of burn toxemia, it may how-

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ever be helpful to consider it tentatively as due to one or more of the following conditions:

(*a*) Inadequate treatment of shock or treatment not instituted early enough with consequent ischemic damage to kidneys, liver or other organs. For example, failure to maintain blood volume by plasma and/or whole blood administration. In other instances loss of electrolytes and fluid from burned surface, also from vomiting and sweating with consequent dehydration and acidosis may be an etiologic factor.

(*b*) Excessive administration of electrolyte (noncolloid) solutions with consequent dilution of plasma proteins to the edema level (less than 5 Gm. of protein per hundred cubic centimeters). This is particularly dangerous if there is associated renal and/or cardiac damage.

(*c*) Accompanying infection of burned areas.

(*d*) It has been suggested that there is absorption from burned tissues of protein products which are "toxic." If this occurs the effect will be minimized by maintaining an adequate blood supply to all the body tissues, i. e., a normal blood volume with normal hemoglobin concentration and adequate renal function.

3. *The Period of Burn Anemia and Hypoproteinemia.*—The anemia and hypoproteinemia develop first during the first seventy-two hours but are usually not evident until the signs of toxicity have largely disappeared. Actual red cell destruction with hemolysis, hemoglobinemia and hemoglobinuria soon after the burn is a cause of early masked anemia. It is likely that failure to maintain nutrition is the most important factor in the production of both and every effort, therefore, should be made to keep the burned patient in nitrogen equilibrium throughout the illness.

CRITERIA TO BE USED AS A GUIDE TO FLUID THERAPY

Fluid therapy in burns should be directed toward two major objectives: (A) rapid replacement of acute deficits and (B) maintenance of daily needs.

A. Rapid replacement of acute deficits:

1. Restoration and maintenance of a normal blood volume.

2. Restoration and maintenance of an adequate hemoglobin concentration (13 to 16 Gm. per hundred cubic centimeters).

3. Restoration and maintenance of plasma protein concentration above 6.0 Gm. per hundred cubic centimeters.

4. Restoration and maintenance of a satisfactory urinary output, usually 100 cc. per hour during the first forty-eight hours.

5. Prevention of dehydration and acidosis. (Determination of plasma bicarbonate concentration by the method of Van Slyke is a useful index of acidosis.)

6. Prevention of salt depletion. (Determination of plasma chloride concentration by the method of Van Slyke may be used to determine approximate salt depletion.)

7. Avoidance of overadministration of electrolyte (noncolloid) solutions by the parenteral route.

B. Maintenance of daily normal fluid and nutritional requirements of water, salt, carbohydrate, protein and other substances.

OUTLINE OF FLUID THERAPY IN BURNS

I. *Early Acute Burns* (up to forty-eight hours): *The Prevention and Treatment of Burn Shock.*—Fluids are given in this phase for three purposes: (1) to restore blood volume and to treat shock (chiefly plasma and blood), (2) to provide extra fluid to compensate for loss from burned surfaces and as edema of injured tissues (plasma and salt solutions) and (3) to provide additional fluid for adequate urinary excretion (water and salt solutions or dilute salt solutions). In a severe burn (30 to 40 per cent of the body surface or more) the volumes involved for the forty-eight hour period are roughly (1) 2,000 cc., (2) 4,000 to 10,000 cc., (3) 2,000 to 3,000 cc. Replacement therapy in the first forty-eight hours thus involves fluid volumes of these magnitudes, totaling 8,000 to 15,000 cc. for the forty-eight hour period. With the larger volumes, close watch should be kept for circulatory congestion.

A. *Intravenous Therapy.*—1. Plasma: Whole plasma is the colloid solution of choice; it supplies fluid and electrolyte as well.

(*a*) The dosage of plasma is best gaged by previously suggested formulas which depend on hemoconcentration, size of burn and, of especial importance, the clinical response of the patient. The depth of the burn is of little practical value as a guide for this purpose.

(*b*) It is best not to give all of the indicated amount of plasma at one time. Even if clinical shock is severe, usually one third of the complete dose is sufficient at first, other equal doses being given over the succeeding four or five hours.

(*c*) When acute collapse occurs, the first dose of plasma should be given rapidly. Since in these circumstances there is an acute failure of venous return to the heart, the fluid introduced must to a considerable extent supply this venous return. An initial introduction of 200 to 300 cc. in the first two minutes is not too rapid; the administration should be continued, up to 1,000 cc. or more, until a satisfactory clinical response is obtained. Subsequent amounts should be given more slowly. In shock, time is extremely important; if plasma or whole blood is not immediately available, give intravenous electrolyte solution (physiologic electrolyte solution or isotonic sôlution of sodium chloride if the former is not available) rapidly until plasma and whole blood are secured. By the term physiologic electrolyte solution is meant a mixture of 2 parts of normal isotonic (one-sixth molar) (0.9 per cent) sodium chloride solution with 1 part of normal isotonic (one-sixth molar) (1.3 per cent) sodium bicarbonate solution. If sodium bicarbonate solution is not available, sodium lactate normal isotonic (one-sixth molar) (1.75 per cent) solution may be substituted. The final mixture is of the following concentration in round numbers: sodium chloride (one-tenth molar, 0.6 per cent, 100 millimols per liter) and sodium bicarbonate (one-twentieth molar, 0.5 per cent, 50 millimols per liter) or, if sodium lactate is used in place of the bicarbonate, sodium lactate (one-twentieth molar, 0.6 per cent, 50 millimols per liter).

(*d*) Plasma is of little value beyond the third day and is seldom needed after the first twenty-four hours if the treatment during that period has been adequate. Its chief role is in large surface area burns (over 10 per cent of the body surface) and during the first forty-eight hours.

(*e*) Technic of intravenous therapy: Insert a large (no. 16 or 18) hypodermic needle into the vein, withdraw 5 cc. of blood, fix the needle in place with adhesive tape and start intravenous fluids. The blood is placed in a test tube containing 5 mg. of a 3:2 mixture of ammonium and potassium oxalate. From this blood sample is obtained the whole blood specific gravity

(see later for method). The remainder is saved for typing and cross matching and if possible a portion is centrifuged or allowed to sediment so that the plasma specific gravity can be determined. After the initial plasma infusion in all patients in whom there is any likelihood of the development of shock or in whom accessible veins are scarce, it is desirable to leave the intravenous infusion needle in place, maintaining its patency with a slow infusion of physiologic electrolyte solution or other available isotonic solution.

(*f*) If superficial arm veins are inaccessible, femoral vein puncture, saphenous vein cannulization in the foot, ankle, leg, or even at the fossa ovalis, or intramedullary injections may be necessary.

Representative Formulas:

(*a*) Formulas dependent on extent of hemoconcentration:

(1) Give 150 cc. of plasma for each specific gravity increase of 0.001 above the normal whole blood specific gravity [1] of 1.060 (i. e., if the specific gravity of whole blood is 1.070, give 1,500 cc. of plasma); (2) or give 100 cc. of plasma for each point the hematocrit exceeds the normal of 45 (i. e., if the hematocrit is 60, give 1,500 cc. of plasma); (3) or 50 cc. of plasma for each point the hemoglobin exceeds the normal of 100, or 300 cc. of plasma for each gram the hemoglobin exceeds the normal of 15 Gm. per hundred cubic centimeters (i. e., if the hemoglobin is 130 per cent or 20 Gm. per hundred cubic centimeters give 1,500 cc. of plasma); (4) or 100 cc. of plasma for each 100,000 the red cell count exceeds the normal of 5,000,000 per cubic millimeter (i. e., if the red cell count is 6,500,000 give 1,500 cc. of plasma).

All formulas based on blood concentration-hematocrit and so on may at times be in serious error. For example, in the first hour or so after the injury the hematocrit may still be normal, plasma loss having just started. In such a case the hematocrit repeated at the third and sixth hours gives a truer picture of the condition. Other patients may be anemic at the time of injury or because of associated wounds. No matter what formula is used, the corresponding dosage for children should be less and is roughly proportionate to the body weight. It should be remembered that formulas dependent on hemoconcentration show only the needs of the patient at the time of testing, not all his requirements during the entire course of the burn.[2]

(*b*) Formula dependent on the area of the burn:

Give 50 cc. of plasma for each per cent of the body surface involved by a deep (blistering) burn during the first twelve hours. Often more plasma must be given later. Burns of the face, groin or buttocks usually lose more plasma than the surface involvement indicates, and more plasma should be given accordingly. Very few persons with less than 10 to 15 per cent of the body surface burned will require plasma transfusions.

2. Albumin: Iso-osmotic human albumin solution is a satisfactory substitute for blood plasma in comparable dosages of protein. With concentrated albumin solutions, saline solution should be given in addition.

3. Whole Blood Transfusions: In patients with a hematocrit below 60, give 500 cc. of compatible whole blood for every thousand cubic centimeters of plasma administered. In any case in which plasma is not available, whole blood is better than intravenous electrolyte solutions.

Rh typing is mandatory in all burn cases which show transfusion reactions on repeated transfusion. It is desirable in all cases of deep burns of more than 20 per cent of the body surface in which repeated transfusions may be needed. The use of Rh negative blood for females under 40 years of age is advisable.

4. Electrolyte Solutions: (*a*) Burns of less than 10 per cent of the body surface: Give 2,000 cc. of physiologic electrolyte solution each twenty-four hours, preferably by mouth; if not, by vein.

(*b*) Burns of more than 10 per cent of the body surface: Chief reliance for prevention or relief of shock is placed on plasma (or albumin or whole blood), as indicated.

However, additional amounts of saline and glucose solutions should also be given parenterally to patients unable to take adequate amounts by mouth or to extensively burned patients in whom the required intake by mouth may be excessive, i. e. more than 8 liters in any twenty-four hour period. The physiologic electrolyte solution or its equivalent should be used. Some of this fluid should also contain glucose, about 100 to 200 Gm. daily. To give average figures, the volume of electrolyte solution given intravenously will be roughly the same as the volume of plasma in the first two days. It will be larger or smaller, depending on the success of oral therapy, but should not exceed 4,000 cc. in any twenty-four hour period.

B. *Oral Therapy.*—As already indicated, oral therapy with crystalloid solutions is chiefly to provide fluid for surface loss and local edema and for adequate urine volume. Water and non-salt containing fluids, such as milk and ginger ale, can be given up to 2,000 cc. a day to aid renal function; no more than this quantity should be given until all of the required electrolyte solution has been swallowed and retained. After this has been accomplished, water can be given ad libitum in controlled and reasonable amounts.

The following suggestions are made for the administration of oral fluids in the first forty-eight hours:

(*a*) Burns of less than 10 per cent of the body surface: Give 2,000 cc. of physiologic electrolyte solution each of the first two days.

(*b*) Burns of more than 10 per cent of the body surface: Give 3,000 to 8,000 cc. of physiologic electrolyte solution the first day, depending on the extent of the burn.

Give 3,000 cc. of physiologic electrolyte solution the second day.

1 Use of the copper sulfate method for determination of specific gravity. This method rapidly and accurately estimates the hemoglobin concentration. Since plasma protein concentration in burns is usually either normal or low (from lost plasma proteins) a specific gravity of the whole blood above 1.060 indicates abnormally high hemoglobin due to deficient plasma volume. With normal or low plasma proteins a specific gravity for whole blood of 1.060 indicates (1) a hematocrit of 45 or more per cent cells, (2) a hemoglobin concentration of 15 or more grams per hundred cubic centimeters of whole blood and (3) a red blood cell count of 5,000,000 or more cells per cubic millimeter.

Injection of plasma and whole blood should be regulated to keep the hemoglobin concentration in the patient's blood down to 15 Gm. per hundred cubic centimeters or the specific gravity of the whole blood down to 1.060.

Plasma protein concentration: The protein concentration in plasma can be quickly estimated from the specific gravity of the plasma as determined by the "copper sulfate method" from the formula $P = 360 (Gp - 1.007)$, where P is the plasma concentration in grams per hundred cubic centimeters and Gp the specific gravity of the plasma. The factor 1.007 is the correction needed for the nonprotein constituents of the plasma. If serum is used instead of plasma the loss of the fibrinogen results in values 0.2 Gm. per hundred cubic centimeters lower than the plasma values.

2 The normal plasma protein range is from 6.3 to 7.7 Gm. per hundred cubic centimeters with an average of 7 Gm. per hundred cubic centimeters, which latter value corresponds to a specific gravity of 1.0264. In burns a hyperproteinemia is not usual and is encountered only in the initial two to three hours and only in patients who have received no fluids and are dehydrated. A hypoproteinemia is the rule. The level may fall so low (below 5 Gm. per hundred cubic centimeters) that general edema results. If possible the protein concentration should not be allowed to drop below a level of 6.0 Gm. per hundred cubic centimeters (plasma specific gravity of 1.024).

1. Such oral therapy should be started immediately on admission before local treatment is begun and while waiting for parenteral therapy. However, in severe shock oral fluids should be started cautiously, as absorption may be slow and there is danger of vomiting and aspiration. In such cases, as already indicated, parenteral therapy must be begun at the earliest possible moment, while oral administration should not be pushed until the patient is out of shock.

2. If, after recovery from acute shock, the patient vomits, a quantity of physiologic electrolyte solution equal to the vomitus should be given again. If this happens repeatedly, oral fluid should be temporarily discontinued, but an attempt should be made to give electrolyte solutions again after a two to three hour rest period. In cases in which the stomach is loaded with food or lack of veins makes oral administration obligatory, preliminary washing out of the stomach to prevent aspiration of solid food, followed by Levine tube fluid administration by steady drip, may be advisable.

3. A definite schedule of oral fluid administration in terms of cubic centimeters per hour should be set up and closely followed to avoid overloading the stomach in an attempt to catch up, if enough fluid is not given in the first six hours. In severe burns, 200 to 400 cc. of fluid should be given regularly on the hour during the first eighteen to twenty-four hours. Usually very large volumes of fluid are tolerated in the first two days after injury. Contraindications are (*a*) the presence of thermal burns of the throat, larynx or lower air passages (a face burn should make one suspicious of such involvement), (*b*) presence of the casualty in a conflagration in an enclosed space where inhalation of toxic gases may have occurred and (*c*) in the aged or cardiac patient, when too vigorous fluid administration may increase the tendency to pulmonary edema. A reduced intake of electrolyte solutions and plasma and the substitution in part of whole blood is considered preferable therapy in such cases.

4. The urinary output is one important indication of the adequacy of fluid therapy. An attempt should be made to maintain the urinary output above 100 cc. per hour during the first forty-eight hours. Obviously at the beginning of treatment fluids administered will pass into dehydrated and injured tissues, and anuria for a matter of hours is not uncommon. With the schedule of treatment already described, however, urine output should start up at least after four or five hours and increase to the 100 cc. per hour level shortly thereafter. An inlying catheter may be useful to follow this more closely. It should be realized, however, that following shock, especially if prolonged, kidney damage may have occurred. If therapy as described does not open up the kidneys, excessive parenteral fluid, especially large quantities of intravenous saline solution, will not do so either but will only dilute blood and body fluids. A key measurement here is the plasma protein concentration, which should not be allowed to fall below 5.0 Gm. per hundred cubic centimeters (plasma specific gravity 1.021).

5. Treatment of Acidosis: If the severely burned patient has received no fluid therapy for several hours after the time of injury, acidosis is not infrequent; this is particularly likely if the patient has been in shock for any length of time. Acidosis should be promptly treated. Normally the carbon dioxide content of the plasma is about 60 volumes per cent.

For each volume per cent the plasma carbon dioxide is less than 55 volumes per cent in a 60 Kg. man give one of the following: (1) 40 cc. of 4 per cent sodium bicarbonate intravenously; (2) 125 cc. of 1.3 per cent (isotonic) (one-sixth molar) sodium bicarbonate orally or intravenously; (3) 125 cc. of 1.75 per cent (isotonic) (one-sixth molar) sodium lactate orally or intravenously; (4) 375 cc. of physiologic electrolyte solution (the larger dosage is necessary since, to prevent alkalosis when administered in large quantities, this solution is purposely made with only one-third the potential bicarbonate—and hence only one-third the antiacidotic power—as is contained in the one-sixth molar solutions).

Example: If the plasma carbon dioxide is 35 volumes per cent, 2,500 cc. of 1.3 per cent sodium bicarbonate should be given orally or intravenously. Such fluid should be given in place of rather than in addition to an equal volume of other fluid such as oral saline solution.

II. *Late Burns* (after forty-eight hours): *The Prevention and Treatment of Burn Toxemia, Anemia and Hypoproteinemia.*—Toxemia may be present early and cause fatalities as late as the third week. Anemia and hypoproteinemia may exist from the first few days and are troublesome until granulating surfaces are completely epithelized. Electrolytes as well as protein are lost from granulating surfaces and should be replaced by an adequate intake of salt in the diet.

Danger of giving too much fluid in later stages of burns: There is a strong tendency in both the edema absorption stage and in the toxemia infection stage for plasma and blood volume to increase above normal when excessive fluid is given, with cardiac strain, general edema formation, decreased renal function and pulmonary edema.

The chief aims of fluid treatment at this stage are as follows:

1. Maintenance of fluid balance and of normal electrolyte balance, a continuation of that listed in I. After forty-eight hours some resorption of the local edema may be expected and it may be unwise to force fluids and electrolyte as vigorously as during the period of local edema formation. If the therapy in the first forty-eight hours has been adequate, a normal intake of fluid with supplemental fluid and salt to cover continued loss from the wound should prove adequate.

2. Control of anemia.

3. Maintenance of body protein.

These aims are accomplished by the following means:

A. *Intravenous Therapy.*—1. Plasma or albumin is seldom necessary after the second day. A 500 cc. plasma transfusion usually contains less than 30 Gm. of plasma protein; a severely burned patient needs 150 to 200 Gm. of protein a day. Hence, while plasma transfusions are helpful in combating hypoproteinemia, they are quantitatively insufficient to accomplish much in this regard.

2. Amino acid solutions, as now available, can usually be tolerated intravenously in amounts up to 100 to 150 Gm. of amino acids in a 10 per cent solution if administered slowly. They are helpful during the first week or longer (after shock has been relieved) in sustaining and restoring the patient's state of nutrition but are indicated only if the patient cannot take adequate proteins by mouth.

3. Whole blood transfusions are of especial value at this stage. Most open burn surfaces are accompanied by a continued red cell loss (loss from bleeding, from increased red cell destruction due to infection and from failure of adequate red cell regeneration). Plasma protein is also lost from open burn surfaces in large

amounts. Whole blood in large amounts and at frequent intervals combats anemia and hypoproteinemia and is one of the best means of maintaining resistance to infection.

The following rules are of help:

(*a*) Give enough whole blood to raise the hemoglobin to 85 (hematocrit to 40, red count to 4.7 million) and to keep it above this level. As much as 1,500 cc. of whole blood daily for several days may be necessary to correct severe anemia in burns.

(*b*) Five hundred cc. of whole blood every three to four days as long as the rectal temperature is above 102 F. or the plasma proteins are below 6.0 Gm. per hundred cubic centimeters.

(For rules concerning Rh typing in repeated transfusions see I, A, 3.)

4. Electrolyte solutions by vein are seldom necessary in the later stages of burns because the patient usually can take sufficient fluids by mouth. However, when this is not possible, adequate fluid balance should be maintained by the use of intravenous physiologic electrolyte solution in sufficient but not excessive amounts. Glucose in saline solution may be substituted for the physiologic electrolyte solution, and at all times a high carbohydrate intake (100 to 200 Gm. a day) is advisable. In the late stages of burns, with infection and low plasma protein, urine volume may diminish, with edema of the body tissues. Strenuous forcing of electrolyte solution then may only increase edema, without diuresis. Moderate fluid intake, with feeding and whole blood transfusions, constitutes the logical treatment.

B. *Oral Therapy.*—The immensely important problem of feeding during the often protracted period of infection and anemia cannot be adequately covered in this memorandum. Each case is an individual problem of dietetics and nursing. A full food intake, including calories, vitamins and especially protein, is essential. A few notes may be useful:

1. Total fluid intake should be sufficient to keep the urine volume 1,500 cc. or higher daily. If salt intake has been adequate, body proteins not too much depleted and heart and kidney function competent, this usually means an intake of between 3,000 and 4,000 cc. daily.

2. Salt (sodium chloride) intake should be maintained around 10 Gm. daily; a little higher if the burn is extensive with much exudate. Too much salt, however, promotes general tissue edema. Blood carbon dioxide tends to run somewhat low, and some alkaline salt is advisable. Try to keep the urine about neutral to litmus. The physiologic electrolyte solution 1,000 to 1,500 cc. *daily will often be useful during the first five* to ten days. Water can be given ad libitum after the fourth day.

3. Diet should be high in protein, carbohydrate, calories and vitamins. The protein intake should be added to with increasing areas of third degree burns as early as possible after the injury and probably by the end of the first week. Such protein intake should be of the following magnitudes: 5 to 10 per cent body surface burned, 125 Gm. of protein per day; 10 to 20 per cent of body surface burned, 125 to 200 Gm. of protein per day; more than 20 per cent of body surface burned, more than 200 to 300 Gm. of protein per day, provided the patient's gastrointestinal tract can tolerate these large amounts. The corresponding caloric intake should be approximately 3,000, 4,000 or 5,000 calories per day.

(*a*) Amino acids by mouth, 100 to 200 Gm. per day, are an effective form of protein intake but difficult to tolerate because of the bad taste. Few patients can take them for more than three or four days.

(*b*) An example of an adequate diet is the diet used by Evans, which is palatable by mouth but also can be given by tube, as follows: 150 Gm. of dehydrated meat powder, 150 Gm. of powdered whole milk, 50 Gm. of corn oil, 150 Gm. of sucrose, 150 Gm. of dextrimaltose, 35 Gm. of chocolate and 1,000 cc. of water (plus vitamins, especially A, B, C and D, and iron).

(*c*) Adequate vitamins and iron are essential in all unhealed burns. A suggested daily dosage is as follows for burns of 20 per cent area of third degree. Correspondingly smaller doses should be used for less severe burns: vitamin A, 20,000 units; vitamin B: thiamine hydrochloride, 40 mg.; riboflavin, 20 mg.; niacin amide, 50 mg.; vitamin C, 1 Gm.; vitamin D, 2,000 units; vitamin K, 1 mg.; ferrous sulfate, 1.5 Gm.

ALCOHOL INJECTION OF LUMBAR SYMPATHETIC TRUNK

IN CASES OF PERIPHERAL VASCULAR INSUFFICIENCY WHEN SURGICAL SYMPATHECTOMY IS CONTRAINDICATED

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The advantages of interrupting the sympathetic nerve supply to an extremity in which there is a circulatory deficiency due to vasospastic disease such as thromboangiitis obliterans or Raynaud's disease has been generally accepted, as a result of the pioneer work of Leriche [1] and the subsequent investigations of many American physicians.[2] The literature on this subject has been reviewed adequately at frequent intervals by White [3] and does not require general discussion at this time.

Unfortunately, some of the earlier publications dealing with peripheral vascular impairment of the extremities place too much emphasis on the differentiation between vasospastic disease and organic obliterative disease, and, as a result, many physicians regard the circulatory insufficiency of old age associated with arteriosclerosis as being an irreversible mechanical occlusion of the blood supply to the extremities. Ochsner and DeBakey [4] have emphasized the importance of realizing that even extreme cases of degenerative organic obliterative disease are aggravated by a certain amount of vasospasm and that the relief of this vasospasm is the one thing which can be accomplished by surgical treatment.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Leriche, René, and Fontaine, Rene: L'anesthésia insolée du ganglion étoile; sa technique, ses indications, ses resultats, Presse méd. **42**: 849 (May 23) 1934. Leriche, Rene: The Surgery of Pain, translated by A. Young, Baltimore, Williams & Wilkins Company, 1939.

2. Allen, A. W.: Results Obtained in the Treatment of Raynaud's Disease by Sympathetic Neurectomy and in Thromboangiitis Obliterans by Desensitization of Peripheral Sensory Nerves, Ann. Surg. **96**: 867 (Nov.) 1932. Flothow, P. G.: Diagnostic and Therapeutic Injections of the Sympathetic Nerves, Am. J. Surg. **14**: 591 (Dec.) 1931. White, J. C.: Diagnostic Blocking of Sympathetic Nerves to Extremities with Procaine, J. A. M. A. **94**: 1382 (May 3) 1930. Smithwick, R. H.: Modified Dorsal Sympathectomy for Vascular Spasm (Raynaud's Disease) of the Upper Extremity, Ann. Surg. **104**: 339 (Sept.) 1936. Ochsner and DeBakey.[4]

3. White, J. C.: Progress in Surgery of the Autonomic Nervous System in 1938 and 1939, Surgery **9**: 115 (Jan.) 1941, Progress in Surgery of the Autonomic Nervous System, 1940-1942, ibid. **15**: 491 (March) 1944.

4. Ochsner, Alton, and DeBakey, Michael: The Rational Consideration of Peripheral Vascular Disease Based on Physiologic Principles, J. A. M. A. **112**: 230 (Jan. 21) 1939.

Recently Mahorner[5] reported good results following lumbar ganglionectomy in persons up to 60 years of age suffering from vascular insufficiency, and Trimble and his associates[6] have published the report of their gratifying experience in a large number of persons in their fifth and sixth decades who were relieved of their vascular insufficiency by lumbar sympathectomy.

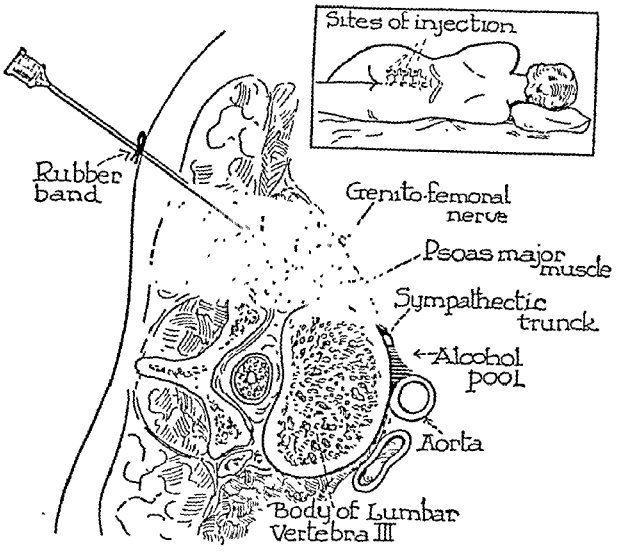


Fig. 1.—With the patient on the side the abdominal contents fall away from the vertebral column, creating a definite retroperitoneal space in the region of the sympathetic trunk. Gravity prevents the alcohol from coming in contact with the genitofemoral nerve.

My experience has coincided with that of Trimble, and we perform lumbar ganglionectomies on such patients when surgery can be tolerated with safety. A great many patients are seen, however, on whom surgery is definitely contraindicated because of heart disease, renal disease or both. In such cases I have resorted to a chemical sectioning of the sympathetic nerve supply to the lower extremities. This is accomplished by injecting sterile 95 per cent alcohol into the region of the lumbar sympathetic trunk. This procedure was undertaken with considerable misgiving because of the many reports of alcoholic neuritis following this type of injection. In some of my early cases alcoholic neuritis did develop but in the past three years I have encountered only 1 relatively mild neuritis of the genitofemoral nerve in a series of more than 150 cases. During this period it has been my practice to do an alcoholic injection of the lumbar sympathetic trunk on all patients suffering from arterial insufficiency of the lower extremities, regardless of their age or general physical condition, provided they were not considered good operative risks. Many patients with frankly infected gangrene have been injected, and it has been my impression that the procedure has enabled me to perform a satisfactory amputation at a lower level with better postoperative healing of the stump. I have had occasion to carry out the procedure on several aged patients, who were fibrillating and had developed saddle emboli of the lower abdominal aorta or of one of the femoral vessels. In these cases I have been able to relieve pain in almost every instance, and the improvement in circulation as a result of the interruption of the associated vasospasm of the collateral blood supply has been most striking. Very few of them have had to undergo amputation.

Many persons in their sixth, seventh and eighth decades have undergone bilateral alcoholic injection of the lumbar sympathetic trunks for relief of claudication and rest pain, and a majority of them have experienced relief from rest pain, much improved in claudication and a definite increase in their ability to walk. Most of those who had early pregangrenous areas on their great toes have overcome this tendency and have developed a healthier tissue in this region.

The following are presented as representative cases:

Case 1.—Mrs. W. H. P., aged 68, with hypertensive cardiovascular disease and severe generalized arteriosclerosis, suffered from rest pain in the calves for two years. Claudication had steadily increased and was so severe that she could not walk across her bedroom without resting. Two weeks prior to her first visit she developed trophic skin changes on the ends of the second and third toes of each foot. The only palpable pulse in the lower extremities was a very faint one at the femoral opening. Oscillometer readings were midcalf 0, midthigh ½ on both sides. During the past three days the patient had insisted on keeping her feet in a dependent position, and considerable edema developed. On Jan. 10, 1941 a bilateral alcohol injection of the first, second, third and fourth lumbar sympathetic ganglion was done. Following this injection the patient was relieved of her pain, and the gangrenous areas gradually healed, over a period of three weeks. Now, three and one-half years later, she is living and comfortable. There has been no recurrence of the gangrene or rest pain, and she can walk 100 feet without claudication.

Case 2.—O. S., a man aged 80 with hypertensive cardiovascular disease of fifteen years' duration with gradually increasing difficulty in walking, complained of cold feet, aches and cramps in the calf muscles during the night. All these symptoms were worse on the left side. For two weeks prior to admission a dark blue spot on the outer aspect of the left great toe became gradually larger, and for two days pus had been draining from it. Examination showed a fair pulse in both femoral vessels and a faint pulse in both popliteal vessels. There was no palpable dorsalis pedis or posterior tibial pulse. The feet were icy cold and white. There was an oscillometer reading of ½ in the midthigh. There was an infected gangrenous area of the skin on the great toe. On Dec. 16, 1942 a bilateral alcohol injection of the lumbar sympathetic trunk was done. The pain subsided immediately and the gangrenous areas cleared up promptly. The patient was last seen on Aug. 9, 1943, when he came in to advise that he was having no trouble and was walking 10 miles daily.

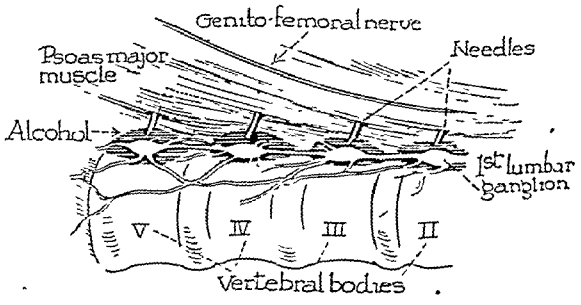


Fig. 2.—With the patient on the side the injected alcohol gravitates downward against the vertebral column and forms pools around the sympathetic trunk.

Case 3.—J. W. E., a man aged 67, presented a painful, cold, weak right lower extremity. He had been aware of a pulsating mass back of the right knee for several months. The day before admission, while lifting a heavy object, he experienced a severe pain back of the knee, followed by blanching and cooling of the leg and foot. The pain was unbearable, and he was unable to stand on the extremity. A diagnosis of

5. Mahorner, Howard: Control of Pain in Post-Traumatic and Other Vascular Disturbances, Ann. Surg. **119**: 432 (March) 1944.
6. Trimble, I. R.; Cheney, W. S., and Moses, W. R.: The Operative Attack on Organic Peripheral Vascular Disease, Surgery **15**: 655 (April) 1944.

thrombosis of an aneurysm of the right popliteal artery was made, and an alcoholic injection of the right lumbar sympathetic trunk was done on Oct. 24, 1942. All pain was relieved and the temperature increased perceptibly. The next day the patient could walk on the extremity. On October 27 an obliterative endoaneurysmorrhaphy was done and the popliteal artery

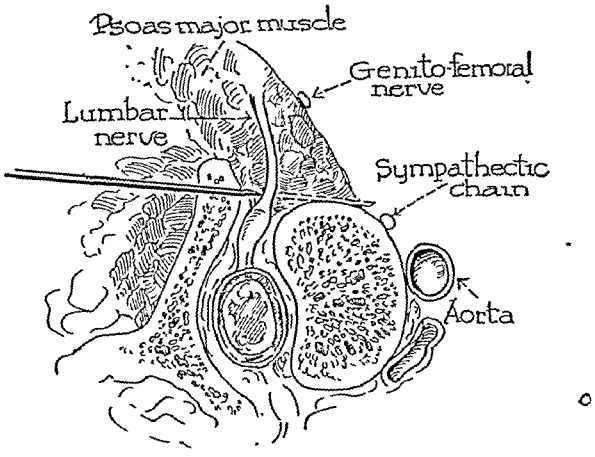


Fig. 3.—If the needle is not long enough, the alcohol may be injected into the substance of the psoas muscle and come into contact with the lumbar plexus. When the needle is inserted through the anterior surface of the psoas muscle, the muscle protects the lumbar nerves from the injected alcohol.

was ligated. The patient made an uneventful recovery and is now going about his usual activities. The right foot is warmer than the left one.

The technic that I employ for performing alcoholic injections is that which has been described by Ochsner and DeBakey[7] for infiltrating the same nerves with procaine, except that a few special precautions are taken in using alcohol which are not required in the use of procaine. As stated previously, the greatest hazard is associated with the danger of inadvertently allowing some of the injected alcohol to come in contact either with the genitofemoral nerve or with one or more of the lumbar nerve trunks (fig. 1). Damage to the genitofemoral nerve is avoided by placing the patient in a modified Sims position with the side to be injected turned up (fig. 2). In this position the injected alcohol pools against the side of the vertebral body and does not extend laterally over the anterior surface of the psoas muscle to come in contact with the nerve, which courses downward and laterally across the anterior surface of the muscle (fig. 3). The lumbar nerves emerge from the intervertebral foramens and pass into the substance of the psoas muscle. If the needle passes well through the substance of the muscle and into the retroperitoneal space, the danger of this complication is quite remote. The most frequent cause of trouble in this regard is the use of a short needle. The ordinary 2½ or 3 inch spinal needle is not long enough to reach the retroperitoneal space in a large, obese adult, and when such a needle is used there is danger of not penetrating the anterior surface of the psoas muscle. I use a special 22 gage 6 inch needle. This needle is inserted through a small piece of rubber band, which is used as a marker. When the tip of the needle strikes the posterior border of the transverse process I adjust the piece of rubber to a point 5 cm. from the skin surface and then insert the needle either above or below the transverse process until the rubber touches the skin. The needle is aspirated to make sure that the point has not been introduced into a blood vessel; then it is withdrawn about 0.25 cm. to avoid the possibility of injecting the solution into the wall of the aorta on the left or of the vena cava on the right. Not more than 2 cc. of 1 per cent procaine is injected slowly, the syringe is removed and a needle is inserted at the next level. Only 2 cc. of procaine is used because the creation of a pool of fluid at the end of the needle would dilute the alcohol which is subsequently injected and would possibly extend out over the psoas muscle to involve the genitofemoral nerve. By the time the second needle is put into position, adequate local anesthesia will have been obtained at the point of the first needle, and I then inject 2 cc. of sterile 95 per cent alcohol very slowly. About 0.25 cc. of procaine is then injected in order to clear the needle of alcohol and thereby avoid leaving any of the alcohol along the course of the needle as it is withdrawn. This injection is done at the level of the second, third, fourth and fifth spinous processes.

Following this procedure the patient is required to remain immobile for two hours to avoid any possibility of spreading the solution into an undesirable area. After two hours he is encouraged to resume his normal activities.

I determine the completeness of the sympathetic interruption by examining the extremity for moisture. If there is any perspiration on the involved extremity the procedure is repeated in two weeks.

It has been my experience that most of these injections are effective for at least six months and frequently for a year or more. One patient, who had a unilateral injection four years ago, still has a dry foot and leg on that side. I must have been fortunate enough in this case to effect an injection directly into the ganglions. I have encountered no contraindications to repeated injections, and reinjection is employed as often as it is indicated by the individual patient's clinical symptoms.

CONCLUSIONS

Paravertebral alcohol injection of the lumbar sympathetic ganglions is a relatively safe procedure when done carefully, and many inoperable persons suffering from arterial insufficiency of the lower extremities can be relieved by this relatively simple procedure. It is not advocated as a substitute for surgical sympathectomy but as a second choice when surgery is contraindicated.

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ABSTRACT OF DISCUSSION

DR. ARTHUR W. ALLEN, Boston: Interruption of the sympathetic pathways to the extremities has a definite place in the treatment of certain peripheral lesions, particularly those that have to do with vasospasm. In the arteriosclerotic group, particularly, and in a great many cases of thromboangiitis obliterans this procedure does have definite merit. In testing these patients before operation by procaine block it takes much longer to get evidence of vasodilatation in obliterative disease than it does in the cases in which the vessels themselves are normal. Any clinic that has had a large experience in this field has tried the alcohol injections that Dr. Lilly has presented. Many of us have practically discarded the method on the basis of the neuritis so often associated with it. Any one who will take the trouble and pains to carry out Dr. Lilly's exact technic may get good results and not have the complicating sequelae which have troubled some of us so much. It has been interesting to watch these elderly patients after they have had surgical interruption of their sympathetic pathways. The mortality has been extremely low. The serious sequelae have been surprisingly few. Recently, however, a man came to our hospital with an arteriosclerotic popliteal aneurysm. He was subjected to lumbar ganglionectomy, and then by

7 Ochsner, Alton, and DeBakey, Michael: Therapy of Phlebothrombosis and Thrombophlebitis, Arch. Surg. 40:208 (Feb.) 1940

aneurysm was operated on and he was given heparin, as is the rule in our clinic following operations on the arteries. He developed a huge retroperitoneal hematoma, which contributed to his death. Possibly the heparin was started too soon. Perhaps it was unwise to use it in his particular case. However, if he could have had a chemical interruption of his sympathetics as described by Dr. Lilly, the probabilities are that he would be alive today. I wish to issue a slight warning about the wholesale and widespread sympathetic interruptions on arteriosclerotic obliterative disease in active persons who like to play eighteen holes of golf without having to rest on the fairways or who are troubled because they can walk only short distances at a time because of intermittent claudication. The operation is very popular at the moment and we may say to these patients "Why, yes, we can eliminate this cramp in your leg to a very large extent by doing this perfectly simple and safe operation of interrupting the lumbar sympathetic chain." These persons are spectacularly improved as far as the intermittent claudication is concerned. However, a certain number succumbed from coronary occlusion in an incredibly short period of months. It has led me to believe that perhaps if one is fortunate enough to develop arteriosclerosis that involves the lower extremities so that the chief handicap is that one must stop and rest while walking rather than stride forth as in previous years, it may be a protective mechanism of nature, and this should not be overlooked in dealing with this group of persons.

DR. GEORGE D. LILLY, Miami, Fla.: Three of my patients have developed coronary occlusion within a few months after satisfactory sympathetic block, although they had no coronary disease prior to the injection. It certainly seems reasonable to suppose that when they increase their activity they run some danger of precipitating a coronary occlusion. I do not feel that this complication is a contraindication to the procedure, especially if patients have severe pain or are threatened with gangrene; but I do believe it would be well to caution them against increasing their activity too much.

ANEMIA IN PREGNANCY

A CORRELATION OF THE PERIPHERAL BLOOD AND BONE MARROW FINDINGS

JOHN R. WOLFF, M.D.
AND
LOUIS R. LIMARZI, M.D.
CHICAGO

Since the circulating blood is affected by many physiologic processes (e. g. work, rest, food, exercise, emotion, infection), an analysis of the peripheral blood by capillary or vein puncture merely tells the state of the blood at the moment it is obtained. The bone marrow is more constant in its pattern and portrays both the present state of the blood organs and the immediate future of the peripheral blood. The correlation of these findings in both the bone marrow and the circulatory blood reveals the true state of the hemopoietic system.

As clinicians, we have difficulty in evaluating the blood findings commonly seen during pregnancy. Because the hemoglobin and erythrocyte values are lower than those seen in the nonpregnant individual, earlier workers thought that pregnancy produced a true anemia. They speculated that this was an iron deficiency anemia due to the demands of the fetus for iron from the mother.

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Dieckmann and Wegner [1] found that the total blood volume was increased 23 per cent during pregnancy and that, although this increase is proportionately greater in the plasma content, the cellular content is also increased. They reported an increase in the total circulating hemoglobin and erythrocytes. However, the plasma is so greatly increased that when a small sample of blood is analyzed the cellular element is diluted. The apparent anemia previously observed is therefore not a true anemia but rather a physiologic anemia or hydremia. This work has been amply confirmed by other workers.[2] Adair and Dieckmann [3] state that the minimum normal figures during pregnancy are hemoglobin 10 Gm., erythrocytes 3.36 million and cell volume 33 per cent.

There are some investigators who do not believe that hydremia alone can produce figures as low as those just mentioned. Whitby [4] says that an erythrocyte count below 4.0 is pathologic. Bethell [5] states that 3.70 million red cells and 11.3 Gm. of hemoglobin are the lowest that will explain a hydremia.

Many clinicians believe that the lowered values seen in pregnancy are due to a lack of iron.[6] This lack is thought to be due either to a withdrawal of the mother's iron reserve for the fetus, to the lack of iron in the diet or to the prevention of its absorption by the change in the gastric secretion during pregnancy.[7] Many clinicians have routinely treated pregnant women with iron in one of various forms and have noted higher erythrocyte and hemoglobin levels in those treated than in control cases.[6] Yet others [8] have found that iron did not affect these values at all.

RESULTS

Physiologic Anemia of Pregnancy.—Thirty patients were examined throughout pregnancy. These normal healthy pregnant women were first seen during the first six to ten weeks of pregnancy. At this time the peripheral blood and bone marrow were examined as described. The peripheral blood was reexamined every four weeks until delivery, shortly after delivery and at the six weeks postpartum visit. The bone marrow was reexamined in many cases during the second and third trimester, in all cases shortly after delivery and in most cases at the final six weeks postpartum visit.

1. Dieckmann, W. J., and Wegner, C. R.: The Blood in Normal Pregnancy: I. Blood and Plasma Volumes, Arch. Int. Med. **53**: 71 (Jan.) 1934.

2. Thompson, K. J.; Hirsheimer, A.; Gibson, J. B., Jr., and Evans, W. A., Jr.: Studies on the Circulation in Pregnancy: III. Blood Volume Changes in Normal Pregnant Women, Am. J. Obst. & Gynec. **36**: 48 (July) 1938. Miller, J. R.; Keith, N. M., and Rowntree, L. G.: Plasma and Blood Volume in Pregnancy, J. A. M. A. **65**: 779 (Aug. 28) 1915. Stander, H. J., and Creadick, A. N.: Blood Volume in Pregnancy, Bull. Johns Hopkins Hosp. **35**: 1 (Jan.) 1924. Oberst, T. W., and Plass, E. D.: Water Concentration of the Blood During Pregnancy, Labor and the Puerperium, Am. J. Obst. & Gynec. **31**: 61 (Jan.) 1936.

3. Adair, F. L.; Dieckmann, W. J., and Grant, K.: Anemia in Pregnancy, Am. J. Obst. & Gynec. **32**: 560 (Oct.) 1936.

4. Whitby, L. E. H., and Britton, C. J. C.: Disorders of the Blood, ed. 4, Philadelphia, Blakiston Company, 1942, p. 238.

5. Bethell, F. H.: The Blood Changes in Normal Pregnancy, J. A. M. A., **107**: 564 (Aug. 22) 1936.

6. Strauss, M. B., and Castle, W. B.: Etiology and Treatment of the Anemia of Pregnancy, J. A. M. A. **102**: 281 (Jan. 27) 1934. Linder, G. C., and Massey, P. J.: Some Factors Bearing upon the Hemoglobin Level in Pregnancy, J. Obst. & Gynaec. Brit. Emp. **46**: 885 (Dec.) 1939. Corrigan, J. C., and Strauss, M. B.: The Prevention of Hypochromic Anemia in Pregnancy, J. A. M. A. **106**: 1088 (March 28) 1936. Lobate, J. S.: Classification and Treatment of the Anemias of Pregnancy, Am. J. Obst. & Gynec. **31**: 640 (July) 1939. Toland, O. J.: The Incidence of Secondary Anemia in Out-Patient Maternity Patients, ibid. **31**: 640 (April) 1936.

7. Strauss, M. B., and Castle, W. B.: Studies of Anemia in Pregnancy: Gastric Secretion in Pregnancy and the Puerperium, Am. J. M. Sc. **184**: 655 (Nov.) 1932. Strauss, M. B., and Castle, W. B.: Studies of Anemia in Pregnancy: The Relationship of Dietary Deficiency and Gastric Secretion to Blood Formation During Pregnancy, ibid. **191**: 25 (Jan.) 1931. Strauss and Castle.[6] Linder and Massey[6] Corrigan and Strauss.[6]

8. Cornell, E. L.: Personal communication to the authors of unpublished data. Evans, E. G.: Anemia in Pregnancy, Illinois M. J. **84**: 317 (Nov.) 1943. Adair, Dieckmann and Grant.[3] Dieckmann and others.[2]

Peripheral blood and bone marrow analysis were also made on 75 other healthy women at various stages of their pregnancy.

The findings in the peripheral blood are in agreement with those of previous investigators (table 1). There is a lowering of the values of hemoglobin, erythrocytes



Fig 1.—Normal pregnancy: peripheral blood, showing the normocytic normochromic anemia

and hematocrit beginning in the third and fourth months of pregnancy. This is much increased by the sixth and seventh month and persists in our series until after delivery. By the sixth postpartum week the blood has returned to normal levels. We note that the mean corpuscular volume is normal throughout pregnancy. In a few cases the volume of the cell on one or two examinations would be small and in other cases somewhat macrocytic, but the average cell throughout pregnancy was normal in size and volume. The mean corpuscular hemoglobin concentration is in the lower limits of normal. Since 32 to 36 per cent is considered the range of normal hemoglobin concentration it would be difficult to state that the erythrocytes are deficient in iron during pregnancy. The larger group of individual cases examined at various months of pregnancy reveal findings similar to those as observed in the same patients (30) throughout pregnancy. The leukocytes were usually within the normal range, but many patients showed a slight leukocytosis at varying times during the pregnancy. The latter fact has been previously noted by Litzenberg and others.[11] We also found an increase in the sedimentation rate, especially in the last trimester, with a rapid return to normal following delivery. The icterus index remained normal throughout pregnancy. In contrast with observations of other investigators,[12] we failed to note an increase in the reticulocytes during pregnancy. The differential smear showed little variation from normal. The erythrocytes always appeared normal in size and shape and in staining quality throughout the pregnancy. In most cases the percentage of polymorphonuclear leukocytes was increased toward the end of pregnancy and there was slight increase in stab forms noted in many instances. The leukocytosis of labor (polymorphonuclear in type) was evidenced by a mild leukocytosis noted during the puerperium. The leukocytes were normal at the sixth postpartum period. The blood platelets are normal or slightly increased.

The bone marrow of normal pregnancy shows no change in the character of normal erythropoiesis. The characteristic cell is that of the polychromatophilic *normoblast. The latter type of the erythroid element* is exactly like that seen in normal healthy nonpregnant women. There is definite evidence of increased myelopoiesis during the first and second trimesters. During the latter part of pregnancy, especially in the last month of gestation and during the puerperium, there is a pronounced myeloid hyperplasia with a tendency toward granulopoietic immaturity. The megakaryocytes are normal or slightly increased in number during the early months of pregnancy, but during the latter months of



Fig 2.—Normal pregnancy: bone marrow, showing normal erythropoiesis and myeloid hyperplasia

pregnancy and especially in the early puerperium there is an evident megakaryocytic hyperplasia of a mature type. There is also a decided increase in the number of bone marrow platelets. This myeloid hyperplasia and megakaryocytic hyperplasia does not entirely return

11 Carey, J. B., and Litzenberg, J. C.: Total Leucocyte Counts in Human Blood During Pregnancy, Ann. Int. Med. 10:25 (July) 1936. Eskridge, J. B., Jr., and Serwer, M. J.: Blood Studies in Private Obstetrical Patients During Pregnancy, South. M. J. 32:24 (Jan.) 1939. Wolff, J. R.: The Leucocyte Count in Labor, Am. J. Obst. & Gynec. 41:611 (March) 1941.

12 Pitts, H. H., and Packham, E. A.: Hematology of Sternal Marrow and Venous Blood of Pregnant and Nonpregnant Women, Arch. Int. Med. 64:471 (Sept.) 1939.

to normal until some three months following delivery despite the relative earlier readjustment of the peripheral blood.

Iron Deficiency Anemia (table 2).—Ten cases were observed. Table 2 shows the average findings in this group. The essential feature is a cell deficient in

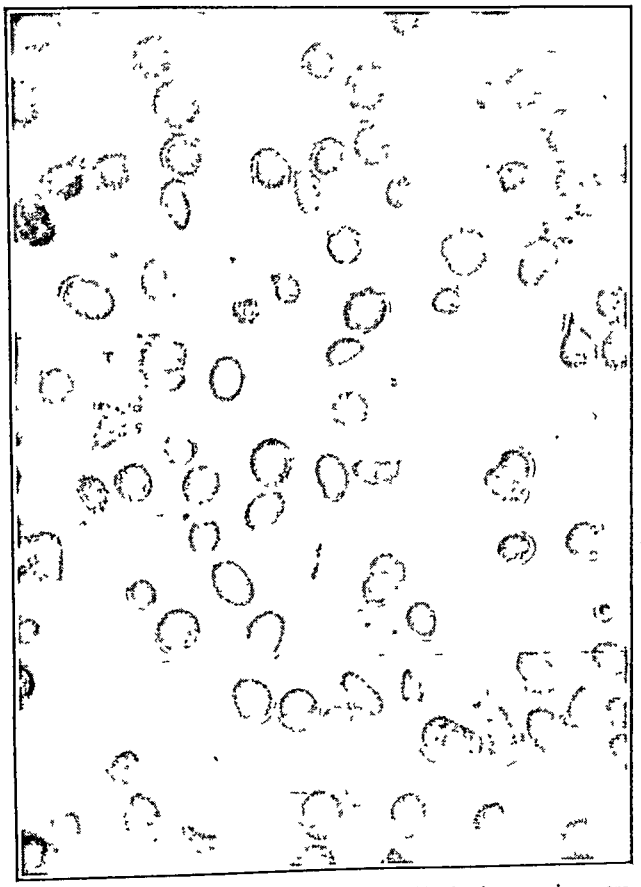


Fig. 4.—Iron deficiency anemia peripheral blood, showing the microcytic hypochromic anemia

hemoglobin, the so-called hypochromic anemia. The hemoglobin falls well below 10 Gm. and the erythrocyte count and hematocrit reading are below those applicable to that of the physiologic changes seen in pregnancy. Calculation of the mean corpuscular hemoglobin concentration shows a decided lack of hemoglobin in the cell. In 4 cases the cell volume was normal, a normocytic hypochromic anemia and in 6 cases the cell volume was considerably lowered, a microcytic hypochromic anemia.

The bone marrow shows a normoblastic erythropoiesis with the presence of a greater or smaller number of pronormoblasts and basophilic normoblasts, but of a normal type. In 1 case with a severe anemia the erythroid hyperplasia in the bone marrow showed an exceedingly large number of pronormoblasts. The pronormoblasts and basophilic normoblasts are only infrequently encountered in bone marrow smears of normal patients and those with the physiologic changes due to pregnancy. A myeloid hyperplasia and megakaryocytic increase is noted in these cases similarly to that described.

When iron was not given to these patients (6) the peripheral blood and bone marrow remained constant as described. When iron was given to these patients (4) the peripheral blood and bone marrow returned to normal. Without iron the bone marrow does not return to normal until six months after delivery.

Four cases of mild anemia (hemoglobin below 10 Gm. and erythrocytes below 3.50 million) were observed in which the cell size was small but the hemoglobin concentration was normal. The bone marrow showed a normal erythroid pattern.

Macrocytic Anemia of Pregnancy (table 3).—Three cases of anemia of pregnancy and the puerperium were observed with a megaloblastic bone marrow quite identical with that seen in addisonian pernicious anemia.

In the first case it was the ninth month of pregnancy. The peripheral blood showed 4 Gm. of hemoglobin, 1.15 million erythrocytes and a hematocrit of 13 per cent. The mean corpuscular volume of 113 cubic microns revealed the macrocytic type of cell. The hemoglobin concentration was 30 per cent. The blood smear revealed moderate anisocytosis and poikilocytosis of the erythrocytes and moderate polychromasia. So-called pernicious anemia neutrophils were also present. There was an abundance of hydrochloric acid in the stomach contents following an alcohol meal or following the injection of histamine hydrochloride subcutaneously. The smooth tongue, splenomegaly and neurologic complications characteristic of true pernicious anemia were not observed.

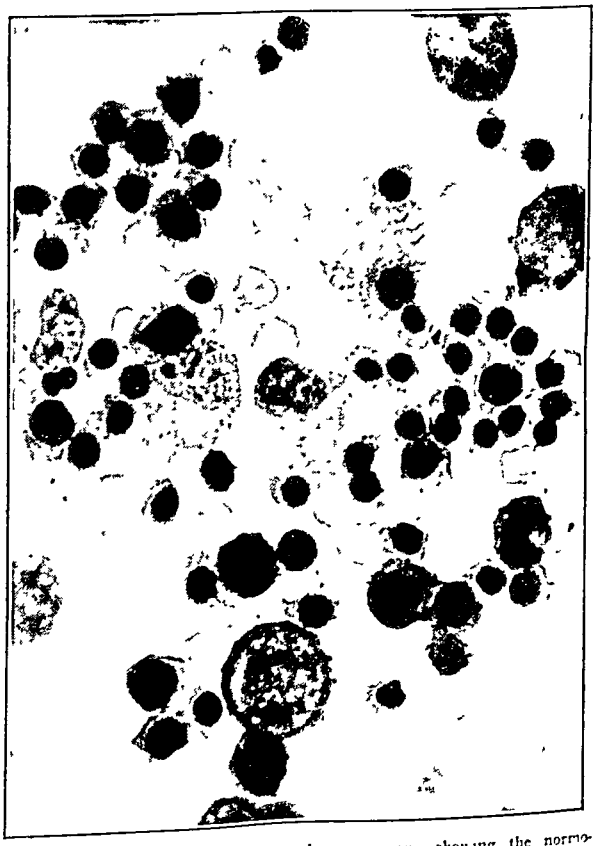


Fig. 5.—Iron deficiency anemia bone marrow, showing the normoblastic hyperplasia

The bone marrow was characterized by the presence of megaloblasts. This is a pathologic type of erythropoiesis which occurs in the bone marrow only in pernicious anemia and related anemias due to a deficiency of the liver principle. This type of marrow is never seen under normal conditions. Megaloblasts are distinctly different from the early forms of normoblasts

(pronormoblasts) and are characterized by a more distinct chromatin network, more parachromatin, more rapid accumulation of hemoglobin in proportion to the maturity of the cell and almost always by a larger cell. Jones [13] has discussed in detail the distinguishing features of both normoblasts and megaloblasts in relation

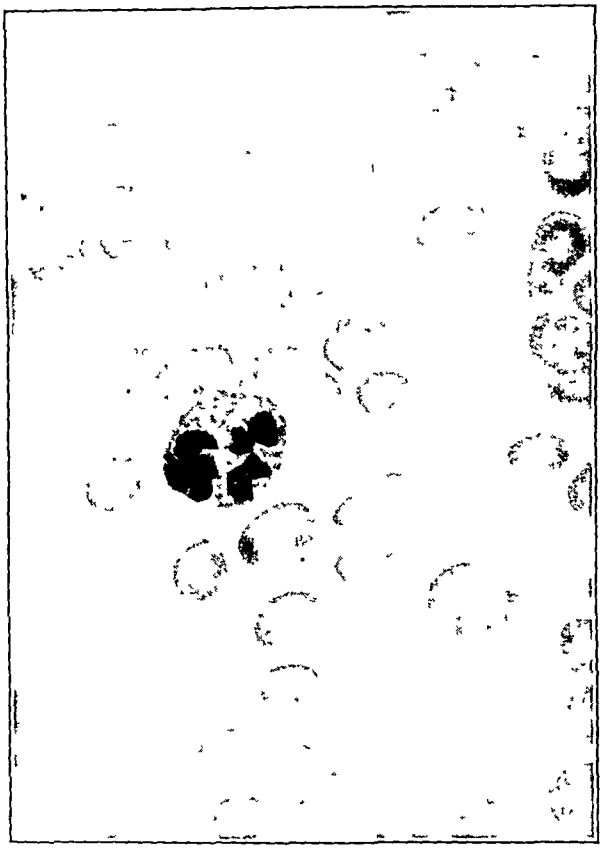


Fig 8.—Pernicious anemia of pregnancy; peripheral blood, showing a pernicious anemia neutrophil (macropolycyte)

to their nuclear pattern and cytoplasmic changes. Limarzi [14] has demonstrated that megaloblasts are arsenic sensitive, while pronormoblasts as seen in normal bone marrow and in the bone marrow in most cases of anemia with an erythroid immaturity are arsenic resistant. The bone marrow in those cases of so-called pernicious anemia of pregnancy also present a pathologic type of granulopoiesis characterized by large hyperpolymorphic neutrophilic promyelocytes, myelocytes and metamyelocytes. These types develop in the pernicious anemia neutrophils (macropolycytes) of the peripheral blood

In the second case the peripheral blood showed the hemoglobin to be 4.5 Gm., red cell count 1.27 million and the hematocrit 12 per cent. Thus the mean corpuscular volume is 94 cubic microns, which is well within normal limits. The mean corpuscular hemoglobin concentration is 35 per cent. One would classify this as a normocytic normochromic anemia, and the etiology and therapy would be somewhat obscure. However, the bone marrow findings were those of a typical megaloblastic anemia as already described.

In the third case the peripheral blood showed the hemoglobin 5.5 Gm., erythrocytes 2.48 million and hematocrit 19 per cent. The mean corpuscular volume was 76 cubic microns and the mean corpuscular hemoglobin concentration was 28 per cent. From the study of the peripheral blood alone one would classify this case as a microcytic hypochromic anemia. That is, it would be considered an iron deficiency anemia and treated accordingly. However, the bone marrow again revealed a true megaloblastic anemia typical of the cases just described.

Intramuscular liver therapy is needed in these cases with a megaloblastic marrow. Following this treatment there is a tremendous proliferation of normoblasts in the bone marrow. Megaloblasts rapidly mature and no new megaloblasts are formed. The action of the liver principle on the megaloblasts is probably to effect the elimination and suppression of their further proliferation.[15] It is not clear how liver extract effects stimulation of the normoblastic tissue. Apparently once the pathologic megaloblastic tissue has been eliminated and suppressed, normoblastic erythropoiesis can assume its normal physiologic function and the anemia in the peripheral blood is corrected. In cases of megaloblastic anemia (pernicious) of pregnancy the conversion of the bone marrow from a megaloblastic to a normoblastic type of erythropoiesis following liver therapy is slow. These cases do not respond as well as

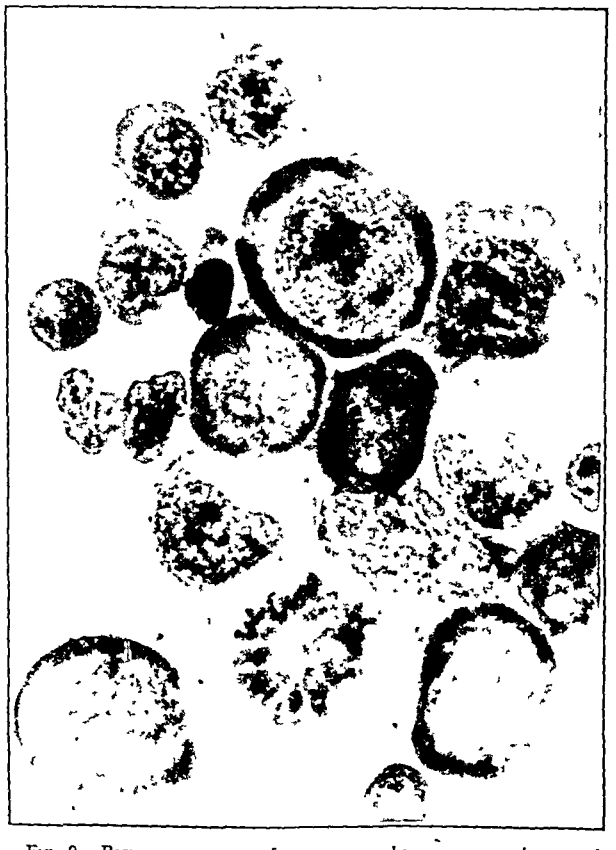


Fig 9.—Pernicious anemia of pregnancy; bone marrow, showing the megaloblastic type of erythropoiesis and abnormal granulopoiesis. Note the presence of a mitotic figure in one megaloblast

13 Jones, O. P.: Cytology of Pathologic Marrow Cells, with Special Reference to Bone Marrow Biopsies, in Downey, Hal: Handbook of Hematology, New York, Paul B. Hoeber, Inc., 1938, vol. 3, p. 2045.

14 Limarzi, L. R.: The Effect of Arsenic (Fowler's Solution) on Erythropoiesis: A Contribution to the Megaloblast-Normoblast Problem, Am. J. M. Sc. 206: 339 (Sept.) 1943.

15 Fieschi, A.: Semeiologia del midollo osseo: Studio di morfologia clinica, in Ferrata, A.: Biblioteca 'Haematologica,' Pavia, Tipografia Cooperativa, 1938. Limarzi, L. R., and Levinson, S. A.: An Undescribed Type of Erythropoiesis Observed in Human Sternal Marrow, Arch. Path. 36: 127 (Aug.) 1943.

cases of addisonian pernicious anemia until after the birth of the child and for some time after the puerperium.

It requires large daily doses of potent intramuscular liver extract and several blood transfusions to bring about a satisfactory recovery phase. The reticulocyte response is never as high as that seen in addisonian pernicious anemia at the equivalent stage of blood and bone marrow findings. In 1 case the pathologic granulopoiesis disappeared more rapidly than the megaloblastic erythropoiesis, while in the other 2 the granulopoiesis was last to disappear, similar to that seen in addisonian anemia. The megakaryocytes were hypoplastic before treatment but increased with treatment.



Fig. 10.—Pernicious anemia of pregnancy: bone marrow, showing the conversion to normal erythropoiesis following liver therapy. Note the large pathologic neutrophilic metamyelocyte.

The peripheral blood and bone marrow recover completely and permanently in about five months after delivery. The infants show normal blood and bone marrow findings, as do other children of the mother.

Six cases of mild anemia in which the mean corpuscular volume revealed a macrocytic type of cell were observed. The mean corpuscular hemoglobin was either normal or slightly below normal. The bone marrow was normal in all respects except for a mild myeloid hyperplasia. In some instances there was a mild erythropoiesis with the presence of a few immature forms (pronormoblasts), but megaloblasts were never found. In these cases recovery followed delivery, although iron was given in those in which there was a lowered hemoglobin concentration.

PHYSIOLOGIC ANEMIA

The bone marrow of normal pregnancy has been studied by several investigators. Daniachij [16] examined the sternal marrow of 50 women during different stages of pregnancy and the puerperium. He found an increase in the number of neutrophilic metamyelocytes and a megaloblastic type of reaction which reached its maximum between the seventh and eighth months of pregnancy. Forssell [17a] examined 8 cases during the first month of pregnancy and noted no difference in the differential counts between pregnant and normal nonpregnant women. Hansen [17b] noted signs of increased erythropoiesis indicated by the finding of normoblast clusters in nests. No statement is made as to the number of cases studied. Markoff [18] reported morphologic studies on the bone marrow in pregnancy. No indication is given as to the total number of cases in which these observations were made. He found an increase in erythropoiesis with normoblasts in nests and an increase in the number of macroblasts from the second to the sixth months of pregnancy. A tendency to large cellular forms in both the myeloid and the erythroid series was found to be present. An increase in eosinophilic cells and a plasma cellular reaction was also noted. Pitts and Packham [13] examined the bone marrow from 41 women in various stages of pregnancy and compared the total number of marrow cells and differential counts with that of 20 nonpregnant women as controls. They found a slight but significant higher count during pregnancy (14,400 to 125,000 per cubic millimeter, average 36,760) to that of the control cases (7,550 to 46,000, average 23,100). These counts are low because these authors aspirated 10 cc. of marrow fluid and this leads to dilution with sinusoidal (peripheral) blood. They found similar differential counts in both pregnant and nonpregnant women.

In our series of 105 normal healthy pregnant women, 30 of whom were studied throughout pregnancy, the bone marrow constantly revealed a normal pattern of erythropoiesis. This is further evidence that the normocytic anemia in the peripheral blood is not a true one but due to hydremia. In fact we must agree with those who prefer dropping the status of "anemia" from these patients and in its place instituting normal standards of the blood during pregnancy which will naturally differ from the accepted nonpregnant standards. According to Adair [3] 89 per cent of all pregnant women are in this group. No treatment of any type is necessary. Iron medication is of no value, as the cells are well concentrated with iron. Studies of the iron content of the blood show normal findings during pregnancy.[19] The bone marrow, as stated, shows evidence of an entirely normal erythropoiesis.

An increased myelopoiesis was observed early in pregnancy. This became more pronounced during the last months of pregnancy. This hyperplasia is reflected in two ways: 1. By a pronounced bone marrow cell

16. Daniachij, M. A.: Schwangerschaft und Hämatopoiesis, Zentralbl. f. Gynäk. 60: 1220 (May 23) 193[illegible] Schwangerschaft und Hämatopoiesis, 60: 1998 (Aug. 2 [illegible] und klinischer Verlauf der Graviditätsanamien, [illegible] u. Gynäk. 100: 328, 1935.

17a. Forssell, J.: Morphologische Veränderungen im Knochenmark und Blut bei akuten Blutungsanamien, Acta med. Scandinav., 1939, suppl. 101, p. 1.

17b. Hansen, R.: Ueber die Funktion des Knochenmarkes in der Schwangerschaft, Ztschr. f. Geburtsh. u. Gynäk. 116: 398, 1938.

18. Markoff, N.: Das Knochenmark bei normaler und pathologischer Schwangerschaft (Ergebnisse der Sternalpunktion), Ztschr. f. Geburtsh. u. Gynäk. 119: 13, 1939.

19. Dieckmann, W. J.: Calcium, Phosphorus and Nitrogen Balances in Pregnant Women, Am. J. Obst. & Gynec. 47: 357 (March) 1944.

volume in the hematocrit. The normal myeloid-erythroid volume is approximately 6.8 per cent. The average during pregnancy was 14 per cent, with values as high as 45 per cent noted. 2. By an increase in the number of nucleated bone marrow cells. Normally the bone marrow of an adult woman contains approximately 300,000 cells per cubic millimeter,[20] while during pregnancy the average is about 600,000 per cubic millimeter with figures as high as 1.0 million often noted. Apparently homoplastic myelopoiesis is accelerated and the insignificant myeloid immaturity observed near the end of pregnancy does not involve the mechanism of heteroplastic myelopoiesis. The slight to moderate leukocytosis observed in the peripheral blood is practically always of the polymorphonuclear neutrophilic type and rarely if ever shows signs of myeloid immaturity.

The megakaryocytic hyperplasia of the bone marrow is only occasionally reflected in the peripheral blood by a great increase in the number of platelets. The mechanism for the rapid and immediate formation of large quantities of platelets is present in the bone marrow, especially during the last months of pregnancy and the puerperium. The relationship of megakaryocytic hyperplasia with the formation of large numbers of blood platelets to the control of postpartum bleeding, the tendency to phlebitis in the puerperium and the increased blood coagulability noted in those with an eclamptogenic toxemia is an interesting speculation.

These hyperplastic changes in the bone marrow and peripheral blood during pregnancy are merely a part of similar physiologic changes noted in every other organ of the body during pregnancy. The bone marrow does not return to normal for at least six weeks after delivery. It thus takes longer to recover than does the peripheral blood and is therefore a finer indicator of complete physiologic adjustment following pregnancy than are the blood or physical findings in this respect. The baby born of the mother shows normal blood and bone marrow findings.

IRON DEFICIENCY ANEMIA

In the cases of hypochromic anemia, especially with a microcytic cell, the bone marrow shows a definite normoblastic hyperplasia with a moderate to pronounced erythroid immaturity to include many more basophilic normoblasts and pronormoblasts than are seen in normal bone marrows. Markoff [18] in cases of microcytic anemia observed a normoblastic erythropoiesis with frequent macronormoblasts. Segerdahl [21] observed a similar type of marrow in her cases of pregnancy with an iron deficiency anemia (sideropenia). The factors that contribute to this type of anemia are similar to those contributing to this state in nonpregnant individuals. That is, the chronic loss of blood (e. g. epistaxis, menorrhagia, hemorrhoids, ulcer) preceding the pregnancy, the lowering of the gastric acidity during pregnancy and dietary alterations alone or in combination tend to produce this anemia. Following the replacement of iron therapeutically, an adequate diet and in some cases diluted hydrochloric acid the bone marrow returns to normal and the anemia in the peripheral blood is corrected. It is interesting that the babies from these mothers show normal peripheral blood and bone marrow findings.

In all cases of evident true anemia or those falling at or just below the level of minimum standard during pregnancy, the key to iron therapy is the mean corpuscular hemoglobin concentration. Every such case deserves a complete investigation of the peripheral blood. The simple hematocrit reading should always be obtained along with the erythrocyte count and the hemoglobin level. The mean corpuscular hemoglobin concentration can then be established. When this index is below normal, iron is indicated. We believe that ferrous sulfate 15 grains (1 Gm.) daily is the best preparation.

MEGALOBLASTIC ANEMIA OR PERNICIOUS ANEMIA OF PREGNANCY

True addisonian pernicious anemia is rare during pregnancy, although many of Biermer's patients were pregnant women. Much of the older reports of pernicious anemia in pregnancy are incomplete not only because of the lack of present rigid diagnostic criteria, especially bone marrow studies, but because any grave or severe anemia was called pernicious. Thus many of the older reports must be looked on with great suspicion. Much of the literature on the blood in the macrocytic anemias of pregnancy has been reviewed by Sodeman.[23] Bone marrow examinations are lacking in practically all of these cases of macrocytic anemia reviewed by him.

In our 3 cases of pernicious anemia of pregnancy megaloblasts were observed in all the bone marrows. Our patients were all white women in the ninth month of pregnancy. Besides the megaloblasts the bone marrow revealed a pathologic type of granulopoiesis. This is characterized by large hyperpolymorphic neutrophilic promyelocytes, myelocytes and metamyelocytes as described by *Jones* [30] *in typical cases of pernicious anemia.* These cells develop into the pernicious anemia neutrophils (Cook's [31] macropolycytes) of the peripheral blood.

The finding of a megaloblastic bone marrow in the presence of either a macrocytic, a normocytic or a microcytic peripheral blood is most interesting. Segerdahl,[32] Lambin and de Weerdt,[32] Callender [29] and Davidson, Davis and Innes [33] have reported similar types of cases. The latter investigators have suggested the name "megaloblastic anemia of pregnancy." The clinical importance of the analysis of the bone marrow as obtained by sternal puncture in all cases of severe anemia during pregnancy is obvious. Also in such severe anemias one may be misled by the findings in the peripheral blood from discrepancies produced by invariable technical errors, whereas the sternal marrow analysis is simple and devoid of such a happening. Our patients with megaloblastic anemia responded to adequate liver therapy and blood transfusions.

SUMMARY

The normal status of erythropoiesis in the bone marrow shows that the physiologic anemia of pregnancy is not a true anemia and thus rules out the need of routine therapy. The cause of the pronounced myeloid and megakaryocytic hyperplasia is not entirely clear. It

20. Limarzi, L. R.: Unpublished data.
21. Segerdahl, Elsa: Pernicious Anemia of Pregnancy: A Clinical and Hematological Study, Acta med. Scandinav. **108**: 483, 1941.
23. Sodeman, W. A.: Anemia in Prgnancy, Am. J. M. Sc. **200**: 117 (July) 1940.
30. Jones, O. P.: Origin of Neutrophils in Pernicious Anemia (Cook's Macropolycytes), Arch. Int. Med. **60**: 1002 (Dec.) 1937.
31. Cook, W. E.: The Macropolycyte, J. Lab. & Clin. Med. **19**: 453 (Feb.) 1934.
32. Lambin, P., and de Weerdt, W.: Sur l'existence dans l'anémie pernicieuse d'un stade initial sans megaloblastose medullaire, Sang **13**: 928, 1939.
33. Davidson, L. S. P.; Davis, L. J., and Innes, J.: Megaloblastic Anemia of Pregnancy and Puerperium, Brit. M. J. **2**: 31 (July 11) 1942.

may be that the granulocytic cells in the living state or their products act as a productive mechanism during pregnancy and the puerperium. The findings of a polymorphonuclear leukocytosis and thrombocytosis during the latter part of pregnancy, labor and the puerperium can be definitely correlated to the findings in the marrow. It is interesting to note that the bone marrow is apparently the last organ to return to a normal state following delivery.

In the hypochromic anemia of pregnancy the conspicuous finding of a disturbance in the erythroid tissue in the form of normoblastic hyperplasia and immaturity but morphologically normal cells speaks for an iron deficiency anemia. The microcytic hypochromic anemia will respond to therapeutic doses of iron. In cases of microcytic normochromic anemia (small cell with normal hemoglobin saturation) and a normal bone marrow iron therapy is of little value. Following delivery the anemia will correct itself spontaneously.

The macrocytic anemia with a normal or pronormoblastic bone marrow will in most instances clear up spontaneously during the puerperium. A normal hemoglobin concentration contraindicates the use of iron, but when this index is low iron should be administered. The absence of megaloblasts rules out pernicious anemia of pregnancy, and liver is not indicated.

In the pernicious anemia of pregnancy with megaloblastic bone marrow and a macrocytic anemia in the peripheral blood, the diagnosis is obvious and the treatment is clear. Large doses of intramuscular liver extract and supportive blood transfusions will carry the patient through the pregnancy and the puerperium. Unless the megaloblasts have been purged from the bone marrow by liver extract, the anemia in the peripheral blood will not be corrected. These cases are refractory to iron medication. Following delivery recovery is apparently complete and permanent, although these women should be observed during future pregnancies and following the menopause for the development of true pernicious anemia. The findings of a normocytic or microcytic and hypochromic anemia may be misleading unless the bone marrow is examined and the presence of megaloblasts observed. It can be said that hypochromic anemia with a normoblastic bone marrow will respond to iron and that a hypochromic anemia with a megaloblastic bone marrow will respond only to anti-pernicious anemia therapy. The fact that these cases respond to liver therapy emphasizes the need for recognizing genuine megaloblasts in the bone marrow in order to determine the correct type of therapy. Perhaps the unexplained success that some clinicians have reported in the treatment of hypochromic anemia with liver extract has been due to the existence of a condition like this. The presence of pernicious anemia neutrophils in the peripheral blood smear prior to the development of a macrocytic blood picture emphasizes the importance of a careful qualitative study of cellular morphology. The presence of these atypical neutrophils in the blood aids in differentiating pernicious anemia of pregnancy from microcytic or normocytic types of hypochromic anemia.

CONCLUSIONS

Four types of bone marrow and peripheral blood patterns are observed during pregnancy:

1. A normocytic normochromic anemia in the peripheral blood. The bone marrow shows a normal erythroid pattern with a myeloid and megakaryocytic hyperplasia toward the end of pregnancy. The physiologic anemia is a normal state during pregnancy and is due to hydremia. Recovery is spontaneous during the puerperium. No therapy is needed.

2. A microcytic hypochromic anemia with a normoblastic hyperplasia in the bone marrow. Adequate iron therapy corrects the bone marrow and the anemia. Occasionally a mild microcytic normochromic anemia with a normal or normoblastic bone marrow is observed. No treatment is necessary as recovery follows delivery.

3. A macrocytic anemia with a normal or pronormoblastic bone marrow. Recovery follows delivery. Iron is indicated only when the mean corpuscular hemoglobin concentration is low.

4. A megaloblastic type of bone marrow with either a macrocytic, normocytic or microcytic and hypochromic peripheral blood pattern. Adequate liver therapy and supportive blood transfusions are needed to carry the patient through the pregnancy. Complete and permanent recovery usually follows. Atypical neutrophils (macropolycytes) in the peripheral blood are a diagnostic aid.

The most accurate criteria for the diagnosis and treatment of the true anemia of pregnancy is the study of the sternal marrow. The changes in the peripheral blood are of a secondary nature and in many instances are misleading.

The close cooperation of the hematologist and obstetrician is essential to the proper management of the anemic state seen during pregnancy.

1853 West Polk Street, Chicago 12.

ABSTRACT OF DISCUSSION

DR. WILLIAM J. DIECKMANN, Chicago: Our trained technicians working with 75 to 150 patients a day, using the Newcomer method, had an error in the hemoglobin determination of 8.7 per cent. With special care this error was 4 per cent. The routine erythrocyte count had an error of 13.7 per cent, while with special care the error was 2 per cent, but the hematocrit, using heparin, had an error of only 2 per cent. Furthermore, the hemoglobin concentration in the same individual, with careful determinations, can fluctuate as much as 15 per cent from hour to hour. More than one hemoglobin determination must be made to establish a diagnosis of anemia or of normality for the patient. The paper contains no data as to how quickly the patient's hemoglobin improves during pregnancy with either liver injections or iron. Our experience at the Chicago Lying-In Hospital, where we have over 2,000 clinic visits monthly, is that 63 per cent are anemic as judged by the standards for the nonpregnant (that is less than 12 Gm. of hemoglobin, 36 hematocrit or 4,200,000 red blood count) or 12 per cent are anemic as judged by the standards for pregnancy (that is less than 10 Gm. of hemoglobin, 33 per cent hematocrit or 3.36 million erythrocytes). We have been giving both ferrous and ferric iron and various proprietary preparations of iron containing liver, stomach and vitamin extracts. Any medication must show a higher percentage of cure and a more rapid return to the normal than our group of controls. We are still using various combinations of iron and other substances in an endeavor to find some substance that will cause improvement of anemia in pregnancy. After delivery or in the nonpregnant woman an adequate iron intake in an iron deficient anemia will cause an appreciable increase in hemoglobin within two weeks. We have seen no such increases in anemic pregnant women. Antepartum care is valuable, but a hemoglobin determination made in the last month is of more value than one made in the third month,

and for the past year we have been insisting on a hemoglobin determination within the month preceding delivery. It is hard for me to believe that the fetal needs for iron are the cause for the anemia of pregnancy and that the pregnant woman must have an increased intake of iron prior to twenty-eight weeks. The incidence of anemia was much higher in our ward patients than in our private patients, and my impression is that in the past few years the incidence has decreased in the ward patients. Patients who are found to have a hemoglobin of less than 10 Gm. per hundred cubic centimeters at delivery are watched carefully to prevent excessive blood loss and the preliminary preparations for transfusion made. If the hemoglobin is less than 9, the patients are transfused either before or directly after delivery. Transfusion entails a risk from incompatible blood, which has become a real one since the war because of the inexperience of the resident staff. Nevertheless, transfusions are carried out because the anemic patient is particularly susceptible to puerperal infection.

DR. HOWARD L. ALT, Chicago: These interesting observations of Dr. Wolff and Dr. Limarzi show that the peripheral blood is not always an index of the bone marrow pattern. I don't think the day is far off when the sternal marrow differential will be almost as routine a procedure as the peripheral blood differential is today. In interpreting the blood count in pregnancy, it is of utmost importance to define the limits of normal. The most common so-called anemia of pregnancy which I see is in the woman in the sixth to eighth month who has a red count in the neighborhood of 3.3 million and hemoglobin of 10 Gm. According to most standards, this degree of depression should not be called anemia; it represents the lower limits of normal. Such patients frequently have low normal counts, i. e. a red blood cell count of about 4.0 million and hemoglobin of 12 Gm. for years preceding the pregnancy. The iron deficiency anemia seen during pregnancy practically always antedates the period of gestation. We know that iron deficiency is common in women during the childbearing period. A hemoglobin of 11.0 Gm. might be disregarded before pregnancy, but, as the hydremia of pregnancy progresses, further lowering of the hemoglobin attracts the attention of the obstetrician and the case is then diagnosed as an iron deficiency anemia. The amount of iron stored in the fetus, placenta and uterus is not sufficient to produce a real iron deficiency anemia if the woman had a normal reserve before she became pregnant. The megaloblastic anemia of pregnancy described is obviously not a true addisonian anemia. The patients had free hydrochloric acid, and 2 did not have macrocytosis. Further, they had a normal icterus index and did not respond in the usual manner to liver extract. I wonder if there is a relationship between this syndrome and so-called primary refractory anemia or achrestic anemia that has been described in the literature. I have seen 1 such instance in a male with a megaloblastic marrow and a hypochromic anemia in the peripheral blood. Further studies of this interesting syndrome occurring during pregnancy are warranted. Of course, besides these three anemias of pregnancy one should also think of the anemias that occur in nonpregnant women. About six weeks ago I saw a woman four and a half months pregnant with a red blood cell count of 1.5 millions. Complete studies revealed the presence of a subacute leukemia. She died four weeks later. If she had lived another six weeks or so it might have been possible to obtain a live infant.

DR. FRANK H. BETHELL, Ann Arbor, Mich.: There are two or three points that I should like to make in connection with this hematologic study by Drs. Wolff and Limarzi. What is the true incidence of anemia in pregnancy? I do not believe that a definite statement can be made because the incidence and severity of anemia in pregnancy varies with the group of patients under observation, depending on economic status, type of antepartum care and a number of other factors. In a group of 484 women in modest economic circumstances whom my associates and I studied at monthly intervals during pregnancy and for a year after delivery we found an incidence of true anemia of 28 per cent, and of those about four fifths were of the hypochromic type. As far as the etiology of these anemias is concerned, I do not share the view that the subject is entirely obscure. I think that iron deficiency in pregnancy can readily be explained. It is largely accounted for by preexisting depletion of iron in young women due either to repeated pregnancies or to hypermenorrhea, or to dietary deficiency. In our subjects, who were studied carefully from the point of view of diet, we found that if the daily food iron habitually taken before pregnancy and during the early months of pregnancy exceeded 15 mg. there was no incidence of hypochromic anemia, but the diet of only about 10 per cent of the group insured that amount of iron intake. On the other hand, about a third of the subjects were habitually receiving less than 8 mg. of iron a day, and of these 36 per cent had hypochromic anemia. My associates and I have previously demonstrated that the protein content of the diet bears an important relationship to the incidence of anemia in pregnancy, particularly of the normocytic and macrocytic types. We have evidence indicating that dietary deficiencies are responsible for the majority of the common anemias in pregnancy and that dietary control is an essential part of adequate antepartum management.

DR. LOUIS R. LIMARZI, Chicago: A great deal of the discussion concerning the anemias of pregnancy is due to poor or incomplete studies of the peripheral blood. One should be cautious in calling an anemia normocytic, microcytic or macrocytic on the basis of a hemoglobin determination and erythrocyte count alone and without the determination of the volume of packed red cells (hematocrit). From a physiologic and therapeutic point of view the accurate method of determining the type of anemia during pregnancy is from a study of the bone marrow by sternal aspiration. This is a simple and practical procedure. In the physiologic normocytic anemia of pregnancy erythropoiesis is normal and iron medication cannot be expected to affect either the anemia in the peripheral blood or the red cell forming tissue in the bone marrow. On the other hand, if the bone marrow reveals a normoblastic hyperplasia and a microcytic and hypochromic anemia in the peripheral blood, iron medication is indicated. This will be followed by a correction of the anemia and the erythroid hyperplasia of a normal type in the bone marrow. The megaloblastic anemia of pregnancy, or, a better term, the megaloblastic marrow of pregnancy is of interest from a diagnostic and a therapeutic point of view since the anemia in the peripheral blood may be macrocytic, normocytic or microcytic. The response to treatment is confusing in the latter 2 instances if the blood alone is studied. If iron is given the anemia does not respond. This is a refractory anemia in a limited sense but should not be confused with true refractory anemia (aplastic anemia with a hypoplastic or hyperplastic bone marrow). The microcytic hypochromic anemia with a megaloblastic marrow will respond to liver therapy. There is no question that many men have encountered cases of this type and have been at a loss to explain the lack of any response following iron therapy but a definite response with liver preparations. A microcytic hypochromic anemia with a normoblastic hyperplasia (normal erythropoiesis) will respond to iron medication, and a microcytic hypochromic anemia with a megaloblastic type of erythropoiesis (pathologic) will react only to liver therapy. The finding of "P. A. polys" in the blood will aid in differentiating a megaloblastic marrow from a normoblastic marrow when the anemia is microcytic and hypochromic in type. Our cases with a slight macrocytic anemia and a normal or hyperplastic marrow of either a myeloid or an erythroid (normoblastic) type recover spontaneously following delivery. These cases are rare in the clinic.

Diseases in the Malay States.—The diseases of greatest importance in the Malay States are malaria, typhoid fever, amebic dysentery, bacillary dysentery, intestinal helminthiasis, the venereal diseases (syphilis, gonorrhea, chancroid, lymphogranuloma venereum and granuloma inguinale), typhus fever, pneumonia, influenza, tuberculosis, dengue fever, filariasis, injuries caused by heat, and diseases of the skin, particularly fungous infections.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

TAMPONS AS MENSTRUAL GUARDS

ROBERT LATOU DICKINSON, M.D.
NEW YORK

Month by month the "curse" hangs over one seventh of a woman's active life. If strung along in sequent days, the flow would carry on for five full years. Yet of the thirty-five years of menstrual periods, the first six or seven and the last eight or ten are times in which pregnancy is little or not all to be desired and chiefly to be apprehended. Therefore, one third of the span of the function is needless fertility, footing up to fifteen years of all but futile vexation. Even with four pregnancies and full nursings, there are still some four hundred periods in which to use ten guards each, or some four thousand nuisances.

Any venture looking to mitigation of menstruation merits unbiased analysis.

For protection against the four or five days of trickle or gush or stain the requirement has been a roll or pad between the thighs, in a cleft so narrow there is no room for it. With this device every step in walking produces some degree of triple-surface rubbing, and every jounce when sitting produces upward pressing. These may be gratuitous discomforts, since, in the absence of the napkin, there is no contact or pressure of the chair seat against the vulva except in unusual conformations, as shown in an unpublished study of mine.

To the external menstrual guard there are some six objections.

To and fro motion may carry contamination from the anal opening to the urinary and vulvovaginal canals, and from the urinary outlet to the vaginal entrance (figures 1 and 6), a process favored by dampness and warmth, to say nothing of surface irritation. In one questionnaire, notice of chafing runs to 14 per cent.[1]

This region, like the armpit, is especially endowed with glands which give forth odor with hampered ventilation, from perspiration and sebaceous secretion, while stale blood, urine and leukorrheal discharge may be factors. Commercial reports show deodorants bought with napkins by one fourth of the purchasers in one series, by nearly half in another[2] and in a third by 59.8 per cent.[3] Recently, napkins carrying a deodorant have appeared in the market. One fourth of certain tampon users praised the freedom from odor.[1]

The support for this surgical dressing calls for some sort of harness or attachment—strap, girdle and buckles—ill adapted to close fitting or diaphanous modern clothing.

Carriage of unnecessary bulk is a bother; disposal after soiling is a trouble, what with the prohibition on blocking drains. The contrast is strikingly shown in figures 5, and between 6 and 7. (Box sizes are as seven to one figured in lots of twelve.)

Lastly, any external menstrual guard, in addition to applying some degree of heat within a confined space, is responsible for rhythmic play of pressure against surfaces uniquely alert to erotic feeling. This may affect a point projecting nearly to the outside and lying in a crevice into which the band may sink—a point which carries more nerve ends closely packed than any like area—namely, the clitoris (fig. 6). The timing of this combination of warmth, friction and pressure fits the peak of congestion of the external genitals for the monthly cycle. Thus an unavoidable focus of attention on the region is emphasized for four days.

The engineering efficiency—or deficiency of the external guard calls for study. This bulk is worn in order to take care of an amount of fluid smaller than is generally appreciated. The total flow averages 2 to 4 ounces (60 to 120 cc.), which is only up to a half cupful.[4] The first day may yield half the total, or a gush may expel retained fluid, or there may be a pause and resumption. Among 30 women only one fourth ran over 3 ounces and one eighth exceeded 4 ounces.[4] Twenty gynecologic textbooks give a much higher average, the range being from 2 to 7 ounces, as compared with those of the researches here summarized—researches which are not yet sufficient or altogether convincing.

The capacity for absorption for the usual commercial article would allow two to four tampons to take up the total output, so that the common employment of ten to twelve, as with napkins—at a cost from 22 to 36 cents—should provide the desirable changes. For the first day, with its possibility of half the total flow, unless the tampon is replaced often or two are worn at the same time, a tenth to a fourth of the women in various reports use a supplementary or substitute external guard. Home made tampons were reported in use by 37 per cent of users in 1942.[3] (This may account for part of the discontinuance.) The common commercial form is a cotton roll compressed to the size of the last two joints of the little finger (figs. 5 and 8), some being slightly tapered. The variety that has far the largest sales runs in three sizes and is provided with a light inserter for placement at any depth by means of a cardboard tube of glazed surface with a cardboard plunger for expulsion of the tampon into the vagina (fig. 8). Four of the six varieties are absorbent cotton, one of cotton linters, one of crape paper held with a net of threads[4a] (fig. 5). All are provided with a waterproofed string for withdrawal. All but one are compressed. They are packaged with individual wrapping of cellophane or paper or in twos or threes. The length, when compressed, is below 2 inches (fig. 5); the diameters run from ½ to 9/16 inch (12-15 mm.). It is to be noted that the posterior vaginal wall averages 3½ inches (9 cm.) in length, while the breadth of the vagina at its upper end, undilated, averages 2½ inches (6 cm.), which is a fact not generally understood. Under ordinary intravaginal pressures the material does not swell as much as in a glass of water. During the process of removal the passage is to be noted as funnel shaped downward. The outlines in figure 5 show tampons compressed and also pulled wide apart to demonstrate differences in construction, but this size is quite beyond their dimensions when saturated within the vagina. As between external and internal guards, the proportional bulk is as fifteen to one.

The living vagina is something of a *terra incognita* as far as slant, shape and dilatability are concerned, and these are all factors bearing on tampon usage. In the dorsal posture the cavity readily holds 10 cc. and, relaxed, 20 to 45 cc., or from ⅓ to 1½ ounces.[5] In the knee chest posture it holds 2 to 3 ounces (60-90

1. Research Bulletin, Womans Home Companion, January 1940.
2. Private study by manufacturers of Meds.
3. Fawcett Publications Market Research Forum, December 1942.

4. Hoppe-Seyler: Ztschr. f. physiol. Chem. 42: 545, 1904. Driessen: Zentralbl. f. Gynäk. 17: 618, 1914. Lahile: Ann. d. gynéc. et obst. 72: 535, 1916-1917. Hermstein: Arch. f. Gynäk., 1927, p. 130. Barer, A. P.; Fowler, W. M., and Balbridge, C. M.: Proc. Soc. Exper. Biol. & Med. 32: 1458, 1935. Barer, A. P., and Fowler, W. M.: Am. J. Obst. & Gynec. 110: 790, 1938. Fluhman, C. F.: Menstrual Disorders, Philadelphia, W. B. Saunders, 1939, p. 60. Lewing, A. W.: Personal communication to the author.

4a. Consumers Reports, June 1942, p. 157; October 1943.

5. Rakoff, A. E., and Caspar, S. L.: Technic of Vaginal Medication, Pennsylvania M. J. 46: 582 (March) 1943.

cc.) but 5 to 10 ounces (145-300 cc.) with its outlet held closed and under pressure (fig. 2). Kolbow [6] found 20 cc. a convenient fill for his 500 x-ray shadows, median and lateral (figs. 2 and 3). The passage, in the

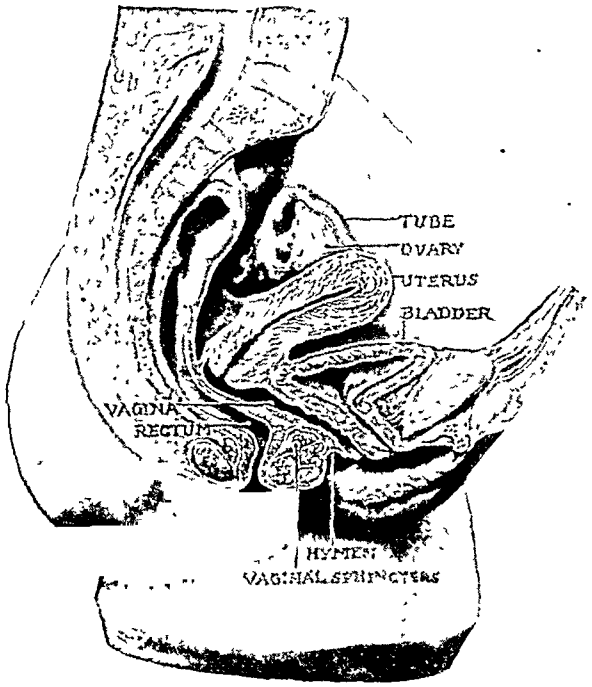


Fig. 1.—Midsection of pelvic contents of women, standing or sitting, with vaginal walls drawn somewhat apart and uterus slightly lifted.

dorsal posture, slopes toward the midsacrum with the tip of the cervix on the level of the ischial spines. In the standing or sitting posture it runs at only a slight

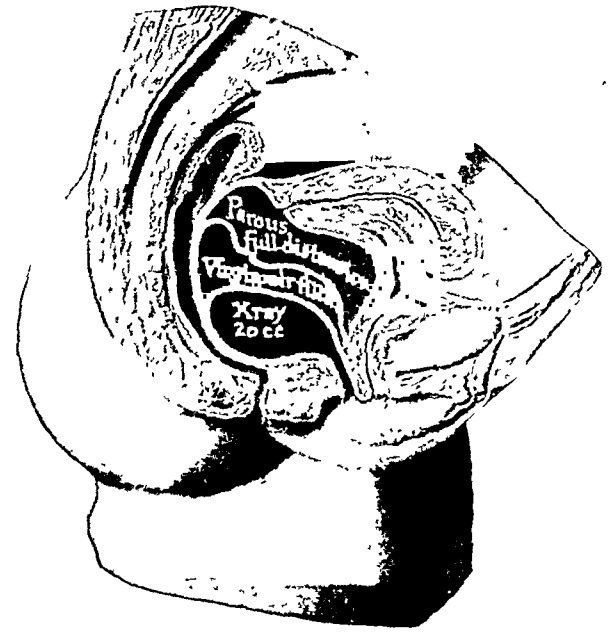


Fig. 2.—Capacity of moderately distended vagina, from the Kolbow x-rays in dorsal posture and the Dickinson averages of 716 cases taken on knee chest posture under atmospheric pressure.

incline, so that the external os lies close to the tip of the coccyx, a situation almost unknown to the pictures in textbooks on anatomy and gynecology, but fully illustrated in my Human Sex Anatomy.[7]

The total channel is most aptly designated by the term vulvovaginal passage. Undistended, the major diameters of the two crevices are set in curious fashion at right angles to each other. The inner aspects of the vulva lie together in the midline of the body; the walls of the empty vagina lie flat crosswise of the body (fig. 3). Only when distended rather fully are the combined passages a continuous tunnel. And this tube exhibits a curve with a moderate hour glass narrowing just within the hymen. Most important is the lateral spread of the passage at its upper end (fig. 3), where it reaches the breadth of 2½ inches (60 mm.) and where such span sometimes permits the retroversion pessary to slip crosswise. The right lateral fornix is usually the deeper and the cervix not in the midline,[6] and the tip of a long tampon slips into the pocket on one side or other of the portio vaginalis, if not behind it.

An important factor is the sling of muscular and fascial layers that sweep downward and backward along the sides and rear of the passage (figs. 1 and 3), forming a sphincter group which retains the tampon within its upper two thirds. The levator ani is pictured for the most part as made up of fan shaped sloping bands with the inner border skirting the sides of the vaginal and anorectal canals. But attention is being drawn more and more to the large numbers of fibers running into the perineal body and into the lateral and posterior walls of the vagina.[8] Hence a new designation is suggested for the group of four muscles that loop around the vagina, maintaining closure of its outlet. The "vaginal sphincter group" would thus be made up of the outer ovals, the deep and superficial bulbocavernosus muscles, plus the pubococcygeal pair, with clearly palpable, thickened inner edges, plus the ischiococcygeals that furnish the inner flattened plane. Indeed, the female pelvic floor is built as if designed to hold a tampon in place in the erect posture, because the vagina lies nearly level on this floor. With any fluid content it becomes the "bowl" of Kolbow,[6] as shown in figure 2, this lesser bowl being supported on the larger bowl, the pelvic floor.

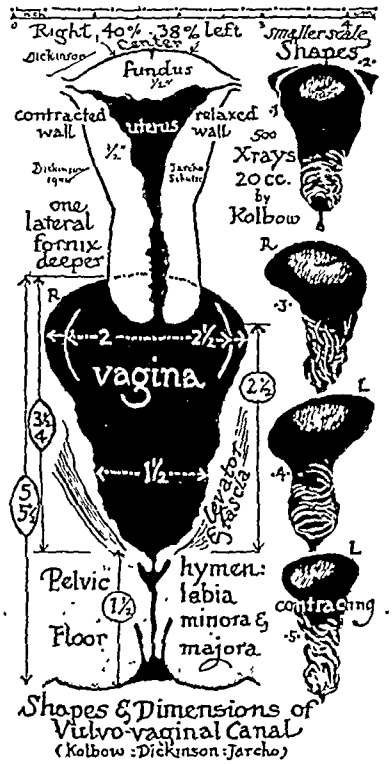


Fig. 3.—Vagina from front to show width at upper end, asymmetry and pelvic floor support for tampon.

Here then is a hollow organ with thin walls endowed with very faint, slow rhythms of contraction; [6] with

6. Kolbow, H.: Ztschr. f. Gynäk. 16: 748, 1941.

7. Dickinson, R. L.: Human Sex Anatomy, Baltimore, Williams & Wilkins Company, 1933.

8. Curtis, A. H.: Surg., Gynec. & Obst. 74: 708-727, 1942.

sensory fibers of the mucous membrane "meager" in the upper two thirds;[9] so little sensitive "in its deeper portion and farther part of the anterior wall" that one can operate here without anesthesia, the sensory capacity developing "the nearer one approaches to the vestibular orifice."[10] Goodall[11] calls this cervicovaginal district the "great silent area of the pelvis." The vaginal response in coitus belongs to the orifice and to the muscular girdle, as my swab tests show. The erotic stimulus of the stationary interior guard should be, therefore, momentary and negligible as compared with that of the moving pressures of the external pad, on areas provided with remarkably different ratios of sensory nerve endings.

The hymen may, at first touch, be tender like the lining of the eyelid, but it is unlike the conjunctiva in that it can become as tolerant as the mucous lining of the mouth and its lips, what with douching, gentle stretching or good lubrication of the tampon tip, and this without any nick or damage. Only in the hypersensitive or in the rare, thick, rigid form, or the somewhat infrequent substandard opening is stretching needed, begun in the hot bath. The looping muscles just within the hymen (fig. 1) may resist entrance because of a reflex due to apprehension of hurt. There is wide variation here as in all other muscles, for these muscle slings are especially thick and tense in tennis addicts and horsewomen, but any spasm disappears with patient avoidance of urgency.

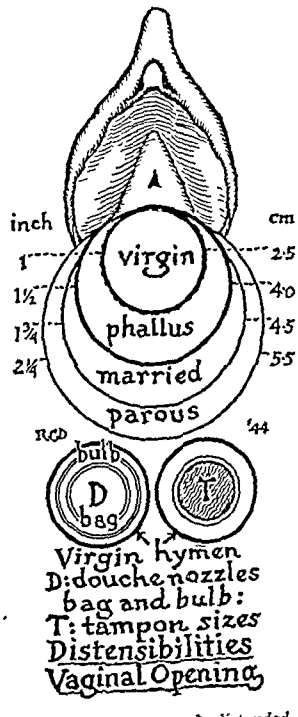


Fig. 4.—Caliber of distended hymen in virginal, married and parous woman, in relation to tampon and douche tube diameters.

A good educator is the douche.

Within the bony walls of the pelvic cavity the organs are provided with capacity for very free displacement, to care for complete filling of the bladder and the rectum and to welcome the to and fro movement of a 6½ inch phallus of a diameter of 1½ inches. Thus room for one or two tampons falls well inside the shifts to which uterus and vaginal walls are keyed.

Concerning the diameters and dilatability of the hymen there has been little published. My long series when pioneer calibrator[7] shows that most unentered hymens admit the average lubricated examining male forefinger for two joints, or the female index entire, the circle having a median diameter of an inch (2.5 cm.) (fig. 4). With the childless married woman two male forefingers pass fully (1½ inches, 4 cm.), which is the peak of the graph of the diameters of the erect penis in the Grien series of 486 white adults[12] and fits the 1,000 of the Kinsey series.[13] Thus the tampon has a caliber that does not impair standard anatomic virginity (figs. 4 and 5).

Unrepaired injuries of labor and sagging vaginal walls may fail to provide support for the tampon. Cervicitis,[14] frequent in the genuine virgin,[14a] or tender uterosacral ligaments, or a sensitive bladder base, or the habitually loaded rectum may exclude tampon usage.

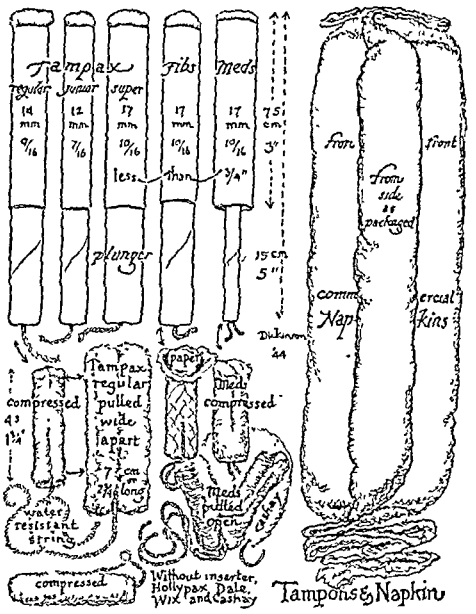


Fig. 5.—Tampons of various makes.

Sales of tampons run to about 10 per cent of sales of commercial napkins. The commercial reports on increase in demand is clinical evidence of value. A continuous survey of 749 drug stores finds the increase all over the country,[15] with 1943 sales five times those of 1937. A

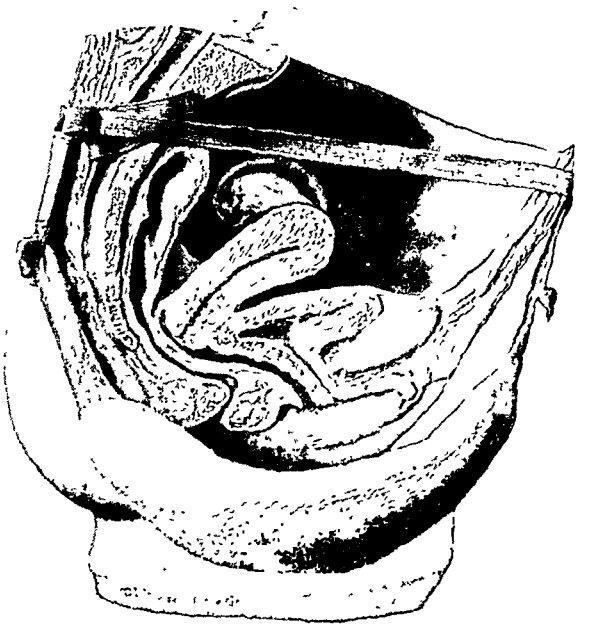


Fig. 6.—External menstrual guard in place to contrast for bulk and simplicity with the tampon in figure 8.

9. Piersol: Anatomy, 1918, p. 2018.
10. Poirier and Charpy: Anatomie, 1907, p. 572 (Rieffel).
11. Goodall, J. R.: Puerperal Infection, Montreal, 1932, p. 75.
12. Grien, S. K.: Research about to be published.
13. Kinsey, Alfred C.: Personal communication to the author.
14. Macfarlane, Catharine; Sturgis, Margaret C., and Fetterman, Faith S.: The Value of Periodic Pelvic Examination in the Control of Cancer of the Uterus, J. A. M. A. 126:877 (Dec. 2) 1944.
14a. Brunet, W. M.: M. Rec. 151:384, 1940 (913 premaritals, 177 cervicitis with intact hymen).
15. A. C. Nielson & Co., Chicago.

study of 1,674 women made in 1940 found one fourth using tampons, though but few depended on them exclusively, while of the total questioned a fifth had made no trial and a seventh discontinued them.[1] A 1944 survey in twenty-six cities covered interviews with 2,500 women purchasing the two kinds of menstrual protectives.[2] Of these, 24 per cent used tampons, including the third with exclusive dependence, and the two thirds with supplement of a napkin part of the time. Such use was equally distributed between married and single women, the higher the income bracket the greater being the employment of the tampon. The peak of exclusive use was between 20 and 24. Availability of the tampon as guard was known to 94 per cent of those seen, but nearly one third were too apprehensive to make a trial, and inertia and satisfaction with the napkin accounted for 43 per cent of nonusers. Among the 300 who stopped, discontinuance had been due to discomfort in one fifth, to defective protection in another fifth and



Fig. 7.—Tampon in place filled with absorbed flow.

to dislike in one sixth. Recommendation by friends started a third; advice by a doctor was the reason for beginning on the part of 34 out of 900 women, while 11 were stopped in such use by their physicians.

The 1941 research of Karnaky [16] on 2,000 women, covering use for a year or more, included 40 who tested its tolerance by wear day and night. They replaced the tampon twice a day and were examined every two to four weeks for vaginal p_H and for glycogen and had cultures for bacterial growth, with biopsies and also a recording of the visual finding. Karnaky made the sweeping claim that the normals stayed normal, the abnormals became normal, and changes in biopsy and vaginal smear were not found. Also that in 6 patients with profuse bleeding he had packed the vagina snugly during one to six days before opening the abdomen, yet he discovered no evidence of backing up into the peritoneal cavity. Among 110 nurses testing tampon use, he reported 95 per cent satisfied with control all through the period. Sackren [17] reports 90 per cent of users completely protected. Magid and Geiger [18] in 25 women found no alteration in p_H, glycogen or flow and with complete absorption wherever the size of the tampon was correlated with the length and caliber of the

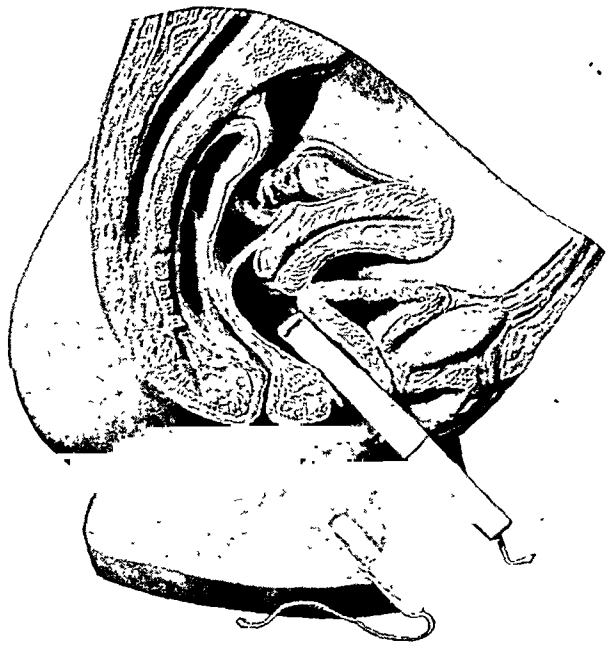


Fig. 8.—Inserter passed into vagina before plunger extrudes tampon; below, average dimensions compressed for introduction.

vagina. Meigs [19] reports tolerance in trichomonas treatments. Barton [20] had 30 patients using tampons four to five years without irritation or inflammation, but with

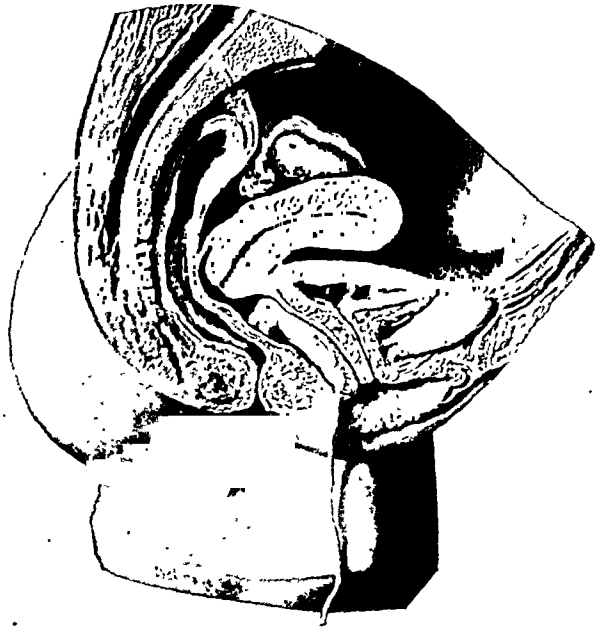


Fig. 9.—Tampon placed too near surface absorbs urine.

virgins showing partial or total "rupture" of the hymen, and found that blood acquired odor only after leaving

16. Karnaky, K. J.: M. Rec. & Ann., May 1941.
17. Sackren, H. S.: Clin. Med. & Surg. **46**: 327, 1939.
18. Magid, M. O., and Geiger, J.: M. Rec. **155**: 316, 1942.
19. Meigs, J. W.: New England J. Med. **226**: 562, 1942.
20. Barton, M.: Brit. M. J. **1**: 524 (April 25) 1942.

OBSERVATIONS AND METHODS

The clinical features observed especially were (1) weight loss sustained, (2) symptoms and signs of gastrointestinal disturbance such as anorexia, nausea and vomiting and (3) degree of weakness ensuing. Other clinical findings of interest were recorded. The hepatic disturbance resulting was evaluated by (1) the quantitative serum bilirubin test, (2) the cephalin cholesterol flocculation test, (3) the twenty-four hour amount of urobilinogen in the urine and the two hour quantitative urine Ehrlich reaction and (4) the sulfobromophthalein dye retention test.

The level of serum bilirubin was determined by a slight modification [8] of the Malloy-Evelyn technic [9] that permits determination of the prompt direct reacting bilirubin (one minute reading), the delayed direct (fifteen minute reading) and the total bilirubin (reading after alcohol addition). Normal values of the one minute reading range are below 0.2 mg. per hundred cubic centimeters; normal total values are below 1.0 mg. per hundred cubic centimeters.[9a]

The urinary excretion of urobilinogen in the twenty-four hour sample was determined by the quantitative method of Watson.[10] The normal range by this method is 0 to 3.5 mg. in twenty-four hours. A simplified method was later employed.[11] It permits colorimetry of the Ehrlich reaction in a given urine sample. This method, although not precise as far as urobilinogen is concerned, has been found to yield information of approximately the same significance as the twenty-four hour method. The color intensity of the Ehrlich reaction is designated in terms of Ehrlich units, 1 unit indicating the amount of color produced by 1 mg. of crystalline urobilinogen. Amounts in excess of 1 unit in the 2 to 4 p. m. urine sample were regarded as indicating impaired liver function.

The cephalin-cholesterol flocculation test was carried out according to the technic of Hanger.[12] Cephalin, supplied by the Difco Company of Detroit, was used Readings were made at the end of twenty-four and forty-eight hours. As a control, known positive and normal serums were tested concomitantly with the unknown serums.

The sulfobromophthalein test was performed using 2 mg. of the dye per kilogram of body weight and the blood sample secured at twenty minutes. Mateer, Baltz, Marion and MacMillan [13] in their control studies found no retention of the dye at this time in normal subjects.

TABLE 2.—*Clinical and Laboratory Data*

Case	Age	Sex	Therapy †	Weight Loss, Pounds	Weakness Severe	Gastrointestinal Disturbances Severe	Other	C C. (b)	C C. (d or a)	Bilirubin, Mg. per 100 Cc. P. D. (b)	Bilirubin, Mg. per 100 Cc. T. (b)	Bilirubin, Mg. per 100 Cc. P. D (d or a)	Bilirubin, Mg. per 100 Cc. T. (d or a)	Urobilinogen, Mg per 24 Hr. (b)	Urobilinogen, Mg per 24 Hr. (d or a)	Ehrlich Units per 2 Hr. (b)	Ehrlich Units per 2 Hr. (d or a)	Sulfobromophthalein, % Retention (b)	Sulfobromophthalein, % Retention (d or a)
1	47	♀	N	9	Yes	No	....	. .	...	0 2	0 8	0 9	1 8						
2	41	♂	C	12	No	Yes	....	...	...	0 2	0 8	0 1	1 2						
3	42	♂♀	C	9	No	No	.. ..	..	...	0,0	0 5	0 3	1 1						
4	49	♂♀	C	16	Yes	No	. . ..	0	2+	0 2	0 5	0 5	1.5						
5	36	♂	C	..	No	No	Jaundice, hepatomegaly, purpura	...	4+	0 2	1.1	1.1	2 8	...	28 7				
6	52	♂	N	10	Yes	No	... .	0	2+	0 2	1 0	0 2	0 9						
7	36	♀	I	12	Yes	Yes	Spider nevi hepatomegaly	...	4+	0 4	1.4	0 4	1 7	1.1	42 4				
8	56	♂	C	..	Yes	No	. . . .	...	2+	..	. .	0 4	0 9						
9	30	♂	N	..	No	No	Spider nevi hepatomegaly	0	2+	0 3	1 0	0 8	1.7	...	72 5				
10	28	♂	C	10½	No	No	. . ..	1+	4+	0 0	0 4	0 1	0 5	2 2	12 8				
11	28	♂	C	11	No	No	. .. .	Dbt.	4+	0 1	0 4	0 1	0 9	1 6	17.4				
12	45	♂	C	..	Yes	No	. ....	Dbt.	4+	0 2	1 0	0 4	1 3	..	3 4				
13	38	♀	C	11	No	Yes	Spider nevi	1+	4+	0 2	0 5	0 2	1.3	0 8	37 3				
14	49	♂	C	..	No	No	... ..	...	3+	0 2	0.8	0 3	0 5	.	143 9				
15	41	♂	I	18	Yes	No	Hepatomegaly	0	4+	.	.	0 2	1 0	0 3	95.4				
16	35	♂	N	8	No	No	.. ..	0	4+	0 1	0 9	0 8	2 6	0 7	168 3				
17	39	♂	C	18½	Yes	Yes	. . . .. .	0	3+	0 1	0 7	1 5	4 0	7 6	133 0				
18	42	♂	I	13	No	No	. . . .	0	4+	0.6	1 0	0 6	2 8	1 6	13.3				
19	35	♂	N	..	No	No	. ..	1+	4+	0 3	0 6	0 2	1 4						
20	37	♂♀	I	..	Yes	Yes	Spider nevi	1+	4+	0 1	0 5	0 3	1 5	0 5	24 3				
21*	43	♂♀	N	1	No	No	. .. .	1+	3+	0.1	0 3	0 2	1.2	. .	. ..	5 2	2.1	5 0	4 5
22	55	♂♀	C	6	No	Yes	.. . .	0	4+	0 1	0 4	0 3	1 0	..	..	0 4	6 3		18 0
23*	49	♂♀	N	4½	Yes	No	....	2+	4+	0 1	0 8	0 6	1 7	...	...	1.1	21 3	0 0	12 0
24	33	♂♀	N	..	No	No	....	1+	2+	0 1	0 4	0 1	0 4	. .	....	0 5	16 0	7 5	
25*	45	♂♀	N	2	No	No	. . . .	2+	4+	0 1	0 3	0 2	1 6	..	. .	2 5	2 8	5 5	
26	33	♂	C	6½	No	No	. ... .	2+	4+	0 1	0 8	0 3	1 7	...	....	1 5	13 7	7 5	12 5
27*	42	♀	I	3½	No	Yes	Increased number of spider nevi	3+	4+	0 0	0 4	1 0	2.1	...	. .	1.0	16 2	7 5	2 5
28	54	♂	I	6	No	No	.	1+	4+	0 2	0 6	0 3	1 0	...	..	0 7	2.1	10 0	5 0
29*	31	♀	I	4	Yes	Yes	.. .	2+	4+	0 1	1.2	0 3	0 8	...	....	0 1	5 6	1 3	32 5
30	62	♂	C	9½	Yes	Yes	. ..	0	4+	0 3	0 6	0 3	0 9	...	....	0 6	4 0	2 0	16 5
31*	36	♂	C	4½	No	No	. .. ..	Dbt.	3+	0 2	0 6	0 2	0 6	.	. .	0 3	2 3	0 0	12.5

* Special diet
† Therapy. C, complete; N, near complete; I, incomplete
b= before malarial therapy, d or a = during or immediately after malarial therapy.
C C = cephalin cholesterol flocculation, readings at 48 hours
P. D. = prompt direct reacting bilirubin, readings at 1 minute
T. = total bilirubin, readings after addition of alcohol.

8. Watson, C. J.: The Bile Pigments, New England J. Med. **227**: 665 672 (Oct 29) 1942 Ducci, H., and Watson, C. J.: The Quantitative Determination of the Serum Bilirubin, with Special Reference to the Prompt Reacting and the Chloroform Soluble Types, J. Lab & Clin Med., to be published
9. Malloy, Helga, and Evelyn, Kenneth: The Determination of Bilirubin with the Photoelectric Colorimeter, J. Biol. Chem **119**: 481-490 (July) 1937.
9a Watson, C. J.: Personal communication to the authors.
10. Watson, C. J.: Concerning Urobilinogen: I An Improved Method for the Quantitative Estimation of Urobilinogen in Urine and Feces, Am. J. Clin Path. **6**: 458-473 (Sept.) 1936.
11. Watson, C. J.; Schwartz, S.; Sborov, V., and Bertie, E.: Studies of Urobilinogen: V. A Simple Method for the Quantitative Recording of the Ehrlich Reaction as Carried Out with Urine and Feces, Am. J. Clin Path. **14**: 605 615 (Dec.) 1944
12. Hanger, F. M.: The Flocculation of Cephalin Cholesterol Emulsions by Pathologic Sera, Tr. A. Am. Physicians **53**: 148 151, 1938
13. Mateer, J. G.; Baltz, J. I.; Marion, D. F., and MacMillan, J. M.: Liver Function Tests: A General Evaluation of Liver Function Tests and an Appraisal of the Comparative Sensitivity and Reliability of the Newer Tests with Particular Emphasis on the Cephalin Cholesterol Flocculation Test, the Intravenous Hippuric Acid Test and an Improved Bromsulphalein Test with a New Normal Standard, J. A. M. A. **121**: 723 728 (March 6) 1943.

RESULTS

The clinical data of the 31 patients studied are listed in table 2.

Data of weight loss before and immediately after malarial therapy was obtained in 23 patients, and the average loss was 9 pounds (4 Kg.). Of these patients 17 received general diets and averaged a loss of 10.9 pounds (highest 18½ and lowest 6 pounds) and 6 were given special diets and averaged a loss of 3.3 pounds (highest 4½, lowest 1). Thirteen of the 17 general diet patients received complete or near complete therapy and averaged a loss of 10.4 pounds (4.7 Kg.). Four of the 6 special diet patients were given complete or near complete therapy and averaged a loss of 3 pounds (1.3 Kg.). A comparison of the malarial courses given the general and special diet patients receiving complete or near complete therapy is justified by the fact that the former averaged 9.6 fevers, 42.8 hours of 103 F. and 136.2 hours of 100 F., whereas the latter averaged 9.3 fevers, 40.0 hours 103 F. and 133.5 hours 100 F. (all oral temperature).

The degree of weakness was recorded as severe or not significant. In 5 instances (cases 6, 7, 15, 20 and 23) the extreme weakness, actually prostration, was a major factor in the decision to terminate the malarial therapy prematurely. Ten of 25 general diet patients were severely weakened from malarial therapy, whereas only 1 of the special diet group experienced this degree of weakness.

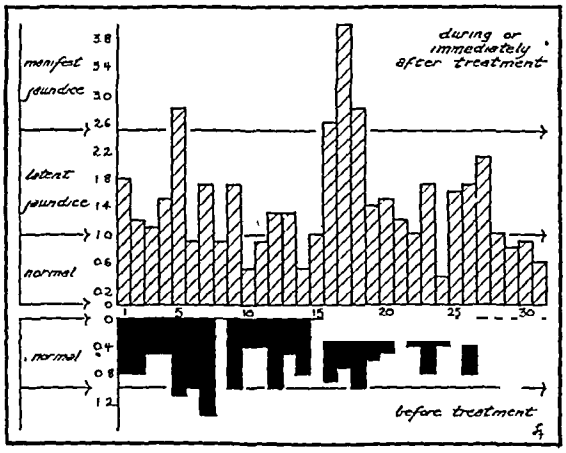


Chart 1.—Quantitative serum bilirubin test reported in milligrams per hundred cubic centimeters; reading at fifteen minutes after addition of Van den Bergh reagent (includes prompt direct and delayed direct reacting pigment); 31 patients.

The gastrointestinal disturbances observed were also considered either severe or not significant. Anorexia invariably developed during malarial fevers. Vomiting frequently followed. These disturbances varied from mild to severe, and in 1 instance (case 20) nausea and vomiting continued four days after termination of the malarial therapy. Seven of 25 general diet patients and 2 of 6 special diet patients had severe gastrointestinal disturbances.

Other clinical findings of interest deserve mention. Purpura, scleral icterus and moderate enlargement of the liver developed in case 5 after eight fevers. Spider nevi developed in cases 7, 9, 13 and 20 after ten fevers. Hepatomegaly during malarial therapy developed in cases 7, 9 and 15. A few spider nevi were noted in case 27 prior to malarial therapy, and other similar nevi developed during the course of her fevers.

The results of the four liver function tests used are depicted in charts 1, 2, 3 and 4 and table 2.

Quantitative serum bilirubin determinations were performed on all 31 patients (chart 1 and table 2). Two patients did not have bilirubin tests before malarial therapy. Twenty-four of the 29 patients studied adequately showed an increase in total bilirubin during the malarial fevers. Elevations to 1.7 mg. per hundred cubic centimeters or more of total bilirubin and 0.6 mg. per hundred cubic centimeters or more of prompt direct reacting bilirubin were considered significant and were observed in 8 cases (1, 5, 9, 16, 17, 18, 23 and 27). Six were general diet patients and 2 were on the special diet.

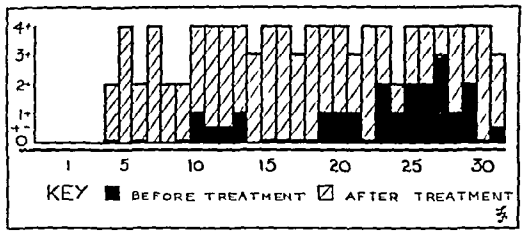


Chart 2.—Cephalin cholesterol test reported in degree of flocculation, reading at forty eight hours, 28 patients.

The influence of malarial therapy on cephalin-cholesterol flocculation is demonstrated by chart 2. The specific data are included in table 2. Eighteen general diet patients and 6 special diet patients developed significant and comparable increases in flocculation. Four general diet patients, not tested prior to therapy, had significant flocculation following their fevers.

Chart 3 shows the urinary excretion of urobilinogen in 24 malarial patients. Thirteen general diet patients were tested by the twenty-four hour method, and significant increases of urobilinogen were noted in 9. The remaining 4 were not tested prior to malarial therapy, but 3 showed excessive excretion of urobilinogen in the course of their treatment. Eleven cases, 5 general diet patients and 6 special diet patients, were tested by the two hour method. Nine of the 11 showed significant increases in urobilinogen excretion. There was no appreciable difference between the general and special diet groups.

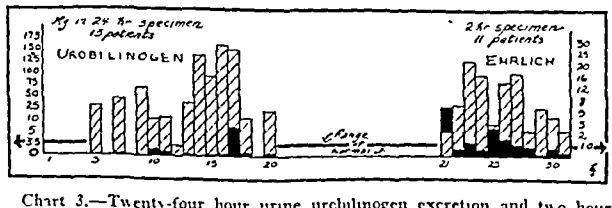


Chart 3.—Twenty-four hour urine urobilinogen excretion and two hour urine Ehrlich values. The data on the right represent Ehrlich units in the 2 to 4 p. m. urine samples. Black areas are observations before malarial fever began.

Chart 4 shows the percentage of sulfobromophthalein retention in 11 patients. Eight were tested before as well as during or immediately after therapy. Five of the 8 showed significant increases. However, in 3 patients the dye retention decreased in the course of their therapy. Again there was no appreciable difference between the general and special diet groups.

COMMENT

Two patients were considered worthy of special mention. Their pertinent histories and findings are given:

CASE 1.—A white woman aged 47, diagnosed as having dementia paralytica, was a chronic alcoholic addict of many years' standing. She was diagnosed as having meningovascular neurosyphilis in 1936 but refused to take antisyphilitic chemotherapy. No clinical liver disease had ever been apparent. Prior to malarial therapy she was considered a good risk. A 9 pound (4 Kg.) weight loss was sustained in the course of nine malarial fevers which terminated spontaneously. At that time the bilirubin test showed a prompt direct value of 0.94 and a total value of 1.76 mg. per hundred cubic centimeters. Her therapy was considered inadequate and she was subsequently given additional fever by typhoid vaccine on three occasions and by artificial fever therapy (hypertherm) twice. A further weight loss of 6 pounds (2.7 Kg.) was sustained. The bilirubin level continued to rise to a height of 1.29 mg. per hundred cubic centimeters prompt direct and a 2.31 total. During her immediate convalescence she stated that she felt the best she had in many years. Forty-three days after malarial therapy jaundice was noted and progressively deepened. The bilirubin, urobilinogen and cephalin-cholesterol tests became very strongly positive. The patient died in hepatic coma fifty-eight days after malarial therapy. Autopsy revealed portal cirrhosis and large areas of acute necrosis.

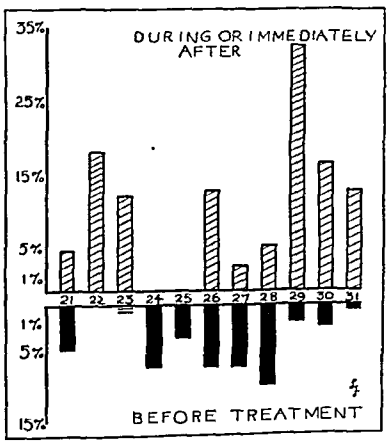


Chart 4.—Sulfobromophthalein retention; readings made twenty minutes after injection of a 2 mg. per kilogram of body weight dose; 11 patients.

CASE 30.—A white man aged 62 was diagnosed as having dementia paralytica. No liver disease was apparent from his past history and clinical findings. He had received fifty to one hundred arsenical injections ten to fifteen years earlier. Prior to malarial therapy the results of the four liver function tests were considered within normal limits. In spite of pure tertian fevers following intramuscular inoculation, considerable weakness, severe anorexia and vomiting developed. A weight loss of 3½ pounds (1.5 Kg.) was sustained. The cephalin-cholesterol test became strongly positive. Quinine was given after nine fevers. During his immediate convalescence weakness and anorexia persisted. A further weight loss of 6 pounds (2.7 Kg.) followed. Urobilinogen excretion was excessive, and 16.3 per cent of the dye was retained in the sulfobromophthalein test. The serum bilirubin remained normal throughout. Liver biopsies taken before and after therapy did not show serious hepatic damage on microscopic examination.

Case 1 demonstrates the need for the detection of latent hepatic disorder. A few simple liver function tests might have forewarned us. Although her need for fever therapy was great, the employment of the liver function tests later used or the more adequate appreciation of the bilirubin values observed would possibly have contraindicated the supplementary fevers given her by typhoid vaccine and the hypertherm. Case 30 illustrates a correlation between clinical findings and liver function tests. However, the liver biopsy after malarial therapy did not show serious liver damage.

It was not possible to correlate consistently the degree of weakness and the severity of the gastrointestinal disturbances with the results of the liver function tests. However, the appearance of jaundice in 1 patient, hepatomegaly in 4 patients and spider nevi in 5 patients correlated strikingly with the hepatic disturbance shown by the liver function tests.

The average weight loss during and immediately after malarial therapy in patients given general diets was very striking. That weight loss could be diminished by special dietary measures was clearly demonstrated. Yet in no case was weight loss prevented. The dietary goal sought for the special diet group of patients was 2,500 calories per day, with 400 Gm. of carbohydrate, 150 Gm. of protein and not more than 35 Gm. of fat. Further study of high carbohydrate, high protein and low fat diets is needed in malarial therapy.

SUMMARY AND CONCLUSIONS

The anorexia and other gastrointestinal disturbances in malarial therapy, if ignored, result in a low caloric intake and a striking weight loss.

More attention should be given to the study and use of protective diets in therapeutic malaria.

Malarial therapy is admittedly contraindicated in the presence of clinically manifest hepatic disease (as, for example, cirrhosis).

It would seem advisable to employ a few simple liver function tests in the selection of patients for this type of therapy. Cases of latent hepatic disease might thus be detected and the clinician thereby forewarned.

The laboratory tests used in this investigation probably represent the more sensitive of the commonly employed liver function tests. Therefore the abnormalities reported are not presumed to indicate irreversible hepatic damage. The occurrence of such changes does not constitute a reason for avoiding the use of a well tried and effective therapeutic agent.

All of the patients adequately studied showed some evidence of hepatic dysfunction.

2437 Third Avenue.

ABSTRACT OF DISCUSSION

DR. L. W. DIGGS, Memphis, Tenn.: The authors have presented further evidence that malaria produces parenchymal hepatic changes with impairment of liver function. Some of the factors in the production of these changes are anemia, deposition of pigment and nutritional deficiencies. The high fevers are also to be considered, for similar changes are observed in artificial fevers. In selecting patients suitable for malaria therapy and for drug testing the more sensitive tests, as the cephalin-cholesterol and twenty minute sulfobromophthalein, are preferred. Since most patients during malarial fevers give positive findings with these tests, they are not of equal value during the febrile period. The icterus index and urinary tests for urobilinogen and bile would be of greater value. The test of the direct van den Bergh reaction of the blood is not necessary, for bilirubin is demonstrable in the urine by the simple foam test when there is regurgitative jaundice. Since malaria produces changes in the blood, it is advised to do the following blood studies on patients receiving malaria therapy: (1) white blood cell count to detect leukopenia, (2) hemoglobin to measure anemia and (3) blood smear to detect hemolytic reaction, neutrophilic shift and degenerative changes, number and types of parasites and number of platelets. Less than 1 platelet per oil immersion field is indicative of thrombocytopenia and may be associated with hemorrhages. I have studied the prothrombin concentration by Quick's method at weekly intervals in 59 patients and have not observed significant decreases during the febrile period. The prothrombin test is therefore of little value as a liver function test either in selecting patients for therapy or in guiding therapy and drug administration. Because the clinical and pathologic changes in terminal malaria are similar to those observed in shock, it is essential that ample supplies of whole blood and plasma be available in

order to prevent death. The giving of arsenicals and heat cabinet therapy following malaria is dangerous and should be used only when there is minimal liver damage as revealed by tests for liver function.

DR. M. G. FREDRICKS, Minneapolis: The main conclusion of the investigation is that there was objective evidence of hepatic disturbance in all therapeutic malaria patients studied with liver function tests.

THE CHEST X-RAY EXAMINATION

AN ANALYSIS OF DISQUALIFYING CONDITIONS FOUND AMONG 105,141 SELECTEES

MAJOR RICHARD E. KINZER
MEDICAL CORPS, ARMY OF THE UNITED STATES

The ultimate effects of the induction into the armed forces of the United States of men suffering from an incipient or a frank form of pulmonary tuberculosis is obvious to medical men as well as to the layman. In addition to the health aspect of this problem as we are affected by it in this national emergency we must take practical cognizance of the economic loss to the national government. Spillman [1] estimated in 1940 that the cost to the government of a case of tuberculosis in a veteran of the first world war was between $7,500 and $10,000 to date and that within the next five years the total cost of service connected disability payments would reach the total sum of nearly a billion dollars. Thus it would seem that from the economic as well as from the health standpoint any program designed for the primary purpose of excluding tuberculous risks from the armed forces would be invaluable.

TABLE 1.—*Analysis of 999 Cases of Pulmonary Tuberculosis Discovered During the Chest X-Ray Examination of 105,141 Selectees*

Tuberculosis, pulmonary		Per Cent of Total Rejectees	Per Cent of Total Rejected for Tuberculosis
Reinfection			
Far advanced	15		
Moderately advanced	66		
Minimal	526		
	607	45.7	60.7
Primary infection			
Primary complex, active	7		
Primary complex, healed but excessive	264		
Miliary calcification, healed	24		
	295	22.2	29.5
Pleural			
Pleurisy, recent	12		
Pleurisy, residual, excessive	73		
	85	4.4	8.5
Under treatment			
a. Therapeutic pneumothorax	4		
b. Thoracoplasty	8		
	12	0.9	1.2
Total	999	75.2	100.0

But let us recognize that this is only part of the benefits derived from such a program. The preinduction roentgenologic screening adapted by the United States Army has offered innumerable advantages to the roentgenologist in identifying other disqualifying defects of a nontuberculous nature as well. In addition, this program of routine preinduction chest x-rays parallels similar work being done by the various public health agencies in this country and offers to these agencies the results of this massive survey.

In the fall of 1940, when the Selective Service System began functioning, the urgent need for routine chest x-rays at the induction stations became apparent. It was impossible for the armed forces to assemble enough equipment to undertake such a task on short notice. In some localities the public health departments offered their facilities and began taking routine chest x-rays as early as November 1940.[2] By midsummer of 1941 adequate x-ray facilities were at hand, and since that time millions of preinductees have had routine chest x-ray studies.

TABLE 2.—*Analysis of Nontuberculous Causes for Rejection Found During the Chest X-Ray Examination of 105,141 Selectees*

		Per Cent of Total Rejectees
Thoracic Cage and Diaphragm		
Cystic degeneration, ribs and upper dorsal vertebrae	1	
Spina bifida occulta	9	
Hemivertebra	1	
	6	
	1	
	9	
	3	
	30	2.2
Heart and Mediastinum		
Gross cardiac enlargement (unclassified)	55	
Aneurysm of thoracic aorta	3	
Coaretation of aorta	4	
Aneurysm of pulmonary artery	1	
	1	
	12	
	7	
	6	
	89	6.6

TABLE 3.—*Analysis of Nontuberculous Causes for Rejection Found During the Chest X-Ray Examination of 105,141 Selectees*

		Per Cent of Total Rejectees
Inflammatory nontuberculous		
Bronchopneumonia	22	
Pneumonitis, etiology questionable	48	
Pulmonary abscess	2	
Chronic bronchitis	6	
Bronchiectasis, chronic	81	
Lobectomy for bronchiectasis	2	
	161	12.2
Neoplastic		
Atelectasis possibly due to bronchogenic tumor	2	
Pleural tumor	1	
Metastatic tumor	2	
	5	0.38
	2	
	5	
Cystic lung disease	8	
Emphysema	17	
Pneumonoconiosis	12	
	44	3.3

During the twenty-two months between Aug. 1, 1941 and May 30, 1943 a group of 105,141 selectees were examined by an armed forces induction station team having headquarters in Michigan. The territory served by this station included largely an agricultural and rural section having only one city of over 150,000 population and few others with a population of over 20,000. The fact that this is a sparsely populated section of the state may be significant when comparing the results of

Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Spillman, Ramsay: The Value of Radiography in Detecting Tuberculosis in Recruits, J. A. M. A. **115**: 1371-1378 (Oct. 19) 1940.

2. Edwards, H. R., and Ehrlich, D.: Examination for Tuberculosis: Roentgenographic Findings of 41,809 Inductees and 9,541 National Guardsmen in New York City, J. A. M. A. **117**: 40-45 (July 5) 1941.

this analysis with those from other areas which include large cities and more densely populated rural communities. The period August 1941 through May 1943 must also be considered as significant when comparing with other analyses. The standards for acceptance, as outlined in Mobilization Regulations 1-9, were high during a large part of this period, and otherwise healthy young men were being disqualified because they had more than the arbitrary limit of ten intrathoracic calcified areas. These limits were relaxed soon after this country declared war, but the number of men disqualified because of apparently healed primary type tuberculosis still remained relatively high.

The method of examination, which during the past three years has been a topic of great interest, should be noted. The photoroentgen unit, utilizing 4 by 10 inch film with stereoscopic exposures on the same film, was used during the examination of about 80 per cent of the men in this series. When examinations were conducted in a satellite station, single 14 by 17 inch chest films were taken. In all instances single or stereoscopic 14 by 17 inch films were taken in doubtful or suggestive cases.

The results of this program will best be seen in the years to come. For the present an analysis of disqualifying defects found during the actual examinations will be of interest. Local reports and surveys of induction station examinations have appeared in the literature from time to time during the past two years.[3] The material to be presented at this time is only an addition to the surveys already made by others in other parts of the nation.

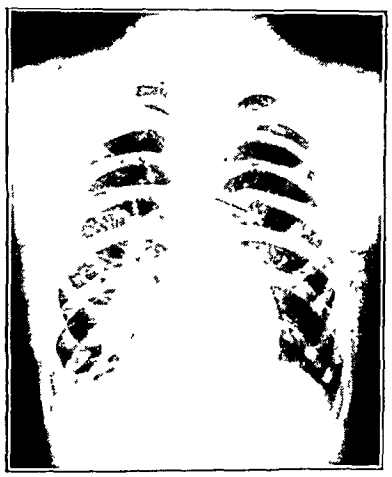


Fig. 1.—Eventration of the right diaphragm.



Fig. 2.—Same case as shown in figure 1, showing stomach located above liver.

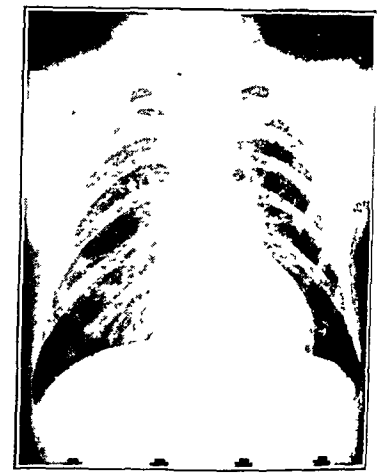


Fig. 3.—Coarctation of aorta.

On the basis of chest x-rays alone 1,328, or 1.26 per cent of the 105,141 selectees examined, were disqualified. Not all of these were permanently disqualified, many being deferred for a period of six months or more because of small lesions which could not be definitely classified as to activity. As no attempt has been made to determine the exact number of men returning for reexamination after having been deferred because of a doubtful lesion, a small number have been counted as chest rejections more than once, thus making some inaccuracy in the tabulation of the number of men rejected because of minimal pulmonary lesions.

Pulmonary tuberculosis, including the primary and adult type infections as well as unexplained pleurisies,

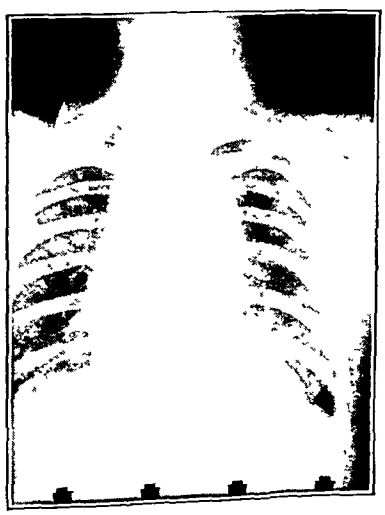


Fig. 4.—Mediastinal lymphoblastoma.

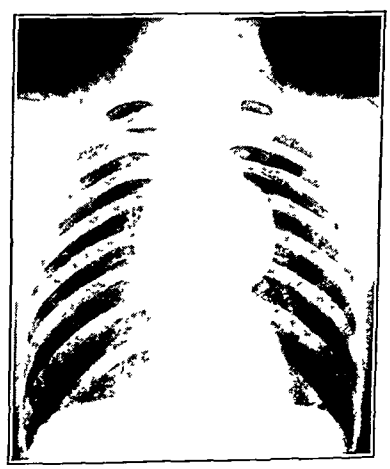


Fig. 5.—Aneurysm of thoracic aorta.

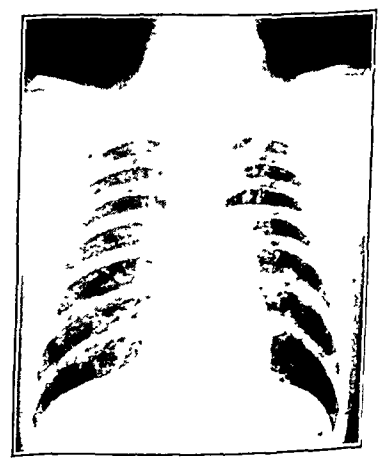


Fig. 6.—Metastases secondary to a testicular tumor.

3. Ashbury, H. E.; Whildin, J. G., and Rogers, F. T.: Roentgenological Report of Chest Examinations Made of Registrants at U. S. Army Induction Station No. 6, Third Corps Area, Baltimore, Md., May 1, 1941 to March 31, 1942, Am. J. Roentgenol. 48: 347-351 (Sept.) 1942. Levitin, Joseph: Ten Thousand Chest Examinations with the Stereoscopic Photoroentgen Unit, Am. J. Roentgenol. 49: 469-475 (April) 1943

was the basis for rejection of 999, or 75.2 per cent, of those disqualified because of chest x-ray findings. Reference to table 1, showing a further tabulation of the tuberculous lesions, reveals that 60.7 per cent of these were reinfection type, 29.5 per cent were primary infection type, 8.5 per cent were pleural lesions and 1.2 per cent were lesions being controlled with either a therapeutic pneumothorax or a thoracoplasty. It is of particular interest to note further that of the 607 reinfection type lesions 526, or more than 86 per cent, were classified as minimal in extent. The total number rejected for all forms of pulmonary tuberculosis, 999, represents 0.95 per cent of the total selectees examined. This is probably a lower rate than will be found in areas having large cities and is actually not a representative figure for the population in general in this part of Michigan, as local board physicians were actively examining selectees and disqualifying obvious cases of tuberculosis during most of the period covered by this analysis. It is true that local board examinations became more and more sketchy, for obvious reasons, during the latter part of 1942 and 1943, and it may be that in the final analysis a representative cross section of the male population reached the induction station for examination. The fact that 1.2 per cent of those rejected because of tuberculosis were under some form of treatment for the disease bears this assumption out to some extent.

I have said that 75.2 per cent of those disqualified on the basis of chest x-rays had some form of tuberculosis. The remaining 24.8 per cent were disqualified for a variety of reasons, as illustrated in tables 2 and 3. Many of the defects listed in these tables were of course obvious to other examiners on the examining line. Thoracic cage deformities due to thoracic scoliosis and other bone disturbances such as old rickets were not considered as chest x-ray disqualifications, as they were obvious to the general musculoskeletal examiner and could best be evaluated by actual physical inspection plus a review of the chest x-ray. Thus, deformities of the thoracic cage and diaphragm, as shown in table 2, make up a total of only 2.2 per cent of those disqualified by the roentgenologist.

Among those disqualified because of lesions of the heart and mediastinum were many requiring consultation with the cardiac examiners before a diagnosis could be made. On the other hand, cardiac lesions requiring disqualification which had no gross changes in the cardiac silhouette were not included in this list. The coarctations of the aorta listed were only those in which an accurate x-ray diagnosis could be made.

The parenchymal nontuberculous lesions listed in table 3 include some with rather uncertain diagnoses. Many of those called pneumonitis may have been due to tuberculosis. Likewise, those labeled bronchiectasis were not all proved cases, although a good many had been previously so diagnosed by means of bronchography. Chronic bronchitis was a diagnosis arrived at only after consultation with the chest examiner and was considered cause for rejection when associated with asthma.

Neoplastic lesions were very infrequent. Of the two metastatic tumors, one was associated with a hard testicular tumor and was therefore accurately classified. The other was of uncertain origin.

The miscellaneous column (table 3) includes emphysema and pneumonoconiosis. These conditions were infrequent enough to warrant histories and consultation with the chest examiners to substantiate the diagnoses. The majority of those rejected because of pneumonoconiosis had been foundry workers, although a few had apparently acquired the condition as a result of several years' occupation as enamel sprayers.

Foreign bodies in the lungs were cause for rejection only when located in the bronchial system or when surrounded by a local reaction in the parenchyma.

The number of rejections for reasons other than tuberculosis may seem unusually large. A careful analysis of the many disqualifying conditions listed in tables 2 and 3 will reveal that they are entirely adequate causes for rejection. For purposes of illustrating and emphasizing this point, several reproductions of chest x-ray films are presented: figures 1 and 2, eventration of the right diaphragm in which the stomach and portions of the large bowel are located between the high diaphragm and the liver; figure 3, coarctation of the aorta; figure 4, mediastinal lymphoblastoma; figure 5, aneurysm of the thoracic aorta; figure 6, metastases secondary to a testicular tumor (this was missed during the genitourinary examination); figure 7, congenital cystic disease of the lung with fluid levels; figure 8, silicotuberculosis.

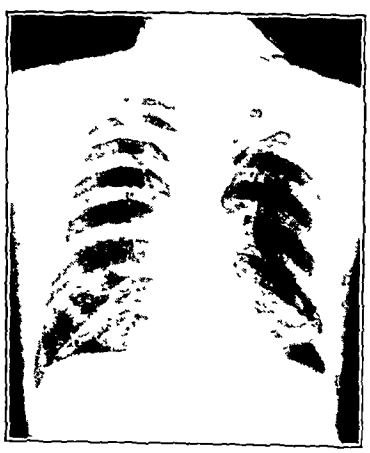


Fig. 7.—Congenital cystic disease of the lung with fluid levels



Fig. 8.—Silicotuberculosis

In addition to the causes for rejection which have been illustrated, the nontuberculous group includes bronchopneumonia, nonspecific pneumonitis and other inflammatory conditions which were the basis for temporary rejection only.

SUMMARY

1. The United States Army, with the early cooperation of the various health agencies in the country, set up and organized facilities for routine chest x-ray examinations in the induction stations throughout the United States shortly after the Selective Service System began functioning.

2. A total of 105,141 selectees were given chest x-ray examinations by an armed forces induction station team in Michigan during the twenty-two months between Aug. 1, 1941 and May 30, 1943. Of this group 1,328, or 1.26 per cent, were rejected on the basis of chest x-ray findings.

3. Some form of pulmonary tuberculosis was the cause for rejection in 75.2 per cent of this total.

4. The remaining 24.8 per cent were rejected for nontuberculous lesions or deformities of the chest.

5. The total number rejected for all forms of pulmonary tuberculosis, 999, represents 0.95 per cent of the total selectees examined.

ABSTRACT OF DISCUSSION

DR. ROBERT G. BLOCH, Chicago: At the University of Chicago we have had some experience with x-ray examinations of the chest among employees and staff members and could match Dr. Selby's stories with some of our own. For instance, the head nurse of the operating rooms at Billings Hospital at one time was found to have active tuberculosis in such a survey. It was found that for months one girl working in the clinical laboratory had contaminated the sputum of nontuberculous patients. They all had been reported to the health department as having tuberculosis. We are now examining all clinic patients by fluoroscopy. Not being a radiologist, I should not like to enter into a controversy as to which is the superior method of x-ray examination from a technical point of view. Our reason for employing it is an academic one: we feel that all medical students should leave the school with a fair knowledge of chest fluoroscopy just as we ask them to be able to do a blood count and urinalysis. The National Tuberculosis Association assures us that the private physician's office is the main tuberculosis case finding agency. He can hardly be expected to buy a 4 by 10 inch fluorogram equipment, but he can be expected to have access to a fluoroscope; to know how to use it will help the private practitioner to keep his place in the future practice of medicine. We have examined about 60,000 persons by fluoroscopy. Joslyn states that 0.4 per cent of the total number of patients seen in medical practice are found to have diabetes by routine urinalysis. The diagnosis of blood dyscrasias found by routine blood counts is of an even lower percentage. Among the expectant mothers in the clinic of the Chicago Lying-In Hospital we find slightly more clinically important tuberculosis by chest fluoroscopy than syphilis is diagnosed by the routine Wassermann test. In spite of this evidence, it occurs to few administrators of medical institutions to introduce this most successful of all routine diagnostic tests. We estimated conservatively that during the first fifteen years of the existence of the University of Chicago Clinics 3,000 clinic patients seeking medical aid for any kind of complaint were permitted to slip by with an actively tuberculous condition of the lungs without that condition being diagnosed. Let us apply that figure to the adult population of the United States; according to the best information obtainable, about 45,000,000 adult people annually are seeking medical aid once or oftener in doctors' offices or clinics. This would suggest that every year over 600,000 people with clinically important tuberculosis of the lungs are seen by a physician without that condition being recognized. If the supposedly healthy population is searched for tuberculosis with so much zeal, we certainly should apply the same methods to the people who report for medical care.

CAPTAIN H. J. PRICHARD, Chicago: I have had experience with induction station chest work and haven't had the ambition to undertake a statistical analysis as Major Kinzer has done, so I can't give you accurate figures; but I did notice that there are some trends that were somewhat different from what he reports. Since I have been with the Chicago station we have examined about 400,000 chests, and we have about twice as many rejects for tuberculosis as Major Kinzer does. We have about 1.75 per cent consistently from month to month. Another difference we have had is in neoplasms. During this series of 400,000 chests the last tabulation showed 53 neoplasms in which dermoids particularly predominated in those cases which we were able to follow through to surgery; and while it was not strictly our business to do it, we did try to get further information voluntarily from these people if they had surgery and were investigated and treated. The dermoids were our most frequent diagnosis. Another condition is coarctation of the aorta. We have accumulated 23 cases of these.

MAJOR R. E. KINZER, M. C., A. U. S.: In comparing this work on chest x-rays, you will always have to consider who is reading them. I worked at all of the induction stations in this service command. I think I worked with Captain Prichard for a short time. I believe that there is a difference in the number of cases of tuberculosis found in a rural district and in a district which is made up of large cities. Apparently there is about 0.78 per cent difference between the tuberculosis rate in large cities and the rate as I found it in rural communities.

DEGENERATIVE ARTHRITIS OF THE HIP JOINT

TREATED BY ONE OR TWO STAGE ARTHRODESIS WITH METAL FIXATION (WATSON-JONES)

G. EDMUND HAGGART, M.D.
BOSTON

Patients with unilateral degenerative arthritis (hypertrophic or osteoarthritis) of the hip joint often exhibit a degree of disability which may be relatively pronounced. This loss of function is primarily the result of pain referred from the region of the hip down the anterior and medial thigh to the knee joint. Muscle spasm producing flexion adduction contracture of the hip perpetuates a vicious cycle because of the resultant abnormal weight bearing on the extremity. While conservative treatment will consistently relieve the severity of symptoms, the results of such therapy have not been permanent. Indeed, usually sooner or later, and as a rule the former, symptoms recur, particularly if the patient is relatively active, as when engaged in a type of work that necessitates long hours of standing and walking about.

The most satisfactory results at the Lahey Clinic have been obtained with fusion of the involved hip, which in the past was secured by a bone graft transplanted from the iliac wing to bridge the prepared area over the femoral neck, head and adjacent ilium. Once a firm arthrodesis developed, the patient was relieved of his major complaint—pain. In the majority of patients so treated there was a good functional result. Our experience with other types of surgical intervention has been unsatisfactory. In none of the patients treated by osteotomy of the femur, either subtrochanteric or between the trochanters, by acetabuloplasty, including removal of hyperplastic bone on the femoral neck and head, or by arthroplasty was pain completely absent.

Conservative therapy, such as bed rest, traction or plaster, including physical therapy, would always ameliorate, at times completely relieve, symptoms, but if the patient was at all active the pain again recurred. Furthermore, these individuals do not tolerate well a long period of bed rest.

It is pertinent to mention the results obtained with arthroplasty. In succession, chromized membrane, fascia lata and finally vitallium have been employed as the interposition medium. In 18 patients of this age group (50 to 65 years) the results have been disappointing when vitallium cup arthroplasty was utilized. All have some pain on weight bearing, and the range of motion is limited. When walking the majority require

From the Department of Bone and Joint Surgery, the Lahey Clinic. Read before the Section on Orthopedic Surgery at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

a cane and in some instances a crutch. In younger patients (third and fourth decades) with degenerative changes in the hip resulting from such conditions as Legg-Perthes disease, fracture or a slipping of the proximal femoral epiphysis, vitallium cup arthroplasty has produced definite improvement in the function of the joint. I believe the comparatively good results in the younger age group is due to their greater stamina and ability to perform the repetitious and monotonous exercises plus better developed and controlled musculature. The older patients early exhibited fatigue, which became more rather than less pronounced as time went on. Hence this group was simply unable to carry out a most important part of the program, namely exercises in the postoperative period.

These experiences indicated a return to the hip fusion operation. However, in these older patients hip joint arthrodesis, by means of a bone graft, is a formidable procedure. Furthermore, the patient must remain in bed in a bilateral hip spica followed by a single spica for a minimum period of three to four months. Vigorous individuals may become ambulatory after application of the single spica, but even so it is a debilitating experience. Return of the normal knee joint function was often long delayed after the patient was out of plaster, in spite of the fact that metal hinges, as suggested by Leland,[1] were routinely incorporated in the single plaster hip spica case, to permit relatively early motion, after weeks of complete immobilization.

It was finally decided to treat those patients selected for operation by the method of Watson-Jones,[2] since he stated that the procedure was especially applicable to degenerative arthritis of the hip joint. Watson-Jones presented this operation before the Section on Orthopedic Surgery of the American Medical Association in 1938.

A review of American literature reveals one paper on this method, that by Warren White,[3] who reports satisfactory results in 7 hips, 2 of which were considered tuberculous. White employed the one stage procedure, that is, nailing only, and stressed the resultant prevention of an adduction deformity, especially in the growing period.

This paper is a report of our experience with this operation, in most instances a two stage procedure as described. Although the number of cases is small, they have been carefully observed and the results are decidedly encouraging. The use of this method will be continued because it causes a fusion of the hip—as noted, the most satisfactory therapy in unilateral degenerative arthritis of this articulation—and, furthermore, hip arthrodesis is obtained with a comparatively minimal degree of bed rest, knee joint disability and general debility.

The belief that a patient with an ankylosed hip would of necessity have pain in the low back has frequently deterred us in the past from advising and carrying out an arthrodesis of the hip joint. We then subscribed to the belief that because a stiff hip placed an increased strain on the low back and hence would produce pain, particularly if the patient had some arthritic changes in the lumbosacral spine, an operation designed to fuse the hip joint should not be considered. However, as Watson-Jones pointed out, in the presence of a unilateral arthritic hip this articulation could be ankylosed and hence symptoms and muscle spasm relieved, with the result that the patient not only has no pain in relation to the hip joint but also does not develop a painful low back. Furthermore, because of the absence of muscle spasm, the individual often will exhibit an increased range of motion in the low back. This fact was becoming increasingly apparent with the utilization of a bone graft to obtain hip fusion. Consequently, since the method of Watson-Jones offers a simpler procedure to obtain that end result, it was decided to try it out in selected cases.

SELECTION OF CASES

Patients with arthritic involvement of both hip joints are not suitable cases for arthrodesis. The optimum type is the individual in whom only one hip is involved. No patient is operated on until careful medical study has shown that his condition will permit such major surgery.

The type of patient selected for fusion operation is indicated by a brief outline of a typical history, together with the significant data. Such a patient is a relatively vigorous person in good general health, between the ages of 50 and 65, who seeks medical advice because of disabling hip pain on weight bearing and progressive loss of ability to stand and walk. Examination reveals moderate to pronounced flexion adduction deformity of the involved hip, with considerable limitation of motion. The leg is held in 10 to 20 degrees external rotation, and there is obvious atrophy of the musculature of the buttocks and thigh. Roentgenograms of the affected hip joint exhibit a narrow joint space, with proliferative bone changes and cystic degeneration in both the acetabulum and the femoral head.

OPERATIVE TECHNIC

In the majority of patients submitted to surgery, the operation is carried out in two stages. The first stage is an intra-articular arthrodesis, while in the second stage, performed at the end of ten days to two weeks, a flange nail (Smith-Petersen) is passed through the trochanter, neck and head of the femur and into the dense bone of the ilium just superior to the acetabulum. The one stage operation, that is, pinning alone, was employed only when the patient's condition did not permit a more extensive procedure.

First Stage.—The hip joint is exposed by the usual anterior incision. This entails subperiosteal reflection of the tensor fasciae latae and a part of the gluteus medius muscles from the lateral aspect of the ilium, while the distal portion of the incision is deepened down to the hip joint between the sartorius and the tensor fasciae latae muscle. The rectus muscle is then reflected distally after division of its tendon insertion into the anterior inferior iliac spine—the anterior superior joint capsule is excised and the head of the femur dislocated from the acetabulum. Any loose bodies in the acetabulum are removed, while hyperplastic synovial membrane is cut away from the neck of the femur and acetabulum (fig. 1).

The exostoses and cartilage on the head of the femur are cut away, first, by chisel, and this completed by the use of a cup reamer, modified from the type originally devised by Murphy. Every effort is made to retain the relatively normal contour of the femoral head, at the same time reducing its size to a minimum consistent with exposure of raw bleeding bone. During this step it is important that the acetabulum be packed off with saline moistened gauze to prevent fragments

1. Leland, G. A., cited by Scudder, C. L. The Treatment of Fractures, ed. 11, Philadelphia, W. B. Saunders Company, 1938, p. 277.
2. Watson-Jones, R.: Arthrodesis of the Osteoarthritic Hip, J. A. M. A. **110**: 278 (Jan. 22) 1938.
3. White, J. W.: Smith-Petersen Nail Fixation in Hip Disease, South. M. J. **36**: 333 (May) 1943.

of cartilage from falling therein, which later might be missed. With a motor driven 1/16 inch bit, numerous channels are driven through the head of the femur well into the neck, thus aiding in rapid vascularization. And finally, by means of a small V shaped chisel, the entire articular surface of the femoral head is successively elevated, that is, "shingled" throughout. The object of these steps is to produce more rapid bone growth across the joint line.

By means of a motor driven burr the cartilage of the acetabulum is next removed, and at the same time ridges or pockets in the bone of the cavity are obliterated, so that the articular surface of the acetabulum presents a uniform, even, raw bleeding bone surface. Particular care is taken to remove all cartilaginous and bone débris. Then with a 1/16 inch bit, multiple holes are drilled in the floor of the acetabulum, penetrating both diploes in order to hasten vascularization and hence fusion, which is additionally expedited by permitting the soft bone shavings resulting from the use of the bit to remain in the acetabulum.

The head of the femur is now replaced in the acetabulum and the wound closed. A Penrose rubber tube drain, removed in twenty-four hours, is efficacious in preventing an accumulation of serum. In obese patients a single plaster hip spica is applied, while in slight or more easily handled individuals Russell skin traction to the extremity has often been instituted. In the average case, however, use of the plaster spica has been more satisfactory, as it permits repeated change of the position of the patient with minimum pain and discomfort.

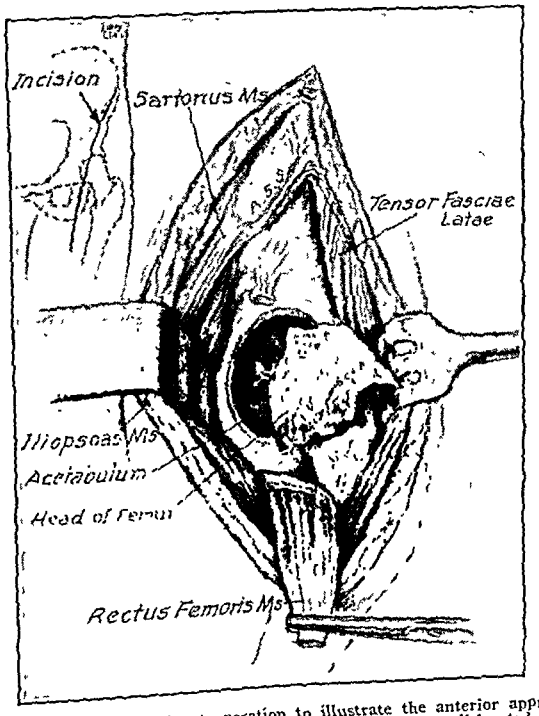


Fig. 1.—Drawing made at operation to illustrate the anterior approach to the hip joint. The head of the femur has just been dislocated from the acetabulum. Note the degenerative changes. See text for technical details.

Second Stage.—Ten days to two weeks later the second stage operation is performed, this time on the fluoroscopic table, again under spinal anesthesia (fig. 2). This procedure utilizes essentially the same technic so commonly employed in nailing fractures of the femoral neck. Under intermittent fluoroscopic observation a guide wire is passed into the center of the neck and head of the femur, up to the articular margin, and the correct position determined in relation to the dense iliac bone just above the acetabulum. The length of the nail required is estimated by a measuring rod photographed on x-ray film, as well as by checking the measurements of a guide wire. A cannulated Smith-Petersen flanged nail is then introduced through a small incision over the lateral aspect of the trochanteric area and driven in along the guide wire through the trochanter, femoral neck and head and into the bone of the superior acetabulum.

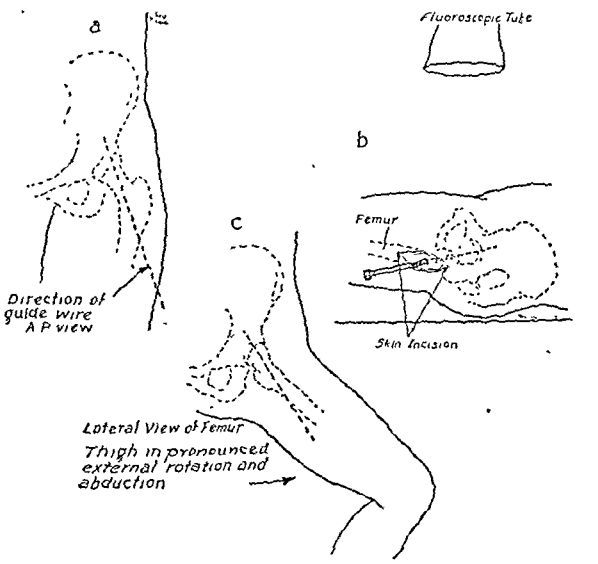


Fig 2.—Line drawing to illustrate the various steps in the second stage procedure. The broken line indicates direction and position of the guide wire, as described in the text, and is introduced only up to the articular margin of the femoral head, thus permitting easy visualization in the lateral plane by "frogging" the hip. A Smith-Petersen nail is then introduced over the guide wire, and it is important to note that it terminates in the lateral portion of the superior acetabular region, where the iliac bone is particularly dense (see fig. 5).

By introducing the guide wire up to the articular margin of the femoral head the entire second stage procedure can be rapidly carried out. With the wire in this position it is possible not only to visualize the trochanter and head and neck of the femur in the anteroposterior view, but by "frogging" the hip joint a true lateral perspective of the position of the wire in the femoral neck and head is obtained. Thus centralization of the guide wire is secured in relation to the femoral neck and head, while in the anteroposterior fluoroscopic view the relation of the wire to the iliac bone above the acetabulum is likewise determined.

Undue exposure of the patient to x-rays from the use of the fluoroscope is prevented by short, intermittent observations, while the operator's hands at no time come into the fluoroscopic field, because of the type of instruments employed. They were designed by Warren White[4] for nailing fractures of the femoral neck and, in my opinion, are an indispensable part of the equipment for the operation here described.

Before driving the nail through the head of the femur into the ilium, it is important that the position of the extremity be carefully rechecked in relation to the trunk. The most satisfactory position is that of 30 to 35 degrees hip flexion, neutral rotation and midposition to 5 degrees abduction.

The final step is firm impaction of the head of the femur against the surface of the acetabulum, following which the small lateral wound of the thigh is closed

4. White, Warren: Personal communication to the author.

and a short plaster hip spica applied. Application of a long leg plaster spica has not been found necessary, since the nail controls any tendency toward rotation and adduction. A short hip spica, however, has been most helpful, as in many of these cases the iliac bone in particular was found to be so decalcified that even with the nail in situ a certain amount of actual hip motion was possible, especially in the anteroposterior plane. No attempt has been made to transfix the head of the nail in the lateral cortical shaft of the femur. To date, none of the nails have extruded or tended to slip back.

Following the second stage operation, the average patient treated by this technic has been kept in bed for two to three weeks, during which period muscle exercises are begun with particular reference to development of quadriceps function and knee joint motion. These exercises are continued a minimum of three months. When allowed up in a single short hip spica, the patient begins progressive walking with crutches. Since immobilization by a long plaster hip spica is unnecessary, knee motion has been maintained in all patients.

STATISTICS

The findings on 12 patients following operation have been carefully observed over a one to five year period, and the results obtained are decidedly encouraging. The favorable results in these patients with degenerative arthritis of one hip joint offer a sharp contrast to the present status of individuals afflicted with a similar type of hip disability who have been treated by other methods (figs. 3, 4 and 5).

The average age of this group is 56 years. The oldest patient treated was 68 years. The operation was advised on the basis of pronounced to complete disability because of hip pain which had been progressive over an average period of four years.

The complication of intratrochanteric fracture due to a fall has so far not occurred It is believed that insistence on postoperative walking with crutches from four to six months has prevented such falls and hastened fusion of the hip joint; furthermore, the use of crutches has been a decided aid in permitting early ambulation as well as assistance in regeneration of muscle power.

ONE STAGE PROCEDURE

The one stage operation was employed when the patient was considered a poor surgical risk but was



Fig 3.—Appearance of the hip joint of a housewife aged 50 who was completely disabled by pain adduction and flexion deformities of the left hip, progressively more severe since fracture of the neck of the left femur three years previously. The fracture had been nailed elsewhere; the nail is still in place. Note pronounced loss of joint space, cystic degeneration in the head of the femur and proliferative reaction around the adjacent acetabulum.

in great pain that was not relieved by adequate conservative treatment.

Three patients were operated on by this procedure, that is, passing a Smith-Petersen flanged nail through the base of the trochanter, neck and head of the femur into the iliac bone just above the acetabulum. The time required to obtain hip join anklyosis was over twice as long as the period in which firm joint fusion was secured by means of the two stage procedure. The latter varied from three to four months. Another

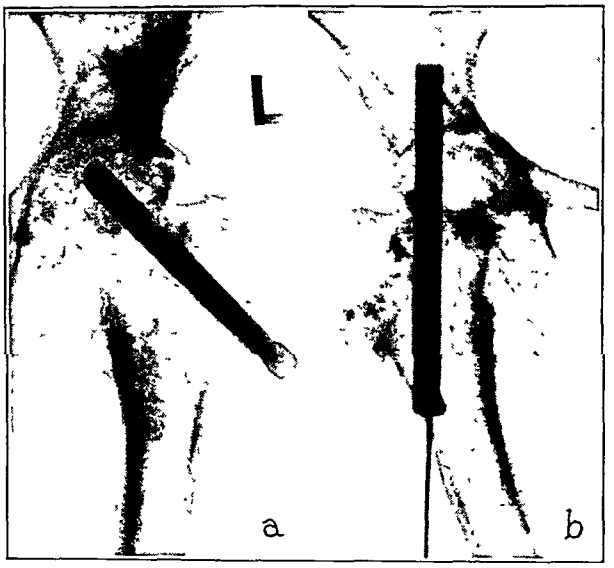


Fig. 4.—Angle at which the pin is best inserted for ankylosis of the hip *a*, condition on admission Pin was inserted elsewhere for fracture of the neck of the femur. The pin was withdrawn at the first stage arthrodesis procedure *b*, final stage of arthrodesis as described in text. Note that the pin terminates in the dense iliac bone just above the acetabulum. Guide wire has not yet been withdrawn, nor has head of femur been impacted against the acetabulum. Compare with figure 5.

obvious disadvantage encountered in these 3 patients, was the fact that, even under anesthesia, practically no correction of the existing deformity, that is, hip flexion and external rotation of the leg, could be obtained. Hence, fusion of necessity had to occur in this abnormal weight bearing position.

RESULTS

Ten patients obtained a painless, solidly ankylosed hip joint, resulting in a decided increase of activity and ability to carry on previous occupations. In each instance the knee joint function equaled or exceeded in range that present before operation. Previously present low back symptoms were not exaggerated.

There were two failures. The data on these individuals are presented in case histories:

CASE 1.—M. N. B., a housewife aged 57, admitted to the clinic on March 10, 1942 with a complaint of pain and practically complete disability in relation to the left hip joint, stated that in July 1940 she had a severe fall down a staircase and sustained a fracture of the left hip She was admitted to a hospital in a neighboring town, operated on and the fracture pinned, and allowed on her feet in four weeks. No further discomfort was experienced until five months later, when she caught a severe cold and then developed a stiffness of the hip which rapidly developed into a completely disabling pain. This had continued until just prior to admission, when the pin had become loose, and it was therefore removed

On admission she exhibited decided limitation of motion in the affected hip, with pronounced muscle spasm. The roentgenogram (fig. 6*a*) revealed an old fracture through the neck of the femur which had healed in good position. The site of the previously placed internal pin fixation can be seen. The films further exhibited an area of considerable density in the head of the femur, indicating that a portion of the head had

not revascularized as well as an extensive degenerative arthritis of the hip joint.

The first stage operation was performed on May 4. A large fragment of the head was found to be definitely necrotic and therefore removed and replaced by bone transplanted from the adjacent ilium. The second stage was done ten days later.

Since that time the patient has not been free from discomfort and at present is again in the hospital because of a failure of fusion (fig. 6 *b*). We now plan to carry out a bone graft to obtain complete fixation of the hip joint.

Failure of hip joint ankylosis in this case was due to the very large bone defect resulting from avascular necrosis of a considerable segment of the head of the femur. Although an attempt was made to replace this dead bone fragment with bone transplanted from the adjacent ilium, it was not successful.

CASE 2.—A. N. C., a housewife aged 60, admitted to the hospital on May 12, 1943, gave a history of three years' progressively increasing pain in the right thigh and hip, so that at the time of admission she was completely incapacitated.

Clinically and by roentgenologic examination the patient exhibited an advanced degenerative arthritis of the right hip joint, with pronounced flexion adduction contracture and external rotation of the leg. She was exceedingly fragile, obviously very arteriosclerotic, and apparently in great pain. For one month the patient was maintained on conservative management, during which interval she did not improve. Therefore, after additional consultation with the medical service and with her family, it was finally decided to carry out a one stage procedure and pin the hip in the position of deformity with the hope that such fixation would reduce pain and discomfort.

The patient was therefore operated on on June 12; a one stage procedure was carried out in which the hip was pinned without incident. She recovered from operation without surgical complications, but her preoperative disorientation became more pronounced and it was in no sense possible to enlist her cooperation in carrying out exercises or progressively increasing her activities.

While a subsequent report from the patient's home physician indicates that by roentgenologic examination she has an ankylosis of this hip joint, nevertheless

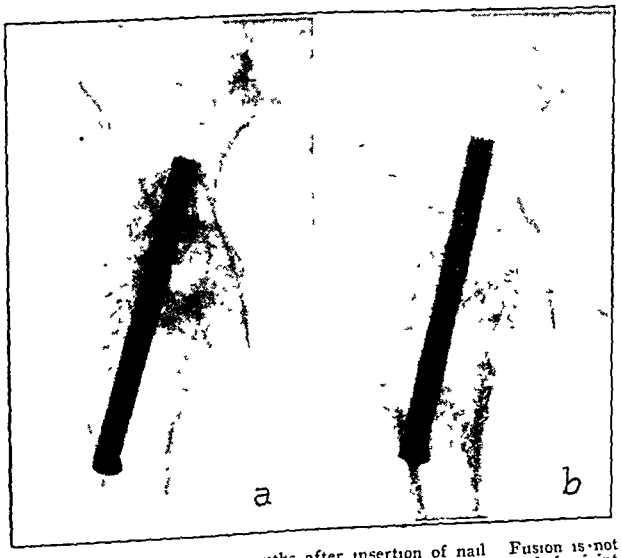


FIG. 5.—*a*, condition two months after insertion of nail. Fusion is not yet complete but is rapidly progressing. The superior aspect of the joint line is obliterated. At this time the patient was clinically free from symptoms. *b*, ten months after operation. Solid bone ankylosis of hip joint. Position of nail remains unchanged.

the result is a failure because of poor selection, due to extensive arteriosclerosis with consequent brain changes that prevented the patient from cooperating in her postoperative management.

SUMMARY AND CONCLUSIONS

Unilateral degenerative arthritis of the hip joint often results in disability which the patient attributes to pain in the region of the hip and referred down the anteromedial side.

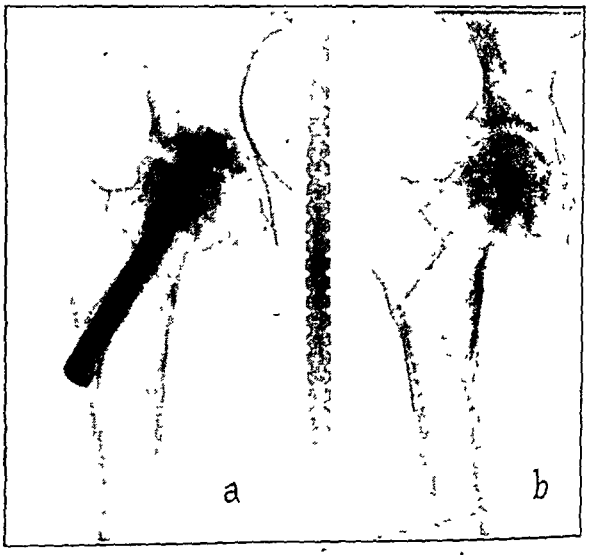


FIG. 6.—*a*, appearance on admission. Note large area of bone sclerosis in the superior portion of the femoral head and cystic areas of degeneration in the remainder of the head. Notched metal bar, an additional aid in measuring length of nail, is described in text. *b*, failure of fusion twenty-two months postoperatively. Note bone absorption about the pin (see text).

In our hands patients within the age group of 50 to 65 years have not obtained permanent relief by conservative treatment nor has arthroplasty eliminated pain. The best results followed arthrodesis of the hip joint, which operation in this age group is now performed in two stages.

It is important to note that no patient is advised operation unless a general medical examination indicates that his condition will permit such treatment.

The course of 12 patients in the age group 50 to 65 has been followed for from one to five years. There were no operative fatalities. Ten patients obtained firm, bony ankylosis of the hip joint and subsequent complete relief of pain, definite improvement in function and the ability to return to their previous activities. There were two failures.

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ABSTRACT OF DISCUSSION

DR. DAVID M. BOSWORTH, New York: Operative intervention on these old people is a grave risk, not on a percentage basis, because the percentage of deaths is small, but in the individual case. Basically the patient has to risk his life to free himself from pain. So, fusion of a hip by any method is a relatively important decision for both the patient and the doctor to make. Dr. Haggart probably would prefer fusion with an iliac or other bone graft were such procedure not more difficult and lengthy. I would be glad to have him comment on this. He states that his experience with other types of surgical intervention (arthroplasties) has been unsatisfactory. At St. Luke's we would concur with that statement. All other types of reconstruction for degenerative arthritis of the hip aside from arthrodesis were unsatisfactory, and we have tried many methods. I would question the efficacy of his one stage procedure. Metal never grows bone. I am not in agreement that driving metal nails across hip joints with residual cartilage intact will secure anywhere near the percentage of solid arthrodeses that a débridement of the joint and a bone graft will. Metal does permit fixation and is a great adjunct for

fixation. Therefore I do not agree that his two stage operation might equal the percentage of results secured by fusion with a bone graft. End result studies not based on recent personal follow-up study of the patient are apt to be misleading. What were some of the complications that ensued? Were there any hematomas or any infections following the removal of drains? Was there any difficulty with wound healing? What was the final position of the hip as compared with the position you put it in? Did any of them roll out to a position of external fixation; did increased flexion take place? Did any of the nails wander from their immediate operative position? A nail with only an inch support in the ilium might shift its position over a period of months. Were there any cases of impaired knee function? I still believe that, in arthrodesis of the hip, iliac grafts or grafts of bone are best, associated with thorough débridement of the joint space.

DR. HERMAN C. SCHUMM, Milwaukee: Dr. Haggart's success was due to the thought and care which he gave to the individal case. In all cases of hip surgery the careful consideration of the patient, which means a careful selection of the patient for the particular type of operation, is the prime requisite. Dr. Haggart has certainly carried out that requisite. There is no question also that his surgical technic is excellent, which is an aid to any surgical procedure. The Watson-Jones operation has its place. There are cases in which a definite arthrodesis cannot be done because of the physical condition of the patient or probably because his life has to be so regulated that he does not have to carry on a strenuous physical life. Those cases can sometimes be helped by a single nailing. Dr. Haggart gives a great deal of credit to Watson-Jones for his operation. If one is going to obtain maximum results in a large majority of cases one is going to have to resort to firm ankylosis. For patients who have a great deal of activity ahead of them, whose physical condition is excellent, there is no operation that can take the place of a good arthrodesis. None of our classic types of operation that attempt to preserve motion will fill the bill. Under the stress and strain of years they are bound to give way, and pain is bound to recur. I should like to ask Dr. Haggart his reasons for doing a two stage instead of a one stage operation. Some cases that are nailed will never go on to an arthrodesis. In a small series that I have done, firm arthrodesis has resulted; 1 patient was probably tuberculous and 2 had arthritis, a young child who had considerable erosion of the hip and a young man who had trouble from childhood.

DR. J. WARREN WHITE, Greenville, S. C.: There is no question about the desirability of doing an intrajoint arthrodesis, but some patients cannot stand that major procedure, and so I have in 1 instance used two nails. Watson-Jones used a supercaliber nail, which cannot be obtained easily. I had a regular nail break, as you will note from my paper on the subject that came out a year ago, and I decided I had better employ something else and hit on the idea of using two nails. I have packed in two nails, and I think I obtained good solidity.

DR. WALTER BLOUNT, Milwaukee: I question the need for an intra-articular operation in most cases. There is no doubt that more rapid fusion is obtained following the removal of the articular cartilage. It has been repeatedly shown that this operation alone is not sufficient. Internal fixation is a valuable addition. It is my contention that, if this internal fixation is adequate, removal of the cartilage is not necessary. If one wishes to fasten two boards together so that they will not move, one does not put a single screw, nail or bolt in the center of the board. Not even one Smith-Petersen nail will hold them. Dr. Haggart notes that motion at the hip following operation requires the application of a cast. Two or more nails will effectively hold the boards securely. Two nails, as suggested by Warren White, are definitely better than one. I prefer to use multiple adjustable nails. I started by using three. Fixation is obtained but the nails do break. I now use more and heavier nails with great confidence. It is imperative that nuts be used if the nails are to be prevented from wandering inward. A lateral view can be obtained by the use of an orthopedic table with a wooden post. The nails must be accurately placed if firm immobilization is to be obtained. The average stay in the hospital is two weeks. I have not used a cast in any of my cases. I feel that the postoperative complications are greatly reduced. Another reason why I prefer the smaller nails is that they can easily be drilled into the sclerotic bone, whereas it is sometimes difficult to drive any type of a nail into this substance. It is advisable to drill extra holes across the joint to encourage ankylosis. In some of my cases I have x-ray proof of bone union. It may take several years for the hips to fuse. In the interval they are solidly nailed and the patients walk without crutches after six months. It may be that some of the cases develop fibrous union rather than complete bony ankylosis. In any event they are relieved of pain. Their gait is greatly improved. Their deformity is reduced. The patient's symptoms are relieved by an operation which is far less formidable than an intra-articular fusion.

DR. G. EDMUND HAGGART, Boston: In reply to the questions of Dr. Bosworth, Dr. Blount answered one. I would prefer to employ a bone graft, but the type of patient here described does not react as favorably—at least in my hands—as with the two stage operation. One definite failure of fusion was described. The second case was a failure because of poor selection, but fusion of the hip joint was obtained. Two other patients I have not had the opportunity to examine personally, but I have received reports from consulting physicians that the roentgenograms reveal strong, firm fusion and the patients are free from any symptoms with reference to the hip joint. Infection occurred in 1 case, fortunately only of the small incision on the lateral side of the thigh. The incision of the original first stage procedure healed perfectly. Infection occurred as a result of poor technic. I have always found the fluoroscopic room a difficult place in which to keep the operative field sterile. This wound has now remained healed five months. Roentgenograms did not reveal any evidence of bone infection. There have been no pulmonary complications of any kind in this group. Why the two stage procedure? Because these patients react more favorably under that regimen than after a one stage operation. In patients more recently operated on, the entire procedure has been carried out at one operation and they have not done as well as similar types of patients treated by the two stage procedure. The operation can be done in one stage, but these people are very fragile and I believe that the two stage operation works out much better than when the operation is performed all at one time. With the exception of the two failures, all the remaining patients have returned to their previous activities. They have other complaints, but not in relation to the hip or as a result of surgery on the hip joint. I agree with Dr. White and Dr. Blount that you would probably obtain better fixation with two nails than with one nail. However, performing the operation in the manner described in the paper achieved the objective, namely hip fusion. I have had no experience with more than one nail. In a number of these patients, immediately following introduction of the nail there has been obvious definite motion at the hip—not abduction, adduction or rotation, but demonstrable anteroposterior motion. I attribute this to the fact that the bone is soft, as is often the case with these older persons. This is the reason for applying the short plaster spica following the second stage procedure. I consider this spica extremely important. Likewise the fact that we have insisted that the patients use crutches with progressive weight bearing for an average period of six months has been of additional aid in preventing complications. However, the patients are up and about, out of the hospital. This activity has also prevented complications that might otherwise have arisen. Dr. Blount certainly has hip joint fixation, but it seems like a considerable amount of hardware. I prefer the simple Smith-Petersen nail.

Strength of Sunlight.—Artificial light, even if perfected to the highest degree, has never the strength of sunlight and is more fatiguing to the eyes, as it does not stimulate the retina by a constant change of the intensity and color of the light rays, as does daylight. Every sensitive person will rejoice to see sunlight again when he comes out of an artificially lighted museum into the day.—New Architecture and City Planning, A Symposium, edited by Paul Zucker, New York, Philosophical Library, 1944.

ONE DOSE PENICILLIN TREATMENT OF CHRONIC GONORRHEAL VAGINITIS IN CHILDREN

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ROSS TILBURY, M.D.
AND
JESSE COLLEY, M.D.
NEW ORLEANS

The treatment of chronic gonorrheal vaginitis has undergone rapid changes in the past few years. Sulfonamide therapy has brought rapid cure of this stubborn disease in the majority of instances. However, since several cases have been found to be sulfonamide resistant, estrogen therapy (diethylstilbestrol) has been recently advocated. With the advent of penicillin, it seems quite evident that this drug is by far the most effective and the safest to use in the therapy of gonorrheal infections.

It is our purpose in this paper to describe our experience with a simplified one dose penicillin treatment of chronic gonorrheal vaginitis. The results in 16 cases show that patients with this chronic disease need no longer be hospitalized but can be satisfactorily treated in the office and rapidly cured.

From the Department of Pediatrics, Louisiana State University School of Medicine and the Charity Hospital of New Orleans.

To conserve time and space, pertinent facts regarding our 16 cases are presented in tabular form.

Children with Chronic Gonorrheal Vaginitis Given One Dose of Intramuscular Penicillin 100,000 Units

Patient	Age	Race	Duration of Disease	Diagnosis by		Previous Therapy		Penicillin Intramuscularly	Results		
				Smear	Culture	Sulfonamide	Diethylstilbestrol		Vaginal Discharge	Smear	Culture
1. C. J.	1 mo.	Negro	Since birth	Positive	Positive	Sulfathiazole 2 wks.	None	100,000 units in saline solution	Cleared in 2 days	Negative for 3 wks.	Negative
2. B. J.	1 mo.	Negro	Since birth	Positive	.....	Sulfathiazole 4 days	None	100,000 units in saline solution	Cleared in 2 days	Negative for 2 wks.	
3. E. M. S.	1 mo.	Negro	Since birth	Positive	Positive	None	None	100,000 units in saline solution	Cleared in 72 hrs.	Negative for 1 mo.	Negative for 1 mo
4. M. B.	6 mos.	Negro	5 mos.	Positive	Positive	Sulfathiazole 1 mo	3 mos.; stopped due to vaginal bleeding	100,000 units in saline solution	Cleared in 48 hrs.	Negative for 3 wks.	Negative for 3 wks
5. J. K.	7 mos.	White	3 mos.	Positive	Positive	Sulfathiazole 2 wks.; sulfadiazine 2 wks.	1 mo.	100,000 units in saline solution	Cleared in 3 days	Negative for 3 wks.	Negative for 3 wks
6. E. F.	8 mos.	Negro	6 mos.	Positive	Positive	Sulfathiazole 3 wks; sulfadiazine 2 wks.	3 mos.; estrogenic response; vaginal bleeding; improved but not cured	100,000 units in saline solution	Cleared in 3 days	Negative for 2 mos.	Negative for 2 mos
7. A. C.	10 mos.	White	3 mos.	Positive	.....	Sulfathiazole 2 wks.	1 mo.	100,000 units in saline solution	Cleared in 2 days	Negative for 3 wks.	
8. M. W.	1 yr.	Negro	6 mos.	Positive	Positive	Sulfathiazole 2 mos.	2 mos.	100,000 units in saline solution	Cleared in 2 days	Negative for 4 wks.	Negative for 4 wks
9. C. A.	1 yr.	White	3 mos.	Positive	Positive	Sulfathiazole 2 wks.	1 mo.	100,000 units in saline solution	Cleared in 2 days	Negative for 2 wks.	Negative for 2 wks
10. A. K.	1½ yrs.	Negro	7 mos.	Positive	Positive	Sulfathiazole 1 mo; sulfadiazine 1 mo.	2 mos.	100,000 units in saline solution	Cleared in 2 days	Negative for 6 wks.	Negative for 6 wks
11. J. A. C.	2 yrs.	White	6 mos.	Positive	Positive	Sulfathiazole 2 wks; sulfadiazine 2 wks	Diethylstilbestrol 6 wks	100,000 units in saline solution	Cleared in 2 days	Negative for 4 wks.	Negative for 4 wks.
12. F. B.	3 yrs.	White	1 mo.	Positive	.....	Sulfathiazole 3 wks	.....	100,000 units in saline solution	Cleared in 2 days	Negative for 2 wks.	Negative for 2 wks
13. V. H. D.	5 yrs.	Negro	3 mos.	Positive	.....	.....	.....	100,000 units in saline solution	No response; subsequently cleared with 8 divided doses of 10,000 units each 3 hrs.	Positive	Positive
14. C. O.	7 yrs.	Negro	7 mos.	Positive	Positive	Sulfathiazole 1 mo	2 mos	100,000 units in saline solution	Cleared in 2 days	Negative for 2 mos.	Negative for 2 mos
15. B. J. W.	10 yrs.	Negro	2 mos.	Positive	Positive	.....	.....	100,000 units in saline solution	Cleared in 24 hrs.	Negative for 2 wks.	Negative for 2 wks
16. D. L.	11 yrs	White	1 yr.	Positive	Positive	Sulfathiazole 2 mos	Diethylstilbestrol 3 mos	100,000 units in saline solution	Cleared in 3 days	Negative for 1 mo.	Negative for 1 mo

COMMENT

Diagnosis was established by smear only if the case was clearcut and gram negative intracellular organisms were found in pus cells. In all other instances diagnosis was made both by smear and by culture. Most patients received sulfonamide and/or estrogen therapy for varying periods of time prior to institution of penicillin therapy. Sulfonamide therapy was discontinued either because of toxicity or of failure to respond. Estrogen therapy was discontinued because of failure to respond, lack of cooperation or uterine bleeding (cases 4 and 6). Sulfathiazole and sulfadiazine were given in doses of 1 grain (0.06 Gm.) per pound daily divided into four equal doses and administered at 8 a. m., 12 noon, 4 p. m. and 8 p. m. Estrogen therapy when instituted was generally given after sulfonamide therapy. Diethylstilbestrol was given orally in doses of 1 mg. daily.

Penicillin therapy was not started until all other forms of treatment were discontinued for at least one week. Penicillin 100,000 units was dissolved in 20 cc. of isotonic solution of sodium chloride and injected intramuscularly. In a few instances 3 minims of epinephrine 1:1,000 was added to the penicillin solution in order to prolong the penicillin effect. The

vagina was carefully examined for discharge every day. No local or systemic therapy was given during penicillin treatment. Smears and/or cultures were taken every other day for the first week and weekly thereafter. All except 6 patients were hospitalized for treatment. The 6 patients treated as ambulatory responded just as well as the hospitalized patients. Only one failure (V. H. D., patient 13) occurred out of 16 treated. This patient was promptly cured after she received eight doses of penicillin, 10,000 units every three hours. No toxic symptoms were noted with penicillin.

SUMMARY

Sixteen cases of chronic gonorrheal vaginitis in children were treated with one dose of penicillin, 100,000 units injected intramuscularly. Clinical and bacteriologic cure was effected in 15 cases within three days, usually two days. The 1 remaining case required further therapy with divided doses of penicillin. Because of its safety and rapid cure penicillin is the drug of choice for the treatment of chronic gonorrheal vaginitis in children. One 100,000 unit dose of penicillin injected intramuscularly seems adequate in most cases. Hospitalization is not necessary.

EPIDURAL SPINAL ABSCESS

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The consequences of an unrecognized purulent collection in the epidural space can be so devastating that further emphasis on the clinical syndrome accompanying this lesion has ample justification. Although over 200 cases are reported in the literature and recent reviews by Gasul and Jaffe,[1] Browder and Meyers [2] and Campbell [3] have drawn attention to this condition, nevertheless the high percentage of delayed diagnoses with resulting irreversible cord damage causing severe and permanent neurologic sequelae warrant a further report. The 14 cases on which this communication is based furnish no new nor striking clinical information. But the antecedent history and development of symptoms is so uniform that repetition is justified, if only to remind the profession that this condition does exist, to describe again its salient features and thereby, perhaps, help in early diagnosis and prompt operation. For unless realization is widespread among medical men that epidural infection can and not infrequently does follow infection in other parts of the body, valuable time is lost in performing laminectomy. In consequence, the spinal cord suffers irreparable damage.

The epidural space is formed by a separation at the foramen magnum of the layers of the dura as it passes down over the spinal cord. The outer layer forms the periosteum of the laminas and bodies of the vertebrae; the inner, the dura proper surrounding the cord. Anteriorly to the cord the two layers are closely approximated, but posteriorly the dura over the cord falls away from the laminas to form the epidural space containing the epidural fat with its many veins. Dandy [4] states that the spinal epidural space is present only dorsal to the nerve attachments. Ventral to the nerve the dura is everywhere closely applied to the bones of the vertebrae and their ligaments. Below the second sacral bony segment the epidural space surrounds the dura on all sides. Of greatest importance are the variations in the size of the epidural space. In the cervical region the space is only potential, there being but a few strands of fibrous tissue and almost no fat between the laminas and the dura. The epidural space really begins to appear at the seventh cervical vertebra and gradually deepens along the thoracic vertebrae, attaining a depth of about 0.5 to 0.75 cm. between the fourth and eighth dorsal vertebrae. The space tapers again and becomes shallow between the eleventh thoracic and second lumbar vertebrae. Over the remaining lumbar and the first and second sacral vertebrae the epidural space attains its greatest depth. Consequently an epidural abscess rarely is found above the fourth thoracic. The lower thoracic and lumbar areas, where the epidural space is largest and the veins in the epidural fat most numerous, are the common sites for infection.

Hematogenous infection is much the more common cause for epidural abscess. Many blood vessels run in the epidural fat and anastomose freely with those entering along the spinal nerves. Batson [5] has shown recently that the venous anastomosis reaching into this area is more extensive than hitherto suspected. The constant repetition in the case histories of local acute infection, usually a furuncle, preceding the epidural focus and the frequency with which the staphylococcus is the organism found in both areas seems convincing evidence that the blood stream has been involved. In the 88 cases from the literature analyzed by Browder and Meyers, 72 were apparently blood borne. The staphylococcus was commonly recovered, 59 of these 72 cases having been due to this organism.

An epidural spinal abscess may be acute, subacute or chronic. If free pus is found in the epidural space without granulation tissue on the dura, the abscess is considered acute; if both free pus and dural granulations are encountered, the abscess is subacute; whereas, if a solid extradural fibrous mass without definite macroscopic evidence of infection is discovered, the abscess is undoubtedly chronic.

An epidural abscess forms as the result of an adjacent infection spreading to the epidural space or by blood borne infection from a distant focus. Direct trauma, a bullet or stab wound or a retropharyngeal or posterior mediastinal abscess are all possible causes of direct infection. Campbell reports a case originating from a furuncle of the external chest wall and 15 cm. from the operative site. Pressure over this area caused pus to well up into the laminectomy wound. Infected pilonidal cysts (Campbell, Stammers [6]) have caused epidural infection. Hunt [7] and Browder and Meyers are of the opinion that osteomyelitis of the vertebra is a constant finding. They account for the frequently recorded tenderness over the spinous processes adjacent to the abscess on this basis. Stammers reports cases in which vertebral osteomyelitis was present

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Read before the Section on Nervous and Mental Diseases at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

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2. Browder, J., and Meyers, R.: Infections of the Spinal Epidural Space: An Aspect of Vertebral Osteomyelitis, Am. J. Surg. **37**: 1-26 (July) 1937.
3. Campbell, M. M.: Pyogenic Infections Within the Vertebral Canal, Bull. Neurol. Inst. New York **6**: 574-591 (Dec.) 1937.
4. Dandy, W. E.: Abscesses and Inflammatory Tumors in the Spinal Epidural Space (So Called Pachymeningitis Externa), Arch. Surg. **13**: 477-494 (Oct.) 1926.
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6. Stammers, F. A. R.: Epidural Suppuration, Brit. J. Surg. **26**: 366-374 (Oct.) 1938.
7. Hunt, J. R.: Acute Infectious Osteomyelitis of the Spine and Acute Suppurative Perimeningitis, M. Rec. **65**: 641-659 (April 23) 1904.

accompanying epidural abscess, but McNutt [8] describes 2 instances in which osteomyelitis of the vertebrae was diagnosed by roentgenographic studies without accompanying infection of the epidural space. In reading the operative notes of the reported cases of epidural infection, mention is made but rarely of osteomyelitis of the overlying spines and laminas, although not uncommonly it is stated that pus was encountered on separating the muscles from the spinous processes. Only occasionally is reference made to softening or other changes in the bone, although such changes may not have been sufficiently extensive to attract the attention of the operator.

An epidural abscess is almost always found posteriorly to the cord. Mixter,[9] Campbell, and Browder and Meyers report cases in which the abscess lay anteriorly. This was true in 1 of our cases. Infection immediately adjacent to the vertebral bodies, as a retropharyngeal or peritonsillar abscess, may track inward, involve the body of the vertebra and enter the epidural space anteriorly. But since in this region the dura is tightly adherent to the bodies of the vertebra, the abscess is always localized. The general infection of the epidural space which is so frequently encountered when the posterior region is involved never occurs when infection appears anterior to the dura. The symptoms are less fulminating, pain is rarely severe and diagnosis may be difficult.

TABLE 1.—*Source of Infection*

Of 88 cases	72 hematogenous
Of 72 cases	59 Staphylococcus aureus

Browder and Meyers in 1937 reviewed 210 cases, of which "156 may be classified as acute, 2 as subacute and 52 as chronic forms of the disease." As just stated, Browder and Meyers found 88 cases with sufficient data to warrant analysis. In this group were 71 cases described as acute, with 43 deaths and 28 recoveries, 2 subacute cases with 2 deaths and 15 chronic cases with 12 recoveries and 3 deaths.

A review of the literature [10] since 1937 shows a total of 55 cases, to which we add 14. Of these 69 cases 44 were acute. In this group 19 patients were operated on with complete recovery of all functions, 11 were operated on and survived the operation with little or no recovery from their paralysis, 13 succumbed following surgical intervention and 1 died without operation. In 6 subacute cases there were 4 recoveries following operation with complete return of function, 1 recovery without improvement in neurologic symptoms and 1 operative fatality. The chronic group numbered 19. Ten recovered completely following laminectomy, 2 survived operation without return of function and there were 2 immediate operative fatalities. In 35 of the 44 acute cases the history states that a furuncle or other acute superficial infection immediately preceded the onset of cord symptoms.

TABLE 2.—*Review of 88 Cases Before 1937*

	Died	Recovered	Mortality
Of 71 acute	43	28	60%
Of 2 subacute	2	..	100%
Of 15 chronic	3	12	20%

It would seem, therefore, that the attention called to this condition by the reviews referred to has lowered the operative mortality rate and, more important still, increased the percentage of patients who have completely recovered from their disabilities. Without question, early diagnosis and prompt operative intervention are essential to total recovery. The delay is commonly caused by lack of appreciation that acute infection can involve the epidural space and that immediate laminectomy is indicated.

The symptoms of an epidural infection appear with an almost monotonous regularity. A careful history will show that a previous infection has existed, usually a furuncle or other skin infection. Within a week or two the patient has pain, usually very severe, in the back or down the legs. A few days after the pain appears, numbness and finally paresis, passing on to complete paralysis, develop in the legs and extend upward rather rapidly. Loss of sphincter control may appear early and be complete. As the anesthesia and paralysis develop, the pain may become less pronounced. Physical examination reveals a sick patient, usually febrile and showing a leukocytosis. Neurologic studies indicate a cord lesion, more or less complete, depending on the time at which the patient is seen and the virulence of the infection. Palpation of the spinal column frequently reveals an area of acute tenderness corresponding with the upper level of sensory change. In some cases a slight edema and swelling of the spinal muscles may be present in this area.

TABLE 3.—*Review of 69 Cases Since 1937*

	Total	Died	Recovered	Mortality	Recovered Function
Acute	44	14	30	31%	19
Subacute	6	2	4	33%	4
Chronic	19	2	17	10%	15
Total	69	18	51	26%	38

Lumbar puncture will give extremely valuable information but must be done with caution. If an epidural infection is suspected, the needle should enter the epidural space and then be aspirated. The presence of pus confirms the diagnosis. It is essential, of course, to avoid penetrating the subarachnoid space through an epidural collection. However, if lumbar puncture

8. McNutt, J. R.: Roentgen Diagnosis of Osteomyelitis of Vertebrae, Am. J. Roentgenol. **39**: 52-58 (Jan.) 1938.
9. Mixter, W. J.: A Case of Epidural Intraspinal Abscess of Metastatic Origin, Boston M. & S. J. **175**: 864 (Dec. 14) 1916.
10. Cases reported since 1937:
Gotten, N., and Simpkins, C.: A Clinical and Anatomic Study of Spinal Epidural Abscesses with Report of Two Cases, Memphis M. J. **13**: 61-65 (April) 1938.
Chinner, M. E.: Extradural Spinal Abscess Secondary to Carbuncle of Wrist, M. J. Australia **2**: 157 (Aug. 1) 1936.
Neale, A. V.: Epidural Inflammation of Spine, Birmingham M. Rev. **11**: 4-8 (March) 1936.
Mitchell, W. R. D.: Acute Epidural Abscess, Brit. M. J. **1**: 1149-1151 (May 28) 1938.
Bunch, G. H., and Madden, L. E.: Acute Epidural Abscess, South. Surgeon **8**: 291-297 (Aug.) 1939.
Weilbacher, J. O.: Acute Epidural Abscess, New Orleans M. & S. J. **92**: 208-215 (Oct.) 1939.
Echols, D. H.: Acute Epidural Abscess, ibid. **92**: 682-683 (June) 1940.
Fitch, T. S. P.: Sulfathiazole in Treatment, Arch. Pediat. **57**: 119-124 (Feb.) 1940.
Raney, R. B.: Acute (Pneumococcic) Metastatic Spinal Epidural Abscess, Bull. Los Angeles Neurol. Soc. **4**: 3135 (March) 1939.
Cohen, I.: Epidural Spinal Infections, Ann. Surg. **108**: 992-1000 (Dec.) 1938.
Boyce, S. W.: Epidural Abscess, Tri-State M. J. **14**: 2753 (Aug.) 1942.
Bodechtel, G.: Clinical Aspects of Epidural Abscess, Nervenarzt **14**: 337-343 (Aug.) 1941.
Boharas, S., and Koskoff, Y. D.: Early Diagnosis of Acute Epidural Abscess, J. A. M. A. **117**: 1085-1088 (Sept. 27) 1941.
Echols, D. H.: Emergency Laminectomy for Acute Epidural Abscess: Four Cases with Recovery in Three, Surgery **10**: 287-295 (Aug.) 1941.
Bailey, A. A., and Love, J. G.: Epidural Abscess of Spinal Cord: Two Cases, Proc. Staff Meet., Mayo Clin. **16**: 24-28 (Jan. 8) 1941.
Browder, J., and Meyers, R.: Pyogenic Infections of Spinal Epidural Space, Surgery **10**: 296-308 (Aug.) 1941.

is carried out in a routine fashion a partial or complete block will be evident with increased protein, possibly xanthrochromia and a slight polymorphonuclear pleocytosis in the fluid. This evidence from the Queckenstedt test of a mass lesion within the vertebral canal eliminates the possibility that the apparent transverse myelitis is due to intrinsic cord disease. Operative intervention at the proper level indicated by the sensory change is urgently indicated. If laminectomy reveals pus, the wound should be packed open after adequate drainage has been assured. The sulfonamide derivatives may be used in powdered form in the wound as well as by mouth. Curiously enough, Reeves [11] in a recent paper reports the first case of acute epidural abscess in which they were employed. His patient recovered.

The cause for the transverse myelitis in the acute cases apparently is a degeneration in the spinal cord due not so much to pressure as to circulatory stagnation. The abscess is seemingly too widespread and diffuse to bring about destruction of the cord by direct pressure, and irreversible damage is too quickly produced to be due to this factor alone. Rather an obstruction of the venous plexuses of the epidural space, meninges, and in the cord itself occurs, due to irritative and inflammatory processes. A stagnation edema appears, causing distention of tissue spaces, and the adjacent neural fibers are affected by compression.

TABLE 4.—*History of Infection*

1. Severe pain in back
2. Painful spinous process
3. Neurologic signs progressive
4. Spinal block

A chronic epidural abscess is often indistinguishable from an extradural spinal cord lesion, both in the development of symptoms and grossly at operation. In many of the cases reported in the literature and in all of the 5 chronic cases in the present series the clinical diagnosis was presumably that of a fibrosarcoma. The majority of these chronic epidural granulomas invade the dura, and either sharp dissection is necessary to separate the dura from the tumor, or the tumor and the invaded dura must be removed in one mass. The prognosis not only for immediate operative recovery but also for ultimate return of function is much better in the chronic than in the acute cases. The slower development of compression symptoms and the absence of widespread interference with the blood supply of the cord and of virulent toxic material in the epidural space result in less serious damage to the neural structures.

In this small series of 14 cases 6 were acute, 3 subacute and 5 of the chronic type of abscess. All the patients were operated on. Of the 6 patients with acute abscess, 2 died following laminectomy and 4 recovered, 2 with serious neurologic sequelae. Two patients with acute epidural abscess recovered function completely as the result of a prompt decompression and drainage. All with subacute abscess survived operation and 2 had satisfactory restoration of function. Of the 5 with chronic abscess 1 died following operation and, of the 4 survivors, but 1 had complete return of power in the legs with adequate sphincteric control.

3400 Spruce Street.

11. Reeves, D. L.: Acute Metastatic Spinal Epidural Abscess: Report of Two Cases with Recovery Following Laminectomy, Arch. Surg. 41: 994-1003 (Oct.) 1940.

ABSTRACT OF DISCUSSION

DR. ADRIEN HENRI VERBRUGGHEN, Chicago: I have not seen a case of this kind since 1937, so it must be becoming a rarity around here. Two of the cases that I had were due to a cause which Dr. Grant did not mention. Both of them were due to attempts to include spinal anesthesia, evidently due to some infection of the skin or in the presence of infection somewhere in the deep tissues. One was an attempt to produce continuous extradural spinal anesthesia; the other was secondary to an ordinary straightforward spinal anesthetic. The prognosis, as Dr. Grant mentions, is quite poor; of the 6 patients with whom I have had some experience 2 died. They were all operated on. Two died following operation, 2 of them remained completely paraplegic following operation and 2 of them had some return of function with bladder control but weakness and spasticity in the legs. It seems likely that we shall see less and less of this condition and not more and more of it, for it seems to be one for which penicillin was invented. If it is recognized early, and possibly large doses of penicillin are given before paraplegia results, it may not be necessary to perform a laminectomy.

DR. A. W. ADSON, Rochester, Minn.: In reviewing the records of cases of pyogenic infection of the spinal extradural space at the Mayo Clinic, I found that we had operated in 12 such cases. The review consisted of an analysis of etiologic factors, symptoms and operative results. Our findings corroborate the observations made by Dr. Grant. Six of the patients were men and 6 were women. The patients were young adults, with one exception—a man of 60. In 4 cases the infection was the result of recurring osteomyelitis. In 2 cases it was due to a diffuse furunculosis; in 1 it was due to a large carbuncle on the neck. In 2 the lesion developed subsequent to a paranephric abscess, and in another case it followed an empyema and a mediastinal infection. In 1 case it developed following trauma to a lumbar vertebra and disk. In the twelfth case we were unable to determine the etiologic factor. The general symptoms were those of a chronic systemic pyemia. The temperature elevations were rarely more than a degree or two. The leukocyte count usually averaged 9,000 to 10,900 per cubic millimeter. The pus contained Staphylococcus aureus; however, it was sterile in 3 cases. In only 2 cases was there roentgenographic evidence of bony destruction. The characteristic local symptoms were those of a transverse myelitis without the signs of a diffuse meningitis. Spinal punctures were avoided. The progress of symptoms was fairly rapid; the symptoms developed within twenty-four to seventy-two hours. In only 3 of the 12 cases did a complete transverse myelitis develop. No recovery was obtained by drainage of the abscess in these 3 cases. Nine patients had partial paralysis. In some instances the motor loss was in excess of the sensory loss, and in others the reverse was true. The results of surgical drainage were successful in 5 cases since complete recovery of function occurred. In the remaining 4 cases only a partial recovery occurred. There were no surgical deaths. The patient with empyema died at home several months after operation. An early diagnosis is imperative, and surgical drainage should be instituted before the signs of a complete transverse myelitis have developed. If the extradural spinal abscess is drained without injury to the dura before extensive paralysis is present the prognosis is reasonably good.

DR. GEORGE B. HASSIN, Chicago: In 1 of our cases there was an abscess above the dorsal surface of the dura. There were no signs of pressure on or compression of the spinal cord. The size and configuration of the latter were preserved but the various tracts showed scattered areas of rarefaction. The dura underneath the abscess was thickened, hyperplastic and separated from the subjacent arachnoid by a widened subdural space. The ventral portion of the dura, in contrast, was normal. In addition the perineurial spaces—over the spinal roots—were obliterated. Because of the obliteration of these spaces, which was caused by adhesions between the roots and the subarachnoid spinal membrane, the flow of the cerebrospinal fluid from the subarachnoid space along the spinal roots was interfered with and the tissue fluids of the spinal cord therefore could not be discharged. They become stagnant, causing the rarefaction. The perineurial space obstruction and not the compression of the spinal cord—as assumed by the neurosurgeons and in general—is responsible for the clinical picture of an epidural abscess,

such as root pains, paraplegia and sensory and genitourinary disturbances. As emphasized by Dr. Grant, the clinical picture should be recognized as early as possible and the abscess removed, thus preventing the occurrence of the changes in the roots and spinal cord as demonstrated.

DR. FRANCIS C. GRANT, Philadelphia: I brought up the subject of epidural spinal abscess and have again described the clinical syndrome connected with this lesion in the hope that earlier recognition might follow. As Dr. Hassin has said, if these patients are permitted to become paraplegic the results following surgery are far from satisfactory. Dr. Verbrugghen suggests that the use of penicillin or the sulfonamide derivatives might avoid the necessity for operation. I am sure that he made this suggestion so that I could protest strenuously against it. Any delay in these cases is dangerous. Immediate operation is indicated as soon as the diagnosis is reached. To wait twenty-four to forty-eight hours to determine the effect of either or both of these drugs can easily result in permanent cord damage. The clinical picture of severe pain in the back, then sudden onset of signs of spinal cord involvement, plus a partial or complete block on Queckenstedt test, forms a triad of symptoms demanding immediate surgical exploration.

Clinical Notes, Suggestions and New Instruments

MALARIA AND THE RETURNING SOLDIER

S. B. OSGOOD, M.D., GRANTS PASS, ORE.
Health Officer, Josephine County Health Department

More than a year ago Coggeshall [1] pointed out the possibilities of the spread of malaria in wartime to civilians. As far as I can determine, the periodical literature for the past two years has contained very few references to the occurrence of malaria cases in new areas or an increase in prevalence of malaria in endemic areas since the war. Jeffries [2] reported 1 case of estivoautumnal malaria occurring in a merchant seaman who returned to Oregon. However, there had been no report of any secondary cases arising. My purpose in the present discussion is to report 2 cases of tertian malaria and the evidence from which I conclude that a returned soldier was the source:

CASE 1.—R. C., a white girl aged 12 years, a student, was seen in the office on Aug. 5, 1944 complaining of chills and fever of one week's duration. Since the child was obviously acutely ill (temperature 104.4 F. by mouth), she was referred to a private physician for further examination and treatment. In view of the history of chills and fever, it was thought advisable to secure a blood culture for undulant fever, together with thick and thin blood films for malaria. Her blood films were examined in my office, in the laboratory of the Josephine General Hospital and in the Oregon State Hygienic Laboratory. The presence of Plasmodium vivax in these films was confirmed independently by each laboratory. The cultures for undulant fever were subsequently reported negative. Quinine therapy was instituted by the attending physician the same day. The patient has remained free from chills and fever since that time. Epidemiologic investigation the following day revealed that the patient had felt perfectly well until July 30, at which time a sharp chill, followed by rise in temperature, occurred. The patient felt well and was able to be up and about on July 31 but was again taken with a severe chill about noon on August 1. Severe shaking chills had occurred again on the 3d and the 5th almost exactly forty-eight hours apart. The patient's household consisted of her mother, the grandparents, a sister and an infant cousin, all of whom were well and had been so for the preceding sixty days. A great-uncle (T. M.) had lived in a tent approximately 50 feet from the patient's house for more than two weeks immediately prior to the illness. Relatives volunteered the information that the uncle had been discharged from the United States Army in February 1944 with chronic malaria after having served in the South Pacific area from March 1942 to November 1943. Effort was made to get in touch with him, but his whereabouts were unknown as he was in another county looking for work.

The patient had lived in the same area of Josephine County for her entire life and had never left the county for even a short period. There had been other visitors in the household, but as far as could be determined no one else had been ill among the household or near neighbors. Neither had any cases of malaria been reported from this county for ten years,[3] with the exception of 2 exogenous cases whose sources were known, and the patients had never lived in the neighborhood.

The patient's residence was a one story frame building only partially completed, in which several of the window panes were missing and which was entirely unscreened. The house was located approximately 50 feet from the edge of Grave Creek. Mosquitoes were abundant in the residence of the patient at the time of the investigation on August 6. Mosquito specimens were collected from the residence of the patient. These were identified as Anopheles punctipennis and Culex tarsalis by Ernest C. Anderson, assistant entomologist, U. S. P. H. S., of Oregon State College.

CASE 2.—Mrs. E. A., aged 44, white, was seen in my office on Sept. 12, 1944 with a history of chills and fever since September 4. Questioning revealed that the chills and fever had occurred every other day since the onset and that the patient's residence was less than a quarter of a mile from that of patient 1. Blood films for malaria were taken and examined in my own laboratory, the laboratory of the Josephine General Hospital and the Oregon State Hygienic Laboratory, all of which reported the finding of Plasmodium vivax. The patient was referred to a private physician for treatment and was placed on quinine therapy. No further attacks of chills or fever have occurred since that time.

Epidemiologic investigation revealed that the household of Mrs. E. A. consisted of herself and her husband. Their home was located on the opposite side of Grave Creek approximately 400 feet downstream from the residence of patient 1. The residence was a one story frame building which had not yet been completed and in which many of the window panes were missing. It was entirely unscreened.

History revealed that the great-uncle, T. M., of the previous patient passed the house very frequently and that his home was well within flight range of anophelines. The patient had not been out of the county for several months and had had no visitors except those from the immediate neighborhood. Unfortunately, on the day of investigation of this case (September 13) the weather was rather cold and no mosquitoes could be found in the house. The patient and her husband said that the mosquitoes had been very numerous during the preceding months and agreed to collect specimens in the house at their earliest opportunity. On September 15 the husband brought in a collection of 7 specimens which were trapped in his house, and these were forwarded to Mr. Ernest C. Anderson, assistant entomologist, U. S. P. H. S., of Oregon State College, who reported that 6 of the 7 specimens were Anopheles maculipennis freeborni—the common malaria vector in Oregon.

After repeated efforts to locate the great-uncle of patient 1 he was finally seen at home on November 1. At this time he gave the history of serving in the South Pacific area from March 1942 to November 1943, having first developed clinical malaria in Townsville, Australia, in October 1943. He was treated intermittently for clinical attacks of the disease from that time until his discharge from the United States Army on Feb. 16, 1944 at McCaw General Hospital, Walla Walla, Wash.

Since his army discharge he had spent most of the time at the home of his mother on Grave Creek. This residence is

Through his alertness, Dr. M. E. Corthell of Grants Pass made possible the diagnosis of the first case within two hours. Dr. A. J. Fawcett of Glendale, Ore., confirmed the fact of preexisting malaria in the source case. Mr. Ernest C. Anderson of Oregon State College, Corvallis, Ore., identified the mosquitoes collected from the homes of the patients.

1. Coggeshall, L. T.: Malaria as a World Menace, J. A. M. A. 122: 8 (May 1) 1943.
2. Jeffries, B.: Wartime Malaria in Oregon, Northwest Med. 42: 285 (Oct.) 1943.
3. Official records of Josephine County Health Department, Grants Pass, Ore., further substantiated by search of communicable disease reports in the files of the Oregon State Board of Health

located on the north side of Grave Creek immediately opposite the residence of the second patient and approximately 400 feet downstream from the residence of the first patient.

During the latter part of July and first part of August he lived in a tent adjoining the residence of the first patient and was frequently bitten by mosquitoes. During this period he was living with a logging partner, C. C. I have been unable to locate this man, as he returned to Texas before the investigation revealed that he was a contact. However, I am informed by the husband of the second patient that C. C. suffered from chills and fever during the last part of his stay on Grave Creek.

Mr. T. M. states that he had several attacks of chills and fever during the summer of 1944 and was quickly relieved of one severe attack, which occurred on or about August 1, by the administration of quinine obtained from Dr. A. J. Fawcett of Glendale, Ore. Correspondence with Dr. Fawcett reveals that Mr. T. M. was seen by him on or about August 1, and the clinical diagnosis of malaria was made, although no blood films were taken.

Mr. T. M. states that he entered the United States Veterans Hospital in Portland, Ore., on or about Oct. 15, 1944 for a check-up leading to a disability claim, that he was told by the attending physician at the hospital that he had chronic malaria, and that he was given a quantity of atabrine. The patient was therefore requested to come to my office for further examination.

He was seen in my office on November 18, at which time blood films were taken and submitted to the Oregon State Hygienic Laboratory and to the laboratory of the Josephine General Hospital, as well as being examined in my office. All three laboratories found Plasmodium vivax present in abundance in the blood films on this date.

It is interesting to note that no cases of malaria occurred in the house of T. M.'s mother, where he spent most of the summer. It seems probable that this was due to the fact that his mother's house was completely screened.

CONCLUSION

Two proved cases of malaria, and possibly a third, were contracted from a returned soldier having chronic malaria. This occurred in a rural area which had been entirely free of this disease as far back as official medical records are available. The existence of anopheline vectors of malaria had not even been suspected prior to the occurrence of these cases. It would appear that careful mosquito surveys must be made in this and other districts where climatic conditions permit the existence of anopheline vectors, and that active mosquito control measures must be instituted if an increased incidence of malaria and its establishment in new endemic areas is to be prevented.

NEPHROSIS PROBABLY DUE TO EXCESSIVE USE OF STA-WAY INSECT REPELLENT

DAVID HOEHN, M.D., PALMER, ALASKA

A white boy aged 3 years was admitted to the hospital on Aug. 4, 1944, acutely ill with generalized edema. The swelling was most noticeable in the lower extremities, and the scrotum was about the size of a large grapefruit.

Urinalysis showed pus, albumin and no casts. A diagnosis of pyelonephritis or nephrosis was made on admission.

During the next few days the swelling decreased and the boy's general condition improved. However, a week later he had more edema, and three weeks after admission the edema became very pronounced again. At that time he was seen in consultation by Capt. H. A. Zimmerman, M. C., whose diagnosis was that of nephrosis.

I tried to elicit some information that might give a clue as to the source of the kidney damage. The child had always been well, and the fact that he was taken seriously ill so suddenly made me think that he might have ingested some toxic substance which caused the kidney damage. The father being a truck gardener, I thought the child might have eaten some of the poisons which are used to destroy insects. But the father insisted that he never kept any poisons around the place because of the child. I told the parents to keep thinking of something the child had done which might be harmful to him.

The mother received information from a friend that the insect repellent Sta-way had been banned for use in the Army because it might be harmful. She brought this information to me and admitted that they had used Sta-way very freely on the child's skin during the summer. The child was dressed in a play suit which covered only a small part of his body, and the exposed surface was liberally greased with the insect repellent. Early in the summer the boy developed a generalized skin rash, but the parents thought nothing of it and continued using the repellent in generous quantities. If the parents had discontinued the Sta-way when the rash appeared, probably no kidney damage would have resulted. The consulting physician and I both feel that this substance was the cause of nephrosis. I decided to investigate.

The physicians in a nearby army hospital were interested in this case and Lieut. Col. C. E. Albrecht, M. C., corresponded with Mr. H. H. Stage of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture. He asked us to mail some Sta-way for toxic tests. Since the father had purchased two cases of Sta-way in the summer of 1943 there was still some of the substance available. It came from the same case that had been used on the little boy. To show how freely this substance was used, for a family of four only three bottles were left out of the two cases.

Tests done by the Committee on Medical Research and the Office of Scientific Research and Development showed that Sta-way is a severe kidney and liver poison to rabbits. Results of the test would indicate that Sta-way could be the cause of nephrosis in this child.

In September 1944 the child became much worse, and about the middle of the month his condition became extreme and it looked as though he would not live more than a few days. He was given plasma at the suggestion of Capt. H. T. Knoblock, M. C., and his condition improved. Four infusions of plasma (250 cc.) and two transfusions of whole blood were given. Although the edema did not clear up completely, we were not able to find any more patent veins to use and decided to abandon transfusing for a time. Possibly marrow puncture could have been used, but we were reluctant to do it, not having had any experience and not knowing how it would work in so small a patient.

For some time the boy was unable to void urine and great difficulty was experienced because of the long prepuce, which became very edematous and made it almost impossible to reach the urethra. On October 1 his condition improved so that we were able to do a circumcision, and this made his care considerably easier, although he was still quite edematous.

One point of interest was the formation of an ulcer in the boy's right inguinal area about October 15 which was very difficult to heal. Doubtless this was due to a thrombosed vessel. Onion vapor treatment was used with considerable success.

At the present time the child is in fairly good condition. The edema is almost all gone, he is fairly active and he eats well. Undoubtedly his life expectancy has been considerably shortened, and the danger of recurrence of the disease is imminent.

My purpose in this paper is not to give the treatment for nephrosis but rather to show the possibility of danger from the unrestricted use of this insect repellent, which has been very popular in Alaska. The Federal Food, Drug and Cosmetic Act does not cover insect repellents and therefore the Food and Drug Administration does not have any jurisdiction over this type of product. It seems that there should be some type of restriction so that indiscriminate use would be warned against. Proper legislation would enable the Food and Drug Administration to have administration over repellents so that such incidents would not be repeated. If the people were warned not to use the substance freely, and especially not to use it in the presence of a skin rash, I believe such unfortunate occurrences could be prevented.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following report. HOWARD A. CARTER, *Secretary.*

MEETING OF THE COUNCIL ON PHYSICAL MEDICINE

Abstract of Minutes

The twentieth annual meeting of the Council on Physical Medicine (formerly the Council on Physical Therapy) was held in Chicago on February 11 and 12. Those present were John S. Coulter, Chairman, Frank H. Krusen, Vice Chairman, Morris A. Bowie, Eben J. Carey, Anthony C. Cipollaro, A. U. Desjardins, W. E. Garrey, George Morris Piersol, H. B. Williams, Frank R. Ober and Howard A. Carter, Secretary.

Dr. John S. Coulter was reelected Chairman and Dr. Frank H. Krusen was elected Vice Chairman, replacing Dr. W. E. Garrey, who resigned at his own request.

A report on methods commonly used in artificial respiration, prepared by Dr. Bernard Ross, was presented for the Council's consideration. His report covers a five year survey of artificial respiration in emergency applications. The survey was supported by a grant in aid of research awarded by the Council. The report confirmed the Council's previous findings.

The Council decided to devote more time to the consideration of products containing radium and radon.

The assignment of frequency channels recommended by the Federal Communications Commission for use by diathermy apparatus was given consideration. The Council voted that in the interests of the public it desires to support the stand of the Federal Communications Commission and that it does not care to be in opposition to the federal agency which is responsible for this important decision.

War casualties have intensified the employment of occupational therapy. In view of the important problems currently arising in this field, the Council appointed a group of consultants. Those appointed were Dr. Winfred Overholser, Chairman, Dr. Raymond Allen, Col. Howard A. Rusk (MC), Dr. William Stroud and Dr. Francis Trudeau.

The Council also decided to revise the film on occupational therapy which will be made available for distribution or loan.

The Council was gratified with the progress being made by the Consultants on Audiometers and Hearing Aids. Drs. Gordon Berry and Moses H. Lurie were appointed to serve as members of this group of consultants.

A report by Dr. Thomas D. Allen for the Consultants on Ophthalmic Devices was accepted with enthusiasm and the Council realized that "orthoptics" might well be given more intensive consideration and study.

The Consultants on Contraceptives reported that they had had two meetings during the year and had defined their functions as follows:

1. To formulate minimum requirements or rules for the acceptance of contraceptive devices; and

2. To pass on evidence as to the effectiveness and dangers of such devices, making recommendations to the Council on Physical Medicine on which the Council may base its decision as to acceptance of such devices.

The Council voted to appoint a group of Consultants on Electroencephalography to assist in the investigation of electroencephalographs.

Considerable discussion was devoted to the role the Council will play in establishing a Section on Physical Medicine and a separate Board of Physical Medicine. At the present time physical medicine is regarded as coming under the American Board of Internal Medicine.

The Council voted to furnish gratuitously the booklet "Apparatus Accepted" to all junior students in schools of medicine. The third year is generally considered the term during which physical medicine is studied in medical colleges.

Considerable discussion was devoted to the responsibility of medical schools in teaching physical therapy and also to the entrance requirements for students studying to be physical therapy technicians. Teaching and entrance requirements of occupational therapy schools for technicians was also discussed. The revision of films on physical therapeutic subjects available through the Bureau of Exhibits was considered. The slides which have been prepared by the Council for teaching and lecturing purposes appear to be a good investment. A set of these slides may be loaned free of charge to qualified persons by writing to the Secretary, the borrower paying the express charges one way.

After due consideration, the Council reaffirmed its decision of several years' standing against the use in accepted advertising of the term "sunshine vitamin" when referring to vitamin D. The Council further reaffirmed its stand not to permit the word "Doctor" or its abbreviation as part of the name of an accepted product.

The Council adopted a list of devices which it considers as coming under its purview.

RADIAIRE (RAD-I-AIR) WITHDRAWAL OF ACCEPTANCE

Manufacturer: Tru Ad Company, 1019-1023 North Madison Avenue, Los Angeles.

The Radiaire ultraviolet disinfecting lamps were accepted and the report appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Dec. 11, 1943. These lamps were accepted for installation in hospital operating rooms, wards and nurseries. When considering the aforementioned lamps the Council had evidence that, under properly controlled conditions, the killing of air borne micro-organisms by ultraviolet rays may be used to supplement ordinary methods of disinfecting air for the prevention of cross infections in the aforementioned installations. Routine sanitary procedures in operating rooms, hospital wards and nurseries augmented by radiation from ultraviolet disinfecting lamps, the Council believes, will be an added precaution, but the Council does not regard these lamps a substitute for the orthodox disinfecting procedures which are accomplished by cleaning, scrubbing and the use of face masks and clean wearing apparel.

Since the acceptance of the Radiaire, the Tru Ad Company, a manufacturer of neon signs, organized a division of the parent firm and called it the Tru-Air Ultraviolet Products Company, 2151 Wilshire Boulevard, Los Angeles, California. This firm changed the name of the product to Rad-i-Air. Although there is a difference in spelling, phonetically the two sound alike.

A yellowish orange folder "Rad-i-Air Conditioner" has come to the attention of the Council. This folder contains claims that are unacceptable to the Council. According to the folder, Rad-i-Air is promoted for uses the Council does not accept, such as in factories, business offices, doctors' and dentists' offices, school rooms and home nurseries. As a matter of fact, the firm gives fifty-two recommended applications, beginning with "assembly halls" and ending with "waiting rooms," in which Rad-i-Air is promoted as valuable for preventing cross infection. In the list "hospitals" is the only installation the Council accepts. Throughout this folder there are unwarranted and misleading statements concerning the effectiveness of the lamps.

The Council is also in receipt of a purple pamphlet which the firm states has been withdrawn from circulation, although copies continue to come occasionally to the office of the secretary. This pamphlet contains unwarranted and misleading statements together with a list of industries in which the lamps are recommended for use, as for example the baking, meat, beverage, dairy and farming industries.

The Council does not accept ultraviolet lamps for disinfecting air in schools, waiting rooms, industrial plants, barracks, assembly halls or refrigerators. Evidence now available does not indicate that the incidence of colds can be reduced by the installation of ultraviolet lamps or by the irradiation of an enclosure occupied by people. Satisfactory evidence is not available to warrant acceptance of ultraviolet lamps by the Council for disinfecting solids.

In view of the unacceptable advertising the Council voted that the Rad-i-Air, formerly called Radiaire, manufactured by the Tru-Air Ultraviolet Products Company, a division of the Tru-Ad Company of Los Angeles, be withdrawn from the Council's list of accepted devices.

Council on Pharmacy and Chemistry

The Council has authorized publication of the following statement. AUSTIN SMITH, M.D., *Secretary.*

STATUS OF COSMETICS CONTAINING HORMONES

Today cosmetic preparations are advertised to the general public with the claim that they produce favorable changes in the human skin rather than merely alter its appearance. The advertising claims that the use of such cosmetics will remove wrinkles, make the skin more soft and pleasant to observe and change older looking persons to younger appearing, attractive and even glamorous people.

Some promoters incorporate hormones, such as estrogenic hormones. Others use impressive statements about lanolin, carbamide or some so-called special stimulating factor. The end result, regardless of the product and the sales approach, is the same—a useless outlay of considerable sums of money by purchasers who still believe in the development of "miracle" compounds that can be used safely with the assurance that their hopes for beauty and health will be fulfilled.

The public is now offered preparations containing ingredients as potent as hormones, without evaluation by any unbiased body. If the cosmetic preparations containing hormones will do all that is claimed for them, they must contain potent agents. Why, then, do none stand accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies? Any compound promoted to affect the structure or function of a part of the body such as the skin should be carefully evaluated before it is released for general sale.

Much experimental work has been done on the cancer-producing properties of estrogenic substances. In susceptible animals the administration of estrogens has apparently produced carcinoma, but further observations are necessary to determine all possible effects of long continued use of such substances in the average human being. Some authorities believe that the injudicious use of estrogen-containing cosmetic preparations may permit sufficient absorption from the skin to upset normal body activities. For example, it has been argued that changes in menstrual rhythm may occur because of the absorbed estrogen affecting the activity of the pituitary gland.

Enormous sums of money are being spent to purchase hormone-containing preparations and yet many authorities in the field of endocrinology have stated time after time that there is no satisfactory evidence which would justify the use of hormone-containing cosmetics for their local effects on the skin. More than one authority has questioned the honesty of manufacturers when claims have been made that the promoted preparations would counteract age changes, wrinkles and skin blemishes.

Authorities in the field of endocrinology have stated that there is no published and acceptable evidence that age changes and wrinkling are consequences of estrogen deficiency or that estrogen therapy in women who are known to be deficient in ovarian secretion produces changes in the skin; nor is the deficiency of ovarian activity to be compared in importance with skin changes due to exposure, lack of care, malnutrition and many systemic diseases.

The physician who is asked to give advice to his patients concerning the use of cosmetic preparations containing hormones will ask: What are the local effects, the general effects, and what may follow long continued use? Satisfactory data to support the answers offered by the promoters have not been provided.

Frequently there has been suggested the need for carefully controlled studies when potentially active preparations are placed in commerce. Those who have kept in mind the importance of such studies have developed criteria for their guidance. However, when the scientific literature is searched for evidence concerning the studies made prior to the commercial distribution of cosmetics containing hormones and other substances, for that matter, the lack of convincing data is significant.

The prevention and treatment of disease and allied subjects are fields in which conjectural reasoning must give way to demonstrable facts. All new drugs should be studied in the laboratory and the clinic. The Council on Pharmacy and Chemistry in its consideration of new drugs asks for evidence of safety and for evidence to support the claims. Such evidence should be available for all who are urged to use a drug or other special preparation or to comment on its efficacy. Similarly, scientific facts concerning hormone-containing cosmetics should be generally available. Certainly the Council has not received satisfactory evidence on absorption, sensitivity, systemic effects, local beneficial effect, toxicity, relation of age, physical factors such as illness, and other factors. Until these and other studies have been completed, made public and found reproducible by unbiased investigators, there can be little honest reason to indulge in the promiscuous sale of hormone-containing cosmetics. Perhaps lack of such evidence is one of the reasons why promoters have not presented their preparations for Council consideration. Can financial gain be dominating humanitarian interests? If this is true, then there is no excuse for the widespread use of hormone-containing cosmetics.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

SULFADIAZINE (See New and Nonofficial Remedies, 1944, p. 178).

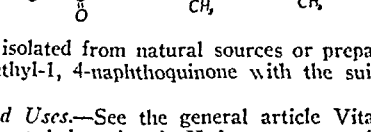
The following dosage form has been accepted:

ELI LILLY & CO., INDIANAPOLIS

Tablets Sulfadiazine: 0.065 Gm. and 0.5 Gm.

VITAMIN K_1.—2-Methyl-3-Phytyl-1,4-Naphthoquinone.—$C_{31}H_{46}O_2$ (M. W. 450.68).

Vitamin K_1 has the following structural formula:



It may be isolated from natural sources or prepared by condensing 2-methyl-1, 4-naphthoquinone with the suitable phytyl derivative.

Actions and Uses.—See the general article Vitamin K. It has been suggested that vitamin K_1 has a more prolonged effect than menadione.

Dosage.—From 4 mg. to 10 mg. by mouth, with or without bile salts. Intravenous dose for adults may be as much as 10 mg. dispensed in dextrose solution. For newborn infants a dose of 0.25 mg. may be administered intravenously.

Tests and Standards.—

Vitamin K_1 occurs as a yellow, very viscous, nearly odorless liquid of specific gravity about 0.967 and refractive index of 1.5250 at 25° C. It is stable in air but decomposes in sunlight. It is insoluble in water; soluble in alcohol, benzene, chloroform, ether and vegetable oils.

Suspend one drop of vitamin K_1 in 10 cc. of methanol, add 0.5 cc. 6 N methanolic potassium hydroxide solution and shake. A deep purple color appears immediately, which slowly turns to reddish blue and finally to reddish brown.

Suspend about 0.5 Gm. of vitamin K_1 in 10 cc. of methanol, add a freshly prepared solution of 0.75 Gm. sodium hydrosulfite ($Na_2S_2O_4$) dissolved in 2 cc. of warm water and shake vigorously for a few minutes. The oily vitamin K_1 dissolves and a reddish purple color forms which soon disappears and the mixture becomes colorless. Dilute with water, extract twice with peroxide free ether and evaporate the ether extract under nitrogen or under vacuum; the white dihydro derivative obtained melts at 98.90° C. This dihydro derivative is readily oxidizable in air. Add one drop of vitamin K_1 to a mixture of 1 cc. of concentrated ammonium hydroxide and 1 cc. of ethanol and then add one drop of ethylcyanoacetate; no purple color is produced *(absence of menadione).* A solution of one part vitamin K_1 and 20 parts ethanol is neutral to litmus.

MERCK & CO., INC., RAHWAY, N. J.

Vitamin K_1: 1 Gm., 5 Gm. and 25 Gm. ampuls.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 16, 1945

EXPERIMENTAL RHEUMATIC ENDOCARDITIS

In 1935 Schlesinger[1] found that deposits obtained by high speed centrifugation of pericardial fluids from cases of acute rheumatism contain minute bodies which in their size and shape resemble virus particles. Relatively pure suspensions of these particles were agglutinated by serums from acute rheumatic patients. They were not agglutinated by normal human serum or by the serum of patients suffering from nonrheumatic disease. Schlesinger did not challenge prevailing belief in the importance of hemolytic streptococci in acute rheumatic infections. He concluded that streptococcic infections lower normal resistance to the rheumatic cardiotropic virus or otherwise activate this virus.

Tests of the pathogenicity of the presumptive rheumatic virus are now reported by MacNeal and his associates[2] of New York Post-Graduate Medical School. In a typical experiment a specimen of pericardial fluid from a patient who had died of acute rheumatic carditis was passed through a Mandel filter. The bacteriologically sterile filtrate thus obtained was injected intravenously into a series of rabbits. The animals were killed at various intervals after the injection. Necropsies revealed scattered foci of inflammation in the myocardium, in one or more valves of the heart and in the pulmonary arterioles. The changes in the heart valves could be distinguished from those in experimental bacterial endocarditis by the absence of bacteria, the more diffuse dissemination of the lesions, their curious edematous verrucous character and particularly the accompanying hyperplastic and reparative activity of the endothelium and connective tissue. The experimental verrucous endocarditis thus produced was ordinarily not fatal.

The disease has been propagated in series through fifteen successive groups of rabbits by blood transfer. The causative agent has been propagated in a series in embryonated eggs. Allantoic fluid from such eggs injected intravenously produces even more pronounced lesions of the rabbit heart than the original pericardial exudate. This is presumably due to greater concentration of the virus. Numerous control injections have been made in rabbits injected intravenously with normal human blood, normal allantoic fluid, vaccinia virus, Theiler virus, influenza virus and similar substances. Such injection has not produced cardiac lesions identical with those following injection of the "rheumatic" virus.

MacNeal does not draw a conclusion from these data as to the probable relation of the virus to acute rheumatic disease. He merely reports his results as exemplifying the type of virus research that will be necessary before the presumably complex etiology of rheumatic infection can be determined.

1. Schlesinger, Bernard; Signy, A. G., and Amies, C. R.: Lancet **1**: 1145 (May 18) 1935.
2. MacNeal, Ward J.; Blevins, Anne; Slavkin, Alice E., and Scanlon, Helen: Science **101**: 415 (April 20) 1945.

SOME MALINGERERS COME HOME

Following World War I many a young man mentally disturbed by the trials and tribulations of military service appeared in the offices of physicians throughout the nation with symptoms that indicated loss of vision or of hearing or of locomotion or other activities of the body. The public dismissed these incidents in most cases with the trite appellation of "shell shock." This time they only shrug their shoulders and say "NP." One such soldier at the end of World War I, presumably blind, claimed to have recovered his sight through a single manipulation by an osteopath. Innumerable cases of loss of hearing recovered following something called the airplane treatment of deafness; they were taken 6,000 or 8,000 feet in the air; the airplane was permitted to make a sudden descent; when the passenger dismounted, he had recovered his hearing.

Apparently many people forget that there is such a thing as the power of suggestion which may strangely influence the sensations and activities of the human body. Many physicians lose sight of the diagnosis of hysterical paralysis. A recent instance concerns a young man who enlisted in the Marine Reserves late in 1943. After two or three months some hearing tests were made. When he missed some of the words he was sent to a physician. The physician told him that he would be totally deaf within one year. He was discharged from the Marine Reserves because of deafness. He was given attention by this physician over a considerable period and apparently recovered his hearing by the use of a bone conduction instrument strapped to his wrist. Indeed, he reported that he had been exhibited at a meeting of the New York Academy of Medicine, Section on Otolaryngology, as a remarkable case. Finally, he was tested recently with the apparatus known as the "lie detector," which indicated his ability

as a prevaricator. His hearing has been perfect ever since the experience with the lie detector.

The incident is here cited merely as another warning to the medical profession of the possible increase in malingering likely to appear with the discharge of many millions of men from military service.

ARTERIOSCLEROSIS

The vascular disorders grouped under the name of arteriosclerosis are becoming increasingly more important from the medical, social and economic point of view as a result of the growing proportion of older people in the population. In addition, the increasing concentration of the population in urban industrial areas has led to greater contact with factors which tend to promote this condition. Hueper [1] has published recently a series of papers reviewing this subject. As arteriosclerosis seemed to be a natural sequence of aging, senescence was early looked on as a causative factor in this condition, a view which, according to Heuper, was responsible for the stagnation in its investigation. This theory has been discarded by most investigators, since appreciable arteriosclerosis is not a constant phenomenon of old age. For any age group definite relation between the degree and distribution of senile vascular changes and arteriosclerotic changes has not been established. A toxin theory has also been proposed; in addition to bacterial toxins many substances of chemical nature, such as tyramine and digitalis, may exert direct toxic effects on the vascular walls.

A number of recent investigators have been concerned with the hydrostatic and dynamic factors of blood flow and their relation to the appearance of arteriosclerosis. The muscle tone of the blood vessels is an important factor in predisposing to arteriosclerosis. Many endogenous and exogenous factors which may influence vasotonia have been cited by investigators as playing some role in this disorder. Evidence has been published indicating that either a general or a local hypertonia, if of sufficient intensity, will cause changes of an arteriosclerotic nature. The hypotonia causes a reduction in blood supply and in pulse pressure, which will lead to an ischemic anoxemia of the blood vessel wall. On the other hand, hypertonia may lead to an ischemic anoxemia by compressing the vasa vasorum against the unyielding adventitia. This local anoxemia of the blood vessel wall is believed to be an important etiologic factor.

Another concept attributes arteriosclerosis to anoxemia which may be produced in the blood vessel wall by an aberration of the normal colloidal state of the blood. This disturbance causes an impairment of the exchange of oxygen and nutritive substances between the vessel wall and the blood by interposing either a film or a precipitate composed of colloids normally present in the blood stream, thus reducing the permeability of the vessel wall. This hypothesis has added interest since highly polymerized macromolecular carbohydrates have been suggested as plasma substitutes. After repeated doses these substances may cause plasma colloid disturbances which give rise to atheromatous changes in the blood vessel walls.

The wide distribution of arteriosclerosis coupled with its increasing incidence should give studies on this problem a high priority. Owing to its polyphasic nature it, like cancer, will probably require the cooperation of both the clinical and the laboratory investigators to elucidate the cause and point to measures of prevention.

1. Hueper, W. C.: Arteriosclerosis, Arch. Path. **38**: 162 (Sept.), 245 (Oct.), 350 (Nov.) 1944; **39**: 51 (Jan.), 117 (Feb.) 1945.

Current Comment

EPIDEMIC MYALGIA, OR PLEURODYNIA

The records of this disease were reviewed editorially eleven years ago.[1] Since then a number of typical new outbreaks have been reported in this country and in Europe. The wide distribution of the disease in temperate climates is illustrated also by an outbreak in New Zealand.[2] The occurrence of the epidemics in the summer time, July and August especially, led de Rudder [3] to raise the question whether pleurodynia may not be a variant of epidemic poliomyelitis. The symptoms are however so different that poliomyelitis and pleurodynia must be regarded as etiologically distinct diseases. In reports of epidemics of pleurodynia, as in Illinois,[4] Massachusetts,[5] Missouri [6] and elsewhere, involving hundreds of cases, mostly in children, mention is not made of any simultaneous cases of poliomyelitis. This question as well as other problems of the nature of pleurodynia await the results of special investigations. So far there does not seem to have been made any biopsy or postmortem examinations in pleurodynia, and there seems to be no known record of any death from the disease. The clinical characteristics of epidemic pleurodynia were studied thoroughly by Locke and Farnsworth [5] in an explosive outbreak of 121 cases among the students of Williams College. The clinical type was constant: sudden onset with pain, fever and headache as the cardinal symptoms, the pain being the most characteristic and referable directly to the pleural covering of the diaphragm, hence in this instance at least the term epidemic pleurodynia seeming particularly appropriate. Clinically fibrinous pleuritis was demonstrated in 17 cases. Others have stressed tenderness, local swellings and firmness of hypogastric

1. Epidemic Myalgia, or Pleurodynia, editorial, J. A. M. A. **102**: 460 (Feb. 10) 1934.
2. Akel, R. N.: Epidemic Pleurodynia. Report of Outbreak at Royal New Zealand Air Force Station in Marlborough, New Zealand M. J. **43**: 289 (Dec.) 1944.
3. de Rudder, B.: Myalgia acuta epidemica und epidemische Poliomyelitis, Klin. Wchnschr. **16**: 585, 1937.
4. Kirkwood, T., and Stoll, G. G.: Epidemic Pleurodynia in Illinois, Illinois M. J. **69**: 29 (Jan.) 1936.
5. Locke, E. A., and Farnsworth, D. L.: The Clinical Characteristics of Epidemic Pleurodynia, Tr. A. Am. Physicians **51**: 399, 1936.
6. Hawkins, G. W., and Harms, F. L.: Epidemic Pleurodynia in Charlton County, J. Missouri M. A. **34**: 121 (April) 1937.

and epigastric muscles, as indicated by the term epidemic myalgia. In the Williams College as well as other epidemics the infection appears to have been spread by contact, but exactly how is not known. A rather mild redness of the pharynx has been noted in certain cases. No doubt unrecognized cases are frequent as well as carriers.

REPORT OF NUTRITION FOUNDATION

The Nutrition Foundation, Inc., has now completed its third year of organization. The original membership of fifteen food manufacturers has increased to twenty-two, with a similar number of sustaining members and seven donors. The objective of the organization has been to support independent research and education in nutrition. Basic information valuable to the food industry and important in public health has been acquired. An impressive number of studies related to many aspects of nutrition are being supported in university centers. These projects cover such subjects as determination of the basic human food requirements, utilization of nutrients within the body, food needs under special conditions and the relationship of food to health. Other projects are assisting the military forces in the solution of nutritional problems directly related to the war. *Nutrition Reviews*, the monthly publication of the foundation, provides authentic information about nutrition, keeping the general worker abreast of significant developments in nutritional research. Foreign language editions are prepared for distribution in Central and South America. This cooperative effort of the food industry makes possible a systematic study of nutritional problems. The closer relationship existing between the research laboratory and the food industry will result in nutritional betterment of the population.

QUANTITATIVE CLINICAL MICROCHEMISTRY

As late as 1912 a reliable blood sugar method required 100 cc. of blood; a glucose tolerance test, run in duplicate under these conditions, would require 800 to 1,600 cc. of blood. Biochemists, among them Folin, Benedict and Van Slyke, developed micro methods through which clinical chemistry became a practical diagnostic tool. The demand for quantitative chemical studies then increased greatly in both number and types of determinations, with a concomitant increase in the amount of blood required. Furthermore, studies were now being undertaken on infants and children from which only small samples were obtainable. By refining the usual blood chemical methods it has been possible to develop ultra micro methods which require only 0.1 cc. of serum or plasma. Using this extremely small sample for each determination, Sobel [1] has outlined methods for the determination of calcium, phosphorus, nitrogen, urea and total base in the blood. In these methods the speed is usually increased and the technic is not highly complicated. The advantages of the ultra micro methods will be that a more adequate evaluation of the chemical status of a patient can be obtained with fewer samples and in a shorter time.

1. Sobel, A. E.: Indust. & Engin. Chem., Anal. Ed. **17**: 242 (April) 1945.

THE HISTOLOGIC ENVIRONMENT OF CANCER OF THE BREAST

Through the application of suitable histologic diagnostic technics accurate differentiation between cancerous and noncancerous lesions in the breast is possible, provided the training, the experience and the judgment of the pathologist are equal to the task. This optimistic statement cannot be made with regard to so-called precancerous lesions, in spite of diligent investigation by those who have so successfully solved the problem of the histologic recognition of cancer. We possess neither the data nor the experience necessary for biologic predictions in this field. Foote and Stewart [1] have tried to find out whether there is, in their own words, "a characteristic soil in which mammary carcinoma is apt to develop." In this investigation of the histologic environment in which cancer of the breast is found Foote and Stewart have relied chiefly on anatomic and statistical methods, but they have supplemented their anatomic observations by a study of the changes in the breasts of 9 women under treatment with estrogenic substance. The material used by these workers in their anatomic and statistical studies consisted of 300 breasts removed at operation for cancer and 200 specimens of noncancerous breast tissues obtained through either partial or total mastectomy. This material was compared in great detail, especial attention being paid to the occurrence in the cancerous and noncancerous breasts of histologic changes that have long been suspected of being intimately related to the genesis of cancer. These include atrophy, cysts, duct papilloma, blunt duct adenosis, apocrine alteration of the epithelium, sclerosing adenosis, periductal mastitis, estrogenic reaction and certain other epithelial proliferative changes in the mammary lobules. A critical analysis of the data accumulated from this comprehensive study failed to show with any degree of certainty either that cancer may be expected to occur when there exists in the breast a histologic environment characterized by the presence of any one, or any combination, of the various structural alterations just listed, or that the development of cancer in the breast is related in any way to estrogenic hormonal influences. It did not prove the absence of such relationships. The contribution lies in the essentially negative outcome of the attempt of these workers to determine what is and what is not a precancerous lesion in the breast. Pathologists will be better informed and more conservative in their recommendations, surgeons will be more hesitant to perform mutilating operations, and general practitioners and internists will be less frequently called on to make embarrassing explanations to patients and their families when the full significance of the findings of Foote and Stewart in this comprehensive study of cancerous and noncancerous breasts becomes widely appreciated. Studies such as this emphasize again the important fact that the two basic pathologic processes hyperplasia and neoplasia, seen so frequently in breasts, are not just simple histologic variants but instead are essentially different biologic processes, which can be differentiated and evaluated only in terms of biologic units of measurement.

1. Foote, F. W., and Stewart, F. W.: Comparative Studies of Cancerous versus Noncancerous Breasts, Ann. Surg. **121**: 6 (Jan.) 1945.

MEDICINE AND THE WAR

ARMY

WHOLE MILK FOR PATIENTS ON HOSPITAL SHIPS

The War Department recently announced that a new method of quick-freezing whole milk is now making it possible to serve this beverage to wounded soldiers returning from overseas on Army hospital ships. This welcome and important addition to the diets on the hospital ships resulted from a series of researches carried out by the Veterinary Division of the Office of the Surgeon General.

Although the milk in some instances has been kept in the frozen state for three months, its taste is as fresh as if it had just come from the cow and the bacterial count is lower than that in the average milk supply of the average American home.

Approximately 30,000 pints of frozen whole milk is now being shipped monthly from Charleston and Boston, and additional large amounts from New York, New Orleans, San Francisco and Seattle.

While the milk is intended for the hospital ships, some of it, when the situation makes it possible, will be sent to overseas hospitals as well. Later it is expected to enlarge shipments for the hospitals. In addition, 400,000 pints is being shipped monthly to Alaska for the general use of American troops stationed there.

PROTECTION AGAINST SCRUB TYPHUS MITE

The War Department recently announced that the Office of the Quartermaster General, on recommendation of the Office of the Surgeon General, is replacing dimethyl phthalate with benzyl benzoate for use in clothing impregnation for protection of troops against the scrub typhus mite, so prevalent in the South Pacific. Clothing impregnated with benzyl benzoate will withstand more launderings before treatment is necessary than those impregnated with dimethyl phthalate. Clothing is dipped in an emulsion of 5 per cent benzyl benzoate in water. One treatment is effective for about two weeks.

1882d SERVICE UNIT RECEIVES AWARD

The 1882d Service Unit, Regional Hospital, Camp Maxey, Texas, was recently cited for superior performance of arduous duties in the care of injured persons resulting from a tornado at Antlers, Okla., April 12, 1945. The devotion to duty displayed by the hospital personnel and the numerous patients who volunteered their services, while coping with a serious situation created by this disaster, adds another achievement to the long list already attained by the Medical Department in war and peace.

ARMY AWARDS AND COMMENDATIONS

Colonel Crawford F. Sams

Col. Crawford F. Sams, chief of the planning branch, Supply Division, was recently awarded the United States of America Typhus Commission Medal. His citation declares that Colonel Sams "rendered distinguished service from January to August 1943 in connection with the work of the United States of America Typhus Commission. As chief surgeon at headquarters of the United States Army Forces in the Middle East, he aided the commission personally and administratively in establishing its first field headquarters at Cairo, Egypt. He assisted in the organization of the commission's early studies of typhus control in Egypt and put at the disposal of the commission essential facilities for all of its investigations. During the critical period of the initial activities of the commission in his theater of operations overseas, Colonel Sams contributed sound advice and guidance based on his expert knowledge of the problems to be solved. His assistance was a direct aid to the advancement of typhus control." Dr. Sams graduated from Washington University School of Medicine, St. Louis, in 1929 and has been in the service since July 1, 1930.

Lieutenant Colonel Robert E. Lyons Jr.

The Legion of Merit was recently awarded to Lieut. Col. Robert E. Lyons Jr., formerly of Shreveport, La., for "Services as chief of the medical record division, Eighth Air Force, from July 1942 to December 1943. He devised methods of compiling wound and injury data from sick and wounded reports and field medical records which resulted in a complete medical record of Eighth Air Force combat wounds. The major portions of the body receiving wounds were indicated by percentages, representing a total of all wounds. This important record revealed that a large proportion of serious and fatal battle wounds among air crews was caused by relatively low velocity missiles incurred in an area of the body that could be protected by armor. Based on this study, individual armor equipment for the protection of air crew members was developed and standardized throughout the Eighth Air Force. By constant review of medical records, he continually developed new methods of presenting and interpreting statistical data. He charted the geographic incidence and sources of injuries and diseases which resulted in an immediate intensification of the venereal disease program in all areas. He utilized the material in the revised care of flier report to prepare charts and data which contributed greatly to the reduction of frostbite and anoxia, thereby increasing the training level of combat crews before their shipment to the theater. He further conducted exhaustive research in the development of accurate attribution tables for air crews of heavy bombardment units by reviewing the combat history of hundreds of crew members in each crew position throughout their entire combat careers. After an enormous amount of work and research he completed the report which served as a temporary basis for computing replacement requirements and proved invaluable to the Army Air Forces material and services commands. By his untiring efforts, competent grasp of the situation and high devotion to study he contributed materially to the outstanding success of the aerial offensive against the enemy." Dr. Lyons graduated from Loyola University School of Medicine, Chicago, in 1937 and entered the service Oct. 24, 1940.

Lieutenant Colonel Douglas B. Kendrick Jr.

The Legion of Merit was recently awarded to Lieut. Col. Douglas B. Kendrick Jr., formerly of Washington, D. C. According to the citation, "while serving as chief of the division of surgical physiology, Army Medical School, Army Medical Center, Washington, D. C., from March 1, 1941 to Nov. 1, 1942 he distinguished himself by performing the duties of that office in an exceptionally meritorious manner by developing the program of the Army for obtaining adequate supplies of liquid and dried plasma, by developing the package for dried plasma, by developing the method for obtaining and processing liquid plasma and by establishing plasma centers for the zone of the interior, which has reflected great credit on him and on the military service." Dr. Kendrick graduated from Emory University School of Medicine, Atlanta, Ga., in 1931 and entered the service Dec. 7, 1936.

Major Bernard Rogoff

Major Bernard Rogoff, formerly of Ozone Park, N. Y., was recently awarded the Bronze Star Medal "for meritorious service in connection with military operations against an armed enemy at ——, Burma, from March 26, 1944 to April 8, 1944. During this thirteen day engagement Major Rogoff was commanding officer of the Medical Detachment of the 2d Battalion, —— Composite Unit. Major Rogoff displayed outstanding courage and judgment in the efficient handling of many

ous casualties at a time when evacuation was impossible and the aid station was subject to constant hostile fire. His calm courage, exhibited under most adverse circumstances, was inspiring to the wounded and to his own men and contributed largely to the superior performance of the detachment. Major Rogoff's conduct reflects great credit on himself and on the armed forces of the United States." Dr. Rogoff graduated from the University of Geneva, Switzerland, in 1936 and entered the service June 1, 1940.

Colonel Byron L. Steger

Col. Byron L. Steger, commanding officer of the 51st General Hospital in the Southwest Pacific, was recently awarded the Legion of Merit. The medal was given in recognition of his services from November 1942 to October 1943, when he was director of medical training at the Army Service Forces Unit Training Center, New Orleans. Dr. Steger graduated from Ohio State University College of Medicine, Columbus, in 1933 and entered the service Dec. 1, 1934.

Major Charles W. Yost

Major Charles W. Yost, formerly of Portland, Ore., was recently awarded the Bronze Star for meritorious service as Regimental Surgeon. The citation reads in part that "in the direction and supervision of medical service in combat and in the evacuation, care and treatment of the sick and wounded the leadership, judgment and devotion to duty displayed by Major Yost have been of superior quality." Dr. Yost graduated from the University of Cincinnati College of Medicine in 1938 and entered the service Dec. 9, 1940.

Captain George H. Lage

An Oak Leaf Cluster to the Purple Heart was recently awarded to Capt. George H. Lage, formerly of Portland, Ore., because of his second wound. Dr. Lage also holds the Silver Star and shares in the Presidential Citation given his unit for its services in the invasion of Normandy as well as the Oak Leaf Cluster for its part in the invasion of the Netherlands. Dr. Lage is now on limited duty with a hospital in England. He graduated from the University of Oregon Medical School, Portland, in 1939 and entered the service Sept. 22, 1942.

Captain Frank R. Hanrahan

Capt. Frank R. Hanrahan, formerly of Cleveland Heights, Ohio, was recently awarded the Bronze Star for "heroic achievement in connection with military operations against the enemy during his division's historic reduction of Metz." He directed operations of a battalion aid station in a highly distinguished manner, despite continuous exposure to enemy fire, and his heroic performance of duty was instrumental in saving many lives. Dr. Hanrahan graduated from Western Reserve University School of Medicine, Cleveland, in 1942 and entered the service July 16, 1943.

Colonel Norton Canfield

Col. Norton Canfield, formerly of New Haven, Conn., was recently awarded the Bronze Star for meritorious service. He is senior consultant in otolaryngology in the office of the chief surgeon at a base overseas. Dr. Canfield graduated from the University of Michigan Medical School, Ann Arbor, in 1929 and entered the service Dec. 1, 1942.

Captain Logan E. Jackson

Capt. Logan E. Jackson, formerly of Portland, Ore., was recently awarded the Bronze Star "for meritorious service in France. An outstanding example of Captain Jackson's leadership and cool judgment is the fact that he has not had a man lost through enemy action during the many combat engagements of this unit." He is commanding officer of a collecting company attached to the 35th Infantry Division and was with the 3d Army in its sweep through the Normandy beachhead and France and into Germany. Dr. Jackson graduated from the University of Oregon Medical School, Portland, in 1943 and entered the service Dec. 26, 1943.

NAVY

MARINE CORPSMAN INVENTS NEW TYPE STRETCHER

A new type stretcher, invented by Navy Chief Pharmacist's Mate John A. Gallegher and known as the Gallegher stretcher, is now being used daily over the tortuous hillside trails and down cliff-like embankments from which Marines are forced to root out encaved enemy machine gun and artillery nests. It is carried by from one to six men, can be used rigid or otherwise, and may be lowered by rope with the patient fully secure.

The stretcher weighs 4 pounds 6 ounces. It is transported in a small pack attached to the cartridge belt. Poles are inserted into its lengthwise seams if rigidity is preferred. Bamboo, usually abundant in the South Pacific, is used often. Three overlapping straps secure the patient in the lying position, while two other straps may be fastened around the thighs, similar to the way a parachute harness is applied, if the wounded man is to be lowered by line over an embankment.

Navy Chief Pharmacist's Mate John A. Gallegher, formerly of Brooklyn, is attached to Major Gen. Lemuel C. Shepherd's Sixth Marine Division. He has been in the service twelve years, eight of which were spent with the Marine Corps. He received a commendation for evacuating wounded from in front of the line of battle at Tulagi.

NAVY AWARDS AND COMMENDATIONS

Lieutenant Ralph W. Getty

Lieut. Ralph W. Getty, formerly of Syracuse, N. Y., was recently awarded the Bronze Star for his work during the Saipan and Tinian operations, where he was attached to the Fourth Marine Division. Dr. Getty graduated from Syracuse University College of Medicine in 1941 and entered the service July 14, 1942.

Lieutenant James S. Cate

The Bronze Star was recently awarded posthumously to Lieut. James S. Cate (DC), U.S.N.R., formerly of Baker, Ore. The citation accompanying the award read "For heroic service while attached to the 23d Marines, 4th Marine Division, during action against enemy Japanese forces on Saipan and Tinian Islands, Marianas Group, from June 15 to July 23, 1944. Voluntarily accompanying the regimental medical section in extremely hazardous operations, Lieutenant Cate repeatedly went to the aid of the wounded despite the peril of intense enemy artillery and mortar fire. With calm courage he skilfully treated and evacuated the stricken men, continuing his heroic efforts until he himself was mortally wounded. Lieutenant Cate's valiant conduct and cool disregard for his own personal safety were in keeping with the highest traditions of the United States Naval Service. He gallantly gave his life for his country."

Commodore William W. Hargrave

For serving as medical officer in command of the United States Naval Hospital, Pearl Harbor, Territory of Hawaii, and later as medical officer in command of the United States Naval Hospital, Aiea, Territory of Hawaii, Commodore William W. Hargrave, formerly of Philadelphia, was recently awarded the Legion of Merit, the citation reading "for exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as medical officer in command of the United States Naval Hospital, Pearl Harbor, T. H., from Aug. 17, 1943 to July 3, 1944 and as medical officer in command of the United States Naval Hospital, Aiea, T. H., from July 4, 1944 to Feb. 9, 1945. A counsellor and director of rare understanding and broad vision, Commodore (then Captain) Hargrave exercised unfailing tact and wisdom in the administration of both hospitals and, applying his special knowledge with skill and judgment, created and maintained exceptionally high standards of professional service to the patients under his command. By his close personal

supervision, his sympathetic concern and genuine interest in the individual welfare and morale of personnel, Commodore Hargrave inspired and encouraged the rapid rehabilitation of patients essential to the successful prosecution of the war against Japan." Dr. Hargrave graduated from the Medical College of Virginia, Richmond, in 1912 and has been in the service since Nov. 2, 1914.

Commander Arthur Proctor Black

Comdr. Arthur P. Black, formerly of El Paso, Texas, was recently awarded the Bronze Star "for heroic service as senior medical officer in charge of a field hospital in northeastern China. Attached to the U. S. Naval Group, China, from Aug. 15, 1943 to Dec. 6, 1944, Commander Black was assigned the duty of organizing and establishing a field hospital in a forward area in the spring of 1944. Although handicapped by poor transportation facilities and the necessity of having most of the hospital equipment and fixtures made locally, he achieved exceptional success in carrying out this difficult project, effectively treating many Americans, some of them escaped from enemy concentration camps, and saving the lives of many wounded Chinese. His exceptional ingenuity, leadership and professional skill under difficult and, at times, adverse conditions were in keeping with the highest traditions of the United States Naval Service." Dr. Black graduated from Johns Hopkins University School of Medicine, Baltimore, in 1926 and entered the service June 10, 1941.

Commander Raymond R. Callaway

Comdr. Raymond R. Callaway, formerly of Birmingham, Ala., was recently awarded the Legion of Merit for his direction of five medical companies while under fire on Guam. The citation mentioned "exceptionally meritorious conduct in the performance of outstanding service . . . during the attack on Guam . . . from July 21 to Aug. 10, 1944. During the planning for the operations against the enemy on Guam he indoctrinated, trained and brought to a high state of efficiency and morale the personnel of the medical battalion. . . . He commanded, coordinated and supervised the activities of the five medical companies in such a manner as to assure prompt and efficient treatment of casualties. During the organized enemy attack on the division hospital on the morning of July 26, 1944 he organized the defense by hospital corps personnel and supervised the evacuation of casualties from the combat zone. All through this period he was frequently exposed to rifle, machine gun and mortar fire and without regard for his own safety contributed greatly to the defense of the hospital area. He displayed high professional skill and sound judgment as commanding officer of the five medical companies of the medical battalion and by his leadership and example contributed materially to the success of this campaign. . . ." Dr. Callaway graduated from the University of Illinois College of Medicine, Chicago, in 1928 and entered the service Dec. 1, 1941.

MISCELLANEOUS

FIGHT DISEASE IN GERMANY

American personnel, displaced persons and German prisoners of war are being safeguarded against communicable diseases and tuberculosis under a sanitation program directed by 5th Infantry Division medical officers in that part of the Ruhr controlled by the 5th.

Lieut. Col. Enos G. Walker, Detroit, division surgeon, and Lieut. Col. Howard H. Base, commanding officer of the 5th Medical Battalion, are directing the sanitation program for Allied personnel, the division's three displaced persons camps and seven Allied prisoner of war camps. By installation of an adequate diet and sufficient sanitation and medical facilities, the 5th Division team has cut the death rate 65 per cent a day in one prison camp.

About 75 persons are evacuated each day in the Hemer prison camp, Colonel Walker said. Of this number about 65 prisoners are suffering from dysentery and 6 from typhus. Small hospitals are being established in the vicinity of prison camps.

Guarding against the spread of typhus the division medical group is delousing thousands of displaced persons daily through use of DDT powder. Allied medical personnel are being assisted in prisoner of war camps by German medical units which have set up their own dispensary facilities, using American supplies and working under 5th Division supervision.

Buildings in the 5th's area of control are being sprayed with DDT powder to destroy breeding places of the typhus carrying louse. In addition to other precautions, men of the division are being educated to take precautions against being bitten by the lice because typhus inoculations are not 100 per cent preventive against the disease.

SELECTION OF FLYING PERSONNEL

Medical representatives of major airlines and aircraft manufacturers, members of the Airline Medical Directors Association, recently met at the Army Air Forces School of Aviation Medicine, Randolph Field, Texas, to study the methods that the Army Air Force has found most effective in the selection of flying personnel and the maintenance of their health.

Following an introductory address of Brig. Gen. Eugen G. Reinartz, commandant of the School of Aviation Medicine, individual members of the staff lectured on topics in which they specialize. The conference was held to aid the civilian doctors in preparing for the increasingly important role which they will play in postwar aviation. The problem of the "combat returnee and his place in postwar aviation" was one of the major topics of the conference.

MEDICAL AND HEALTH EXPERTS SENT TO CHINA

Herbert H. Lehman, Director General of the United Nations Relief and Rehabilitation Administration, recently announced that arrangements have been completed to send thirty medical and health experts to China to train personnel in medical centers to be established by the Chinese government. UNRRA will provide the essential medical supplies to equip the training centers. Shipment of these supplies has already started. It is estimated that within the coming months some 90,000 pounds of medical equipment will be sent to China.

The Chinese government plans to establish training centers in Chungking and Chengtu early this summer and later in Kweiyang. When Nanking and Peiping are liberated from Japanese control, other centers will be established in these cities. Short intensive courses averaging from six to eighteen months will be given to people recruited in China by the Chinese government. Refresher courses for medical practitioners, public health courses for recently graduated doctors and nurses who have not had public health experience, technical courses for partially qualified doctors and nurses and training courses for attendants, nurses and midwives will be given.

One of China's most serious needs is for skilled medical and technical personnel, and provision of foreign experts is part of the relief and rehabilitation program for China. Even before the Japanese invasion, China's public health services were inadequate for her population, and there was a shortage of doctors and nurses, medicines and hospital equipment. Now after eight years of war it is estimated that there is only 1 doctor for every 40,000 persons in China and 1 hospital bed for every 10,000 persons. War action has wrecked sewage disposal plants and contaminated water supplies. Up to 40 per cent of the hospitals in China have been destroyed or looted. The danger to national health will be even greater when the millions of Chinese who have been driven from their homes start their return. It has been estimated that China will need to train roughly 35,000 technicians in the next four years to administer her medical relief program.

For this program UNRRA is now recruiting medical experts in the United States, Great Britain, Australia and Canada. The recruits include surgeons, physicians, dentists, nurses, sanitary engineers, hospital and public health administrators and other specialists of various kinds. First to be sent to China will be the men with general medical experience. The specialists will follow later after the training programs are set up.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

June 11, 1945.

Veterans Administration Probe Continues Despite Bradley Appointment

Investigation of the Veterans Administration will continue despite appointment of Gen. Omar N. Bradley to replace Brig. Gen. Frank T. Hines, who is to be given another assignment by President Truman. Chairman John E. Rankin of the House Committee on World War Veterans Legislation said that the change in chiefs would not affect the inquiry into the agency prompted by allegations of mismanagement of hospital and medical facilities.

Inadequate Hospitalization Found by Veterans of Foreign Wars

In its findings on conditions in Veterans Administration hospitals, to be released tomorrow, the Veterans of Foreign Wars reports that inadequate hospitalization for discharged veterans were found in 47 per cent of the hospital facilities operated by the Veterans Administration. Its survey, like the legion investigation, was conducted at the invitation of Brigadier General Hines. "We find grave conditions that must be corrected immediately," said Joseph M. Stack of Pittsburgh, Senior Vice Commander in Chief of the Veterans of Foreign Wars. "As we anticipated, the report underlines the shocking need for construction of a large number of new facilities and the desperate shortage of trained medical and service personnel. Management of the hospitals, both in the Veterans Administration central office and in the field, is subject to considerable, apparently justified, criticism. Unconfirmed allegations of abuse and mistreatment of veteran patients dot the individual state reports. But, while our overall survey discloses singularly few substantiated cases of mistreatment, there are too many instances of alleged and physical abuse cited for the Veterans of Foreign Wars not to demand an immediate sympathetic investigation of every charge by an impartial, authoritative body." The organization advocated an "undercover" probe, assuring immunity to each complainant.

Reorganization of Veterans Medical Division Urged

The entire Veterans Administration medical division should be reorganized and a medical man of the highest professional caliber should be appointed to direct hospitalization, treatment and care, the American Legion will recommend tomorrow to the House committee investigating the Veterans Administration. In a dual report prepared for release on June 12 the legion proposed (1) a list of eleven recommendations based on the results of a hospital and medical survey ordered by National Commander Edward N. Scheiberling in the nation's ninety-seven veterans' facilities and (2) a ten point administrative program calling for an administrator and six instead of three assistant administrators and also decentralization of much detail to eliminate red tape. "Hospital treatment and care should be at the same high level as that in the famous Mayo Clinic and Johns Hopkins Hospital," the report stated. The legion claims that veterans' hospitals are suffering from lack of medical personnel, red tape, staff dissension at some points, overcrowding and such low pay scales that staff morale is adversely affected. In some instances there is urgent need for latest scientific equipment. The legion recommended that the outstanding medical man to be assistant administrator or to have equal status should head the medical, surgical, clinical, dental, hospital and domiciliary services.

Veterans Administration Official Denies Charges

Magazine articles by Albert Q. Maisel criticizing treatment given ex-servicemen in the Veterans Administration were branded by Director John H. Baird of Veterans' Neuro-Psychiatric Hospitals as "distortions of the truth, half-truths and malicious falsehoods" during his testimony before the House Veterans Committee. "Mr. Maisel's articles," he said, "should be entitled 'Third Rate Lying and Slander for Money and Undisclosed Purposes' instead of 'Third Rate Medicine for First Rate Men.'" He further told the committee "Do not understand that I am contending that the care and treatment of our patients is all that we desire. Progressive medicine calls for continuous change and improvement. What I am telling you is that we are not practicing third rate medicine." He further stated that he was "not entirely satisfied" with the doctors under his control. He claimed that Civil Service standards are too loose to permit him to hire the type of physicians he required and he urged the committee to approve the pending bill to take Veterans Administration medical divisions out of the Civil Service System.

Approval of Permanent Postwar Scientific Research

A permanent postwar program of scientific research and development has been appoved by the House Military Affairs Committee. It authorized an annual expenditure of $8,000,000 for work to be conducted by the National Academy of Sciences through a research board made up of civilians of outstanding accomplishments" and Army and Navy representatives. President Truman has given War Mobilization Director Fred M. Vinson responsibility for reviewing scientific and technical information so that information which has been restricted for security reasons can be given to the public. The idea behind the executive order is to release details of scientific and technical progress developed during the war by the government. The Navy Department reports that it has formed a new Office of Research and Inventions to develop weapons and battle technics for use in the event of another war. The new office mérges the Naval Research Laboratory, the Special Devices Division of the Bureau of Aeronautics, the Office of Research and Development and the Office of Patents and Inventions. Navy Secretary James V. Forrestal will have direct supervision, while Rear Adm. Harold Bowen, known for his work with radar, will head the new office. The War Production Board also reveals that its Office of Production Research and Development has participated and cooperated in developing methods for increasing domestic production of quinidine and in developing superior processes for manufacture of DDT, and also helped to create a successful rubberless adhesive, using non-critical materials.

President Warns That Chemicals Should Remain on Critical List

In his outline of the war situation President Truman warned that certain chemicals, along with food, clothing, petroleum products and lumber, will remain on the critical list until the defeat of Japan. They are among a number of items, he said, in which there will be little lessening of demand for an indefinite period.

Capital Notes

Edward D. McKim, chief administrative assistant to President Truman, has denied that "politics" influenced the recent announcement that a new veterans' hospital would be constructed in eastern Montana.

An annual life insurance fund to be devoted to promotion of medical research was announced here by M. Albert Linton.

chairman of the joint Medical Research Committee of the American Life Convention and the Life Insurance Association of America. Half a million dollars is expected to be the amount of the fund available each year. The exact amount will depend on the number of companies accepting the invitation to participate.

Sanitation of merchant ships will be handled under a unified engineering and inspection program announced by the United States Public Health Service and the War Shipping Administration.

National Rehabilitation Week, proclaimed by President Truman, is being held to direct attention to the plight of the physically handicapped.

The War Production Board announces that the production period during which nurses' uniforms may be manufactured has been extended ninety days, or until the end of September.

Postwar Medical Service

MINUTES OF MEETING OF MAY 12

The meeting of the Committee on Postwar Medical Service was called to order by the Chairman, Dr. Ernest E. Irons, at 10:04 a. m., Saturday, May 12, in the Board of Trustees Room of the American Medical Association Building in Chicago

There were present Dr. Irvin Abell, Dr. Paul C. Barton, Lieut. Col. Robert D. Bickel, Dr. Walter L. Bierring, Dr. Paul C. Bucy, Dr. F. F. Borzell, Dr. C. W. Camalier, Capt. C. W. Carr, Dr. Frederick A. Coller, Mr. Graham L. Davis, Dr. Morris Fishbein, Dr. Evarts A. Graham, Dr. E. L. Henderson, Mr. Thomas A. Hendricks, Dr. W. W. Herrick, Dr. Ernest E. Irons, Dr. Victor Johnson, Dr. Edwin P. Jordan, Lieut. Col. H. C. Lueth, Dr. James M. Mason, Col. Hugo Mella, Col. F. V. Meriwether, Dr. James E. Paullin, Brig. Gen. Fred W. Rankin, Rev. A. M. Schwitalla, S.J., Dr. R. L. Sensenich, Dr. H. H. Shoulders, Dr. LeRoy H. Sloan, Mr. Barry C. Smith, Dr. Olin West, Major Richard J. White, Dr. R. C. Williams and Dr. Fred C. Zapffe.

Approval of Minutes.—The Chairman presented the minutes of the meeting of the Committee on Postwar Medical Service held on March 17, 1945 as they had been circulated and stated that a correction in the wording of his remarks had been submitted by Col. G. F. Gessner, that copies of the minutes containing this correction were available to the members and that the correction had also been incorporated in the printed minutes which appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for May 12. The minutes as circulated, with the correction mentioned, were approved.

Membership.—It was announced by the Chairman that Lieut. Col. Gerard F. Gessner, who has attended meetings of the Committee as a representative of the Surgeon General's Office of the War Department, has been assigned to other duties, and that Lieut. Col. Harold C. Lueth, formerly liaison officer between the Office of the Surgeon General and the American Medical Association, has been designated to take Colonel Gessner's place. The Chairman also announced that Capt. C. W. Carr of the Great Lakes Naval Training Station was in attendance at the present meeting to represent the Bureau of Medicine and Surgery of the Navy in place of Capt. William E. Eaton, the regular representative; that Dr. Paul C. Bucy was again in attendance to represent the Advisory Board for Medical Specialties, and that Dr. Paul C. Barton, Executive Officer of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, represented that service in the absence of Miss Mary E. Switzer, who was unable to be present.

Further Report on Questionnaires Sent to Medical Officers.—Lieut. Col. H. C. Lueth presented the following brief report supplementing the report given at the previous meeting:

> The section of the analysis of the questionnaires returned by medical officers dealing with economics will be presented to the Editor of THE JOURNAL. (It appears on page 528 of this issue.) The matter of most importance in this section is the question of the median monthly salary. It was asked in the questionnaire how much money medical officers would desire if they were to be on a full time paid monthly basis. The median salary desired is $583 a month. The different graduation groups show a surprisingly small variation. An even smaller variation occurs among men from the smaller communities.
>
> Perhaps the most interesting feature is the problem of whether the medical officers wish to enter group or private practice. The analysis shows that the majority wish to go into private practice by themselves or in a group. The greatest majority want to practice in an individual capacity.

Colonel Lueth's summary was received and publication of the full report authorized.

Request of American College of Hospital Administrators.—The Chairman presented a letter from the American College of Hospital Administrators in which it was stated that that organization is conducting a survey of officers in the Medical Administrative Corps of the Army to determine their interest in hospital administration as a career on returning from service and in which also the request was made that pertinent information, including names and addresses contained in the questionnaires of the Committee on Postwar Medical Service, be made available to the American College of Hospital Administrators.

Mr. Graham L. Davis stated that the College of Hospital Administrators and the American Hospital Association are working with several universities to establish courses of training, at the graduate level, in hospital administration; that it is desired to find out how many medical officers would be interested in going into hospital administration when demobilized, and that it had been thought the questionnaires would be an excellent source for such information. Colonel Lueth said that unfortunately the records compiled from the returned questionnaires are not on a name basis and that it is not known who wishes certain courses but only how many. He suggested that it might be well to get in touch with the various separation centers through which every man to be released from service must pass. Dr. Paul C. Barton stated that the Procurement and Assignment Service sends a questionnaire to every man under its purview who is leaving active duty, that about 50 per cent are returned and that if any of the men should say anything about hospital administration the Procurement and Assignment Service would let them know about this opportunity.

Some members of the Committee thought that to furnish the information requested might be interpreted as violative of confidences, and it was the final opinion of the Committee that it would be inadvisable to grant the request of the American College of Hospital Administrators. A motion was adopted approving the reply of the Chairman, in which it had been stated that the overall values for medical officers interested in hospital administration could be obtained from the recently published analysis of the returned questionnaires.

Request from Publisher of "Industrial Medicine."—The Chairman presented a communication from the publisher of *Industrial Medicine*, who wishes to reprint in that periodical Colonel Lueth's report on "The Medical Officer and Future Industrial Practice," which appeared in THE JOURNAL, May 12. It was the opinion of the Chairman and of the Committee that this was a matter for decision by the Editor of THE JOURNAL.

Further Report on Educational Internship and Residency Opportunities for Medical Officers.—Dr. Victor Johnson presented the following report:

> The Council on Medical Education and Hospitals has completed an analysis of the facilities for advanced training of veterans requiring expansion as well as the degree of expansion required in each field to meet the demands indicated by the questionnaires returned from medical officers.

This report will be published in detail shortly. The areas in most acute need are in surgery and its subspecialties, where nearly 1,600 new residencies will be required, and in medicine and subspecialties, where nearly 1,100 new residencies will be required. Large numbers of places will be needed in rotating internships and in obstetrics and gynecology.

Reports from hospitals are continuing to come in and indicate a fair likelihood that the expansion needs will be met if all concerned continue as vigorously as they have in the past in planning for the postwar period. The Council is now engaged in following up the original circular to obtain information from a considerable number of hospitals which have not replied. It is anticipated that a list of available residencies for the postwar period will be incorporated into the regular list of such house officerships published annually by the Council in the Educational Number, which will appear this year early in September.

In review and refresher short courses it is evident that the most acute need for expansion lies in the field of courses of three to six months' duration. There appear to be available now a sufficient number of courses of shorter duration, especially those of a month or less.

The Bureau of Information and the Council on Medical Education and Hospitals are cooperating in a reporting system from hospitals which makes available at frequent intervals information concerning vacancies in house officerships. This system will supply the relatively few medical officers who return within the next few months with the information they desire until the complete published lists can be produced.

In addition to the plans made by hospitals and medical schools, several of the state medical societies are also planning to assist in the educational program after the war, partly by contributing to teaching programs in which individual members are involved, partly by offering short courses under the auspices of the state medical society and partly by establishing funds to supplement other stipends which might be available to the returning physician during the training period. A survey is being made of all state medical societies requesting the details of such programs as may be contemplated.

Dr. Johnson's statement was received as a continuation report.

Dr. W. W. Herrick informed the Committee concerning a tentative plan of the New York Academy of Medicine to organize courses in New York City that will not be under university management, and the Chairman said that he thought similar procedures were being taken in Chicago and no doubt in many other places. Dr. Fred C. Zapffe stated that, as Secretary of the Association of American Medical Colleges, he had sent out a number of memoranda to medical schools about refresher courses and had received replies from about a dozen schools, a number of which maintained that nothing could be done until members of the faculties now absent in war service had returned; others are working on plans. He was sure that the medical schools will be ready. In reply to a question from Dr. LeRoy H. Sloan as to what is being done for the men now being discharged, Dr. Johnson stated that this matter is being handled through the Bureau of Information and asserted that there is no difficulty at all just now, since the hospitals are short of house officers and the Procurement and Assignment Service has declared that discharged medical officers accepted as house officers by hospitals will not be included in the hospitals' quotas. It was brought out in the discussion that many hospitals did not seem to be informed of this decision of the Procurement and Assignment Service, so that when some of the discharged men have applied for places they have been told that the hospitals were bound by the Procurement and Assignment Service and could not extend their facilities or their residencies, which, under the quotas, were filled up for two or three years to come. Dr. Barton stated that announcements concerning the decision of the Procurement and Assignment Service had been sent out more than once but that he would circularize all the hospitals again at the earliest possible time. Father Schwitalla mentioned that the Veterans Administration has figures on the number of men who are now in schools and hospitals under the G. I. Bill of Rights, that this information could be obtained easily and that hospitals are now taking in men on a nonquota basis.

Report on Bureau of Information.—Dr. Olin West informed the Committee that the Bureau of Information is not receiving as promptly as it had hoped the master sheets that contain information that it was desired to have checked in the individual states. He thought the chief reason for this, however, was that the state society offices were operating with depleted personnel. He stated that the Bureau of Information intends to act in strict, cordial and persistent cooperation with the state and county medical societies. The returns that have come in from the state and county medical societies are for the most part extremely informative. Dr. West deplored the fact that the state records, the records of the Bureau of Information and the Army records are not altogether in agreement. He reported that a number of inquiries already had been received from medical officers who have completed their terms of military service and wish to secure information that will enable them to move into a location at once. They are interested in communities that are at present short of physicians. Dr. West stated "We want to guard as fully as we can against the filling of places of men who expect to return to their own homes; we don't want to put others in their places." Some of the states are developing and wish to operate their own plans, and he knew of no reason why they should not do so and also cooperate with the Bureau of Information. He doubted that the machinery was as yet fully set up in the states. It is the plan of the Bureau of Information to refer to the states the men who are looking for locations. The collection of pertinent information will proceed and in due time the Bureau will be in position to be of great help. Dr. West stated that, if the members of the Committee wished to have more detailed information concerning the Bureau of Information, Lieut. Col. R. D. Bickel, liaison officer, would be glad to supply it.

Dr. Barton informed the Committee that the Procurement and Assignment Service has for some time been trying to do something quite similar, that with respect to the discrepancies in the records the Procurement and Assignment Service has some fine field workers who do nothing but check the lists and that theoretically the lists which the Bureau of Information obtains from the local Procurement and Assignment workers when checked with the information available at American Medical Association headquarters should bring the records into agreement. Dr. Barton mentioned two points in connection with the program of the Bureau of Information, the first being the policy concerning men over 65 years of age. He thought that the majority of these older men are located in communities to which younger men will never be attracted and that to leave the former out of the picture is to cause distortion. His second point was that he was in agreement with Dr. West's contention that the practices of men now in service should be saved for them, but he wondered if in adhering strictly to that procedure the field was not left open for less professional practitioners. Dr. West then asserted that with respect to sending men into areas where physicians are needed the plan was to let the states settle that, that no pressure will be put on any community or state and that the whole plan is to be helpful to the men themselves.

Dr. James E. Paullin pointed out that the phase of the Committee's plans that is being carried on through the Bureau of Information can best be done ultimately at a state level; state organizations know the needs in a particular state; the redistribution of physicians in rural areas is important; a letter might be sent to state organizations stating the purposes of the Committee on Postwar Medical Service, particularly in the matter of location of physicians in needy areas.

Report of Subcommittee to Draw Up Recommendations to the Governors of the States Concerning the G. I. Bill of Rights.—Dr. H. H. Shoulders, chairman of the subcommittee, reported as follows: The letter that was prepared by the subcommittee along the lines agreed on at the last meeting of the Committee on Postwar Medical Service was incorporated in the minutes of that meeting and published as a part of the minutes in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for May 12. The letter was sent to the governors of each of the forty-eight states, to the president of the Board of Commissioners of the District of Columbia and to each territorial governor with the exception of the Virgin Islands and the Philippines. At the same time a copy of the "Governors Letter" was forwarded to the secretary and to the president of each constituent state and territorial medical association. Replies have so far been received from thirty-five governors and appear to be entirely favorable and cordial.

It was suggested by several present that follow-up letters should be sent to the state medical society secretaries, and Dr. Shoulders thought the governors might be asked to supply the committee with lists of those who are functioning as accreditors. No action was taken.

The report was received and the subcommittee continued.

Report of Subcommittee on Enrolment of Medical Students.—The Chairman announced that Dr. Victor Johnson would serve as chairman of the Subcommittee on Enrolment of Medical Students, and Dr. Johnson presented the following report:

There has been considerable delay in consideration of the Ellender bill by the Senate Committee on Military Affairs This bill was introduced late in February and seeks to correct the present policies and regulations which will either reduce medical school freshman enrolments materially in 1945 and drastically in 1946 or result in the admission of inferior applicants by some schools The delay was caused by failure of the Army, the Navy and the Selective Service System to communicate with the Senate committee expressing their views on the bill.

However, hearings were finally conducted on May 1. The Army, the Navy and the Selective Service System oppose the bill, contending that deferment of the few thousands involved would seriously hamper the war effort The measure was called unnecessary, since it was claimed that adequate numbers would be available for these classes without deferments Medical education was represented at the hearings by Dr Walter Bloedorn of the executive council of the Association of American Medical Colleges and Drs Harvey Stone and Victor Johnson of the Council on Medical Education and Hospitals of the American Medical Association Dr Johnson presented a joint statement over the signatures of Dr Fred C Zapffe and himself and in addition answered numerous questions by the senators Dr Stone reinforced and supplemented the contentions of the joint statement

As nearly as could be judged from the attitude of the senators, there appears to be considerable doubt that favorable consideration will be given the bill This is particularly true because of the strength of the opposition and not because of the individual opinions of the senators, who seemed impressed by the information provided them The hearings have been published, and it is planned that the committee will consider recommendations on this measure on Tuesday, May 15. Should this measure fail, attempts should again be made through adjustment of the regulations in the light of the altered military situation

Dr. Zapffe stated that he had received a telephone call from Washington the day before to the effect that the Ellender bill is unlikely to receive favorable action. A lengthy discussion ensued, during which Dr. Herrick stated that the New York Academy of Medicine is to have a meeting very soon at which this matter will be taken up, and Father Schwitalla read paragraphs from the report of his Subcommittee on Graduate Education of Physician Veterans, which he later presented in full.

Dr. C W. Camalier said that the American Dental Association is much interested and that the 1945 classes in dentistry were affected After further discussion Dr. Johnson stated that there is no intention of quitting now but that every opportunity will be taken to get some satisfactory adjustment

The Committee assented unanimously to the Chairman's appointment of Dr. Evarts A. Graham as an additional member of the Subcommittee on Enrolment of Medical Students.

It was Dr. Fishbein's opinion, in which the Committee concurred, that every possible means should be taken to acquaint the public—and not merely the medical profession—with the seriousness and urgency of this matter. Dr. Barton thought the Chamber of Commerce of the United States would assist in supporting any sort of program that the Committee on Postwar Medical Service would set up to help the situation

On motion of Dr. Abell, seconded by Dr. Shoulders and carried, the subcommittee was empowered to act along the lines suggested in the discussion without the necessity of further reference to the whole committee.

Further Report of Subcommittee on Surplus Medical and Hospital Supplies—At the request of Father Schwitalla, chairman of the subcommittee, Dr. Fishbein presented the following statement concerning a conference held in Washington on May 8 at which he and Dr. Irons were present as representatives of the American Medical Association on the invitation of Surgeon General Parran:

Surgeon General Parran was requested by the Surplus Property Board to assume as a function of the Public Health Service the responsibility of making recommendations regarding the disposal of strictly medical surplus supplies The Surgeon General was reluctant to take over this duty and, since the Surplus Property Board must depend on a federal agency, it was decided to request Governor McNutt, as head of the Federal Security Agency, to appoint a special committee to include representatives of the medical profession, of the hospitals, of the dental profession, of public health and of sanitary engineering and similar professions in the health field. It is understood that Governor McNutt has agreed to appoint such an advisory committee to the Surplus Property Board

There will be a considerable amount of surplus medical equipment Under the law it apparently is desirable and feasible for the Surplus Property Board to designate areas in need from a medical and public health point of view and to designate the need in those areas It was said that the material even could be given outright to a needy area. In connection with the determination of what areas may be in need, it also would be necessary to determine whether hospitals, physicians and dentists are available in the areas to use equipment provided The facilities of the Bureau of Information should be of value in this connection.

There are certain priorities established under the law itself as to where the surplus materials may be offered—first to federal institutions, then to state and local institutions and then to nonprofit and voluntary institutions Educational institutions on a nonprofit basis also have a priority Then comes the question of priority for individuals, for veterans Regulations were published about three days ago as to the manner in which opportunity will be given to all to purchase this material.

It was stated at the Washington conference that the proposed advisory committee might list the minimum equipment necessary for a physician or dentist to establish himself in a needy area, and then the Surplus Property Board could assemble such equipment and furnish it to returning veterans at a discount

Dr Walter L. Bierring remarked that at the Conference of State and Territorial Health Officers in Washington on April 12 Mr. Rosenfield of the Surplus Property Board, Miss Switzer and others had urged that the state and local health agencies become more active in the matter of surplus property disposal and, as a result, the conference had adopted a resolution asking Surgeon General Parran to invite representatives of various interested organizations to create some sort of agency that could be of assistance.

Major Richard J. White, who is working on the problem of surplus medical and dental supplies as far as the Office of the Surgeon General of the Army is concerned, was introduced by Father Schwitalla. Major White stated: This is an absolutely long range program; the type of equipment at first available as surplus will be field equipment, which is not the type placed in station hospitals or in army hospitals in the United States but may be and can be adapted for general hospitals; there is a lot of medical material that was procured in 1917, which *was turned* over to the Office of Civilian Defense; we are in no position to state what we are going to have for surplus nor when we are going to have it but are looking toward surplus in the future, the long range; we are trying to get together with interested and informed groups in medicine to try to formulate some policy; the Surgeon General's Office is in accord with everything that has been done so far; there is an excellent opportunity for some group such as the Committee on Postwar Medical Service to formulate a plan for the returning physician and dentist who wants to secure some of the surplus material to set up his own office; it might be possible for this committee to formulate a policy whereby it could be recommended to the state medical societies that they establish a special section in their state committees and have some one at the headquarters of the disposal area concerned who can act as the go-between and keep the physicians and dentists who come back from service informed as to the availability of the surplus material so that he need not go to the retailer; there will be no competitive bidding in the long range program; it would be desirable if a central buying agent could be established in each state and form a group in each state of those who would like to have something done for the doctor and dentist who wishes to set up his own office in a location of his own choice—this would take care of the individual veterans who do not come under the priority categories

Dr. Fishbein thought the points mentioned by Major White might well be referred to the committee that is to be established by Mr. McNutt

Father Schwitalla reminded the Committee of the report on the surplus property matter which he had presented to the Committee at the March meeting and which had been tabled He requested authority to bring that report up to date, to withdraw the recommendations made therein and have it published The request was granted

Dr. Camalier said that the American Dental Association would be very glad to go along with the plans as expressed by Major White.

It was voted to request the representative of medicine on the proposed McNutt committee to bring the views set forth by Major White to the attention of that committee. Father Schwitalla stated that as chairman of the Subcommittee on Surplus Medical and Hospital Supplies he would interpret this action as a command for his subcommittee

Report of Subcommittee on Establishment of Medical Corps in Veterans Administration—Father Schwitalla, chairman of the subcommittee, told the Committee of a communication he had received from Mr. Watson Miller of the Federal Security Agency regarding the Rogers bill.

The Committee was informed by Dr. Fishbein that more letters had been received recently at the offices of the American Medical Association concerning the Veterans Administration and its difficulties than had been received on any subject at any previous time, that many were from physicians in service who are fearful that when they return from active duty they will be assigned to service with the Veterans Administration and that some hundreds already had been so assigned. He thought it was a function of the Committee on Postwar Medical Service to represent the medical profession in this matter and that some expression should go to the suitable government officials to the effect that these physicians enlisted in the respective branches of the armed forces and not in the Veterans Administration. He asserted that it is absolutely against everything that American medicine stands for to have these men forced into the Veterans Administration as a part of their service with the armed forces

Dr. Irvin Abell informed the Committee that at a meeting of a special advisory committee to the Veterans Administration in March a reorganization of the service was suggested, that a subcommittee was then appointed to formulate plans for such reorganization and that a report has been prepared and is ready for presentation.

The following statement was presented by Dr. E L Henderson, a member of the Executive Committee of the Board of Trustees of the American Medical Association, who announced that the statement had been adopted the previous day by the Executive Committee:

In November 1944 the Army Medical Department was directed to transfer at least 300 Medical Corps officers to the Veterans Administration, this number to include those officers in the zone of the interior who were formerly employed by the Veterans Administration as civilians Apparently about 100 men meeting the latter classification were so assigned and in addition some 200 others selected largely from among men who had been marked "limited service" Some of those thus assigned have protested and others are now protesting bitterly against these assignments on the ground that their enlistment was distinctly for military service and that assignment to the Veterans Administration cannot be thus characterized Physicians who have served with distinction in both the European and Pacific theaters of operation are now indicating by communications addressed to the offices of the American Medical Association the fear that they may be assigned on their return to the United States to service with the Veterans Administration The unwillingness to serve with the Veterans Administration is based not only on their belief that this cannot be considered military service but also on the point of view that competent, scientific medical care is difficult under the conditions that prevail in the veterans' hospitals

The Committee on Postwar Medical Service, which includes representatives of the American Medical Association, American College of Surgeons, American College of Physicians, American Hospital Association, Federation of State Medical Boards, Association of American Medical Colleges, Catholic Hospital Association, Advisory Board for Medical Specialties and other groups, after careful consideration of the problems involved, urges that the Secretary of War, the Secretary of the Navy and all others concerned with the activities of physicians voluntarily enlisted in the armed forces recognize the righteousness of the protests made by these medical officers against assignment to the Veterans Administration It is further urged that the needs of the Veterans Administration for physicians be met either by voluntary enrolment of men in the armed forces at the time of their release from the service or by recruitment of medical personnel from civilian sources

The statement presented by Dr. Henderson was unanimously adopted by the Committee on Postwar Medical Service. (Since the meeting of the Committee on May 12, the foregoing statement has been forwarded by telegraph to the Secretary of War and to the Secretary of the Navy and was printed in the editorial columns of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for May 19, 1945)

It was brought out by Dr. Barton in the discussion on the Veterans Administration that there is an agreement in the offices of the Veterans Administration that attention will be paid to the expressed desire of a returning medical officer to go to a community of need before he may be assigned to duty with the Veterans Administration It was the opinion of the members of the Committee that the medical officers themselves know nothing about such an agreement.

Report of Subcommittee on Formulation of Lists of Medical Officers to Be Considered for Demobilization.—Dr. Frederick A. Coller, chairman of the subcommittee, presented the following report:

On April 21 there was a joint meeting in Washington of the directing board of the Procurement and Assignment Service and the Subcommittee on Formulation of Lists of Medical Officers to be Considered for Demobilization, which was represented by Dr Coller, chairman, Dr Bloedorn for Dr. Zapffe, Dr. Shoulders, Lieutenant Colonel Lueth and Father Schwitalla It was intimated that the Surgeon General of the Army would be willing to consider for discharge a small selected list of essential teachers This subcommittee was requested to obtain such a list through Dr Zapffe In brief, it was agreed that the list should be in three categories for each school first, those most urgently needed; second, those who are desirable but somewhat less urgently needed, and, third, important teachers but still less urgently needed In each category it was agreed that each school should limit the number of names submitted to 5 per cent of those of its teachers who were in service and that in any case no more than five names should be listed in each category.

The problem of the civilian need for physicians was discussed, and it was felt that the Procurement and Assignment Service was closely in touch with civilian needs through information received from its state chairmen It was felt that the relation between the state chairmen and the central office of the Procurement and Assignment Service might be tightened so that information concerning such needs could be presented to the Surgeon General of the Army through the Procurement and Assignment Service as soon as such needs occur

The need of industry for physicians did not seem to be pressing at the time We were informed that there had been very few requests sent to the Procurement and Assignment Service for aid in this field and that should such needs occur they will be handled by the Procurement and Assignment Service as heretofore

As far as the subcommittee is able to make out, there has been no important shortage of physicians in the public health field However, to clarify this situation it was determined that Dr. Victor Johnson would write a letter to the public health officers of the states to obtain factual evidence concerning the needs as they exist in this field

Dr. Zapffe reported that letters requesting the names of faculty members now in service whom the medical schools thought absolutely necessary to be returned were sent to the seventy-eight approved medical schools, that fifty-five replies had been received and that there are about 200 men on the lists who are urgently needed. Dr. Coller stated that the deans of some medical schools had had a communication from Surgeon General Kirk asking for lists of ten faculty members whom they would like to have returned and the order in which they wish them, and that confusion was created as the result of this duplication General Rankin stated that practically all of the medical schools had replied to the Surgeon General's letter, that it is not at all certain the plan can be worked out and that both the lists obtained through the direct communication of the Surgeon General and those submitted by the Committee on Postwar Medical Service will be used

There was considerable discussion on the methods to be used in the screening of the lists of needed faculty members, and it was decided that the lists obtained through the efforts of the subcommittee should be turned over to Colonel Lueth for use by the Surgeon General.

The report of the subcommittee was accepted and the committee continued

Question of Further Distribution of Information on Topics Considered by the Committee on Postwar Medical Service—The Chairman stated that in his opinion publication of the minutes of the Committee's meetings had been valuable He informed the members that a bibliograpy of all pertinent material which has appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has been prepared and that copies are available to any one interested. Copies of the bibliography were distributed among those present. He further stated that suggestions for further publicity would be welcomed

Refresher Courses for Medical Officers in Foreign Countries—Colonel Lueth reported that from personal letters it appeared that attempts were under way to give refresher courses for medical officers in Europe as a part of the educational program of the Army. It is believed such refresher courses will be continued in the near future. Definite information concerning this work will be given at a later time

Situation of the Medical Profession in the Philippines—The Chairman presented a letter that had been received from a medical officer now on duty in the Philippines in which concern was expressed as to what the profession in the United

States might do to aid the rehabilitation of medical education and the practice of medicine in the Philippines

It was the consensus of the Committee that all possible aid should be given but that no immediate plans can be made until the entire situation is clarified Measures are now being taken to obtain first hand information

Report of Subcommittee on Graduate Education of Physician Veterans—Father Schwitalla, chairman of the subcommittee, presented the following progress report which he stated had been approved via telephone by Mr H V Stirling of the Veterans Administration and was ready for release

PROGRESS REPORT OF SUBCOMMITTEE ON GRADUATE EDUCATION OF PHYSICIAN VETERANS

A meeting took place in the office of Mr H V Stirling, director, Vocational Rehabilitation and Education Service of the Veterans' Administration, on Saturday afternoon April 21 1945 The meeting was attended by Mr Stirling and three members of the Subcommittee on Graduate Education of Physician Veterans namely, Dr Victor Johnson, Lieut Col Harold C Lueth and Father Alphonse M Schwitalla, S J

The purpose of the meeting was to bring before Mr Stirling a number of questions which had been raised concerning the application of the educational provisions of the G I bill to the residencies in hospitals, particularly in nonuniversity hospitals

NUMBER OF VETERANS NOW IN EDUCATIONAL PROGRAMS UNDER PUBLIC LAWS 16 AND 346

As of the end of February 1945 there were in training under Public Law 16 a total of 11,937 (21 per cent) trainees 11 673 (21 per cent) cases were pending, 29,464 (52 per cent) had been denied training or were temporarily deferred from training and 3 128 (5 per cent) had terminated their training, the total in all groups being 56,202

Under Public Law 346 as of the same date there were in industrial training 17,583 veterans in institutional programs 17 029 and in "on the job training 554 Of those in institutional courses 589 were in 'below college' programs, 301 in junior colleges 406 in teachers colleges, 12 331 in colleges of arts and sciences and 3 402 in trade schools The number who discontinued their training is 2,679, of this number 181 had completed the work which they began, 854 interrupted it voluntarily, 1,052 discontinued the program voluntarily, 86 were declared unsatisfactory for their programs and 505 transferred from opportunities under Public Law 346 to opportunities under Public Law 16 No figures were specifically available for persons training in schools of medicine or dentistry at the present time

NUMBER OF VETERANS CHOOSING MEDICINE AND DENTISTRY

Mr Stirling was good enough to supply information concerning present trends in the number of applications for medicine and dentistry and allied fields among the persons who had come under his office, that is, under the Vocational and Rehabilitation Service One study had been made of a total of 9,359 applications approved by the regional offices under Public Law 16 In this group there were 38 applications requesting an opportunity to study dentistry, 81 to study pharmacy, 59 to study medicine and 18 to study chiropractic or osteopathy

In another study of the applications under Public Law 346, two groups of 5 000 applications as approved by the state agencies were each analyzed with the results given in the accompanying table

Analysis of Applications

Applications for	In the First Group of 5 000	In the Second Group of 5 000
Predentistry	14	18
Dentistry	530	503
Medicine	184	203
Premedicine	69	82
Pharmacy	34	37
Chiropractic	17	18
Osteopathy	2	3
Chiropody	4	7

GENERAL STATISTICS ON VETERANS EDUCATION

A fairly complete statement concerning the general statistics on veterans' education is contained in Bulletin No 80, Higher Education and National Defense of the American Council on Education March 27, 1945, page 6

'During January 1945 the number of veterans entering on training Public Law 16 was 3 872 as compared with only 2 138 new trainees under Public Law 346 In February the numbers were 1 261 and 2 027 respectively It is significant that the number enrolling during February, when the second semester begins in many colleges was only 2,391 under the two acts While the relative numbers were reversed for the two months the larger number for January and February combined came under Public Law 16 If this trend continues there will be more veterans in colleges and universities under the vocational rehabilitation program than under the G I bill until the beginning of demobilization of large numbers of nondisabled veterans"

Statistics such as these are obviously of great value to medical educators and hospital executives for their planning

TUITION CHARGE MADE BY HOSPITALS

Mr Stirling was asked whether any change had been made in the provisions previously announced in the Committee's memorandum of Oct 16, 1944 It was there stated as follows "The law provides that if the institution has no established tuition fee, or if the administrator deems the established tuition fee to be inadequate compensation, the administrator is authorized to provide for the payment, again, however, with the $500 ordinary school year limitation" Mr Stirling said that there has been no change with reference to this provision and that, therefore a hospital may charge tuition for a residency

Mr Stirling's attention was called to Mr McCarran's bill S 181, introduced on March 22, 1945 and now in the hands of the Committee on Finance of the Senate, the essential provision of which reads as follows "And provided further, that if a publicly supported institution or private institution exempt from tax under section 101 (6) of the Internal Revenue Code has no established tuition fee or if the established tuition fee of any such institution is less than the actual cost to such institution of furnishing the education or training the administrator is authorized to provide for the payment to such institution with respect to any such person, of the actual cost of furnishing such education or training but not to exceed $500 for an ordinary school year' Mr Stirling commented that this was essentially the understanding which he had of the intent of the Servicemen's Readjustment Act of 1944

PAYMENT OF SALARIES TO RESIDENTS UNDER THE G I BILL

Mr Stirling was then asked whether the previous understanding of the Committee that veterans who are appointed residents in hospitals but who participate in the benefits of the G I bill may continue to receive a salary from the hospital Mr Stirling replied that there is no question in his mind but that nothing in Public Law 346 prevents either the payment of a salary by the hospital or the acceptance of a salary by the resident, provided the limitations which are recognized under Public Law 16 are applicable also under Public Law 346 He felt, however, that there should be no difficulty whatever in meeting the provisions to which he refers The particular provision of Public Law 16 reads as follows "That when the course of vocational rehabilitation furnished to any person as herein provided consists of training on the job by an employer, such employer shall be required to submit monthly to the administrator a statement under oath showing any wage, compensation or other income paid by him to such person during the month, directly or indirectly and based on such sworn statements the administrator is authorized to reduce the pension of such person to an amount considered equitable and just, but not below the amount of pension or retirement pay to which he would be entitled for service connected disability if not following a course of vocational rehabilitation" In a memorandum of the Veterans Administration of Public Law 16 dated Dec 15, 1943 managers are authorized to reduce the pension of a person when the employer trainer pays wage or compensation in whole or in part if the sum thus paid "when added to the increased pension exceeds the minimum entrance wage paid by the employer trainer to an employee in the particular job for which the person is being trained" A provision which bears on this point is found in the Veterans Administration Instruction No 2 dated Jan 18, 1945, page 8, paragraph 19 (b), which reads as follows

"Where the veteran is receiving compensation for productive labor, performed as part of his apprenticeship or other training on the job, the amount of subsistence when added to his current monthly salary or wage based on the standard work week exclusive of overtime, shall not be in excess of the standard beginning salary or wage payable to a journeyman workman in the occupation or trade in which training is being given, similarly based on the standard work week exclusive of overtime"

THE ADMINISTRATOR'S SPECIAL COMMITTEE ON VOCATIONAL REHABILITATION, EDUCATION AND TRAINING PROBLEMS

Mr Stirling kindly supplied the names of those who are serving as members of the Administrator's Special Committee on Vocational Rehabilitation, Education and Training Problems The committee members are as follows

Dr Arthur Andrews, president Grand Rapids Junior College, Grand Rapids Mich

Dr Horace S Ford, treasurer, Massachusetts Institute of Technology, Cambridge, Mass

Dr R W Kent, director, Essex County Vocational Schools Newark, N J

Dr Thurman D Kitchin, president, Wake Forest College, Wake Forest, N C

Dr Robert G Sproul, president, University of California, Berkeley, Calif

Dr Robert B Stewart, comptroller Purdue University, Lafayette Ind chairman of the committee

Dr Rufus C Harris, president, Tulane University, New Orleans

Perhaps attention might be called to the desirability of adding to this special committee the names of an educator or of educators who are familiar with the medical aspects of the many educational problems with which the Veterans Administration is now dealing

STUDENTS OF NONAPPROVED SCHOOLS

The question was asked whether nonapproved schools of medicine were receiving student veterans under the G I bill The members of the subcommittee are completely satisfied that from such information as is now available, no serious difficulty need at present be foreseen

APPROVAL AGENCIES FOR INSTITUTIONS IN THE STATES

Mr. Sterling was asked whether he could furnish to the Committee a list of the organizations functioning in the various states as the approval agencies for institutions approved as qualified and equipped to furnish training to veterans under Public Law 346. He was kind enough to accede to this request and furnished the accompanying list, indicating, however, that in many instances "there has been no specific designation by the governor of the approval agency in a given state" Mr. Stirling's list has been compiled from the best information available and represents the conditions up to April 30, 1945.

The report was accepted and the subcommittee continued.

Informational Reports.—Wartime Graduate Medical Meetings: Dr. F. F. Borzell reported for the Central Committee of the Wartime Graduate Medical Meetings that the work of that committee continues to be received enthusiastically but that some difficulty is now being encountered in finding speakers for the Army, Navy and Air Corps refresher courses.

Approval Agencies

State	Agency
Alabama	Department of Education
Arizona	Department of Public Instruction
Arkansas	Department of Education
California	Department of Education; Division of Readjustment Education
Colorado	Governor's Advisory Committee on the Education and Training of War Veterans
Connecticut	Department of Education
Delaware	truction
Dist of Columbia	
Florida	
Georgia	Council
Hawaii	truction
Idaho	State Department of Education
Illinois	Office of Public Instruction
Indiana	State Department of Public Instruction
Iowa	Department of Public Instruction
Kansas	Kansas Committee on Institutions for Veteran Training
Kentucky	State Department of Education
Louisiana	State Department of Education
Maine	Commissioner of Education
Maryland	State Department of Education
Massachusetts	State Department of Education; Board of Collegiate Authority
Michigan	Public Instruction
Minnesota	
Mississippi	
Missouri	State Department of Education
Montana	State Superintendent of Public Instruction
Nebraska	Department of Public Instruction
Nevada	State
New Hampshire	State
New Jersey	State Development; Division of Veterans Affairs
New Mexico	State Planning Board
New York	University of the State of New York; State Education Department
North Carolina	Department of Public Instruction
North Dakota	State Board of Higher Education (Colleges); State Department of Public Instruction (Public Schools)
Ohio	State Department of Education
Oklahoma	Department of Public Instruction
Oregon	ication
Pennsylvania	struction
Puerto Rico	
Rhode Island	
South Carolina	struction
South Dakota	
Tennessee	State Department of Education
Texas	State Committee for Veterans Training
Utah	Office of the Governor
Vermont	State
Virginia	State
Washington	State
West Virginia	State
Wisconsin	Veter
Wyoming	State
Alaska	(No a
Panama Canal	(No a
Virgin Islands	(No agency designated)

Federation of State Medical Boards: Dr. Walter L Bierring stated that the Federation had received a number of inquiries from graduates of unapproved schools who have served as medical officers in the armed forces as to whether their military service would be given special consideration when they applied for licensure in those states where graduates of unapproved schools are not eligible at the present time.

Time and Place of Next Meeting.—It was decided that the next meeting of the Committee should be held at American Medical Association Headquarters in Chicago on Saturday, June 23, 1945.

The meeting adjourned at 1:13 p. m.

H. H. SHOULDERS, M.D., Secretary.

ECONOMIC ASPECTS OF FUTURE MEDICAL PRACTICE

Lieutenant Colonel Harold C. Lueth
Surgeon General's Liaison Officer
MEDICAL CORPS, ARMY OF THE UNITED STATES

The Committee on Postwar Medical Service mailed a questionnaire to all medical officers on duty requesting information as to their desires in regard to future practice. Previous studies of the answers contained in the 21,029 questionnaires returned have appeared in THE JOURNAL.[1] One set of questions referred to economic aspects of medical practice, and the results are discussed in this paper.

TYPE OF MEDICAL PRACTICE DESIRED

There were 4,326 medical officers who indicated a desire to engage in general medical practice after release from service This constituted only about three fourths of those who entered the armed forces from general practice. Nearly two thirds of all medical officers, 12,627, indicated that they were interested in special medical practice in the future They were about equally divided between those who expressed a desire to engage solely in specialty practice, 6,456, and those who expressed a desire to engage in specialty practice combined with part time teaching, 6,171.

Medical officers who were interested solely in future specialty practice seemed to favor communities of 25,000 to 250,000 population. There were only 27 who wanted to go to communities of less than 2,500, 906 who wanted to go to communities of 2,500 to 25,000, 2,539 who wanted to go to communities of 25,000 to 250,000 and 949 who wanted to go to communities of more than 250,000 population. Nearly one third of the group of medical officers gave no indication of the preferred size of community.

There were 2,821 medical officers who expressed a desire to engage in medical practice on a full time basis. Included in this group were 278 men who desire to become full time teachers.

ACCEPTABLE MONTHLY SALARIES

One of the questions asked was "What is the *minimum* monthly salary you would accept on a salary basis?" A wide range of answers was given. The median monthly salary mentioned was $583. There were 1,485 medical officers who would accept a monthly salary of $400 to $499, 2,610 medical officers who would accept a monthly salary of $500 to $599 and 1,090 medical officers who would accept a monthly salary of $600 to $699. There was fairly even distribution among the various graduation groups.

VOLUNTARY REDISTRIBUTION OF MEDICAL OFFICERS

Eleven per cent, or 2,364 medical officers, expressed willingness to go to a different community than that from which they came if a subsidy was provided for several months. About 13 per cent of medical officers (2,817) stated that they would be willing to go to an area needing physicians if there was an office established. More than 15 per cent (3,284 medical officers) were willing to move to an area in need of physicians if diagnostic facilities were available. Nearly 29 per cent (6,091) would go to a community in need of a doctor if there were hospital facilities. The proportions in each graduation group who would go to a community needing physicians with office established, subsidy provided, diagnostic facilities or hospital facilities were about equal

A few men wanted to go to communities of less than 2,500 population. There were 41 who would go if a subsidy was provided, 43 if there were diagnostic facilities, 56 if an office was established and 74 if there were hospital facilities available. About one fifth of all men who were willing to relocate wished to go to cities of 2,500 to 25,000 population. Six hundred and forty-three medical officers would go to such cities if there was an office established, 531 medical officers if there was a subsidy

1. Lueth, H. C.: Postgraduate Wishes of Medical Officers: First Report on 21,029 Questionnaires, *J. A. M. A.* **127**: 759 770 (March 31) 1945; The Medical Officer Returns to Civilian Practice, ibid **127**: 1039 1043 (April 21) 1945, The Medical Officer and Future Industrial Practice, ibid. **128**: 93 95 (May 12) 1945; Results of Pilot Questionnaire to Physicians in Service, ibid **125**: 558 560 (June 24) 1944

provided, 710 if there were diagnostic facilities and 1,327 if there were hospital facilities

Many men gave no indication of the size community they would go to but said they would go if an office was provided (631), a subsidy was provided (481), diagnostic facilities were provided (641) and hospital facilities were provided (1,166)

FULL TIME MEDICAL PRACTICE

About 85 per cent of medical officers indicated that they did not desire to remain in government service Medical officers of the regular medical corps or governmental agencies were considered separately and constituted a group of 532 officers There were 237 Regular Army officers, 181 Regular Navy officers, 15 United States Public Health Service officers, 10 Regular Veterans Administration officers and 4 regular officers from other governmental agencies who indicated their desire to remain in government service, or a total of 2,501 In addition, 49 regular officers stated that they did not want to remain in government service

Of Reserve officers 672 men were willing to accept army service Naval medical service attracted 406 officers About the same number of men (411) chose the United States Public Health Service There were 435 medical officers who desired service with the Veterans Administration About one third of these officers graduated from medical school before 1930

GROUP AND PRIVATE PRACTICE

The questionnaires of medical officers were divided into several categories—those wanting to reengage in individual private practice (8,041), those not desiring to reengage in private practice (1,345), those desiring private practice with a group (10,994) and those who gave no indication of their wishes (649) The distribution by graduation groups is shown in the accompanying table

Answers to Group Practice Question

Graduation Group No	Dates of Graduation	Want to Reengage in Private Practice *	Do Not Desire to Reengage in Private Practice	Desire Private Practice with a Group	No Indication of Wishes	Total
1	1941 1945	1,432	181	2,608	142	4,363
2	1938 1940	1,422	198	2,461	124	4,205
3	1933 1937	1,472	180	2,053	98	3,802
4	1930 1934	1,999	302	2,304	119	4,724
5	1920 1929	1,592	287	1,336	115	3,330
6	Before 1920	194	197	143	91	625
Total		8,041	1,345	10,994	649	21,029

* No indication as regards group practice It also includes men who want to enter private practice

CONCLUSIONS

1 More than one fourth, or 5,785 (27 4 per cent) medical officers, were formerly in general medical practice The smallest number of men (624) came from communities of less than 2 500 population and more than three times that number came from cities of 2,500 to 25,000, cities of 25,000 to 250,000 and cities of over 250,000

2 About one third (7,282 medical officers) had been in special practice in civilian life More than three fourths of the specialists came from large cities, and many had been certified by American boards

3 There were 4,326 medical officers who indicated a desire to engage in general medical practice, or only about three fourths of those who came from general practice to duty with the armed forces In contrast, more than half again as many men who were originally in specialty types of practice before coming to duty (7,282) indicated that they would like to engage in specialty practice after the war (12,627) Medical officers interested in future specialty practice seemed to favor communities of 25,000 to 250,000 population

4 A wide range of answers was given to the question as to the minimum acceptable monthly salary that medical officers would accept in the future The median monthly salary was $583, and there were slight variations for the different sized communities and larger variations between the different graduation groups

5 Eleven per cent (2 364 medical officers) were willing to go to a new community in need of physicians if a subsidy was provided for several months About 13 per cent of medical officers or 2 817, stated that they would be willing to go to an area needing physicians if there was an office established More than 15 per cent, or 3,284 medical officers, would go to such areas if there were diagnostic facilities, and nearly 29 per cent, or 6,091, if there were hospital facilities In general a larger number of young men indicated their willingness to locate in new areas than older medical officers

6 About 85 per cent of medical officers indicated that they did not desire to remain in government service

7 Private practice, either individually or as part of a group, was the choice of more than four fifths of medical officers There were 8,041 medical officers who expressed a desire to engage in the individual private practice of medicine and 10,994 who desired to engage in private practice as a member of a group

Medical Legislation

MEDICAL BILLS IN CONGRESS

EMIC Program

H J Res 212 has passed the House and Senate, appropriating an additional $2,200,000 to provide medical, nursing and hospital maternity and infant care for the wives and infants of enlisted men during the remainder of the present fiscal year, which will end June 30 There is pending in the Senate Committee on Appropriations the regular appropriation bill for the Labor Department, which will make available for this program $44,189,500 for the fiscal year beginning July 1

Dental Health

Three identical bills have been introduced to provide assistance to states in developing and maintaining dental health programs, S 1099, introduced by Senator Aiken, Vermont, for himself and Senator Pepper, Florida, H R 3414, introduced by Representative Traynor, Delaware, and H R 3412, introduced by Representative Brehm, Ohio This legislation would create a National Dental Health Council and would authorize for each fiscal year a sum sufficient to enable the Surgeon General of the United States Public Health Service (1) to assist, through grants and as otherwise provided, states and political subdivisions in establishing and maintaining adequate measures for the prevention, treatment and control of dental diseases and the development and maintenance of effective means for the education of the public concerning such diseases, (2) to make available to states and political subdivisions and to educational institutions and other nonprofit agencies grants for approved studies, investigations and demonstrations in dental health care and education projects, and (3) to conduct studies and demonstrations and to collect information relative to the prevention, treatment and control of dental diseases

Official Notes

DOCTORS LOOK AHEAD

Remaining programs in the series of network broadcasts by the NBC and the American Medical Association will be on the air June 23 and 30 except in Chicago

Doctors Look Ahead is broadcast each Saturday at 4 30 p m Eastern War Time (3 30 p m Central War Time, 2 30 p m Mountain War Time, 1 30 p m Pacific War Time) except in Chicago where each week's program as broadcast on the network will be heard on the next Saturday afternoon at 3 p m Central War Time

The programs remaining are as follows

June 23 Postwar Doctor Problems in medical education and their influence on the public health Guest speaker Dr Victor Johnson, Secretary American Medical Association Council on Medical Education and Hospitals

June 30 Health in Schools A program devoted to health education and related topics in our schools, where doctors look ahead to greater progress in the next decade Speaker Dr Charles C Wilson, Teachers College, Columbia University, speaking from New York

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Dr. Ross Reappointed Health Officer.—Dr. Thomas T. Ross, state health officer, Little Rock, was reappointed for a four year term when the state board of health met in quarterly session April 19. His new term begins July 1, it is reported.

District Meeting.—The Fifth Councilor District Medical Society was addressed in Magnolia, May 22, by Drs. William Decker Smith, Texarkana, and Stanley George Wolfe, Shreveport, La., on "The Gastroscope—Its Use in the Examination of the Stomach" and "Plasma Fractionation—Its Use in the Diagnosis and Treatment of Disease" respectively.

COLORADO

Dr. Parran Addresses Open Meeting.—Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, addressed an open meeting of physicians and interested lay persons under the auspices of the Colorado State Medical Society at the Shirley-Savoy Hotel, Denver, May 24. His subject was "Pending Legislation Relative to Public Health and Hospitals for the Future." The talk was a feature of a two day meeting of the Colorado Public Health Association which was being conducted by a team of speakers sponsored by the American Public Health Association. These speakers included Drs. Karl F. Meyer, San Francisco, and George M. Wheatley, New York, on "Legislative Proposals for Medical Care in California" and "Rheumatic Fever and Its Public Health Significance" respectively.

DISTRICT OF COLUMBIA

Personal.—Dr. Daniel L. R. Borden has resigned as chairman of the district board of police and fire surgeons, effective April 16. Dr. Borden has been on leave from the board since 1941, when he entered military service.

The Curtis Lecture.—Dr. Ulysses Grant Dailey, Chicago, delivered the fifth annual Austin M. Curtis Memorial Lecture before the faculty and students of Howard University College of Medicine, Washington, May 28, on "Treatment of Thyrotoxicosis."

Clinical Society Inaugurates Distinguished Service Award.—The Georgetown Clinical Society on April 19 presented its first G award for distinguished service in the practice of medicine or surgery to Comdr. Joseph J. Mundell (MC) at a dinner meeting in the Statler Hotel. This was the first presentation of the new annual award to be given in the form of a G plaque and an inscribed certificate to be made to an alumnus of the Georgetown University School of Medicine who distinguished himself in private practice and in service to the school of medicine. Commander Mundell graduated at Georgetown in 1903 and has been practicing in the district for thirty-nine years. For the past eleven years he has been professor and head of the department of obstetrics at Georgetown. He helped found the Georgetown Clinical Society in 1906.

FLORIDA

Annual Graduate Short Course.—The thirteenth annual graduate short course for physicians will be held June 25-30 at the George Washington Hotel, Jacksonville. The first three days will be devoted to medicine and the last three to surgery. Preliminary plans call for the following faculty:

Dr. Eugene A. Stead Jr., professor of medicine, Emory University School of Medicine, Atlanta, Medicine.
Dr. Robert L. Sanders, associate professor of surgery, University of Tennessee College of Medicine, Memphis, Surgery.
Dr. Herbert C. Miller Jr., Yale University School of Medicine, New Haven, Pediatrics.
Dr. Oren Moore, dean of obstetrics, Southern Pediatric Seminar, Charlotte, N. C., Obstetrics.
Dr. Edwin C. Hamblen, chief of division of endocrinology, Duke University School of Medicine, Durham, N. C., Gynecology.
Surgeon Richard C. Arnold, U. S. Public Health Service, venereal disease research laboratory, Staten Island, N. Y., Venereal Diseases.

Additional information may be obtained from Dr. Turner Z. Cason, Jacksonville, director of the department of medicine, Graduate School, University of Florida.

Oldest Medical Society in State.—On May 25 the Duval County Medical Society observed its ninety-second anniversary. The society was created in 1853, eight years after Florida became a state, and was the first component society of the state medical association to be established. Its first officers were the late Drs. John S. Murdoch, president; W. J. L'Engle, secretary, and Richard P. Daniel, treasurer. The state medical journal reports that apparently there were no other county medical societies in Florida until after the war between the states. In a history prepared by Dr. J. Webster Merritt, Jacksonville, it is shown that the late Dr. James Hall represented the profession in and around Jacksonville for a quarter of a century before the Floridas, east and west, were ceded to the United States by Spain. His successor, the late Dr. A. S. Baldwin, arrived in Jacksonville in 1838, and the Duval County Medical Society was created at his instigation in 1853. The medical history written by Dr. Merritt is now being published serially in the *Journal of the Florida Medical Association*.

GEORGIA

New Law Asks Parents to Register Births.—On July 1 a law will become effective making the registration of births the responsibility of the parents. The medical attendant will be responsible for supplying the medical record. *Georgia's Health* believes that parent participation will result in better and more accurate reporting. Two particular advantages will be obtained from the filing of a separate medical report, it was stated. Medical information useless to the lay person will be removed from the legal certificate. Second, because it is a confidential report, the physician may report medical items of public health interest without prejudicing the interests of his patient.

Report of Warm Springs Foundation.—During the fiscal year 1944, 543 patients received 36,549 hospital days' care at the Georgia Warm Springs Foundation, according to its annual report. Of the total, 289 received financial assistance, this group receiving 22,852 hospital days' care, or 62.52 per cent of the total hospital days' care. The average daily number of patients in residence throughout the year was 100. Newspapers reported recently that a syndicate of life insurance companies is making payments to the foundation on a $560,000 policy taken out by the foundation in 1930 on the life of Franklin D. Roosevelt, then governor of New York. The foundation paid the premium and also was the beneficiary, it was stated.

ILLINOIS

House Committee Urges Passage of Pure Food Bill.—A bill providing for state control of food, drug and cosmetic standards and advertising in intrastate commerce was recommended for passage May 28 by the house committee on public health. Similar measures were sponsored in 1941 and 1943, but this is said to be the first time that the bill was reported to the floor of the house.

Payment of Physicians' Bills for Employees.—S. DeWitt Clough, president and general manager, announces a plan for payment of physicians' bills for employees of Abbott Laboratories, North Chicago, according to *Industrial Medicine*. Employees will be reimbursed for physicians' bills incurred in the hospital, at home or at the doctor's office. The entire cost of the program, which will benefit approximately 2,800 employees of the laboratories and its seventeen branches in the United States and Canada, will be paid by the company. Under a medical expense plan, which is underwritten by Equitable Life Assurance Society of the United States, an employee will be repaid up to $2 for each visit to a doctor's office or at a hospital and up to $3 for each visit by a physician to the employee's home. Payment will be limited to one visit each day and to a maximum of fifty visits in any one calendar year.

Chicago

Ninety-Four Years of Age.—On May 23 Dr. Samuel Collins Buchan observed his ninety-fourth birthday. Dr. Buchan graduated at Bellevue Hospital Medical College, New York, in 1877 and came to Chicago in 1919.

Gilbert Wynekoop Released from Mental Hospital.—According to newspaper reports, Dr. Gilbert H. Wynekoop was held sane and released from the Illinois Security Hospital at Menard on a writ of habeas corpus issued by Judge L. P. Harris in the circuit court of Randolph County May 17. In 1934 the Illinois state department of registration revoked his license because he had been adjudged insane.

Nathanson Denied Court Review.—The U. S. Supreme Court on June 4 denied a motion for review of the case of Dr. Frank L. Nathanson, who in May 1942 was convicted of conspiracy to commit abortion. At the time he was sentenced by John A. Sbarbaro, then a judge of the criminal court, to a year in the county jail and to pay a fine of $2,000. He was released on a $5,000 bond pending his appeal. His conviction followed the testimony of a woman who claimed that Nathanson had performed an abortion on her. He is said to have been arrested on similar charges eight times previously. Newspapers reported that the appellate court upheld the conviction on Dec. 17, 1943 and the state supreme court upheld it on January 18 of this year.

Special Society Elections.—At the annual meeting of the Chicago Gynecological Society, May 18, the following officers were chosen: Drs. James E. Fitzgerald, president; Ralph A. Reis, president-elect; Eugene A. Edwards, vice president; Herbert E. Schmitz, secretary, and Henry Buxbaum, treasurer.——New officers of the Chicago Society of Internal Medicine elected May 21 include Drs. Samuel Soskin, president; Laurence E. Hines, vice president, and Howard L. Alt, secretary-treasurer.——Dr. Frederick W. Schacht was elected president of the Chicago Urological Society at its annual meeting on May 24, Dr. Harry J. Dooley vice president and Dr. James W. Merricks secretary-treasurer.——The Chicago Orthopaedic Society recently chose Dr. Charles N. Pease president-elect. Other officers include Drs. Walter R. Fischer, president; Arthur H. Conley, vice president; John R. Norcross, secretary and Manley A. Page, assistant secretary.

INDIANA

Executive Secretary for Indianapolis Medical Society.—Ray E. Smith, Indianapolis, a member of the state board of tax commissioners, has been appointed executive secretary of the Indianapolis Medical Society, a newly created position. Mr. Smith, whose resignation from the tax board was effective June 1, will serve as assistant to Mr. Thomas A. Hendricks, executive secretary of the Indiana State Medical Association, dividing his time between the two offices.

KENTUCKY

Hospital Construction Program.—On May 17 Governor Simeon S. Willis signed an $84,000 contract with three architects to draft plans for construction of five tuberculosis hospitals, one each in Madisonville, first district; Paris, third; Ashland, fourth; London, fifth, and Glasgow, sixth. Existing facilities in Louisville in the second district were embraced in forming the areas, explains the Hopkinsville *New Era* in discussing the districts set up by the 1944 general assembly in creating the tuberculosis sanatorium commission. The legislature set aside $1,500,000 to start construction and empowered the commission to determine which sanatorium would be constructed first. It is expected that each hospital will have about 100 beds.

MARYLAND

New Bacteriologist at Maryland.—Oscar N. Allen, Ph.D., professor of bacteriology and plant pathology at the University of Hawaii, Honolulu, since 1940, has been appointed head of the department of bacteriology at the University of Maryland, College Park. Dr. Allen succeeds Lawrence H. James, Ph.D., who has opened a consulting laboratory in Chicago.

De Lamar Lecture in Hygiene.—Dr. George Baehr, clinical professor of medicine, Columbia University College of Physicians and Surgeons, New York, gave the De Lamar Lecture in Hygiene at the Johns Hopkins University School of Hygiene and Public Health, May 17. His subject was "Medical Service Under the Health Insurance Plan of Greater New York."

MASSACHUSETTS

Physician Honored.—Dr. Alice S. Woodman, associate professor of histology and embryology and for thirty-eight years a member of the faculty of the Boston University School of Medicine, was honored at a special gathering by students and members of the faculty recently to mark her retirement at the end of June. Dr. Woodman graduated at Boston in 1903.

Diabetes Mellitus in Relation to General Medicine.—A graduate course will be conducted at the New England Deaconess Hospital, Boston, July 9-11 and October 1-3, on "diabetes mellitus in relation to general medicine." It will consist of ward teaching and didactic presentation of such topics as pathology of diabetes, alloxan and experimental diabetes, treatment with diet and the various insulins, hypoglycemia, diabetes in childhood and pregnancy, cardiovascular disease, management of complications including gangrene, pulmonary diseases, ocular and dermatologic lesions, diabetic neuropathy and ketosis and the treatment of diabetic coma. Instructors of the course will include Drs. Elliott P. Joslin, Howard F. Root, Priscilla White, Charles Cabell Bailey, Shields Warren, Leland S. McKittrick, John Herbert Waite, William P. Beetham, Richard H. Overholt, Arthur M. Greenwood, Orville T. Bailey and George W. Thorn, Harry C. Trimble, Ph.D., and Thorne M. Carpenter, Ph.D. Applications for the course should be made to the assistant dean, course for graduates, Harvard Medical School, Boston 15.

MICHIGAN

New Academy of Medicine.—The Southwestern Michigan Academy of Medicine was formally organized in St. Joseph, May 11, to bring to members of the profession in Berrien County prominent speakers. According to the St. Joseph *Herald Press* the new group is not to supplant the existing Berrien County Medical Society in any way. Officers of the new academy of medicine include Drs. Donald W. Thorup, Benton Harbor, president, and Robert C. Conybeare, Benton Harbor, secretary.

Campaign on Rheumatic Fever.—The Michigan State Medical Society and the Michigan Crippled Children's Commission are planning to launch a statewide campaign against rheumatic fever July 1. The two groups have been sponsoring a program in seven counties of the upper peninsula for the past two years. Patients were treated with the sulfonamides, and the experiment has proved sufficiently successful to carry on the statewide program with special emphasis in the congested areas. Every facility of the Michigan Crippled Children's Commission and of the state society is to be made available to the family physician, who will be invited to make full use of the commission's resources for blood and heart tests and for taking roentgenograms. The commission will pay the cost of care for children whose families are financially unable to meet the usual charges, which frequently are high because of the long hospitalization and convalescent period. In the cases in which private physicians cannot devote much time because of the long convalescent stage he may refer his patients to the pediatricians associated with the commission. Present plans call for a closer supervision of the sick child, special consultation service of pediatricians and cardiologists and follow-up care in the family.

NEW JERSEY

Division of Migrant Labor.—*Industrial Hygiene News Letter* reports the establishment of a division of migrant labor in the New Jersey Department of Labor to cooperate with the state department of health in prescribing minimum standards for sanitation and preventive and curative health centers for migrant workers. Through the state department of health, the commissioner of labor will provide essential medical, clinical, and hospital facilities; through the state director of health, he will exercise powers of a local health officer with respect to communicable diseases in migrant camps.

State Medical Election.—Dr. Frank G. Scammell, Trenton, was chosen president-elect and Dr. Samuel Alexander, Park Ridge, was installed as president of the Medical Society of New Jersey at the meeting of its board of trustees in Atlantic City, May 23. Other officers include Drs. Royal A. Schaaf, Newark, and J. Howard Hornberger, Roebling, vice presidents; Alfred Stahl, Newark, secretary, and George J. Young, Morristown, treasurer. The board, which met in place of the 179th annual convention of the society, scheduled five public meetings throughout the state in defense of what is called "the American way of medicine," according to the New York *Times*. The sessions were to be held in Atlantic City June 11, Camden June 12, Trenton June 13, Paterson June 14 and Newark June 15 and will represent the five judicial districts of the state society.

NEW YORK

Typhoid Carriers.—A total of 480 typhoid carriers were under supervision in upstate New York at the close of 1944, according to *Health News*. Forty-one new carriers were added to and 35 were removed from the register during the year. Twenty-three were discovered as a result of epidemiologic investigation of sporadic cases of typhoid, 4 by means of release cultures, 10 accidentally as a result of routine culturing, and 1 on the basis of information furnished by the

New York City Department of Health Three previously discovered carriers were added to the register, these carriers had been residing temporarily out of the state Of the 35 carriers whose names were removed from the register, 23 died, 6 were released from restrictions after the submission of the required number of negative fecal and duodenal specimens following cholecystectomy, while the names of 6 others were removed because of change of residence of the carrier to a community outside the jurisdiction of the department Noteworthy is the fact that only 97 cases of typhoid were reported to have occurred in the upstate area during 1944 Since the best evidence indicates that an average of 3 per cent of typhoid patients become chronic carriers, it is assumed that not more than 3 chronic carriers will develop from these cases On the other hand, during the same period 23 carriers died These data indicate the extent to which the typhoid problem is diminishing in New York State

New York City

Heart Association Moves.—The New York Heart Association, Inc, is now located in the New York Academy of Medicine, 2 East 103d Street

New Drug Exhibit.—On October 1 a drug exhibit will be opened at the New York Academy of Medicine which will be unrestricted as to subject and will include a variety of significant and new therapeutic agents The first drug exhibit of the academy opened Oct 9, 1944 and will be dismantled some time this month This exhibit was restricted to items bearing on the treatment of infections Thirty-eight pharmaceutical organizations participated in the current exhibit

United Medical Service Extends Service.—At an increased rate of 12 cents a month the United Medical Service, Inc, on May 23 offered its subscribers an additional service covering payment of medical bills in hospitals Newspapers reported that the new plan, which would provide payment for such hospitalized cases not requiring surgery or obstetric cost such as pneumonia, heart trouble and kidney disease, further broadens the services offered by organized medical societies in the service

Physician Sentenced for Bandage Diversion—Dr Abraham Freitag, Brooklyn, who pleaded guilty May 25 to violation of War Production Board priority regulation through the diverted sale of three million yards of bandage material intended for the armed forces into production of civilian goods, was sentenced May 31 to three years in prison and fined $100,000, newspapers reported (THE JOURNAL, April 14, p 1002) Francis G Caffey, federal judge, imposed the sentence which is said to be the "heaviest black market sentence ever imposed" in the New York area Dr Freitag, whose action was characterized by U S Attorney John F X McGohey as 'one of the meanest frauds ever perpetrated in this district," was given until June 18 to surrender

NORTH CAROLINA

New Hospital Control Board and Advisory Commission—Governor Cherry has appointed fifteen members of the new North Carolina Hospitals Board of Control authorized by the last general assembly The board is composed of one member from each of the state's twelve congressional districts and three members at large Among physician members of the board are Drs Yates S Palmer, Valdese, representing the tenth district and Thomas V Goode, Statesville, ninth district The governor also appointed a twelve man advisory commission to assist the hospital board of control and named Dr Hubert B Haywood, Raleigh, chairman Other members of the commission include

Dr Coy C Carpenter, Winston Salem dean of the Bowman Gray School of Medicine of Wake Forest College
Dr Wilburt O Davison, Durham, dean of the Duke University School of Medicine
Dr Walter R Berryhill Chapel Hill dean of the University of North Carolina School of Medicine
Dr Maurice H Greenhill Durham, in the psychiatric department of Duke Hospital
Dr George T Harrell Jr Winston Salem, professor of internal medicine of the Bowman Gray Medical School
Dr Lois B T Stanford Durham on the staff of Watts Hospital, only woman member of the committee and former member of the state hospital board of control
Charles C Poindexter, Greensboro past president of the North Carolina Dental Society and former member of the hospitals board of control
Dr James W Vernon, Morgantown, superintendent, Broadoaks Sanatorium
Dr Charles T Stroupe, Goldsboro, in the field of internal medicine, with considerable experience in the work of the Negro hospital at Goldsboro
Dr Paul F Whitaker, Kinston, president of the North Carolina Medical Association
Dr Carl V Reynolds, Raleigh secretary of the state board of health

OHIO

Birthdays of Physicians—Dr John H Norris, Fostoria observed his ninetieth birthday May 13 Dr Norris first located in Bowling Green in 1877, moving to Fostoria in 1889, where he has been practicing since that time——Dr Auguste Rhu, Marion, celebrated his ninety-sixth birthday April 5 According to the state medical journal, Dr Rhu is believed to be the oldest practicing physician in the state

Edward Malone Retires—Dr Edward Fall Malone, professor of anatomy at the University of Cincinnati College of Medicine, Cincinnati, will retire, effective July 1 Dr Malone is retiring at his own request because of ill health He joined the staff of the University of Cincinnati in 1910 as assistant professor of anatomy, in 1918 he was made professor of histology and in 1925 Francis Brunning professor of anatomy and director of the department His successor has not been announced

Tuberculosis Control Program.—For the first time in the history of the state, a widespread tuberculosis control program has been inaugurated by the state department of health involving patients and employees in all state welfare department institutions Nearly 40,000 patients and employees will soon undergo chest x-ray examinations as part of the control program, according to the state medical journal A mobile unit, including a physician and a technician, will be lent by the United States Public Health Service for the survey

Ohio Medical Indemnity—The Ohio State Medical Association on May 23 filed papers of incorporation for the Ohio Medical Indemnity Inc The insurance company, which will be controlled by the state medical association and operated on a statewide basis will provide indemnity for obstetric and surgical expenses and will be available to participants to Blue Cross hospital plans in the state According to the Cleveland *Plain Dealer* the company will start business with $100,000 capital assets and a cash surplus of at least $30,000 funds to be raised through the sale of stock to Ohio physicians and others interested in the plan The benefits at the start will range from $10 to $150, depending on the disability and payable to the policyholder The *Plain Dealer* stated that the Ohio State Medical Association invited the Cleveland Hospital Service Association to cooperate with the physicians in their insurance plan but this organization decided to go ahead with plans for its own indemnity insurance company, which was launched May 22 under the name Medical Mutual of Cleveland, Inc, and which also provides benefits in case of surgical and obstetric expenses

RHODE ISLAND

Society News—The Providence Medical Association was addressed May 7 by Drs Roland Hammond, Providence on "Hugh Owen Thomas The Apostle of Rest" and Orville T Bailey, Boston, on "The Uses of Purified Human Fibrinogen and Thrombin in Medicine and Surgery"

Meeting on Industrial Health—The New England Conference of the American Association of Industrial Physicians and Surgeons was held at Pawtucket, May 2 Included among the speakers were

Dr John E Donley, Providence, Rehabilitation of Workers Under the Workmen's Compensation Act at the New Curative Center
Dr Ubaldo F Zambarano Wallum Lake, Tuberculosis in Industry
Dr Vincent J Ryan Providence, Industrial Dermatoses—Treatment
Dr Henry B Moor, Providence, Burns and Treatment

SOUTH CAROLINA

Personal—Dr Luther A Riser has resigned as director of the department of vital statistics of the state board of health, Columbia

"Industrialights."—The South Carolina State Board of Health and the division of industrial hygiene are cooperating in the publication of a health news abstract entitled *Industrialights*, which was to appear for the first time in May

Dr. Williams Honored.—A special program was held May 1 honoring Dr Charles F Williams on his retirement as medical superintendent of the South Carolina State Hospital, Columbia, to become director of the hospital's research activities (THE JOURNAL, March 24, p 725) A feature of the occasion was the announcement of a portrait of Dr Williams to be painted by Charles Mason Crowson Dr Williams held the superintendency for thirty years Dr Cort Ham, clinical director at the hospital, is the new superintendent, and Dr. Glenn B Carrigan will succeed Dr. Hoyt in his position

Statewide Tuberculosis Program—The industrial committee of the South Carolina Tuberculosis Association plans to photofluorograph all industrial employees in the state Results will be checked and cooperation will be extended to place employees in sheltered work as well as to assist private physicians in the isolation of infectious cases of tuberculosis The program was adopted from an x-ray survey carried on by the state board of health The program will work through the county health departments and tuberculosis associations and with the full assistance of the consultant nurses of the industrial hygiene division

TENNESSEE

Physician Expands Telephone Service—Dr Leander C Bryan, who owns the Rutledge Telephone Company of Rutledge, has received permission by the state railroad and public utilities commission to enlarge his telephone exchange and install dial telephones The physician entered the telephone business for the convenience of his patients, newspapers reported, and is said to have taken over the exchange because improved service was necessary for his practice His company's 230 miles of line serves 192 subscribers

Fifty Year Practitioners Honored.—Dr William L Howard, Memphis, who has completed fifty years in the practice of medicine, observed the event by giving a dinner recently for his colleagues who have practiced the same length of time Guests at the dinner included Drs Eugene M Holder, Benjamin F Turner, Elmer E Francis, William B Burns, Alfred Moore and Arthur B Williams Two physicians who could not attend because they were out of town were Drs Edward C Ellett and Pope M Farrington All are of Memphis

VIRGINIA

Special Meeting to Discuss Health Education—The health education program now being promoted in a limited number of counties on an experimental basis under the direction of the health and physical education section of the division of instruction, state department of education, was the reason for a special meeting of the council of the Medical Society of Virginia in Richmond, April 6 The state medical journal reported that the program as first presented was all right but that it had not been carried out according to plan and, further, it had been found that it was started before being presented to the council or state health department It had been stated that the medical and hospital services would be financed by civic and community organizations, but it was learned that the parents were being required to pay if they were thought to be financially able One physician at the meeting contended that if a fee is paid by the parent the patient is a private one and should be allowed the selection of his physician It was pointed out at the meeting that the Lynchburg physicians had done no operations nor would they under the present plan and that hospitals had stated that they would be unable to accommodate for hospital care these children under the program One recommendation urged that an announcement be published pointing out that the worker carrying on the educational program was a Ph D and not an M D and stating that the defects found in school children were the result of an examination made by teachers and that therefore many of these defects probably would not be found to be present if examined by competent physicians The meeting resulted in the agreement of the council to appoint a committee to meet with Mr Eliot V Graves, supervisor of physical and health education for the state, to develop a standard and cooperative program A resolution previously adopted by the council was reaffirmed, approving the principle of health education in state schools but disapproving other aspects of the project as carried out in the experimental counties The resolution further approved the examination of school children by competent physicians and the correction of remediable defects The opinion of the council that the project should be supervised by the state health department was carried

WASHINGTON

Hospital Beneficiary on Insurance Policies—The Children's Orthopedic Hospital, Seattle, recently received $156,465 from the Seattle Life Underwriters Association from insurance policies that have been written as a part of a campaign started in 1925 to provide the hospital with an adequate endowment fund Eventually the hospital is to realize $366,232, which would have been $32,492 more had not the hospital been required to pay this amount to keep in force policies of some persons who could not continue to pay premiums The Children's Orthopedic Hospital was founded as a 7 bed ward in the Seattle General Hospital in 1907 by 24 women who pledged $20 each to help the city's crippled children In 1925 the insurance idea was launched and the recent sum of $156,465 was the result of endowments maturing in 1945 A total of $789,771 of insurance was written during a two week campaign More than half of the amount, principally in $500 and $1,000 policies, was kept in force despite the depression, an unusual retention record for bequest insurance, an announcement stated The proceeds of the policies go into the institution's permanent fund and cannot be expended for maintenance or building needs

GENERAL

International Health Organization—A security conference committee in San Francisco on May 28 voted unanimously to support a China-Brazil proposal for an early world conference to form an international health organization, newspapers report

Papaverine Removed from Quota Restrictions—H J Anslinger, commissioner of narcotics, Bureau of Narcotics, Treasury Department, Washington, D C, announces that the increased production of papaverine has so improved the supply situation pertaining to this drug that it can now be removed from quota restrictions Manufacturers and wholesalers may now purchase whatever quantities of the drug are required by them for manufacture or distribution for medical needs, irrespective of any quota limitation heretofore imposed

First Scholarship Awarded in Physical Therapy.—The first scholarship award in the campaign of the National Foundation for Infantile Paralysis to recruit 1,000 persons for physical therapists was made to Miss Marjorie Katherine Ionta, North Weymouth, Mass, during a luncheon meeting at the Waldorf-Astoria, New York, May 25 Miss Ionta will study at Harvard Medical School, Boston This activity will be financed by $1,267,600 earmarked for physical therapy by the National Foundation (THE JOURNAL, March 24, p 727)

Architects Urge Accessibility of Buildings for Cripples—A seven point program to make public buildings easily accessible to handicapped persons, both veterans and civilians, has been proposed by the architects' advisory committee of the National Society for Crippled Children, newspapers report The plan would eliminate outside steps to public buildings and flights of steps by providing grade level entrances It would provide convenient elevator service in all buildings, eliminate inside steps, do away with all excessively high curbs and place hand rails on both sides of steps the full length of flights wherever steps cannot be eliminated

Abbott Laboratories Provides Research Fellowships—The Abbott Laboratories, North Chicago, Ill, has appropriated $50,000 to provide for research fellowships in ten universities Under the terms of the grants, $5,000 has been given each university to support research in the field of medicinal products during a five year period beginning a year after cessation of hostilities The universities are to have the sole right to publish, patent, license or otherwise dispose of the results of the research conducted The grants do not restrict the universities regarding the type or scope of the problem selected within the specified field of research The ten universities and the fellowships to be established in them are California Institute of Technology, Pasadena, Calif, research in physical chemistry and biophysics, Cornell University, Ithaca, N Y, research in bacteriology, Harvard University, Cambridge, Mass, research in pharmacology, University of Illinois College of Medicine, Chicago, research in pharmacology, Massachusetts Institute of Technology, Cambridge, research in organic chemistry, University of Minnesota, Minneapolis, research in biochemistry, Ohio State University, Columbus, research in organic chemistry, Purdue University, Lafayette Ind, research in organic chemistry, Tulane University of Louisiana New Orleans research in chemotherapy and tropical diseases, and the University of Wisconsin, Madison, research in nutritional chemistry

CORRECTION

Rats and Rat Bites—The Current Comment with this title published in THE JOURNAL, June 2, page 367 contains the statement that "almost 25 per cent of the people in a 2 square mile area of Baltimore were bitten by rats over a four year period!" This should have read "Almost 25 people per year in a 2 square mile area of Baltimore were bitten by rats over a four year period!"

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 12, 1945.

The Shortage of Medical Books and Journals

As with all other forms of publication, the medical is in great difficulties as a result of the paper control imposed by the war. In the House of Lords Viscount Buckmaster raised the question of the supply of paper for medical publications. He said that publishers were now unable to supply the basic minimum of books needed by medical students. "Gray's Anatomy" was quite unobtainable. He had tried to get it, either new or second hand, without success. The same applied to "Buchanan's Anatomy" and "Cunningham's Anatomy." In physiology matters, if anything, were worse. In one class of students 15 per cent could not beg, borrow or by any means short of theft obtain a copy of any of the leading works. The physician in practice was in the same trouble. Not merely were writers prevented by shortage of paper from writing books, but there was a shortage of journals. An editor had advised him that he had a waiting list of 1,500 doctors seeking to become subscribers and that he was quite unable to meet the demand for his journal in the liberated countries. Another editor assured him that he could not meet the demands of his subscribers, that his correspondence was drastically cut down and that much medical knowledge of the first importance could not be passed on. The new field of social medicine required every encouragement, but the Ministry of Supply refused to allow the British Medical Association a ton of paper a year to start a *Journal of Social Medicine*.

Replying for the government, the earl of Selborne, minister of economic warfare, said that the government was aware of the immense importance of books, especially at the present time. But although we had more ships than ever before, shipping shortage was greater than ever owing to other demands. We had acquired all the paper we could in America and an addition was not possible. Moreover, every ton of shipping was now required for pursuing the war and for feeding liberated Europe. Paper was not the only bottle neck; labor in the printing and publishing trades was also in short supply. As to medical books, he was advised that their publication at the moment was 80 per cent of that before control. But this was a matter requiring the most serious consideration and he would draw the attention of the president of the board of trade to the remarks made.

The Presidency of the British Medical Association

The British Medical Association has had the misfortune of losing two presidents in the past two years who died while in office: Sir Beckwith Whitehouse and Lord Dawson. The council has appointed Mr. H. S. Souttar, surgeon to the London Hospital, as president until the next annual representative meeting in July and has recommended to the representative body his election as president for the coming year. The new president is a leading surgeon in active practice and has held a succession of high offices in the association. In 1934-1937 he was chairman of the representative body. He was chairman of the council during the first four years of the war, of the Central Medical War Committee and of the Medical Planning Commission.

Medical Students for German Concentration Camp

The official report on the conditions in the German concentration camps for political prisoners which have been captured by the Americans have horrified the British public. To help in the treatment of cases of starvation 95 senior medical students from the London hospitals have been sent to Belsen camp under the auspices of the Red Cross. The students volunteered in response to a call from the Ministry of Health. They will operate in teams of 12 under the guidance of experts from the Ministry of Health and Ministry of Food and under the direction of the Civil Affairs Branch of the British Armies of Liberation. At Belsen concentration camp six civilian teams are already workering. Five are manned by members of the Red Cross and the sixth is a relief team of the Society of Friends. Each team consists of 12 men and women and is self supporting, carrying its own cooking and washing apparatus and its own stores and equipment. Two ambulances, two trucks and a 3 ton lorry are attached to each team.

PARIS

(From Our Regular Correspondent)

April 24, 1945.

Health Conditions in France

The minister of public health, who is the guardian of the health of the nation, has given to the consultative assembly serious evidences on the health conditions in the country. The figures and comments concern not only the physical status of the population, with impressive demographic statistics, but also the moral status created by the years of war and suffering. For instance, 37,000 children have been abandoned, compared to 20,000 in 1936; the number of delinquent children has advanced during the same period from 12,000 to 36,000; the assistance organizations at present have in their charge more than 200,000 minors but are far from having sufficient resources and equipment necessary to accomplish this hard task.

Infant mortality has increased 40 per cent; cases of typhoid have doubled, those of diphtheria have tripled; cases of tuberculosis have increased by about 11 per cent on the average, but in Paris by 48 per cent and at the mouth of the Rhone (Marseilles) by 74 per cent.

In 1943 there were 64,000 deaths from tuberculosis, a figure certainly lower than it is in reality, particularly since the deaths are often declared under other causes than tuberculosis. For the ages between 20 and 40 years, more than 40 per cent of the deaths are due to tuberculosis and for the women of this age, which is that of maternity, it is 49 per cent. This is different from cancer, which kills 10 per cent of women but mostly those over 40. This shows what influence the tuberculosis mortality can have on the birth rate. According to Moine, statistician of the Comité national of the campaign against tuberculosis, this disease has killed 4 million in France since 1900, of which number 1½ million would have been alive today, a figure which would add to the population yet another million of the children they would have had. If France had only had the tuberculosis mortality of Great Britain, its population today would be 600,000 more. The tuberculosis mortality in France remains at 137 per hundred thousand inhabitants in contrast with 48 in the Netherlands, 54 in the United States and 71 in Great Britain. It has decreased in all countries by 66 since the beginning of the century: 66 per cent in the United States, in the Netherlands and Germany, 55 per cent in Great Britain and only 39 and 38 in Italy and France.

Three different periods during the war can be differentiated: from September 1939 to the winter of 1940; 1941 and 1942, and 1943 and 1944. The first period which followed the declaration of war presents nothing unusual, but beginning with the summer of 1940 one observed a noteworthy increase in the cases registered by the insurance organizations. The seriousness of 20 per cent of these cases became alarming. The miliary and meningitic forms multipled; the rapidly fatal developments advanced from 15 per cent in 1937 to 45 per cent. The fatal extrapulmonary localizations, bilateralization and relapses were seen more frequently. During the third period the serious forms became less frequent and the mortality decreased. It seems that there had been a sort of epi-

demic of serious tuberculosis; all those who did not have sufficient resistance having been decimated, the surving ones were less vulnerable. But it is now already certain that the mortality figures of tuberculosis in France for the years to come will be above all those recorded up to now.

Criminal Abortion

According to Dérobert of the Société de médecine légale de France, in 1938 it was estimated that 500,000 criminal abortions were practiced in France; that is to say, a figure much greater than that of living births. Dérobert affirms that this figure of 500,000 is greatly exceeded at present. Meanwhile the legislator has not ceased to increase legal action against this national scourge, either by repressive measures or by arrangements such as the pardon for informers, the dispensation from professional secrecy, the supervision of maternity homes and so on. However, the evolution of repression is "a series of capitulations."

Sociologists as well as physicians have hoped to conquer the scourge by repression rather than by prevention. Criminal abortion depends on two types of factors, moral and pecuniary. The one or the other predominates, depending on the environment. In former times the moral factor was principally the dishonor of being an unmarried mother; at present it consists above all in the selfishness and the amorality of the prospective mother and her surroundings. This degradation in individual and social morality goes parallel with the weakening of religious morality, which lives or sleeps in every soul.

However, it is necessary to consider the pecuniary factors. The child who is born in France in our days is a heavy burden and a considerable encumbrance. The first born is accepted, but the others are undesirable. Statistics set up by social insurances show that 66 per cent of women who abort have only one child. France is the country of the family with one child. The second one costs too dear and creates too many difficulties in a country where everything is missing.

Certainly there are fiscal privileges and special allocations for large families, but they hardly count for one or two children; they increase only slightly for a family of three children; they are far from compensating for the increase in expenses which the children cause.

Food Rationing in France After the War

Based on the general forms of human food allowance fixed by the League of Nations in 1936 and 1938, Simonnet of the Institut national d'hygiène has tried to establish the food ration suitable for the French after the war. He has adapted theoretical information to the various realities: resources of the nation, former habits, climatic conditions and nutritional needs created by the state of malnutrition resulting from the war. He has also taken account of the correlations between nutrition and the morbidity in various diseases and the needs of certain groups of the population.

The work of Simonnet consists of four parts: (1) the determination of energy producing foods, (2) the determination of the protein requirements, (3) the determination of the mineral and vitamin requirements and their transposition in protective foods and finally (4) the estimation of fat and carbohydrate requirements.

He arrives at two conclusions: 1. The per capita consumption without taking into account the age, the occupation and the pathologic or physiologic status. 2. The establishment of a scale of coefficients applicable to every category of the total population.

The energy producing needs correspond to the sum of several elements: the caloric needs of the basal metabolism, the specific dynamic action of the foods, the thermoregulation, the muscular and digestive work, growth and, in pregnant women or young mothers, the requirements of gestation and lactation. On the other hand, the environment in which the person lives, his present state of nutrition, his age, sex and muscular activity may modify the average figures. The specific dynamic action varies according to the nature of the foods ingested and according to their combination. The thermoregulation is influenced by the work, the clothing and the external temperature. Muscular work varies greatly, as do also the requirements of growth. A careful study arrives at a figure between 2,400 and 2,750 calories for twenty-four hours for a person weighing about 143 pounds (65 Kg.).

Reliable statistics indicate for the usual consumption of a person in France before the war an average of 3,000 calories. The soldier, for instance, receives a ration of from 2,926 to 3,434 calories. In a large insane asylum the ration was 2,800 calories. Richet has evaluated the intake of a Parisian before the war at 3,278 calories. In 1943 the allowance was only from 1,500 to 1,800 calories according to the categories of consumers; the Germans had decided that the French ate too much. Moreover, it should not be forgotten that the French food allowance was terribly unbalanced, which complicates the study of its effect on the disturbances of malnutrition observed since 1939.

The fats should account in the diet of tomorrow for about 46 Gm. and the carbohydrates for 400 to 450 Gm.

The theoretical ration of the French will be established at around 2,800 calories, provided by 100 Gm. of proteins, of vegetable and animal origin in equal parts, 420 Gm. of carbohydrates and 60 to 80 Gm. of fats.

Pressure in the Right Ventricle

Lenègre and Maurice communicated to the Société de cardiologie their first investigations on the pressure in the right ventricle. They introduce through an arm vein and into the right ventricle a semisoft catheter of small caliber that is connected with a Claude manometer. The pressure observed in normal subjects was between 10 and 20 cm.; it is slightly higher in adults than in young subjects. In 37 patients with cardiac disorders figures as high as 60 were reached; the mean was 31. Thus between healthy subjects and those with heart disease differences of as much as 1 to 5 may exist; that is to say, the differences are much greater than those encountered in the systemic circulation. The ventricular pressure attains its maximum in grave mitral valvulitis with cardiac insufficiency or pulmonary complications. It was also ascertained that the intraventricular pressure is higher in the reclining than in the upright posture; this may explain the dyspneas of the reclining position, which are so distressing in the course of ventricular syncopes.

Marriages

JUDSON ALBERT MILLSPAUGH, Lieutenant Commander (MC), U. S. Navy, to Miss Ellen Ann Huskes in Hollywood-in-Florida, April 9.

GUY PARRY YOUMANS, Chicago, to Miss Anne Louise Stewart of Springfield, Mo., in Winnetka, Ill., March 17.

JACK M. STEMPER to Miss Dorothy Mae Campbell, both of Kansas City, Mo., in Kansas City, Kan., March 10.

WILLIAM CHARLES RUCKER to DR. VENDELA EVELYN OLSON, both of Hackensack, N. J., April 28.

SIEGFRIED R. BERTHELSDORF, Olene, Ore., to Miss Mildred Freiderich of Tampa, Fla., May 13.

ROBERT LANCEFIELD THOMAS, to Miss Gladys Margery Watt, both of Berkeley, Calif., April 28.

MICHAEL V. GUALTIERI to Miss Shirley Margaret Lawson, both of Waterbury, Conn, May 5.

WILLIAM LE GRAND HOON, Prospect, Pa., to Miss Anna M. Tyrrell of Merion, Pa., March 29.

ALBERT GAYLAND YOUNG, Boston, to Miss Mary A. Kennedy of Rochdale, Mass., April 7.

Deaths

Oliver James Fay ⊕ died at the Iowa Methodist Hospital, Des Moines, June 2, of arteriosclerosis and myocardial failure, aged 70.

Dr. Fay was born in Pottsville, Iowa, July 2, 1874. He received his B.S. degree at the Iowa State College in 1898 and graduated at the College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, in 1902, serving his internship at Augustana Hospital, Chicago. In 1904 he returned to Des Moines to specialize in surgery. Subsequently he became a charter member of the American College of Surgeons and a founder member of the American Board of Surgery. He had served as president of the Polk County Medical Society and of the Iowa State Medical Society, holding membership on the latter's board of trustees since 1924. He had also been president of the Northwest Conference for Medical Service. Included among the groups in which he also held membership are the Western Surgical Association, the American Association of Railway Surgeons and the American Association of Industrial Physicians and Surgeons. He was a member of the staff of the Iowa Methodist Hospital and a consultant to the Broadlawns General Hospital, chief district surgeon for the Rock Island Railroad, consultant surgeon for the Burlington and Northwestern railroads and retired medical director of the Northwestern Bell Telephone Company.

Dr. Fay had been medical director of the Iowa State Industrial Commission since its inception in 1913; in 1933 he was one of nine members of a committee specially appointed by the legislature to investigate the causes and suggest remedies for the waiting list of indigent patients committed but not admitted to the University Hospitals, Iowa City.

One of Dr. Fay's chief interests was the acquisition of a medical as well as a comprehensive general library. In 1940 he donated his own private collection of some 1,500 volumes to found the medical library at the Iowa Methodist Hospital.

Max Winsor ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1932; member of the American Orthopsychiatric Association; educational director of the Amalgamated Clothing Workers Union from 1922 to 1924, and from 1926 to 1931 engaged in the study of penal institutions in the United States and psychologic studies of one hundred leading criminals for the Rockefeller Foundation; from 1932 to 1937 initiated liaison between the Neurological and Psychiatric Institute of the Columbia Presbyterian Medical Center and the New York State Training School for Boys to provide medical and psychiatric treatment for delinquent boys; administered this program at the New York Training School for Boys at Warwick, N. Y., where he was a resident in the medical center unit; in 1937 established the first clinic for psychiatric treatment in the Children's Court in New York City; in 1938 appointed to the bureau of child guidance of the city board of education as psychiatrist in charge of the Harlem area; beginning in 1940 the New York School of Social Work of Columbia University established a teaching unit under his direction for psychiatric social work majors; in September 1943 named director of clinical work in a two year research project sponsored by the New York Foundation and the board of education; in the summer of 1944 appointed to the staff of the New York School of Social work as lecturer in social psychiatry; vice chairman of the citywide citizens' committee for Harlem and served as chairman of its subcommittee on delinquency; a member of the board of Wiltwyck School and of the advisory committee of the Treatment Clinic of the Domestic Relations Court; died in the Beth Israel Hospital May 4, aged 47, of coronary heart disease.

Maurice Holmes Rees ⊕ Denver; Washington University School of Medicine, St. Louis, 1921; since 1925 dean and since 1921 professor of physiology and pharmacology at the University of Colorado School of Medicine, where during 1924-1925 he served as assistant dean; fellow in zoology at the University of Illinois, 1904-1905; professor of science at the York (Neb.) College, 1905-1906; professor of biology at the Tarkio (Mo.) College from 1906 to 1914; assistant professor of physiology at the University of Kansas from 1914 to 1916; associate in physiology at the University of Chicago, 1916-1917; professor of physiology at the University of South Dakota from 1917 to 1921; chairman of the Section on Pathology and Physiology of the American Medical Association, 1928-1929; member and formerly chairman of the executive council of the Association of American Medical Colleges, of which he had been president and vice president; had been active in that organization for several years; elected vice president of the Advisory Council on Medical Education at its formation in 1939; past president of the Denver Public Health Council; fellow of the American College of Hospital Administrators; in 1941 elected to membership in the National Board of Medical Examiners, serving as chairman of the subsidiary board of Denver; member of the American Physiological Society and the Denver Clinical and Pathological Society; in 1932 chairman of the medical service division of the Colorado White House Conference on Child Health and Protection in Denver; superintendent of the Colorado General Hospital; died May 25, aged 62, of coronary occlusion.

William Anthony Mulherin ⊕ Augusta, Ga.; Harvard Medical School, Boston, 1901; emeritus professor of clinical pediatrics at the University of Georgia School of Medicine; member of the House of Delegates of the American Medical Association in 1942, 1943 and 1944, and vice chairman of the Section on Diseases of Children in 1921, serving as chairman of the section in 1928-1929; in 1922 appointed a member of the Abraham Jacobi Committee of the section and later a member of a committee to study teaching of pediatrics in American universities and report to the section with suggestions as to betterments; fellow of the American Academy of Pediatrics; one of five to organize the pediatric section of the Southern Medical Association, serving as secretary of the section in 1919 and chairman in 1920; member of the American Pediatric Society; past president of the Medical Association of Georgia; served as a member of the state board of health and as chairman of the Richmond County Board of Health; dean emeritus of the Southern Pediatric Seminar, which he organized; organized pediatric societies in various localities; served as a member of President Hoover's Conference on Child Health and Protection; on the staffs of the University and Children's hospitals; received the honorary doctor of science from the University of Georgia in 1929; died in his sleep April 19, aged 72, of coronary thrombosis.

Joseph Byrne, New York; College of Physicians and Surgeons, New York, 1895; formerly dean and professor of neurology at the Fordham University School of Medicine; veteran of the Spanish-American War; past president of the medical board of the Central and Neurological Hospital on Welfare Island; had long been a consultant to the City, Fordham and Neurological hospitals; served as a member of the advisory board of the city health department; fellow of the New York Academy of Medicine; member of the Royal College of Surgeons of England, Society for Experimental Biology and Medicine, New York Neurological Association and the Alumni Association of the College of Physicians and Surgeons; received the bachelor of laws degree from the New York Law School in 1900 and the degree doctor of laws from the Fordham University in 1921; author of numerous books; had made extensive experimental and clinical studies on the mechanism of sensation and contributed numerous articles to the literature; died May 13, aged 75, of cardiac asthma.

Howard Elmer Ashbury ⊕ Baltimore; University of Maryland School of Medicine, Baltimore, 1903; also a pharmacist; specialist certified by the American Board of Radiology, Inc.; member of the American Roentgen Ray Society and the American College of Radiology; for many years assistant in surgery and orthopedic surgery at the Johns Hopkins University School of Medicine and Hospital; during World War I a major in the medical corps of the U. S. Army, serving as professor of roentgenology at the Army Medical School, as inspector of the roentgenologic service of the Eastern department and as chief of the x-ray laboratory of the U. S. Army; relieved from active duty as a lieutenant colonel in the medical corps of the Army of the United States in February 1944; consultant roentgenologist for the U. S. Veterans Bureau; roentgenologist at St. Joseph and Provident hospitals; consultant on the staff of the Waynesboro (Pa.) Hospital; died February 20, aged 64.

Hiram N. Vineberg ⊕ New York; McGill University Faculty of Medicine, [illegible] Canada, 1878; in 1918 president of the New [illegible]ty and in 1926 a vice president of the [illegible] Society; fellow of the American Colleg[illegible] appointed chief of staff in the outpatient department of Mount Sinai Hospital, where he had been ever since, having been appointed consulting gynecologist on his retirement in 1921; in June 1943 was presented by his colleagues with a special volume of scientific writings to mark his completion of sixty-five years in the practice of medicine; the gift consisted of a three hundred and sixty page issue of the Journal of the Mount Sinai Hospital; associated at various periods with the Polyclinic, St. Mark's and Post-Graduate hospitals and the Montefiore Home for Chronic Invalids; for many years gynecologist in chief at Beth Moses Hospital; died May 4, aged 87.

George Mason Creevey ⊕ New Hartford, Conn.; Columbia University College of Physicians and Surgeons, New York, 1896; an Affiliate Fellow of the American Medical Association; member of the Medical Society of the State of New York, American Society of Anesthetists, International Anesthesia Research Society and the International College of Anesthesia; specialist certified by the American Board of Anesthesiology, Inc.; formerly chairman of the anesthesia committee of the Doctors Hospital, consulting anesthetist, Flower-Fifth Avenue Hospitals, New York Eye and Ear Infirmary and New York Orthopedic Dispensary and Hospital all in New York; died April 30, aged 72, of coronary occlusion.

Charles Eugene Ferguson, Indianapolis; Medical College of Indiana, Indianapolis, 1892; professor emeritus of obstetrics at the Indiana University School of Medicine; at one time secretary of the city board of health; past president of the Indianapolis Medical Society and the Indianapolis Literary Society; fellow of the American College of Surgeons; member of the consulting staff and formerly superintendent of the Indianapolis City Hospital; served as superintendent of the City Dispensary; consultant, Robert W. Long Hospital; formerly on the staffs of the City Hospital, St. Vincent's Hospital and the Methodist Hospital, where he died May 18, aged 88, of cerebral hemorrhage.

Louis Joseph Burns, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1900; associate professor of laryngology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; member of the American Medical Association, the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; life member of the Philadelphia Laryngological Society; specialist certified by the American Board of Otolaryngology; on the staff of the Philadelphia General Hospital; died May 20, aged 70.

Thomas Ambrose Bray, Holliston, Mass.; Georgetown University School of Medicine, Washington, D. C., 1922; member of the American Medical Association; interned at the Central Dispensary and Emergency Hospital in Washington, D. C., and St. Francis Hospital in New York; served a residency at the New York Eye and Ear Infirmary in New York; formerly on the staff of St. Vincent Hospital in Worcester; on the staffs of the Framingham (Mass.) Union and Milford (Mass.) hospitals; died April 1, aged 50, of acute myocardial failure.

Robert Swan Alston ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1917; fellow of the American College of Surgeons; served during World War I; surgeon at the Stetson Hospital; chief of service in general surgery at the Germantown Hospital, where he died April 24, aged 52, of coronary thrombosis.

Edmund Kent Ayling ⊕ South Bend, Ind.; Northwestern University Medical School, Chicago, 1903; died in St. Joseph Hospital April 25, aged 74, of pneumonia.

George Henry Benton, Coconut Grove, Fla.; Metropolitan Medical College, Chicago, 1899; died in a hospital at Miami March 24, aged 77, of cerebral hemorrhage, hypertension and coronary artery disease.

James Henry Boulware, Zanesville, Ohio; Leonard Medical College, Raleigh, N. C., 1911; member of the American Medical Association; city prison physician; on the staffs of Bethesda Hospital and the Good Samaritan Hospital, where he died April 30, aged 63, of coronary occlusion.

Albert William Bouseman, Fountain Green, Ill.; Barnes Medical College, St. Louis, 1910; found dead about 3 miles southwest of La Harpe April 15, aged 64, of heart disease.

Gilbert Freck Bretz, Pottsville, Pa.; Jefferson Medical College of Philadelphia, 1914; member of the American Medical Association; treasurer of the Schuylkill County Medical Society; on the staff of the Lemos B. Warne Hospital, where he died April 14, aged 70, of occlusion of cerebral blood vessels and generalized arteriosclerosis.

Matthew Gardner Buckner ⊕ Nashville, Tenn.; University of Nashville Medical Department, 1896; served during World War I; for many years president of the Y. M. C. A.; died April 10, aged 74, of acute nephritis.

James Pettigrew Bunn ⊕ Rocky Mount, N. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1935; secretary treasurer of the Edgecombe-Nash Counties Medical Society; past president of the Lions Club; on the staff of the Park View Hospital; part owner of the Speight-Stone-Bunn Clinic Hospital, where he died April 5, aged 35.

C. Dana Carter ⊕ Thermopolis, Wyo.; Missouri Medical College, St. Louis, 1895; county health officer and city physician; physician and surgeon for the Chicago, Burlington and Quincy Railroad; county welfare physician; examiner for the Selective Service; for many years owner of the Carter Hospital; died March 20, aged 71, of cardiac failure.

Franklin Harvick Carter ⊕ San Diego, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; died April 13, aged 57, of tuberculosis.

Raymond Carlton Clapp Sr., Wichita, Kan.; University of Louisville Medical Department, Louisville, Ky., 1907; died April 20, aged 64.

Charles Ely Coleman, Belleville, Ill.; Bennett Medical College, Chicago, 1914; died April 8, aged 73.

John R. Colson, Schell City, Mo.; University Medical College of Kansas City, 1890; member of the American Medical Association; died in the Nevada Hospital, Nevada, April 14, aged 80, of pernicious anemia.

Artice Edward Culberson ⊕ Anniston, Ala.; Birmingham Medical College, 1915; health officer of Calhoun County and city physician; served in France during World War I and as team physician for the athletic organizations at the Anniston High School; on the staff of the Anniston Memorial Hospital, where he died May 1, aged 52, of carcinoma of the stomach.

Edward Thomas Curran, Brooklyn; Long Island College Hospital, Brooklyn, 1905; also a lawyer; veteran of the Spanish-American War and of the Boxer and Philippine rebellions; died March 28, aged 73.

Gilbert Alexander Daniel ⊕ Belle, W. Va.; Medical College of Virginia, Richmond, 1926; died April 20, aged 42.

John McCamie De Armon, Charlotte, N. C.; University of Maryland School of Medicine, Baltimore, 1886; member of the American Medical Association; honorary member of the Medical Society of the State of North Carolina; past president of the Mecklenburg County Medical Society; died in the Mercy Hospital April 22, aged 87, of acute dilatation of the heart.

Charles E. Dorr, Worden, Ill.; Marion-Sims Beaumont Medical College, St. Louis, 1903; member of the American Medical Association; on the staff of the St. Francis Hospital at Litchfield; died April 20, aged 64, of angina pectoris.

William Lincoln Downing, Moulton, Iowa; Rush Medical College, Chicago, 1886; member of the American Medical Association; died April 16, aged 83.

Albert C. Earnest, Wheeling, W. Va.; Hospital College of Medicine, Louisville, Ky., 1896; member of the American Medical Association; retired medical examiner for the Baltimore and Ohio Railroad; died April 29, aged 73, of pulmonary tuberculosis.

Logan Felts, Russellville, Ky.; Kentucky University Medical Department, Louisville, 1905; member of the American Medical Association; served overseas during World War I; died April 18, aged 62, of coronary occlusion.

Sidney LaSalle Ford, Hensonville, N. Y.; University of the City of New York Medical Department, New York, 1891; member of the American Medical Association; at one time chairman of the Green County Board of Supervisors; health officer of the towns of Windham and Jewett; died in the Memorial Hospital, Catskill, April 16, aged 80, of coronary thrombosis.

Charles E. Freeman ⊕ Colonel, U. S. Army, retired, San Antonio, Texas; Barnes Medical College, St. Louis, 1899; Army Medical School, 1906; entered the U. S. Army as an assistant surgeon in 1906; served during World War I; promoted through the various grades to that of colonel in 1932; retired on Aug. 31, 1937 by operation of law; died in the Brooke General Hospital, Nov. 19, 1944, aged 71, of coronary heart disease.

Frederick J. Freshley, Evansville, Ind.; University of Louisville Medical Department, Louisville, Ky., 1908; died April 8, aged 60, of pulmonary tuberculosis.

Obe C. Gibson, Tampa, Fla.; Louisville (Ky.) Medical College, 1884; died April 22, aged 81, of cardiac collapse with hypertension.

John Fordyce Gruber ⊕ Cadillac, Mich.; Saginaw Valley Medical College, Saginaw, 1902; county coroner; served overseas during World War I; on the staff of the Mercy Hospital; died April 18, aged 63, of carcinoma of the small bowel.

Richard Emerson Herring, Arlington, Tenn.; Memphis Hospital Medical College, 1903; died April 15, aged 70, of sulcus tumor of the lung.

John Thomas Herron, Jackson, Tenn.; Jefferson Medical College of Philadelphia, 1884; honorary member of the Tennessee State Medical Association; member of the American Medical Association and served as a delegate from Tennessee in 1904-1905; died in the Memorial Hospital April 21, aged 85, of senility.

Frederick William Hodgins ⊕ Oakland, Calif.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1896; died April 6, aged 71, of generalized arteriosclerosis.

Isaac Jones Hoover ⊕ Owensboro, Kv.; Hospital College of Medicine, Louisville, 1907; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; past president of the Daviess County Medical Society; served during World War I; on the staff of the Owensboro-Daviess County Hospital, where he died April 22, aged 63, of cardiovascular disease.

William Thorpe Hopkins ⊕ Lynn, Mass.; Boston University School of Medicine, 1890; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; formerly health commissioner of Lynn; on the staff of the Lynn Hospital; died April 10, aged 76, of arteriosclerotic heart disease.

Roy Howe ⊕ Daytona Beach, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905; served during World War I; on the staff of the Halifax District Hospital; died in the Veterans Administration Facility, Lake City, May 3, aged 69, of cancer of the gallbladder.

Charles Stowell Hunter, West Sunbury, Pa.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1904; member of the American Medical Association; on the staff of the Butler County Memorial Hospital, Butler, where he died April 5, aged 69, of coronary occlusion and pulmonary embolism.

Alvin Keller, Bloomington, Ill.; Rush Medical College, Chicago, 1901; died in the Alta Bates Hospital, Berkeley, April 6, of coronary thrombosis.



Capt. Orrin Fluhr Crankshaw
M. C., A. U. S., 1910-1945

Albert Charles Lamade ⊕ Williamsport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; a captain in the medical corps of the U. S. Army, stationed at Camp Wadsworth, during World War I; died April 13, aged 67, of cerebral hemorrhage.

William Sterling Langfitt ⊕ Pittsburgh; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1894; fellow of the American College of Surgeons; with his father founded St. John's General Hospital, where he had been director and for many years chief of the surgical staff; died April 16, aged 72, of cerebral arteriosclerosis.

John Wesley Milam, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1894; died in the Nashville General Hospital April 9, aged 79, following a prostatectomy.

Floyd Palmer ⊕ Glens Falls, N. Y.; University and Bellevue Hospital Medical College, New York, 1899; coroner of Warren County; a captain with the American Expeditionary Forces during World War I; on the staff of the Glens Falls Hospital; died March 27, aged 71.

Laura Margaret Preble, Old Town, Maine; Woman's Medical College of Pennsylvania, Philadelphia, 1908; died in a hospital at Bangor February 24, aged 76.

Edward Augustine Quinlan, Port Chester, N. Y.; Albany (N. Y.) Medical College, 1898; a member of the staff of the Ladies Hospital and its successor, the United Hospital, where he remained an active member of the staff until 1942, when he retired; at one time in charge of the Nurses Training School of the institution; died March 16, aged 69.

James William Sparks ⊕ Kansas City, Kan.; Kansas City (Mo.) Hahnemann Medical College, 1907; past president of the Wyandotte County Medical Society; on the staffs of the Providence Hospital and the Bethany Hospital, where he died April 9, aged 67, of hemolytic Staphylococcus aureus blood stream infection.



Capt. Arthur Robert Gersabeck
M. C., A. U. S., 1906-1944

Charles Edward Terry, Wingdale, N. Y.; University of Maryland School of Medicine, Baltimore, 1903; health officer of Jacksonville, Fla., from 1910 to 1917; served as health officer for Harlem Valley State Hospital, where he died February 18, aged 67, of cerebral arteriosclerosis.

Joseph Paul Traynor ⊕ Medical Director, Captain, U.S.N., retired, Biddeford, Maine; Medical School of Maine, Portland, 1901; fellow of the American College of Surgeons and of the American College of Physicians; entered the U. S. Navy on May 15, 1902 and retired on June 10, 1928 for incapacity resulting from an incident of the service; died in Scarboro Sept. 12, 1944, aged 66, of coronary occlusion.

Christian Walkonig, Atlanta, Ga.; College of Physicians and Surgeons, Baltimore, 1902; at one time assistant in clinical laboratory at his alma mater; died April 13, aged 66, of cirrhosis of the liver.

KILLED IN ACTION

Orrin Fluhr Crankshaw, Summit, N. J.; Cornell University Medical College, New York, 1935; member of the American Medical Association; served an internship and residency at the New Haven Hospital in New Haven, Conn., where he had been an instructor in the department of internal medicine at the Yale University School of Medicine; served as attending physician for the Bell Telephone Laboratories at Murray Hill and on the staff of the Overlook Hospital; began active duty as a captain in the medical corps, Army of the United States, on July 15, 1942; went abroad with the Yale Medical Unit in November 1942 and later transferred to the medical corps; participated in the battle of Guadalcanal; after returning to this country was sent to England in February 1944; awarded the Bronze Star and Purple Heart for treating injured soldiers under heavy enemy fire after he himself was wounded; attached to the Sixth Armored Division; killed in action in Germany February 23, aged 34.

Arthur Robert Gersabeck, Ypsilanti, Mich.; University of Michigan Medical School, Ann Arbor, 1938; interned at the West Suburban Hospital in Oak Park, Ill.; member of the American Medical Association and the West Virginia Medical Association; entered the medical corps, Army of the United States, on July 20, 1942 as a first lieutenant; began active duty as a captain on Aug. 21, 1942; killed in the European area Dec. 18, 1944, aged 38.

Correspondence

"THE EXPANDING SCOPE OF PUBLIC HEALTH LABORATORIES"

To the Editor:—In the March issue of the *American Journal of Public Health* there appeared an article entitled "The Expanding Scope of Public Health Laboratories," outlining a plan developed in Montgomery County, N. Y., whereby "an approved county laboratory, supported entirely by state and county funds, provides as a free public service for a population of 70,000 people not only the usual diagnostic and sanitary services but also all the medical tests which in most other communities are the task of hospital and private pathological laboratories. This includes all autopsies, surgical pathology, hematology, serology, blood grouping, urinalysis, chemistry of blood and other body fluids, bacteriology, bacterial and agglutination tests, preparation of bacterial vaccines, gastric analysis, basal metabolism, examination of feces and exudates."

In the article the plan is commended on the basis (1) that the centralization of all types of medical and public health laboratory work in one organization eliminates a good deal of duplication and makes better use of plant, apparatus and personnel and (2) that as a consequence of this it is possible to give a small community adequate laboratory service when the amount of work would not be sufficient to support several different hospital, public health and private laboratories.

As chairman of the Committee on Education and Publicity of the American Society of Clinical Pathologists, I have been instructed to call your attention to a situation which is fraught with a great deal of potential danger to the practice of laboratory medicine in particular and perhaps also to that of independent medical practice in general. As the pathologist of an approved hospital laboratory in this state and hence as one who knows from first hand experience the excellent service rendered by the New York State Department of Health Laboratories under the indefatigable efforts and vision of Dr. Augustus Wadsworth, recently retired, I can attest to the valuable progress this group has made in service both to the community and to organized laboratory medicine in the field of public health for the past twenty-five years. However, it would seem to me that in their enthusiasm to enlarge the usefulness of laboratory service to the community by including free laboratory service not directly concerned with public health, as is the case in the plan adopted by Montgomery County, they run a distinct risk of defeating the very ends they desire to attain by any such approach as is outlined in the article. Such a system if put into practice throughout the state and perhaps also in other states would, in my opinion, seriously jeopardize the healthy and natural development that laboratory medicine is now enjoying. It would first of all limit the freedom of choice of the younger pathologist and would tend to force him into seeking state laboratory appointments as the only means of professional and economic development. It would also place at a serious economic disadvantage those private pathologists who work in proprietary hospitals or have laboratories of their own and who engage in outside practice as do other specialists in medicine. These two things to my mind would be serious deterrents to the entry into the specialty of pathology by younger men who might be so inclined. In respect to the public also it would tend to weaken the value of pathologic services, on the basis that something free is not necessarily valuable. It might be harmful also to organized medicine in that, if such a plan by chance should become acceptable to the public, attempts might be made to offer the services of other medical specialists on the same basis to the community.

I should like to make it clear that it is the wish of the American Society of Clinical Pathologists to see a more widespread distribution of laboratory service to the individual community, a point on which the Health Department of New York State concurs; but we seriously question the wisdom of the present approach in recommending that such service be dispensed as a free one to the public. It would seem to us that, with the admitted agreement on a common objective on the part of both the pathologists and the public health agencies in the state and the country at large, the matter might lend itself to a better solution if it was approached jointly by representatives of both groups, motivated by a sincere desire to give an all inclusive modern laboratory service to communities, on a basis of individual community needs and not as is recommended in the Montgomery County Plan, as an overall free public service.

THEODORE J. CURPHEY, M.D., Hempstead, N. Y.

"CHRONIC TOXICITY OF ERGOT"

To the Editor:—In your editorial of April 21 on "Chronic Toxicity of Ergot" you state that "there has been no thorough investigation of the chronic effects of ergot in laboratory animals." The paper by Fitzhugh, Nelson and Calvery (*J. Pharmacol. & Exper. Therap.* **82**:364 [Dec.] 1944) which you quote at length referred only to my first communication in the *American Journal of Pathology* (**6**:299 [May] 1930). I have published additional observations on experimental chronic ergot poisoning in the *Archives of Internal Medicine* (**47**:548 [April] 1931) and in the *Archives of Surgery* (**25**:1135 [Dec.] 1932). Although my first paper described the morbid anatomy of experimental ergot poisoning in 28 roosters, Fitzhugh and his collaborators quote only my observations on 2 animals. These I submitted at length only because the lesions were most typical. In my experiments I obtained lesions of the vessels, particularly of the comb, that were significant. There was intimal proliferation, frequently associated with thrombosis. In some instances there was canalization of the thrombus. Sclerotic and hyaline degeneration of the vascular walls were common findings. The vascular changes resembled closely those observed in thromboangiitis obliterans. There were also trophic changes in the skin, muscles and fasciae supplied by the affected vessels that resembled lesions observed in scleroderma and dermatomyositis. In some instances gangrene of the comb occurred and in 1 animal an esophageal fistula, the result of necrosis. Fitzhugh and his collaborators were not able to produce any vascular changes in rats as a result of ergot feeding. In my original paper I also reported that I was unable to produce vascular lesions in rats, mice, rabbits and guinea pigs by ergot feeding. Feeding with 5 per cent ergot produced no toxic effect. The animals abstained from eating a 10 per cent mixture of ergot because it was distasteful. Ergotism, however, has been produced in rats. McGrath (*Arch. Int. Med.* **55**:942 [June] 1935) injected ergotamine tartrate in doses of 25 to 100 *mg.* per kilogram of body weight and obtained vascular lesions similar to those I reported, including thrombophlebitis, which incidentally also occurs in human ergotism. The trophic changes in his rats arose chiefly in the tails, which became gangrenous, with a line of demarcation occurring in from sixteen to twenty days. It is well to compare McGrath's doses of ergotamine tartrate toxic for rats to the doses of 9.5 to 117 mg. per 50 to 100 Kg. weight, which have been found very toxic in human beings. It is obvious that the rats are far more resistant. This may account for our inability to obtain vascular lesions in these animals by feeding. McGrath also investigated the greater susceptibility of males to ergotism, a fact I had stressed in the resemblance of this condition to thromboangiitis obliterans. With the administration of estrogens he was able to prevent gangrene in the females and retard it in the males after the administration of ergotamine tartrate.

In 1935 Sir Thomas Lewis (*Clin. Sc.* **2**:43 [Sept.] 1935) noted necrosis of the combs in fowl which he had injected

with ergotoxin The necrosis he ascribed to a stasis resulting from the combination of a constriction of the arteries with dilatation of their capillaries This mechanism for the necrosis I reported in my second publication on ergotism in 1931

JULIUS KAUNITZ, M D, New York

To the Editor —Apropos the editorial "Chronic Toxicity of Ergot" appearing in THE JOURNAL, April 21, may I suggest that you supplement your comments on the effect in animals by calling attention to a report in the *American Journal of Veterinary Research* for April 1945 The article on page 107, "Ergotism in Pregnant Sows, Female Rats and Guinea Pigs" will be a revelation

GEORGE F FASTING, M D, New Orleans

DIAGNOSIS OF HERNIATION OF LUMBAR INTERVERTEBRAL DISKS

To the Editor —Dr Keegan (Diagnosis of Herniation of Lumbar Intervertebral Disks by Neurologic Signs, THE JOURNAL, Dec 2, 1944, p 808) describes a technic submitted to him by Dr A W Abts in a personal communication Disclaiming any intention to establish a prior use, or of any attempt to claim credit for devising the technic, I do put forth the simple statement that during my service in World War I, while on duty as a medical officer at Peter Bent Brigham Hospital, Boston, in 1918 and later at the Base Hospital at Camp Devens, Mass, I worked out a technic identical with that described by Dr Keegan, the only variation being that with the knee fully flexed on the thigh and the thigh fully flexed on abdomen, instead of forcible and quick extension at this juncture of the procedure, a torsion movement of the knee is executed toward the opposite shoulder with both shoulders resting firmly on the table At this point, or after this torsion maneuver has been executed two or three times to the point of tolerance of pain, a forcible extension is done with the full cooperation of the patient, who kicks out while the operator pulls on the ankle The same procedure is carried out on the opposite side I have used this technic continuously in private practice since that time for twenty-seven years It has, with few exceptions, proved to be a valuable manipulation In a small percentage of cases sufficient relaxation has not been possible without an anesthetic, and even with sodium pentothal the procedure is still a simple one and is a manpower hour saver, for the patients are sent right back to work Furthermore, the relief experienced after the procedure keeps these patients out of the physical therapy department, thereby conserving man hours and prevents many from becoming 'body conscious" It certainly is true that it is much easier to rub disease into the back than to rub it out of the mind Orthopedic men have been slow to recognize the role of the nucleus pulposus in low back pain As a matter of fact orthopedic surgeons in many instances have "high browed" the suggestion of manipulation on the acutely strained back and are reluctant to go beyond the usual measures employed in acute low back pain, such as heat, massage and strapping Dr Keegan's series of 243 cases of herniation of the nucleus with 115 verified by operation should do much to emphasize and clarify the foggy conception that has so long existed in the profession concerning low back pains

The flexion-torsion maneuver, I believe, not only has a tendency to increase the disk width posteriorly but widens the disk laterally as well, and, as Dr Keegan has shown, the herniation is not directly against the posterior ligament but slightly laterally in the narrow angle of the canal against a special lateral portion of the ligamentum flavum, for which Dr Keegan suggests the name interarticular ligament

JOHN B TYRRELL, M D
Southern Permanente Hospital,
Fontana, Calif

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL June 9, page 462

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Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

15:1-34 (Jan.) 1945

Micro Methods of Estimating Penicillin in Blood Serum and Other Body Fluids. A. Fleming.—p. 1.

Use of Fleming's Modification of Wright Slide Cell Technic for Determining Penicillin in Body Fluids. D. H. Heilman and W. E. Herrell.—p. 7.

Schistosomiasis (Bilharziasis) and Egyptian Splenomegaly. H. K. Giffen.—p. 10.

Actinomycosis Due to Nocardia Asteroides: Report of Case. C. H. Binford and J. D. Lane.—p. 17.

Laboratory Anticipation of Sulfonamide Resistance in Gonorrhea, with Associated Study of Hospital Days Saved by Prompt Penicillin Therapy. R. A. Sloan, R. D. Baker and B. W. Fraser.—p. 24.

Erythema Multiforme Bullosum Following the Use of Sulfadiazine. V. J. Dardinski.—p. 28.

American J. Digestive Diseases, Fort Wayne, Ind.

12:97-150 (April) 1945

Pathology of Regional Ileitis. G. W. H. Schepers.—p. 97.

Gastric Acidity in Apparently Healthy Individuals. C. S. Smith, Helen L. Wikoff and M. E. Southard.—p. 117.

Malnutrition Causing General Lowered Tissue Resistance and Local Tissue Pathology. Elizabeth Steele.—p. 119.

New X-Ray Method of Studying Anatomy and Motility of Stomach and Duodenum: Its Diagnostic Value. W. F. Gruber.—p. 127.

Common Features of Chronic Amebic Colitis. J. P. Lopes Pontes.—p. 137.

Action of Ketocholanic Acids on Lower Bowel Motility. M. M. Dasco, K. Zeltmacher and S. Shapiro.—p. 142.

American J. Obstetrics and Gynecology, St. Louis

49:307-454 (March) 1945. Partial Index

*Carcinoma of Cervix and Pregnancy: Clinical Study of Eight Cases. A. J. Kobak, J. E. Fitzgerald, V. C. Freda and L. Rudolph.—p. 307.

*Androgenic Therapy in Malignant Disease of Female Genitalia: Preliminary Report. S. Abel.—p. 327.

Development and Degeneration of Ovum and Follicle as Observed by Intravital Staining. E. O. Strassmann.—p. 343.

Papillary Lesions of Cervix Uteri in Pregnancy. H. A. Edmondson, L. M. Levi, N. Evans and Paula Horn.—p. 356.

Manual Removal of Placenta: Policy of Treatment. M. E. Aaberg and D. E. Reid.—p. 368.

Noninvolution of Placental Site. R. N. Rutherford and A. T. Hertig.—p. 378.

Influence of Stilbestrol on Lactation. H. Fields.—p. 385.

Catheter Method for Continuous Caudal Anesthesia. G. C. Downing, M. Miller and R. B. Durfee.—p. 391.

Similarity of Mouth and Vulvar Lesions. J. Parks.—p. 396.

Five Hundred Consecutive Cesarean Section Operations. E. G. Free.—p. 401.

Maternal Morbidity. W. G. Cummings.—p. 409.

Hirsutism in Pregnancy. F. J. Stoddard.—p. 417.

Hysterosalpingography as Diagnostic Aid in Certain Types of Ruptured Uteri. J. B. Sheffery.—p. 423.

Bilateral, Multilocular, Pseudomucinous Cysts of Ovaries Necessitating Cesarean Section. A. H. Kanter.—p. 428.

Placenta Delivered Five Hours Before Birth of Fetus. R. Torpin.—p. 436.

Fetus Adipocere Monster. J. J. Gill.—p. 440.

Cervical Carcinoma and Pregnancy.—Kobak and his associates have seen 8 cases of concurrent cervical carcinoma and pregnancy during the last five years at the Cook County Hospital in Chicago. The youngest of the patients was 25, the oldest 43 years of age. In 7 patients the growth was a stratified squamous cell carcinoma and in 1 patient it was an adenocarcinoma. There is a tendency to regard carcinoma of the cervix during pregnancy as so improbable that other causes of bleeding are given precedence in diagnosis and therapy. The growth is thus diagnosed more often toward the end of pregnancy when it has achieved large proportions. Carcinoma of the cervix develops at a rapid pace during pregnancy. The treatment depends on the disposition of the pregnancy. In the first trimester the pregnancy is disregarded and high voltage x-ray therapy is instituted. With the death of the fetus, radium is added to the treatment. In advanced pregnancy the cervix should be spared the injuries that occur during parturition. If there is no infection a classic cesarean section is performed to prevent cervical trauma and to leave intact the fundal portion of the uterus to facilitate radium therapy, which is started after uterine involution has occurred. A total of 4,500 mg. hours of radium is given in three equally divided doses. As soon after the delivery of the baby as possible, high voltage x-ray treatments are started and are continued for a long time. In the presence of local infection a Porro cesarean section is preferred. In pregnancies close to viability the cesarean section may be deferred, and 1,500 to 3,000 mg. hours of radium may be given to the cervix to inhibit temporarily the progress of the new growth. The ultimate prognosis for the patient depends on the persistent continuation of the high voltage x-ray and radium therapy that is instituted after the disposition of the pregnancy.

Androgenic Therapy in Malignant Disease of Female Genitalia.—Abel directs attention to the difficulty of selecting patients for treatment with androgen because to withhold for experimental purposes any of the accepted modes of treatment to patients with early carcinoma was unjustified. Endocrine therapy had to be reserved for those patients who failed to respond to orthodox forms of treatment and for whom it was felt that nothing more could be accomplished. From 140 to 150 mg. of testosterone propionate was given by mouth every week (two 10 mg. tablets daily) or the patients were given three 50 mg. injections a week intramuscularly. The first 5 patients, including 3 with carcinoma of the cervix and 2 with carcinoma of the corpus, have been receiving testosterone propionate for ten months. Symptomatically these patients have been definitely improved. A feeling of well being, improved morale, control of menopausal symptoms and increased libido have all been regularly observed. No regression or even retardation of the malignant process was noted.

49:455-602 (April) 1945

Differential Psychology of American Woman. W. R. Cooke.—p. 457.

Spasmolysant Action of Magnesium Ions on Tetanically Contracting Human Gravid Uterus. A. R. Abarbanel.—p. 473.

Hysterectomy with Preservation of Ovarian Tissue in Treatment of Endometriosis. B. Z. Cashman.—p. 484.

Surgical Complications During Pregnancy and Labor. W. A. Scott.—p. 494.

Pregnancy Following Myomectomy. R. D. Mussey, L. M. Randall and L. W. Doyle.—p. 508.

Rupture of Uterus. F. J. Lynch.—p. 514.

Uterine Defense Mechanism Against Infection. J. R. Goodall.—p. 532.

*Wertheim Operation for Carcinoma of Cervix. J. V. Meigs.—p. 542.

Mortality Study of 187 Deaths in 66,376 Live Births. J. F. Norton.—p. 554.

Observation on Breech Deliveries in General Hospital. M. G. Potter, H. W. Erving and J. B. Brown.—p. 567.

Critical Analysis of Twenty-Two Years' Experience with Cesarean Section. R. A. Johnston.—p. 576.

Prolapse of Urethra Treated by Hepburn Operation. J. R. Miller.—p. 591.

Wertheim Operation for Cervical Carcinoma.—Sixty-five patients form the basis for this report. Patients selected for the operation should be young, preferably below 50 years of age and in good physical condition. Obese women should not be chosen. The tumor may involve the cervix in part or entirely; it may advance on the vaginal walls to not over 1 cm. from the cervix. The cervix should be movable, as felt by vagina and by rectum; fixation must mean infiltration beyond the cervix, and, although the lesion can be removed, lymphatics full of cancer cells cannot. Palpation of lymph nodes in the iliac, ureteral or obturator regions is no excuse for not operating if the other reasons for selection are satisfactory. It is exactly in such cases that there is hope for cure by means of radical surgery. The operation is the classic Wertheim or Clark operation, which involves a complete dissection of the pelvic lymph nodes from the bifurcation of the aorta down, plus the removal of the cervix, vagina and parametrium. Meigs prefers to call this operation the Wertheim-Clark plus the Taussig operation. The only really serious and annoying complication is damage to the ureter and consequent ureterovaginal

fistula. There was no postoperative mortality. Five of the 65 patients are known to be dead and in 3 of the 5 the lymph nodes had become involved. Of the 53 patients who were free from lymph node involvement only 2 have died. Surgical removal of early cervical cancer is as safe as radiation treatment. The number of fistulas of the ureterovaginal type is still too large, but with a better understanding of the blood supply fewer such calamities are expected. Lymph node involvement is curable by surgery.

American Journal of Psychiatry, New York

101:429-572 (Jan.) 1945. Partial Index

Psychiatry of Benjamin Rush. R. H. Shryock.—p. 429.
Contrast Between Electroencephalograms of 100 Psychoneurotic Patients and Those of 500 Normal Adults. Mary A. B. Brazier, J. E. Finesinger and S. Cobb.—p. 443.
Seven Year Survey of Insulin Treatment in Schizophrenia. A. Gralnick.—p. 449.
Cerebral Metabolism in Patients with Depression. H. E. Himwich, E. Cameron, E. Homburger and F. Feldman.—p. 453.
Comparative Study and Evaluation of Electric Shock Therapy in Depressive States. K. J. Tillotson and W. Sulzbach.—p. 455.
Personalities of American Psychotherapists: Mitchell, Salmon, Riggs. Margaret C. L. Gildea and E. F. Gildea.—p. 460.
Psychiatric Rehabilitation Therapy. T. A. C. Rennie.—p. 476.
Psychiatric Investigation in Britain. A. Lewis.—p. 486.
Military Group Psychotherapy. H. P. Rome.—p. 494.
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Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:213-318 (March) 1945

Pathology of Anomalies Found in Knee Joints. S. H. Nickerson.—p. 213.
Spondylolisthesis: Commentary on Etiology, and Improved Method of Roentgenographic Mensuration and Detection of Instability. I. Meschan.—p. 230.
Pleuritic Involvement Associated with Primary Atypical Pneumonia: Roentgenographic and Clinical Study. A. L. Bachman, N. O. Sara and H. E. Mantz.—p. 244.
Evaluation of Teleroentgenographic Mensuration and Cardiac Roentgenoscopy in Diagnosis of Early Mitral Valve Disease. B. S. Epstein.—p. 259.
Elongation and Tortuosity of Descending Aorta in Case of Right Aortic Arch, Simulating a Right Sided Pulsating Mediastinal Mass. M. Szabados.—p. 270.
Congenital Hydronephrosis Caused by Polar Artery: Report of Case. E. Ingber.—p. 273.
Aberrant Pancreatic Tissue as Roentgenologic Problem. G. J. Baylin.—p. 277.
*Necrotizing Bronchopneumonia: Its Relation to Radiation Therapy of Cancer of Oral Cavity. L. V. Ackerman, H. M. Wiley and D. V. LeMone.—p. 281.

Necrotizing Bronchopneumonia.—Ackerman and his associates maintain that necrotizing bronchopneumonia and necrotizing suppurative bronchopneumonia are more descriptive and accurate terms than aspiration pneumonia. Necrosis of the bronchial walls and suppuration of the lung parenchyma supplied by the involved bronchus or bronchi are invariably present. The distribution is lobular and localized to one or more bronchopulmonary segments. Patients with cancer of the oral cavity are likely to develop this complication, particularly if the lesion interferes with deglutition. The authors present observations on 14 patients with necrotizing pneumonia. Three had primary carcinoma of the tongue, 2 of the lip, 3 of the buccal mucosa, 5 of the larynx and 1 of the gum. Twelve of these patients died after completion of treatment, the shortest time interval before death being three days and the longest period eleven months. The 2 remaining patients, whose clinical symptoms and x-ray findings strongly suggest necrotizing bronchopneumonia, are well. Necrotizing pneumonia can occur during, immediately after or relatively late after radiotherapy to cancer of the oral cavity and larynx. The clinical symptoms and signs are typical. A high pulse rate with a relatively low grade fever is of particular significance. The x-ray appearance is characteristic and the differential diagnosis is not difficult, provided adequate knowledge of the historical and clinical aspects is available. The most important preventive measure is carefully planned roentgen therapy, with particular attention to divided dose technic, selection of fields and adequate filtration. If necrotizing bronchopneumonia is diagnosed early roentgen therapy may be effective, but in late cases no treatment will be of value.

American Journal of Surgery, New York

68:1-138 (April) 1945

Surgical Management of Vascular Trauma. H. L. Pugh.—p. 5.
Painful Scar and Other Surgical Neuroses. T. L. Hyde.—p. 21.
Potential Anatomic Spaces in Face. J. G. Kostrubala.—p. 28.
Urologic Manifestations Associated with Chronic Appendical Abscess. J. A. Lazarus and M. S. Marks.—p. 38.
Intrasternal Infusions in Obstetric Hemorrhage. M. D. Schnall and R. J. Heffernan.—p. 44.
Simplified Procedure for Treatment of Impassable Urethral Strictures and Rupture of Urethra. T. E. Gibson.—p. 49.
Two Stage Mammaplasty in Relation to Blood Supply. J. W. Maliniac.—p. 55.
Renal Ectopia: Study of 23 Cases. E. F. Nation.—p. 67.
Hemorrhoidectomy by Incision and Dissection: P. H. Rakov.—p. 73.
Pilonidal Cyst. M. J. Brockbank and J. R. Floyd.—p. 77.
Dicumarol in Surgery. D. C. Daughtry.—p. 80.
Epigastric Hernia: Improved Method of Repair. E. F. Berman.—p. 84.
Tube Feeding. F. H. Kidd Jr. and Vesta Odell.—p. 87.
Joint Aspiration: Simple Method. D. Goldberg.—p. 89.
Inversion of Appendical Stump: Improved Method. J. J. Stratte.—p. 91.
*Air Embolism in Obstetrics and Gynecology. W. F. Finn.—p. 100.

Air Embolism Following Tubal Insufflation.—A woman aged 28 was admitted for tubal insufflation because of sterility of four years' duration. On the twenty-first day of the menstrual cycle she was anesthetized with nitrous oxide and ether. After the uterine cavity had been sounded at 9 cm., passage of gas at 80 to 100 mm. was heard on two occasions. Curettage was performed and 0.5 cc. of tissue grossly characteristic of secretory endometrium was obtained. About twenty minutes after the start of the operation the patient had difficulty in breathing. Respirations had ceased and only a feeble carotid pulse could be obtained. Resuscitation and stimulants were used without avail. Necropsy revealed a patent left tube, stenosis in the outer third of the right tube and 25 cc. of air in the right ventricle and pulmonary arteries. Finn reviews 4 similar cases of fatal air embolism following tubal insufflation which had been reported before and stresses that, because of the danger of air embolism, tubal insufflation should not be performed in the premenstrual phase, nor should a curettage be done simultaneously.

Annals of Surgery, Philadelphia

121:385-544 (April) 1945

Treatment of Carcinoma of Colon. F. A. Coller and H. H. Vaughan.—p. 395.
Method of Reestablishing Continuity Between Bile Ducts and Gastrointestinal Tract. A. W. Allen.—p. 412.
Primary Carcinoma of Gallbladder. J. M. T. Finney and M. L. Johnson.—p. 425.
Nonsuture Method of Blood Vessel Anastomosis. A. H. Blakemore and J. W. Lord, Jr.—p. 435.
End Results in Treatment of Hyperparathyroidism. R. D. McClure and C. R. Lam.—p. 454.
Cases of Severe Pelvic Injury. L. G. Lewis.—p. 470.
*Studies on Traumatic Shock: V. Treatment of Clinical Shock with Gelatin. E. I. Evans and H. S. Rafel.—p. 478.
Pentothal-Metrazol Antagonism: Method of Shortening Recovery Period Following Pentothal Anesthesia: Clinical and Experimental Study. K. L. Pickrell.—p. 495.
*Heparin in Abdomen: Clinical Report. F. M. Massie.—p. 508.
Methods of Constructing a Vagina. L. Brady.—p. 518.
Spontaneous Perforation of Rectovaginal Septum Five Weeks After Construction of Vagina: Case Reports. L. R. Wharton.—p. 530.
Intervertebral Disk Lesions Are Most Common Cause of Low Back Pain With or Without Sciatica. J. A. Key.—p. 534.

Treatment of Clinical Shock with Gelatin.—Evans and Rafel used gelatin in the treatment of 67 patients who were in shock because of trauma to the extremities, chest and abdomen, and of 28 severely burned patients. Gelatin for intravenous use is prepared by hydrolysis; if certain precautions are observed, a product of rather unusual uniformity as regards viscosity and molecular homogeneity can be obtained. Studies have made it clear that for intravenous use not "any" gelatin solution will suffice. Tourtelotte supplied the authors with two types of gelatin solution, the "lightly" and the "heavily degraded." The heavily degraded gelatin leaves the blood rapidly, while most of the lightly degraded gelatin is still present in the blood stream at the eighth hour after rapid infusion. Only by the "rapid syringe technic" have the authors

found it possible to restore rapidly and adequately the circulating blood volume of many severely shocked patients. Blood volume determinations and hematocrit estimations were made on many patients. That shock was due mainly to the decreased circulating blood volume was borne out by these laboratory investigations and also by the recovery of large quantities of whole blood in many of the patients operated on. Experience with gelatin in the management of burn shock has been very satisfactory. The present plan of management is to reserve its use for the first twenty-eight to forty-eight hour period, when burn shock is most to be feared, and then give whole blood.

Intra-Abdominal Use of Heparin.—Lehman and Boys found that best results are obtained by administering heparin at the close of an abdominal operation and by paracentesis every twelve hours for three days. Massie used this method with a slightly modified technic in 7 cases. After the first operating room dose he gives 10,000 units every twelve hours until a total of 40,000 units has been given. The postoperative course was stormy in most of the cases. Intra-abdominal heparin to prevent obstructing adhesions should be limited to patients who have had one or more operations for obstruction or repeated attacks following abdominal surgery. The hazards are hemorrhage, infection and possibly delay in wound healing. The contraindications to its use are recent abdominal surgery, incomplete hemostasis and intestinal resection. The hazards should be recognized promptly and can be checked by blood transfusion. Red cell and hemoglobin determinations, blood pressure reading and the general appearance of the patient are better guides than coagulation time tests. Accidental opening of the bowel during the dissection of adhesions is not a contraindication for heparin administration. In this small series there has been complete absence of obstruction in the months and years following the use of heparin in the abdomen.

Archives of Internal Medicine, Chicago

75:145-214 (March) 1945

Sporotrichosis in New York State: Report of 2 New Cases and Tabulated Discussion of 26 Previous Ones. G. W. Leiby, M. B. Sulzberger and R. L. Baer.—p. 145.
Hepatolenticular Degeneration: Report of 2 Cases with Predominantly Hepatogenic Symptoms, 1 Associated with Cruveilhier-Baumgarten Syndrome. E. E. Wollaeger and H. C. Shands.—p. 151.
*Efficacy of Some Drugs and Biologic Preparations as Therapeutic Agents for Tularemia. J. F. Bell and O. B. Kahn.—p. 155.
*Clinical Features of Relapsing Plasmodium Vivax Malaria in Soldiers Evacuated from South Pacific Area. H. H. Gordon, S. W. Lippincott and others.—p. 159.
Absorption, Excretion and Distribution of Sulfamethazine. I. F. Volini, Gertrude M. Engbring and Hildegarde A. Schorsch, with the technical assistance of Kathleen O'Donnell.—p. 168.
*Occlusion of Hepatic Veins: Review of 20 Cases. M. P. Kelsey and M. W. Comfort.—p. 175.
Dengue-like Fever Occurring in Iowa During Poliomyelitis Epidemic of 1943. W. D. Paul, E. H. Antes and A. L. Sahs.—p. 184.
Primary Splenic Neutropenia. H. M. Rogers and B. E. Hall.—p. 192.
Vascular Diseases: Tenth Annual Review. T. R. Van Dellen, G. W. Scupham, Geza de Takats and E. F. Fowler.—p. 197.

Therapy of Tularemia.—Bell and Kahn administered the following therapeutic agents to guinea pigs infected with tularemia: sulfanilamide, sulfadiazine, sulfamerazine, acriflavine, metaphen, iodide and bismuth (iodobismitol with saligenin), arsenic and bismuth (solution of bismuth subgallate and sodium para-aminophenyl arsonate), trivalent arsenic alone (oxophenarsine hydrochloride), antimony (stibophen), penicillin and hyperimmune equine antitularemic serum. These drugs were used in amounts which proportionately exceeded the doses given human patients. Therapeutic trials did not demonstrate any advantage in employing these drugs.

Relapsing Plasmodium Vivax Malaria in Soldiers from South Pacific.—Gordon and his associates describe the clinical features of relapsing Plasmodium vivax malaria in 435 soldiers evacuated to the United States from the South Pacific area. During observation at Harmon General Hospital a total of 421 clinical attacks occurred in 295 or 68 per cent of the 435 patients. Of the 139 patients with no attacks, 47 had been observed for only one month. Chills were frequent; in only 12 per cent was there neither chill nor chilly feeling. There were headache, backache and generalized aches, malaise and weakness, nausea and vomiting, herpes labialis and cerebral symptoms. The spleen and liver could be palpated in 23 and 11 per cent respectively. In 313 attacks treated solely with quinacrine, fever subsided promptly. The effect of quinacrine hydrochloride on the incidence of positive malarial smears was studied in 200 patients. All patients had positive smears before treatment was started. On the fourth day after quinacrine had been started only 1 per cent still had positive smears. The great efficacy of quinacrine in controlling symptoms and fever is thus a reflection of its effect on parasitemia. All except one of the attacks observed were due to P. vivax. The need for a program of rehabilitation became obvious. A majority of the patients had somatic complaints for which no definite organic cause could be found. There is evidence that the rate of relapse of malaria decreases as time goes on.

Occlusion of Hepatic Veins.—According to Kelsey and Comfort the records of all cases in which necropsy was done at the Mayo Clinic from 1910 to 1939 inclusive has disclosed 20 cases of occlusion of the hepatic veins. In 16 cases the occlusion was an incidental finding at necropsy and had not produced recognizable symptoms. In 4 cases it had caused symptoms, and in 3 of these it had contributed to or been the chief cause of death. The occlusion was in all cases due to thrombosis. Thrombosis of the hepatic veins is not so rare that it can be dismissed entirely as a diagnostic possibility. In the chronic forms of the disease the progressive course, in some cases punctuated by acute episodes, the relatively rapid increase in the size of the tender liver and the severe epigastric pain extending to the thoracic or the lumbar region should arouse suspicion that some unusual condition, such as thrombosis of the hepatic veins rather than cirrhosis or carcinoma of the liver, is the cause of the symptoms. Peritoneoscopy may eventually serve to distinguish the congested liver of obstruction of the hepatic veins from the cirrhotic or carcinomatous liver. Hepatosplenomegaly in a case in which evidence of thrombosis of the inferior vena cava has been present will suggest extension of the thrombosis to the hepatic veins. Examination of the direction of the flow of blood in the collateral circulation will aid in the differentiation of obstruction of the hepatic veins and obstruction of the inferior vena cava. An upward flow indicates obstruction of the inferior vena cava, a downward flow obstruction of the hepatic veins. In cases of more acute occlusion of the hepatic veins as well as in the acute terminal episodes of the chronic form of the disease the rapidity of increase in the size of the liver together with evidence of profound disturbances of hepatic function and of portal obstruction that could be caused only by some rapidly developing process, such as thrombosis, may well suggest the correct diagnosis. Acute occlusion has been confused with acute pancreatitis, but elevation of values for serum amylase as well as rapid enlargement of the liver and rapid development of portal obstruction should materially aid in distinguishing the two conditions.

Archives of Neurology and Psychiatry, Chicago

53:257-328 (April) 1945

Studies on Pain: "Spread of Pain"; Evidence on Site of Spread Within Neuraxis of Effects of Painful Stimulation. B. S. Ray and H. G. Wolff.—p. 257.
*Edema and Trophic Disturbances of Lower Extremities Complicating Prefrontal Lobotomy. L. H. Ziegler and C. W. Osgood.—p. 262.
Organic Psychotic Syndromes Occurring During Electric Convulsive Therapy. L. B. Kalinowsky.—p. 269.
Origin of Spike and Wave Pattern of Petit Mal Epilepsy: Electroencephalographic Study. J. B. Hursh.—p. 274.
Electroencephalographic Study of Prefrontal Lobotomy: Study of Focal Brain Injury. R. Cohn.—p. 283.
Transtentorial Herniation of Brain Stem: Characteristic Clinicopathologic Syndrome: Pathogenesis of Hemorrhages in Brain Stem. I. M. Scheinker.—p. 289.
Lipoma of Brain: Report of Cases G. J. Elini and A. W. Adson.—p. 299.
Bromine Content of Blood in Mental Diseases: I. Dementia Precox. Helen L. Wikoff, R. L. Martin and T. R. Marvin.—p. 305.
Skull Defect and Herniation of Cerebrum with Absence of Dura Following Head Injury in Adolescence. W. S. McCune and B. Woodhall.—p. 307.
Myelitis Complicating Measles. L. A. Senseman.—p. 309.

Edema of Lower Extremities Complicating Prefrontal Lobotomy.—Two of the older patients among 19 on whom prefrontal lobotomy had been performed died of pneumoni while convalescing from the operation Still another had acut

collapse of a lung soon after the lobotomy but recovered. Immediately after operation all had rectal and vesical incontinence. Ten of the 17 survivors continue to have occasional sphincter accidents. Postoperative observations on these 17 patients revealed that 8 had complications referable to the legs and feet, mostly edema associated with tenderness. In some patients bullae developed about the heels at areas most vulnerable to pressure. Ziegler and Osgood emphasize that alteration of the vascular supply of the brain may be responsible for the functional impairment of structures at a considerable distance from the vascular defect. The anterior cerebral artery courses backward over the mesial surface of the brain, sending branches laterally, upward and posteriorly to supply the gray and white matter of a narrow volume of the cerebrum adjacent to the mesial surface, as far back as the parieto-occipital sulcus. Some branches of the anterior cerebral artery supply the anterior portion of the thalamus, the basal ganglions and a part of the internal capsule. Small branches of the anterior cerebral artery might suffer interruption by the lobotomy, with consequent damage to cortical association fibers and even the cortex itself. The anterior cerebral artery and its possible anomalies deserve renewed investigation. Milroy's disease (familial hereditary edema) and other obscure edemas of the feet and legs, as well as bullae, may be found to have a causative factor in the central nervous system, and it may well be discovered that enuresis is more than a defective habit.

Archives of Ophthalmology, Chicago

33:173-264 (March) 1945

Ocular Effects of Altitude Flying and of Deep Sea Diving. L. D. Carson.—p. 173.
*Herpes Simplex Keratitis in Malaria: Clinical and Experimental Study. W. P. Chamberlain Jr. and L. H. Bronson Jr.—p. 177.
Toxoplasmosis: Report of Ocular Findings in Infant Twins. P. Heath and W. W. Zuelzer.—p. 184.
Factors Affecting Hemorrhage Following Extractions of Cataracts. E. E. Neff.—p. 192.
Glaucoma Due to Peripheral Anterior Synechias After Operation for Cataract. P. C. Kronfeld and J. S. Haas.—p. 199.
Retrolental Fibroplasia in Premature Infants. V. Further Studies on Fibroplastic Overgrowth of Persistent Tunica Vasculosa Lentis. T. L. Terry.—p. 203.
Two Unusual Ocular Tuberculomas. P. H. Boshoff and E. Grasset. —p. 209.
Intravitreal Penetration of Penicillin and Penicillin Therapy of Infections of Vitreous. I. H. Leopold, with the technical assistance of Marjorie Wiley.—p. 211.
Cyclopia Completa and Arhinencephalia Completa with Umbilical Hernia in Full Term Child: Report of Case. J. E. Kindred.—p. 217.
Development of Galactose Cataract in Albino Rat Embryo. Stephanie L. Bannon, Roberta M. Higginbottom, Jeannette M. McConnell and Helen W. Kaan.—p. 224.
Frequency and Location of Punctate Opacities in 300 Young Crystalline Lenses. J. Bellows.—p. 229.
Total Herpes Zoster of Ophthalmic Maxillary and Mandibular Divisions of Trigeminal Nerve: Report of Case in Which There Was Also Involvement of Geniculate Ganglion and Vestibular Portion of Eighth Cranial Nerve. H. O'Neill—p. 237.

Herpes Simplex Keratitis in Malaria.—Chamberlain and Bronson encountered among troops who have contracted malaria in tropical combat areas numerous instances of keratitis due to herpes simplex virus. These infections have frequently resulted in serious scarring of the cornea, and the ulcers have been prone to recur with successive attacks of malaria. Plasmodium vivax was demonstrated in blood smears from 13 patients who had keratitis associated with herpes simplex and who had been exposed to malaria. In each patient the onset of corneal ulceration followed shortly after an acute malarial recurrence. The incidence of dendritic keratitis in the malaria group was 1 in each 188 new patients examined in the ophthalmologic clinic, whereas among patients not exposed to malaria the incidence was 1 in each 1,100 new patients. Corneal infection associated with herpes simplex would seem to be about six times as frequent among troops infected with malaria. Sulfadiazine powder applied locally to 5 dendritic ulcers promoted rapid healing in each instance. In 4 cases of atypical recurrent herpetic ulcers sulfadiazine was of no demonstrable benefit. Results suggest that sulfadiazine may prove a satisfactory adjunct to the accepted treatment of dendritic keratitis with strong solution of iodine U. S. P. Local applications of sulfanilamide were of no value. From the cornea of each of 2 patients with recurrent malarial attacks and dendritic keratitis the causative agent was transferred to a rabbit's cornea and thence to the chorioallantoic membrane of a chick embryo, where characteristic lesions of herpes simplex virus were produced. The identity of the virus was confirmed by neutralization tests. When the skin was tested for sensitivity to herpes simplex antigen, positive responses were obtained in about 80 per cent of a sample of hospitalized adult patients, and there was no appreciable difference in incidence between malarial and nonmalarial patients. Thirteen patients with herpes simplex keratitis were shown by neutralization tests to have serum antibodies against a known strain of herpes simplex virus. Each of these patients gave a strongly positive cutaneous reaction to the herpes simplex antigen.

Archives of Pathology, Chicago

39:133-220 (March) 1945

Experimental Nephropathies: II. Renal Phosphatase After Poisoning with Mercury Bichloride, Uranyl Nitrate and Potassium Dichromate. O. E. Hepler, Helen Gurley and J. P. Simonds.—p. 133.
Ischiopagus Tripus: Report of 2 Cases. H. G. Schlumberger and J. E. Gotwals.—p. 142.
Studies on Pathogenesis of Glomerulonephritis: I. Production of Autoantibodies to Kidney in Experimental Animals. P. A. Cavelti and Else Staehelin Cavelti.—p. 148.
Cysts and Cystic Tumors of Mediastinum. T. C. Laipply.—p. 153.
Some Endocrinologic Considerations of Canine Neoplastic Diseases. R. M. Mulligan.—p. 162.
Theory of Transposition of Arterial Trunks Based on Phylogenetic and Ontogenetic Development of Heart. M. Lev and O. Saphir. —p. 172.

Archives of Surgery, Chicago

50:125-176 (March) 1945

Chronic Thyroiditis and Primary Thyrotoxicosis (Exophthalmic Goiter). K. I. Gürkan.—p. 125.
Continuous Spinal Anesthesia: Observations on 1,200 Patients. R. C. Martin, H. Livingstone and V. Wellman.—p. 130.
Thromboplastic Reagent: Development of More Suitable Preparation for Measuring Accelerated Clotting Tendency and for Use Following Administration of Dicoumarin (3,3'-Methylene-Bis-[4-Hydroxycoumarin]). C. E. Brambel.—p. 137.
*Transplantation of Epiphysial Cartilage. H. L. Wenger.—p. 148.
*Blocking of Middle Cervical and Stellate Ganglions with Descending Infiltration Anesthesia: Technic, Accidents and Therapeutic Indications. A. DeSousa Pereira.—p. 152.
Protein Metabolism During Convalescence After Trauma: Recent Studies. J. E. Howard.—p. 166.
Use of Omentum to Close Perforations of Stomach. P. B. Price and T. F. Lee.—p. 171.
Cysts of Urachus. C. F. Sawyer.—p. 174.

Transplantation of Epiphysial Cartilage.—A boy now 11 years old was injured when at the age of 3 years some one stepped on his foot with a high heel. Cellulitis developed and operation revealed osteomyelitis of the first metatarsal bone. In response to the Orr treatment the patient rallied, but extreme shortening of the large toe and pronation of the foot resulted. Four years later epiphysial cartilage from a fibula, containing a portion of diaphysis, was successfully transplanted to the first metatarsal bone. The toe, which was greatly shortened prior to operation, was immediately corrected by the transplant. Observations made over approximately three years show that the transplant has taken and is functioning physiologically. The metatarsal bone in the foot which was operated on is of exactly the same size as the bone in the opposite foot. The proximal portion of the epiphysis appears to have fused with the cuneiform bone without impairing the growth of bone, which takes place more distally. Wenger cannot prophesy the eventual fate of the transplant at this time, but the extremely gratifying results obtained to date give assurance that this procedure is valuable.

Blocking of Middle Cervical and Stellate Ganglions.—Pereira blocks the middle cervical and stellate ganglions by an anterior approach. This method has the following advantages: 1. It is devoid of the risk of vascular and pleuropulmonary accidents. 2. It has a deep point of osseous reference, easy to identify by palpation of the transverse process of the sixth cervical vertebra. 3. The maximum effect is produced by blocking not only the stellate ganglion but the intermediate and the middle cervical ganglion. He arrived at obtaining without accidents a block of the middle cervical, intermediate and stellate ganglions by descending infiltration anesthesia of these ganglions, with the needle inserted at the level of the base of the anterior surface of the transverse process of the sixth cervical vertebra. If the anesthetic does not diffuse downward suffi-

ciently to block completely the stellate ganglion, the needle must be inserted a second time and directed to the base of the transverse process of the seventh cervical vertebra, and the anesthetic must be injected close to the intermediate ganglion and the vertebral artery. In this manner one can obtain a safe block of the middle cervical, intermediate and stellate ganglions.

Bulletin New York Academy of Medicine, New York

21:171-222 (April) 1945

*Diverse Clinical Picture of Coronary Heart Disease. L. R. Levy.—p. 171.
Treatment of Coronary Disease. C. C. Wolferth.—p. 185.
*Use of Concentrated Human Serum γ-Globulin in Prevention and Attenuation of Measles. C. A. Janeway.—p. 202.

Coronary Heart Disease.—Levy stresses the diversity of manifestations of coronary heart disease. There may be minimal symptoms and pronounced changes in the form of the electrocardiogram. In the presence of advanced coronary sclerosis a severe emotional strain can induce acute coronary insufficiency and so cause sudden death. The electrocardiogram may be normal less than twenty-four hours before fatal coronary occlusion. There may be striking serial changes in the electrocardiogram indicating closure of coronary arteries in a patient who is ambulatory, active and entirely free from cardiac discomfort. When the symptoms are puzzling and the examination, including the electrocardiogram, reveals no signs of heart disease, the anoxemia test is often useful in affording graphic evidence of a diminished coronary reserve. This consists in permitting the patient to breathe a mixture of 10 per cent oxygen and 90 per cent nitrogen for twenty minutes or until cardiac pain appears. A control electrocardiogram is taken and records are made at intervals of five minutes while the patient breathes the low oxygen mixture. Measurement of these records shows in patients with a diminished coronary reserve characteristic changes which are not observed when the coronary blood flow is adequate.

Concentrated Human Serum Gamma Globulin in Measles.—Janeway demonstrated that concentrated human serum gamma globulin derived from blood collected by the American Red Cross contains a twenty-five-fold concentration of most of the antibodies present in normal adult serum. This makes it possible to give the equivalent of 125 cc. of pooled adult serum in a single intramuscular injection of 5 cc. This material is now being distributed by the American Red Cross, through public health agencies, for the prevention and modification of measles, a purpose for which it has been proved particularly effective and safe. When administered in the first six days after exposure to measles, a dose of 0.08 to 0.1 cc. per pound will give protection to 3 out of 4 persons, with mild measles in the fourth, while a dose of one fourth this much, or 0.02 to 0.025 cc. per pound, will result in an attack of mild measles in most cases. In a large series of cases, very few reactions to intramuscular injection of the globulin have been observed, and these have been mild and chiefly local. The complication rate in modified measles appears to be definitely lower than in the typical disease.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

87:1-122 (April) 1945

Penetrating War Injuries of Brain: Desirability of Early Definitive Surgery. A. I. Finlayson.—p. 61.
Treatment of Skin Diseases in Tropics. T. W. Clark.—p. 70.
Tourniquet Problems in War Injuries. L. H. Wolff and T. F. Adkins.—p. 77.
Repair of Fixed Bridges and Acrylic Dentures in Field. M. Arnold and A. Baranowski.—p. 85.
Introduction to Psychiatric Problems. J. J. Michaels and C. Smith.—p. 87.
Venereal Disease Control Program. L. L. Heimoff.—p. 93.
Perennial Bronchial Asthma: Analysis of 100 Cases. P. E. Zanfagna.—p. 100.
Diagnosis of Schistosomiasis. V. Vermooten.—p. 104.
*Air Blast Injury: Report of Cases. R. E. Brubaker.—p. 110.
Contact Poison Plants in Old World Tropics. E. D. Merrill.—p. 115.

Air Blast Injury.—Brubaker reports observations on 15 patients suffering from the percussive effects of high explosives. In 3 patients pain and hyperesthesia were presumably due to a traumatic peripheral neuritis of the supraorbital nerve. Injection of the supraorbital nerve with procaine produced complete although transient relief. Two patients had hypersensitiveness of the skin of root distribution. In cases with supraorbital pain and hyperesthesia it is possible that the nerve was contused at its exit from the supraorbital canal. In the treatment of critical pulmonary blast injuries strict bed rest and limitation of motion are necessary. Plasma is rarely indicated for the accompanying shock because increase in the intravascular hydrostatic pressure resulting from the introduction of plasma augments the outpour of fluid and thus hastens death. The chief problem is to tide the patient over the acute transudative phase of the injury by preventing loss of circulating fluid into the lungs. This might be accomplished by exhalation against positive pressure as provided by a type of intermittent flow mask such as that designed by Barach. It is possible that such pressure on exhalation might stem the transudation of fluid into the alveoli in blast injury, thus preventing the anoxia resulting from the loss of absorptive surface and, at the same time, the shock secondary to the diminution of circulating fluid. Measurement of the depth of foxholes and their distance from the bomb craters suggested that a hole rendering the maximum protection from blast should be about 4 feet deep. Men in shallow foxholes have been killed outright, while others in the same radius protected by holes 4 to 5 feet deep escaped injury. A hole much deeper than this involves the risk of suffocation from collapse.

Canadian Journal of Public Health, Toronto

36:131-174 (April) 1945

Manitoba's Health Proposals. F. W. Jackson.—p. 131.
Bacteriologic Observations on Diphtheria in Halifax. E. T. Byone and Dorothy E. Helmer.—p. 135.
Acute Methyl Alcohol Poisoning: Observations in Some 30 Cases. A. Branch and D. J. Tonning.—p. 147.
Dietary Survey in Farm Households at Ile Perrot, Quebec. F. M. Webster and Margaret S. McCready.—p. 152.
*Second Attack of Poliomyelitis After Thirteen Years. J. Wyllie.—p. 156.
Studies in Pullorum Disease: III. Serologic Differences in Strains of Salmonella Pullorum. R. Gwatkin and E. W. Bond.—p. 160.

Second Attack of Poliomyelitis.—A woman at the age of 32, in October 1942, developed a second attack of poliomyelitis, having had a first attack thirteen years previously at the age of 18. The first attack, which had developed after intimate contact with a sister who had a paralytic attack of poliomyelitis, had left the patient with wasting and flabbiness of the calf muscles of the right leg but with little loss of function. The patient walked with a slight limp. During the second attack, examination revealed a partial paralysis of both legs and weakness of the lumbar muscles. Wyllie reports that treatment with the Kenny packs was begun on the day of admission and continued daily for twenty-five days. On her discharge from the hospital there was some loss of power in the extensor muscles of the right thigh and loss of power in the left thigh muscles but improvement in the muscles of the lumbar region.

Delaware State Medical Journal, Wilmington

17:37-58 (March) 1945

Penicillin Therapy. H. F. Flippin.—p. 37.
Treatment of Low Back Strain. P. N. Jepson.—p. 42.
Coincidence of Affective Disorder and Circulatory Encephalopathy. G. J. Gordon.—p. 46.

Georgia Medical Association Journal, Atlanta

34:47-66 (March) 1945

Choice and Proper Use of Intravenous Fluids. T. Harrold.—p. 47.
Acacia Treatment of Nephrotic Edema. L. L. Whitley.—p. 51.
American Medicine Tomorrow. MacF. Cahal.—p. 53.

Indiana State Medical Assn. Journal, Indianapolis

38:121-148 (April) 1945

Treatment of Rheumatic Fever. N. C. Gilbert.—p. 121.
Significance of Ocular Fundus Changes in Hypertension. M. Mann and R. D. Taylor.—p. 125.
Emotional Hypertension: Study of Group of High School Boys. D. L. Urschel.—p. 128.

Kansas Medical Society Journal, Topeka

46:73-108 (March) 1945

Renal Cyst, Solitary. J. W. Martin.—p. 73.
Are Doctors People? R. I. Lee.—p. 76.

Michigan State Medical Society Journal, Lansing

44:209-312 (March) 1945

Peripheral Nerve Injuries. F. H. Mayfield.—p. 269.
Treatment of Thyrotoxicosis with Thiouracil. W. S. Reveno.—p. 276.
Management of Common Cold. A. W. Proetz.—p. 279.

44:313-424 (April) 1945

Will Free Enterprise Survive in Medicine? What the Profession Must Do to Obviate Government Control. J. F. Hunt.—p. 363.
American Medicine in Transition. E. F. Stegen.—p. 368.
Council on Medical Service and Public Relations: A. M. A. Work of the Washington Office. J. S. Lawrence.—p. 372.
Vocational Rehabilitation Program of Federal Government. E. F. Sladek.—p. 373.
Effect of Estrogens on Bone Healing. P. J. Connolly.—p. 377.
Tropical Diseases in America After the War. H. A. Lichtwardt.—p. 382.

Military Surgeon, Washington, D. C.

96:*293-376 (April) 1945. Partial Index*

New Technical Procedure in Fabrication of External Prosthetic Appliances. V. H. Dietz.—p. 293.
Medical Pioneers in the Peruvian Amazon. E. A. Westphal.—p. 303.
Laboratory Examination of Milk and Dairy Products as Conducted by Army Medical Department. R. Randall.—p. 308.
Sanitary Engineering Activities of United States Public Health Service. H. N. Old.—p. 316.
Penicillin in Military Surgery. J. S. Jeffrey.—p. 320.
British Medical Research in Aviation. A. Walbank.—p. 322.
Ruptured Peptic Ulcer Among U. S. Troops in Panama: Report of 10 Cases. W. B. Harrell and R. O. Wilson.—p. 336.
Nutrition in the Army. A. J. Dyer.—p. 342.
Sanitation in United States Navy. J. C. Geyer.—p. 344.
Löffler's Syndrome—Eosinophilic Pneumonia: Case Report. S. Scherlis.—p. 349.
Labial Sunburn in the Tropics. H. Greenfield.—p. 355.
Preparation of Plaster of Paris Bandages. H. Andre.—p. 356.

Missouri State Medical Assn. Journal, St. Louis

42:209-256 (April) 1945

What the General Practitioner Should Know About Leprosy. N. Tobias.—p. 209.
Operative Management of Ingrown Toenail. C. J. Heifetz.—p. 213.

New England Journal of Medicine, Boston

232:301-334 (March 15) 1945

Early Diagnosis of Diseases of Chest. N. J. Wilson.—p. 301.
Challenges to Medicine. V. Johnson.—p. 310.
Insect Vectors of Disease. V. A. Getting.—p. 315.

232:335-364 (March 22) 1945

Treatment of Ureters Injured During Gynecologic Operations. F. M. Ingersoll and J. V. Meigs.—p. 335.
Time Factor in Development of Complications of Gallstones. C. Bearse.—p. 338.
Low Back Pain as Presenting Symptom of Malignant Breast Tumors. T. D. Cohn and H. Cohn.—p. 342.
Insect Vectors of Disease. V. D. Getting.—p. 344.

232:365-388 (March 29) 1945

The Young Stethoscopist. R. Fitz.—p. 365.
Dermatitis Exfoliativa Following Arsphenamine Therapy: Observations on 50 Cases. M. J. Costello and S. Landy.—p. 369.
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232:389-414 (April 5) 1945

*Papaverine in Treatment of Coronary Artery Disease. W. Gray, J. L. F. Riseman and S. Stearns.—p. 389.
Plethora of Intracranial Venous Circulation in Case of Polycythemia: Pathologic Physiology and Diagnostic Considerations. J. Loman and W. Dameshek.—p. 394.
Psychosomatic Interrelations in General Medicine. Gertrude F. Frisbie.—p. 398.
Treatment of Infections with Penicillin. D. G. Anderson.—p. 400.

Papaverine in Disease of Coronary Arteries.—Gray and his associates present the results of objective studies on the use of papaverine in the treatment of 13 patients with angina pectoris who made weekly visits to the angina clinic of the Beth Israel Hospital. Papaverine hydrochloride appears to have a definite but limited and temporary vasodilator action in patients with coronary artery disease. The administration of this drug intravenously enabled half the patients with angina pectoris to do more work than was possible otherwise and decreased the electrocardiographic changes following exercise. This effect reached its maximum in five to fifteen minutes after injection and was negligible after about sixty minutes. This therapy is of little value in the clinical treatment of patients with angina pectoris. The oral administration of papaverine hydrochloride in doses of 33, 100 or 200 mg. to ambulatory patients did not improve their ability to exercise and does not appear to be of practical value in the treatment of angina pectoris. Studies on a small group of patients suggest that the administration of papaverine hydrochloride intravenously in doses of 65 or 100 mg. is of considerable value in treating the pain of coronary occlusion or coronary failure.

232:415-438 (April 12) 1945

*Trench Foot and Immersion Foot. J. C. White and W. B. Scoville.—p. 415.
Treatment of Infections with Penicillin. D. G. Anderson.—p. 423.

232:439-462 (April 19) 1945

Current Trends in Biologic Products. E. S. Robinson.—p. 439.
Engineers and Engineering in Massachusetts State Board of Health. G. M. Fair.—p. 443.
Clinical Importance of Rh Blood Type. L. K. Diamond.—p. 447.

Trench Foot and Immersion Foot.—White and Scoville state that trench foot and immersion foot are similar clinical entities that differ from frostbite in the type of exposure and the reaction of the tissues and their method of recovery. Three stages are described: the initial response to cold, short of actual freezing of the tissue cells, the early period of recovery, characterized by painful hyperemia, and the residual effects of fibrosis. The initial treatment is similar to that for burns but should include cooling to reduce the oxygen demands of the skin to a level compatible with the flow of blood through damaged subcutaneous vessels. Late treatment consists in conservative minimal amputations, exercises and physical therapy to decrease tissue fibrosis and joint stiffness and sympathectomy in selected cases with residual circulatory insufficiency. Gangrene of the toes and distal portions of the feet constitutes a serious problem in trench foot but is rare in immersion foot, in which the lower extremities are less liable to trauma and infection. Prolonged partial disability is frequent in both conditions. Improvement in protective clothing, widespread instruction in foot care and first aid and a critical evaluation of the response of the fibrosed tissues to sympathectomy are in order.

New Jersey Medical Society Journal, Trenton

42:75-104 (March) 1945

Role of Vitamins in Physiology of Vision. W. H. Hahn.—p. 81.
Simplified Local Treatment of Sinusitis with Sodium Sulfathiazole, with Special Reference to Ethmoids. E. C. Kern.—p. 89.

New York State Journal of Medicine, New York

45:449-560 (March 1) 1945

Changes Which Have Resulted from Use of Sulfonamide Therapy in X-Ray Findings in Mastoiditis. W. R. Cashion.—p. 493.
Sulfonamides in Management of Osteomyelitis. J. M. Flynn.—p. 493.
Filariasis. D. L. Augustine.—p. 495.
Review of Recent Findings in Filariasis. D. R. A. Wharton.—p. 500.
Medical Aspects of Recalcitrant and Complicated Ulcer. Sara M. Jordan.—p. 505.
Role of Quinine in Colds, Influenza and Virus Pneumonia. H. M. Feinblatt.—p. 509.
Mycosis Fungoides: Two Unusual Types, One Presenting Leonine Facies, the Other Parapsoriasis (?) in Patches for Thirty Years. E. W. Abramowitz and B. Kanee.—p. 512.

45:561-672 (March 15) 1945

Anomalies of Speech Mechanism and Associated Voice and Speech Disorders. J. S. Greene.—p. 605.
Hypoprothrombinemia: Effect of Oral and Parenteral Therapy with Synthetic Vitamin K (Synkayvite). N. H. LeTourneau.—p. 609.
Penicillin—Rapidity of Its Effect in Treatment of Gonorrhea. V. M. Dunfield and A. Mandel.—p. 614.
Multiple Sclerosis Complicating Pregnancy. C. H. Peckham.—p. 617
Differential Diagnosis of Early Lesions of Venereal Disease. B. A. Kornblith.—p. 623.

Oklahoma State Medical Assn. Jour., Oklahoma City

38:89-146 (March) 1945

Carcinoma of Rectum N W Woodward—p 89
Otitis Media O A Watson—p 93
Such Is Life L J Moorman—p 97
United States Medicine in Transition L J Moorman—p 98

38:147-188 (April) 1945

Management of Urinary Tract Stones V R Sugg—p 147
Severe Head Injuries H L Puckett—p 150
Para Basedowian Syndromes L S McMaster—p 153

Physiological Reviews, Baltimore

25:203-376 (April) 1945

Adrenal Gonad Relationship A S Parkes—p 03
Phlorhizin Glucosuria F W McKee and W B Hawkins—p 255
Physiology of Prostate Gland C Huggins—p 281
Cerebral Concussion D Denny Brown—p 96
Appraisal of Nutritional Status (Nutriture) in Humans with Especial Reference to Vitamin Deficiency Disease W J Dann and W J Darby—p 326
Proteins of Plants H B Vickery—p 347

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7:73-132 (March) 1945

Objective Personality Studies in Migraine by Means of Rorschach Method W D Ross and F L McNaughton—p 73
Rorschach Performance with Neurocirculatory Asthenia W D Ross—p 80
Rorschach Method and Psychosomatic Diagnosis Personality Traits of Patients with Rheumatic Disease, Hypertensive Cardiovascular Disease Coronary Occlusion and Fracture Camilla Kemple—p 85
Role of Autonomic Nervous System in Cancerous Disorders S Rothman—p 90
Experimental Study of Functions of Frontal Lobes in Man G K Yacorzynski and L Davis—p 97

Radiology, Syracuse, N. Y.

44:213-318 (March) 1945

Carcinoma of Cheek Alveolar Processes Floor of Mouth and Palate R H Beinwanger and K W Stenstrom—p 213
Streamlining X-Ray Therapy for Wartime Service A Soiland—p 225
Response of Retina to Direct Roentgen Beam Method of Assessing Condition of Retina and Aid in Localizing Intraocular Foreign Bodies E W Godfrey, H P Schenck and L F Silcox—p 229
Traumatic Pneumocephalus L H Garland and M E Mottram—p 237
Response of Liver to Irradiation F Fillmore—p 241
Congenital Solitary Pelvic Ectopic Kidney with Report of Case B H Nichols and J T Mary—p 255
*High Altitude Joint Pains (Bends) Their Roentgenographic Aspects S F Thomas and O L Williams—p 257
Contribution to Treatment of Postirradiation Necrosis J E Moseley—p 262
Radiology vs Monsoon Effect of Climate on Equipment P J Hodes and G P Keefer—p 266
Depth Dose Measurements at 400 Kilovolts Lillian E Jacobson—p 273
New Principle in Roentgenography of Lateral Lumbar Spine D B Slauson—p 280
Further Studies on Relation Between Radiation Effects Cell Viability and Induced Resistance to Malignant Growth II Effects of Roentgen Rays on Bagg Jackson Mouse Carcinoma 755 Irradiated in Vitro and in Situ Anna Goldfeder—p 283

High Altitude Joint Pains.—Thomas and Williams made an x-ray study of the affected joints in a decompression chamber at altitudes of 33,000 and 38,000 feet both in the presence and in the absence of pain Lateral views of the knees were made with a small portable x-ray machine Gas can be shown in the knee joint in every person, whether with or without "bends" pain, at an altitude of about 20,000 feet increasing to a maximum in about thirty minutes at 30,000 feet Large volumes of gas (estimated at 50 to 75 cc) are clearly shown in one of the reproduced roentgenograms Gas in the knee joint is not necessarily associated with pain and may be freely aspirated It consists of nitrogen, oxygen and carbon dioxide approximately in equilibrium with the normal blood gases It appears also in periarticular tissues in small irregular collections, in small discrete bubbles and in streaks along fascial planes and tendons The gas is usually reabsorbed from the soft tissues and joint spaces by the time sea level is reached although small (2 mm) bubbles persist in a few instances for as long as five minutes after return to sea level

South Carolina Medical Assn. Journal, Florence

41:55-84 (March) 1945

Treatment of Tetanus with Tetanus Antitoxin and Penicillin J M Albergotti—p 55
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41:85-106 (April) 1945

Surgical Management of Thrombophlebitis and Phlebothrombosis of Lower Extremities H G Smithy—p 85
Use of Sulfonamide Ephedrine Nose Drops After Tonsillectomy G R Laub—p 89
Pregnancy Spacing in South Carolina from Public Health Standpoint J B Nettles—p 89

Southern Medical Journal, Birmingham, Ala.

38:229-292 (April) 1945

Fulminating Meningococcemia (The Waterhouse Friderichsen Syndrome) H R Pratt Thomas, W H Kelley and P C Gazes—p 229
Relation of Hydrochloric Acid and Vitamin B Complex Deficiency in Certain Skin Diseases J R Allison—p 233
Discussion of Angiomata and Pigmented Nevi L Bivings—p 241
Magnetic Removal of Foreign Bodies from Food and Air Passages Under Fluoroscopic Guidance M Equen—p 243
Treatment of Fractures of Tibial Condyles R A Knight—p 246
Treatment of Acute Appendicitis H C Fisher and J C Burch—p 255
Care of Patient Following Prostatic Resection H P McDonald—p 260
Postmenopausal Vaginal Bleeding W Long—p 264
Serious Slough and Fistulous Formation Resulting from Injection Treatment F B Campbell—p 268
Classification of Fungous Infections According to Form of Fungus in Tissues R D Baker—p 272
Larger Units of Local Health Jurisdictions Indispensable for National Health H Emerson—p 276
Age Segments W D MacVicar—p 282

Tennessee State Medical Assn. Journal, Nashville

38:61-90 (March) 1945

Surgical Activities of Overseas General Hospital J A Kirtley Jr and C C Trabue IV—p 68

38:90-120 (April) 1945

Gonococcal Infections in Infancy and Childhood A Christie—p 91
*Results of High School Tuberculosis Program in Tennessee A Dillon, R S Gass W W Hubbard and E I Harrison—p 97

High School Tuberculosis Program in Tennessee.—Dillon and his associates review the results of the tuberculin testing of 51 818 high school students and of the x-ray examination of positive reactors by the Division of Tuberculosis Control of the Tennessee Department of Public Health Of these students 7,525, or 14 5 per cent, reacted to 0 01 mg of old tuberculin and 371, or 0 7 per cent, were found to have significant lesions The percentage of white students reacting was 13 3 and of colored students 28 4, more than double that of the white The percentage of students with significant lesions was 0 6 for white and 2 2 for colored Of the 371 students with significant lesions, 369 had lesions of the reinfection type, 189 of which were definite and 180 suggestive One hundred and forty-eight, or 77 5 per cent of the 191 definite lesions were minimal in extent, 41 were moderately advanced and only 2 were far advanced Of 5,848 white students who reacted to tuberculin and received an x-ray examination 2,357, or 40 3 per cent, were found to have calcified lesions in the lungs, including those with significant lesions who also showed evidence of calcification

Wisconsin Medical Journal, Madison

44:277-371 (March) 1945

Cancer Treatment with Radium Bearing Molds K Wiener—p 297
Psychiatric Problems in Aged W Overholser—p 300
Measles Interesting Disease F B Welch—p 303

44:373-479 (April) 1945

Nutrition in Pregnancy C J Lund—p 393
What Constitutes Normalcy During Prenatal Period H A Stuck—p 399
Management of Toxemias of Pregnancy Review of Recent Cases R D Mussey and Elizabeth Mussey—p 404
Pregnancy and Tuberculosis F M I Meixner—p 413
Dangers and Sequela of Birth Injuries in Use of Anesthetics and Soporifics H A Cunningham—p 419
Double Pregnancy and Fibroids in Duplex Uterus Report of Case E A Riley and J D Leahy—p 421

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

52:1-96 (Feb.) 1945

*Blood Pressure and Incidence of Hypertension in Nulliparous and Parous Women in Relation to Remote Prognosis of Toxemias of Pregnancy. Josephine Barnes and F. J. Browne.—p. 1.
Renal Failure in Obstetric Practice. G. S. Adam.—p. 13.
*Definition of Prematurity: Proposed Minimal Weight Standard for Viable Premature Infants. J. L. Henderson.—p. 29.
Value of Rhesus Test in Obstetrics. C. V. Harrison.—p. 36.
*Riboflavin Deficiency in Pregnancy. K. Braun, Y. M. Bromberg and A. Brzezinski.—p. 43.
"Long External Rotation" of Fetal Head. G. B. Thomas.—p. 48.
External Endometriosis and Pregnancy (Report of 2 Cases). M. B. McIlrath.—p. 52.
Some Curiosities of Mammalian Reproduction: Part 3.—Mammals That Produce Uniovular Litters. F. W. Jones.—p. 55.
Full Time Intraligamentous Ectopic Gestation. L. G. Selliah and W. C. O. Hill.—p. 71.

Blood Pressure and Hypertension in Toxemias of Pregnancy.—Barnes and Browne analyzed the blood pressure of 1,956 women. Of these 915 were nulliparous and 1,041 were parous. There were no statistically significant differences between the mean level of blood pressure in nulliparous and in parous women at any age. There was no significant difference between the percentages of nulliparous and parous women with blood pressures over 120/80 or over 140/90. The number of pregnancies had no demonstrable effect on the mean level of blood pressure in parous women. Pregnancy does not cause chronic hypertension. Pregnancy does not aggravate a tendency to hypertension, nor does chronic hypertension develop earlier in parous women. Though hypertension is a common remote sequel of toxemia of pregnancy, it is not caused by the toxemia. A tendency to hypertension often contributes to the severity of toxemia. Toxemia of pregnancy may be regarded as a temporary disorder leaving no permanent lesion. There is therefore no justification for terminating a toxemic pregnancy prematurely in order to protect the mother from chronic hypertension. There is no evidence that pregnancy permanently aggravates hypertension already existing when pregnancy starts. There is therefore no justification for terminating an early pregnancy in a patient with essential hypertension.

Minimal Weight Standard for Viable Premature Infants.—Henderson regards it as unfortunate that a minimal weight standard for viable premature infants was not adopted concurrently with the maximal weight standard of 5½ pounds (2.5 Kg.). The relation of the birth weight and the estimated period of gestation in 1,041 liveborn premature infants (twins excluded) has been investigated. The average weight of infants of twenty-eight weeks gestation, the age at which the fetus is generally presumed to become viable, appears to be between 3 and 3½ pounds (1.3-1.5 Kg.). A minimal arbitrary weight standard for premature infants of 2 pounds 12 ounces (1,250 Gm.) has been proposed for the following reasons: (*a*) The average weight of infants of twenty-eight weeks' gestation appears to be about 2¾ pounds. (*b*) The weight of 2¾ pounds avoirdupois corresponds to the weight of 1.25 Kg. (1,250 Gm.) in the metric system. This correspondence in round figures is an essential condition of an international standard. (*c*) The minimal weight of 2¾ pounds is exactly half of the maximal weight of 5½ pounds, a fact which simplifies the definition of the weight range of prematurity. The term "previable" has been proposed for the separate category of liveborn premature infants with a birth weight of less than 2¾ pounds. Only 4 of 118 previable infants survived.

***Riboflavin* Deficiency in Pregnancy.**—Braun and his associates designate maceration and fissuring at the lips and angles of the mouth, glossitis, seborrheic accumulations of the nasolabial folds and certain ocular manifestations as evidence of riboflavin deficiency. In Palestine riboflavin deficiency is observed with some frequency in pregnant women. In a series of 900 pregnant women studied by the authors 190, or 21 per cent, presented manifestations of riboflavin deficiency. These symptoms made their appearance almost always during the last trimester of pregnancy and regressed shortly after delivery. An etiologic relationship between these symptoms and riboflavin deficiency was established by economic and dietary investigation, the low urinary excretion of riboflavin and the favorable response to treatment with riboflavin.

Chirurg, Berlin

15:697-756 (Dec. 15) 1943. Partial Index

Gunshot Injury of Heart with Missile Retained in the Wound. K. H. Bauer.—p. 697.
One Stage Pulmonary Lobectomy. A. Hart.—p. 701.
Composition of Anesthetic Solutions. J. Tóth.—p. 707.
Exposure of Vertebral Artery. K. E. Herlyn.—p. 713.
*Joint Excision in Gunshot Injuries. H. von Haberer.—p. 729.
Solitary Extoses. H. Sjövall.—p. 737.

Excision of Joint in Gunshot Injuries.—Haberer feels that excision of a joint is warranted by improvement in methods of joint surgery in which shortening of the extremity may be kept within certain limits. Secondary osteomyelitis may be prevented by adequate drainage, by immobilization with extension and by avoidance of too early transportation of the wounded. The great majority of joint injuries are caused by shell fragments rather than by infantry missiles, as in the first world war, and thus the danger of infection is increased. Excision should be done in cases in which infection threatens life and in which at least partial functional capacity may be preserved. Except for injuries of the hip joint, amputation is suggested for injuries of the lower extremities in which excision would have to be very extensive so that functional capacity could not be preserved. In a similar type of injuries of the upper extremities the extremity as such should be preserved by excision of the joint.

Deutsche medizinische Wochenschrift, Leipzig

69:739-768 (Oct. 29) 1943. Partial Index

Importance of Tuberculin Test, Immunity and Immunization in the Campaign Against Tuberculosis. H. Selter.—p. 739.
Cryptogenic Peritonitis and Scarlet Fever Epidemics. G. Stinner.—p. 742.
Diphtheria and Pseudodiphtheria Bacteria in Burns. W. Herrmann and T. Pütz.—p. 744.
*Observations on Undernourished Persons. K. Perakis and D. Bakalos.—p. 746.

Observations on Undernourished Persons.—Observations in the General State Hospital in Athens revealed four types of hunger edema. The cachectic type was characterized by emaciation and by slight swelling of the face and the extremities. Extreme weakness was the chief complaint and sudden death occurred regularly in the absence of prodromal signs or after diarrhea of short duration. Generalized dropsy was the second type; it was observed in less debilitated persons. Recovery occurred in the absence of intestinal disorders, and the prognosis was much more favorable in younger persons. The incidence of the third, the polyserositic, type was high. Prolonged ascites was observed frequently, but recovery occurred regularly although reaccumulation of fluid took place after evacuation. The serous fluid was deficient in albumin (2.25 per cent to 5.50 per cent). The presence of chyle associated with fatty globules was observed in 2 cases. Prognosis was less favorable in cases in which all the serous cavities were involved. The fourth type with localized edema of the face and of the extremities was characterized by a mild clinical course. Gastrointestinal disorders played an important part. Dilatation of the stomach was frequently present together with hypoacidity of the gastric juice. Diarrhea with ten to thirty movements daily was considered to be an unfavorable symptom. Stools containing undigested food, mucus, blood and pus were observed in the grave cases in which extensive ulceration of the mucous membrane of the colon was demonstrated at necropsy. Polyuria and excessive excretion of sodium chloride, bradycardia and hypotension were common. Capillary alterations in cachectic patients resulted in formation of a vascular nevus on the back of the hand and on the face. Frostbite caused by cold alone has not been observed in Athens heretofore but did result from the combined effect of cold and undernourishment. Nervous disorders with loss of tendon reflexes and of vesical and rectal control were frequent. Epithelial and subepithelial polymorphous keratitis were frequently

present. A protracted hyperglycemic course was revealed by the blood sugar curve. There was a pronounced increase in the diastase values of the blood serum. A balanced diet was not available, but young people recovered on a diet which consisted of 30 Gm. of olive oil, 90 Gm. of bread and 180 Gm. of legumes (lentils, peas and beans). Fifty cases of pellagra occurred, but the nonmalignant course of the disease is emphasized. No other diseases due to vitamin deficiency were observed.

69:769-798 (Nov. 12) 1943. Partial Index

Sulfonamide Therapy of Trachoma. W. Rohrschneider.—p. 769.
Renal Symptoms and Renal Changes in Acute Infectious Diseases. F. Munk.—p. 771.
*Serous Radiculoneuromyelitis. W. Ederle.—p. 773.
Observations on Typhus. Heimberger.—p. 775.

Serous Radiculoneuromyelitis.—Generalized motor paresis with paresthesia, especially in the distal parts of the extremities, are to be considered a uniform neuritic symptom of a group of diseases. Secondary postdiphtheritic polyneuritis is a typical representative of this group, but the same clinical course may be observed after localized pyogenous infection or after gastrointestinal disorders. Serous inflammation of the nerve roots, the spinal cord and the peripheral nerves was the basis of 23 cases reported by Ederle. The collective term "serous radiculoneuromyelitis" is suggested for this group of cases, which presented an increase in the protein in the cerebrospinal fluid without corresponding increase in cells (Guillain-Barré type). There was considerable edema about the spinal cord, particularly of the meninges and the spinal ganglions. Only 1 of the author's patients died; 22 recovered within two to three months. Malarial therapy is contraindicated because of myocardial involvement demonstrated by electrocardiograms in half of the cases. Treatment consisted in rest in bed while paralysis was in progress. Exercises and electrotherapy were instituted during the quiescent stage. Intravenous injections daily of 100 mg. of crystalline vitamin B_1 hydrochloride and subcutaneous injections of 1 ampule of acetylcholine were given.

Münchener medizinische Wochenschrift, Munich

90:705-734 (Dec. 17) 1943. Partial Index

Causalgia Complaints After Gunshot Injuries. H. Moser.—p. 705.
Ophthalmologic Examination for Prescription of Glasses to Soldiers. R. Klin.—p. 707.
Progress of Virus Research. W. Schmidt Lange.—p. 709.
Simultaneous Occurrence of Several Congenital Clefts of Face and Jaws in Association with Other Deformities of Body. J. Gerke.—p. 712.
*Therapy of Severe Diphtheria. O. Hess.—p. 716.
Complications and Intricacies in Treatment of Pleural Empyema. K. Vossschulte.—p. 719.
Dangerousness of Intestinal Worms. F. Hamburger.—p. 722.
Therapy of Causalgia. A. Scholz.—p. 723.
Hysterosalpingography and Methylene Blue Test. H. Wirths.—p. 723.

Therapy of Diphtheria.—Hess reports results of treatment of diphtheria with serum and homeopathic drugs. Of 1,045 patients with diphtheria who were treated only with serum during the period from 1925 to 1942 71 (6.4 per cent) died. From Dec. 1, 1941 to Nov. 30, 1942 318 of 503 patients with diphtheria were treated only with serum, while 185 were given serum and homeopathic drugs; 12 (3.7 per cent) of the patients treated with serum died; 20 (10.8 per cent) of the patients given the combined treatment died. There were more toxic cases among those treated with serum and homeopathic drugs, but the total mortality rate of the 503 patients was 6.3 per cent, almost the same as the mortality rate of 6.4 per cent of the 1,045 patients treated only with serum. The good results claimed by the homeopaths from combined therapy were not proved. The administration of homeopathic drugs in addition to serum is ineffective in toxic cases of diphtheria as well as in uncomplicated cases in which serum therapy was instituted too late or in insufficient doses. Early administration of serum (at least 500 immunizing units per kilogram of body weight) intravenously (in fractional doses twice a day) and continued intramuscularly until the false membrane disappears is highly recommended. Shock from intravenous injections of serum and blood transfusions, or rise of temperature and chill produces changes in the organism which may have a good effect on the course of diphtheria. An abscess may be produced by subcutaneous injection of turpentine in addition to intensive serum therapy to divert the defense power of the organism to a different localization and to relieve the heart in toxic cases. Recovery resulted from this combined treatment in 12 of 13 cases and only 1 case proved fatal. The patients were between the ages of 2½ and 57 years.

Acta Medica Scandinavica, Stockholm

116:231-408 (Feb 17) 1944. Partial Index

New Cytologic Method of Examination. G. Wihman.—p. 231.
Atypical Amyloidosis, with Particular Consideration of Heart. P. Soisalo and V. Ritama.—p. 260.
*Experimental Studies on Significance of Various Regions of Stomach to Anti-Pernicious Anemia Principle Content of Liver (in Swine): II. Counter Effect of Nicotinic Acid on Disappearance of Anti-Pernicious Anemia Principle in Liver Following Resection of Fundus of Stomach. S. Petri, O. Bang, W. Kraer and A. K. Nielsen.—p. 273.
Monosymptomatic, Isolated Riboflavin Deficiency (Ariboflavinosis) in Human Subject. P. J. Wising.—p. 288.
Rheumatic Mesarteritis Pulmonalis. P. Brummer.—p. 294.
Treatment of Undulant Fever with Sulfapyridine. S. G. Sjöberg.—p. 304.
*Ulcerative Colitis After X-Ray Treatment for Cancer of Uterus. J. Engelbreth Holm.—p. 308.
Course of Diabetes Mellitus During Old Age: Report of 25 Cases of Spontaneous Recovery from Diabetes Mellitus in Aged Persons. V. Schmidt.—p. 340.

Gastric Regions and Anti-Pernicious Anemia Principle of Liver.—To determine where and how the anti-pernicious anemia principle is formed, Petri and his associates performed resections of various parts of the stomach on hogs. Previous investigations revealed that total resection of the fundus leads to complete disappearance of the anti-pernicious anemia principle of the liver. However, nicotinic acid administration subsequent to total resection of the fundus compensates this loss of the active principle. This compensation depends on the presence of the cardia and on parenteral administration of nicotinic acid.

Ulcerative Colitis After X-Ray Treatment of Uterine Cancer.—Engelbreth-Holm reports the histories of 4 patients in whom radium and roentgen treatment of cervical carcinoma was followed by severe colitis with purulent diarrhea and fever. The disease took a rapid course, and all 4 patients died after from nine to thirty days.

Acta Psychiatrica et Neurologica, Copenhagen

18:377-500 (No. 5) 1943

Electromyogram of Atrophic Muscles in Cases of Intramedullary Disorders. F. Buchthal and S. Clemmesen.—p. 377.
Clinical Application of Electroencephalography, with Description of New Electroencephalograph. F. Buchthal and E. Kaiser.—p. 389.
Myositis Fibrosa Progressiva vel Generalisata. M. Ellermann.—p. 411.
Reaction of Blood in Epilepsy. A. Faurbye.—p. 419.
Case of Acute Encephalomyelitis of Neuroptic Myelitis Type. T. Fog.—p. 439.
Narcolepsy: II. Studies on Diurnal Variations in Skin Temperatures in the Narcoleptic. G. Magnussen.—p. 457.
*Cerebral Disturbances in Angioneurotic Edema. Estrid Ottesen.—p. 487.

Cerebral Disturbances in Angioneurotic Edema.—Ottesen reports a case of angioneurotic edema associated with convulsions in a man aged 41. The family history was negative as to epilepsy and other nervous and mental disorders and for allergic disease. At the age of 10 the patient suffered from urticaria and at 17 he fell from a height of about 35 feet and injured the left side of his head. The injury produced only mild symptoms and no subsequent discomfort. Six weeks prior to his admission to the hospital he had suffered from a sudden generalized attack of tonic-clonic convulsions accompanied by unconsciousness. He subsequently suffered from three similar attacks, one of which affected only the left side. During the patient's stay in the hospital there was noted the typical angioneurotic edema of the lower lip, the tongue, the right cheek, the right foot, the prepuce and the dorsum of the penis. Diagnosis of angioneurotic encephalopathy was made. Literature records 7 cases of angioneurotic edema associated with convulsions. In 22 additional cases from the literature a number of other symptoms of neurologic interest were described, such as transitory exophthalmos, oculomotor paresis, aphasia, hemipareses of apoplectiform character, symptoms of increased intracranial pressure and choked disk. The etiology of angioneurotic edema is associated with disturbances of the vegetative nervous system, allergy and heredity. The prognosis is good in the nonhereditary cases. The possibility of angioneurotic edema should be kept in mind when one is faced with an obscure morbid condition associated with cerebral manifestations.

Book Notices

Operations of General Surgery. By Thomas G. Orr, M. D., Professor of Surgery, University of Kansas School of Medicine, Kansas City, Kansas. Cloth. Price, $10. Pp. 723, with 570 illustrations. Philadelphia & London: W. B. Saunders Company, 1944.

A surgical generation ago a book on operative surgery was the chief preceptor of the physician who desired to expand his activities into operative therapy. This demand for didactic instruction in technical procedures was filled by many books dealing with this subject, some of which presented the surgical technic of the time in a manner complete and historically correct but without selective guidance. Since then surgery has become more specialized, based as it is on new developments, but it has also become more critical of operative procedures, as the result of the study of end results and of the application of basic medical sciences to diseases treated by operative measures. The interest of surgeons has been directed to the more general aspects of preparing patients for operation and to treating and preventing complications of the operation. This expansion of surgical interest has been of major importance to the betterment of surgical results but may have led us too far away from the technics which, while not of sole importance, must always be of a high fixed quality in any operation. Dr. Orr has rendered a real service in bringing up to date the technics of operative procedures, presenting them anew in the light of surgical advance in the past decade. The book covers, with careful selection, the technics of operations on all parts of the body except the eye, the nose and the throat. Those who specialize in the fields of neurologic, gynecologic, thoracic or genitourinary surgery may find that the presentation of the operative technics in these fields is inadequate for those who limit their endeavors to these fields, but to the surgeon who may be called on to treat the sick without benefit of consultations with specialists the presentation in these special fields will be extremely helpful. As Dr. Orr states, "students of surgery should be familiar with the standard operation of all fields of surgery."

There are twenty-one chapters arranged according to systems rather than to specialty. The first three chapters deal satisfactorily with the wound and the factors that influence healing and the details of its management. In the presentation of each system and in the discussion of the parts of these systems, the subject is approached by a general consideration of the problem, followed by a summation of a philosophical nature that clarifies and enunciates the objectives. In all situations where anatomic facts are pertinent to operative procedures, a description of the anatomy involved is given. Before each description of operative technic there is given with detail the dangers encountered during this operation and the safeguards that should be observed to minimize them.

The clinical indications for each operation are given simply and clearly. The steps of the operation are given in the same manner, with critical comments from the personal experience of the author, with pertinent additions from surgical literature that combine to give the presentation a human and very readable quality. Following each chapter is a list of references to surgical work on the topic under discussion. The illustrations are profuse, clear and instructive. Many are original and others are selected from the literature, and all have been reproduced in such size and detail that they supplement well and amplify the written text. The artists are to be complimented on their contributions to the usefulness of the book. The minor parts of technics such as dressings and the management of drains and sutures are given in detail that is of help to even the neophytes in surgery. The book is of an agreeable and satisfying format, holdable and readable. It will prove a boon to the young surgeon for whom it was actually written, to be used during his training period and immediately afterward, but it should be in the working library of every general surgeon, especially if he works without benefit of numerous consultants in surgical specialties. To all others who are interested in the technics of present day surgery the book is heartily recommended. The teachers of surgery owe to Dr. Orr a debt of gratitude for his compilation of operative technics streamlined to the practice of the present day.

Anatomy as a Basis for Medical and Dental Practice. By Donald Mainland, M.B., Ch.B., D.Sc., Professor of Anatomy, Dalhousie University, Halifax, N. S. Cloth. Price, $7.50. Pp. 863, with 61 illustrations. New York & London: Paul B. Hoeber, Inc., 1945.

The amount of time allotted to gross anatomy in the curriculum of medical schools has been reduced, because other preclinical sciences have required increased time owing to their great development during the twentieth century. Some teachers in these other sciences have felt that the time given to dissection was wasted; but most faculties feel that "menders of the human body" should trouble to know that body thoroughly, and state laws require dissection. But the anatomists have revised their courses, reducing the content considerably, though sometimes wondering if the facts of biochemistry, newly introduced, are really more important than those of anatomy which they have displaced.

Further, the anatomists have produced new books as substitutes for the old textbooks and dissecting manuals. Mainland's is one of the best of these new books. It is called simply "Anatomy," being neither a textbook (storehouse) nor a dissecting guide. It is a general educational guide for the student starting the study of human anatomy and so starting the study of medicine or dentistry. The first twenty-eight pages prepare his mind for the study of medicine, the next forty-one for the study of anatomy and the next eighty-six for dissection by a systematic consideration of the tissues of the body—of their general structure, of what they do and something of how they do it. Such an introduction to dissection has been practiced by W. E. L. G. Clark of Oxford and by many American teachers of anatomy. Five hundred and ninety-two pages are devoted to regional study of the body, and after that follow appendixes and references—ninety pages, and index—twenty-four pages.

Features of the book which seem open to criticism are the amount of attention given to statistics and statistical methods, necessary for physical anthropologists but not for medical students, and the unvarying requirement that findings in the cadaver be transferred to and marked on living bodies at once. Living models would be all dirtied up in the dissecting rooms. Instead, thorough students will doubtless make groups and study anatomy on one another at home. Some students will question both the accuracy and the logic of some answers given by the author to his own questions; but at least such students will think.

Features especially commendable are the references to recent anatomic literature, which are the best in any handbook on gross anatomy, and the questions (three hundred and thirty-seven of them) asked throughout the book and answered in one of the appendixes at the back. Good teachers make students animated interrogation points. Many facts impossible to remember are conveniently tabulated at the back, e. g. age of appearance and of fusion of ossification centers.

Each part of the book is excellent. The plan and treatment are largely original and are evidently the result of long experience by a capable and conscientious teacher. The student who works conscientiously under its guidance will become a good doctor and a good thinker. He will spend a lot of work on anatomy—every good student always will; he will not have found this book a "shorter" anatomy. Indeed, he will probably have acquired in addition to this book one of the old textbooks (for frequent reference) and an atlas (as a constant companion) and, unless the teacher prefers to give directions orally, he will also have a dissecting guide. Nevertheless, this book is one of the best guides ever written for learning the practical anatomy useful to practitioners.

Pre-Excitation, a Cardiac Abnormality: Patho-Physiological, Patho-Anatomical and Clinical Studies of an Excitatory Spread Phenomenon Bearing upon the Problem of the WPW (Wolff, Parkinson and White) Electrocardiogram and Paroxysmal Tachycardia. By Richard F. Ohnell. Acta medica Scandinavica, Supplement No. 152. Translated by Ulla Schott. Paper. Pp. 167, with 29 illustrations. Stockholm, 1944.

This monograph, a supplement to *Acta medica Scandinavica*, is an excellent translation, by Ulla Schött, of the author's views regarding the WPW syndrome. The report of 70 carefully studied cases with correlated discussion of 250 from the literature reveals his comprehensive knowledge. Since 1930 forty theories have been advanced, fifteen of these since 1940. The term preexcitation indicates an additional excitatory spread in the ventricles of the heart, coupled to the auricular excitation,

wave; the phenomenon being represented graphically by a short PR interval and a prolonged aberrant QRS complex. The author reports a case with muscle bundle connection of the left auricle and ventricle. A right sided auriculoventricular junction has been reported. Hence such an anomaly could result from the excitation wave being transmitted via both the normal and accessory conduction pathways. He gives reasons for assuming an acquired as well as a congenital etiology in these cases. He reports observations suggesting the possibility of a hereditary factor. He thinks that mechanical stimulation of an excitable ventricular focus by auricular systole or vice versa seems likely. This monograph presents the latest and most complete information.

The Treatment of Peptic Ulcer Based upon Ten Years' Experience at the New York Hospital. By George J. Heuer, M.D., Professor of Surgery of Cornell University Medical College and Surgeon-in-Chief of the New York Hospital. Assisted by Cranston Holman, M.D., Assistant Professor of Clinical Surgery, Cornell University Medical College, New York, and William A. Cooper, M.D., Assistant Professor of Clinical Surgery, Cornell University Medical College. Fabrikoid. Price, $3. Pp. 118, Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

This presents a statistical study and discussion of 1,139 case histories over a period of ten years at the New York Hospital. A critical evaluation is given the reader of results from both the medical and the surgical treatment of the disease without giving too many descriptive details of the therapy itself. The book is divided into two parts, on medical and on surgical treatment. In the medical section there is discussion of both ambulatory and hospital treatment. Considerable emphasis is placed on the question of hemorrhage and of malignancy in gastric ulcer. In addition there is some mention of an attempt to deal with the psychologic problems involved. The surgical section is of course chiefly concerned with the results obtained with gastroenterostomy as compared with gastric resection. No attempt is made to influence the reader as to the method of choice, but the authors do feel that in resection a moderate resection is the operation of choice. There is, of course, a chapter on surgery for perforations and an excellent chapter on the effects of operation on gastric secretion. The book closes with a survey of the literature on the subject and finally a discussion and summary of the material covered in the book. A bibliography of the literature referred to is given. The authors do not purport to offer the final answer or give a cure-all. Rather they are attempting to help clarify many controversial facts to aid one in the therapy of what is at best a difficult disease to treat. Certainly we are reminded of the fact that peptic ulcer is still a serious problem and that much remains to be done to untangle the many ramifications of the therapy of peptic ulcer.

An Introduction to Pharmacology and Therapeutics. By J. A. Gunn, M.A., M.D., D.Sc., Professor of Therapeutics and Director of the Nuffield Institute for Medical Research, University of Oxford. Seventh edition. Fabrikoid. Price, $2.25. Pp. 268. New York & London: Oxford University Press, 1941.

The first edition of this delightfully written pocket size synopsis of pharmacology appeared in 1929. Its popularity both in the British Isles and in this country has given impetus to frequent revisions. The present edition, like the previous ones, summarizes in an authoritative manner the principal actions and uses of the more important drugs. The discussions in many instances are briefer than those found in the comparable American publication Useful Drugs. The emphasis in the book has been placed on drugs official in the British Pharmacopeia or the United States Pharmacopeia. Unfortunately, although the book was actually revised in 1943, many of the newer and widely used useful drugs are omitted. Desoxyephedrine ("Pervitin," "Methedrine"), which was first used in Europe, is not mentioned; quaternary ammonium antiseptics are omitted; the discussion of the sulfonamides is extremely brief and the newer ones, such as succinylsulfathiazole and sulfamerazine, are not mentioned; no discussion of the antibiotics is to be found, although the omission of penicillin is not surprising since the published clinical information on this drug was scant at the time this edition was prepared. The book's chief usefulness is as a readable summary of conservative pharmacology and as such will prove useful both to the student and to the practicing physician.

The Reticulo-Endothelial System in Sulfonamide Activity. By Frank Thomas Maher, Ph.D., Assistant Professor of Pharmacognosy and Pharmacy. Contribution from the Department of Pharmacology, Materia Medica and Therapeutics in the College of Medicine. Illinois Monographs in the Medical Sciences, Vol. V, Nos. 1-2. Paper. Price, $2.50. Pp. 232, with 23 Illustrations. Urbana: University of Illinois Press, 1944.

This interesting monograph was presented in 1941 as a dissertation for the degree of doctor of philosophy in pharmacology in the Graduate School of the University of Illinois. It is an important contribution to the role of "defense mechanisms" in chemotherapy. The "defense mechanisms" of the body against bacterial infection depend in part on the activity of the reticuloendothelial system. The many careful experiments reported in this study show that blocking the reticuloendothelial system (by thorotrast) reduces the resistance of animals to infection with Staphylococcus aureus, depresses conjugation of sulfanilamide and sulfathiazole and reduces the chemotherapeutic effectiveness of sulfathiazole in animals infected with Staphylococcus aureus. It is therefore concluded that reticuloendothelial activity is necessary to effective sulfonamide chemotherapy. The large bibliography of six hundred and twelve references refers chiefly to bacterial infections and the sulfonamides. The illustrations offer evidence of the successful blocking of the reticuloendothelial system by means of thorotrast. While the monograph exhaustively reports a large and interesting group of experiments, it affords little information of significance to the "practical" physician. However, it adds materially to the growing body of evidence showing the importance of the reticuloendothelial system in resisting infection and in contributing to the effectiveness of chemotherapeutic agents. Many workers have demonstrated the importance of the reticuloendothelial system, particularly the spleen, in relation to trypanosome infections and the chemotherapeutic effectiveness of arsenical drugs. Little information has been made available as to methods whereby the reticuloendothelial system can be stimulated to afford increasing resistance to bacterial infection. The work of Bogomolets and his Russian collaborators suggests methods that may become of "practical" interest.

Keys to the Anopheline Mosquitoes of the World With Notes on Their Identification, Distribution, Biology, and Relation to Malaria. Prepared for the Preventive Medicine Division, Office of the Surgeon General, U. S. Army. By Paul F. Russell, M.D., M.P.H., Lieut. Colonel, Medical Corps, A. U. S., Lloyd E. Rozeboom, B.S., Sc.D., and Alan Stone, B.S., Ph.D. Paper. Pp. 152, with 10 Illustrations. Philadelphia: American Entomological Society, Academy of Natural Sciences, 1943.

This excellent handbook was prepared especially for use by the Army in its education program to keep pace with the global expansion of the war. The introduction includes a brief history of the discoveries of mosquitoes as vectors of disease and comments on how Anopheles with particular habits may be related to malaria in a community. Chapter II gives a simple but effective outline on mosquito identification, which is well illustrated with appropriate drawings. The keys in the following chapters are largely borrowed from previous works. The chapters of keys are Anopheles of Canada, the United States and Northern Mexico, Anopheles of Central America, Anopheles of Europe, North Africa and the Near East, Anopheles of South and Central Africa, Anopheles of Asia, except the Philippines, southern Asia, northern Asia and the Malayan region, Anopheles of the Philippines and Anopheles of the Australian region. Following the key in each chapter the mosquitoes are listed alphabetically and notes on their identification, distribution, biology and relation to malaria are given. Another chapter summarizes the known vectors of malaria for specific localities of the world. The list of references is extensive. The index to specific and subspecific names is adequate for the volume. This practical volume will undoubtedly find wide application by those who have occasion to identify anopheline mosquitoes in any part of the world.

Voenno-meditsinskiy sbornik. 1. [Compiled by] Voenno-Sanitarnaya Komissiya. [Collection of Articles on Military Medicine.] Paper. Price, 8 rubles. Pp. 160, with Illustrations. Moskva & Leningrad: Izdatelstvo Akademii Nauk, SSSR, 1944.

The volume contains several papers on the effects of amphetamine on fliers, on the effect of nitrogen concentration in fliers, on a new biochemical preparation for acceleration of wound healing—an autolysate of brewers' yeast—and so on. The symposium is of the type that does not rate a review in THE JOURNAL.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EFFECT OF SULFONAMIDES AND VITAMINS ON THE TEETH

To the Editor:—A dentist maintains that the sulfonamide compounds, sulfanilamide in particular, has a softening effect on the teeth. A patient with pharyngitis was given sulfanilamide two years ago and the decay of some of his teeth has been attributed to the sulfonamide compounds. The dentist is now prescribing vitamins to a patient who has had a liberal mixed diet and says he will have to replace all fillings because of the damage done to the teeth by the use of the sulfonamide compounds. What is the best opinion concerning the use of sulfonamide compounds for pharyngitis and what effect if any can sulfonamide compounds have on teeth? In what manner can vitamins repair brittle or soft teeth?

S. A. Kleger, M.D., Astoria, Ore.

ANSWER.—In a large group of patients given sulfanilamide for various reasons, no effects on the teeth have been observed or reported. There is no mechanism known whereby sulfonamide compounds could affect the structure of the teeth or modify the process of dental decay.

The description brittle or soft teeth is indefinite. Imperfect calcification of the teeth can occur only during their developmental period. Decalcification of the enamel, on the other hand, results only from the local action of acids on the surface of the tooth. Perhaps reference is made to dental caries: the relation of sulfanilamide to this condition is not known.

The use of vitamins to prevent or treat dental caries has been proved to be ineffective in a number of investigations. The enamel of the tooth, which is the first dental structure attacked by decay, is avascular and acellular and does not have power of regeneration or repair. Removal of the decay and replacement of the lost structure by proper restoration is the only effective treatment.

HAZARDS OF EXPLOSIVE ANESTHESIA

To the Editor:—What precautions should be taken in the use of explosive anesthetics? Is the use of cyclopropane and ethylene without intercouplers or insulation safe? What are the minimum safeguards? Is cyclopropane as safe as nitrous oxide, oxygen and ether, as some authors state? I would like to install the legitimate requirements on two new Heidbrinks and a Foregger machine.

V. M. McCartney, M.D., Warren, Ohio.

ANSWER.—In order to produce a fire or explosion in the operating room, two conditions are necessary: there must be an ignitible mixture of vapors or gases, and such a mixture must come in contact with a source of heat sufficient to ignite it. A mixture to be ignitible must contain the ignitible substance (usually a hydrocarbon compound such as alcohol, ether, ethylene or cyclopropane) and an adequate amount of available oxygen. Sources of heat may be furnished by open flames such as gas burners or alcohol lamps, by cauteries, by partially broken connections and other imperfections of electric surgical instruments and lights and by static sparks. It should be remembered that gases compressed in containers under high pressure may explode without the aid of ignition when the pressure is higher than the strength of the container. Absolute protection would forbid the presence of any ignitible mixture, a requirement as practical as it would be to forbid the use of illuminating gas in kitchens or of gasoline in automobiles. Intelligent application of precautions which are obvious can reduce the hazard in operating rooms to a point no more dangerous than is the use of a gas range, a water heater or an automobile. Any added hazard in the operating room as compared with the kitchen has to do with the presence of superabundant oxygen to promote combustion. Nitrous oxide supports combustion almost as well as does oxygen.

Certain of the obvious precautions may be listed categorically. 1. Open flames (gas, alcohol) and glowing fire (smokers) are not permissible. 2. All electric equipment (lighting, cauteries, electrosurgical) should be inspected frequently and kept in perfect condition. 3. Containers and apparatus for the control of volatile substances and compressed gases, including oxygen and nitrous oxide, should be inspected frequently and kept in proper leakless operating condition. 4. Oxygen and nitrous oxide or their mixtures must be looked on as superabundant sources of support for combustion.

More specific "rules for the anesthetist" are often laid down, but these cannot replace an ever present awareness of the possibilities and recognition of the laws of physics. Such rules are: 1. Use only noninflammable agents when the cautery or other sources of ignition must be applied near the face or in the air passages. Be sure that infinitesimal quantities of inflammable agents are not inadvertently mixed with oxygen and nitrous oxide under such circumstances. 2. If the anesthetist is capable of using a closed technic (carbon dioxide absorption) without leaks, the cautery, electric knives and so on may be used on distant parts of the body when inflammable agents are employed. 3. Precautions regarding hazard from static sparks have been controversial. Engineers answer the question academically by advising complete "grounding" of all objects in contact with or in the vicinity of the patient. When they become familiar with operating room conditions, however, they realize that complete grounding is impossible to achieve in the operating room. Humid atmosphere, radiated atmosphere, intercouplers (special metal connectors between all objects) and other safeguards have been suggested. Experience to date is not convincing that any of these affords a more practical safeguard from static sparks than if the anesthetist makes it a rule to place his hands in contact with the patient, apparatus and table in preparing to anesthetize and maintains contact between all objects within the area contaminated by ignitible mixtures throughout the administration.

References:

1. Conference Committee on Operating Room Hazards: Combustible Anesthetics in Hospital Operating Rooms, Boston, National Fire Protection Association, 1944.
2. Fundamentals of Anesthesia, ed. 2, Chicago, American Medical Association Press, 1944, p. 204.
3. Explosion Jitters, editorial, *Surgery* **10**: 661 (Oct.) 1941.
4. Slocum, H. C., and Finvold, R.: Ionization of the Air: A Method for the Dispersion of Charges of Static Electricity, *Anesthesiology* **5**: 33 (Jan.) 1944.

DEVELOPMENT OF RED BLOOD CELLS

To the Editor:—What is the normal percentage of normoblasts or erythroblasts, if any, present in the cord blood of a living or recently dead 4½ to 7 months fetus? Is a normoblast the same as an erythroblast? If not, in what respect do they look different under the microscope?

Charles J. Marshall, M.D., Binghamton, N. Y.

ANSWER.—According to the great majority of investigators there are two generations of red blood cells in all vertebrates. The first of these is called the primitive or transitory or temporary generation in which the final product is a spherical, nucleated, hemoglobin containing cell—the first oxygen carrier of the embryo. In the mammals it develops almost exclusively in the yolk sac. The permanent or definitive red blood cell generation in the embryo develops in several successive sites beginning with the liver and ending with the bone marrow. Its final product is the non-nucleated erythrocyte, which is identical in all respects with the erythrocyte or erythroplastid of the postnatal and adult mammal. According to some investigators all precursors of normal erythrocytes of both generations should be called erythroblasts and the specific stage of blood cell formation should be indicated by a modifying adjective such as primitive basophile erythroblast or definitive basophile erythroblast, and similarly for polychromatic and orthochromatic erythroblasts of both generations. According to this terminology the orthochromatic erythroblast is also called a normoblast. This is a relatively small cell in the definitive generation with an eosin staining cytoplasm of the same color as that of the mature non-nucleated erythrocyte. There are a few authorities, however, who use the term normoblast for all of the precursors of the erythrocytes of the definitive generation. These authorities thus speak of basophile normoblasts, polychromatic normoblasts and normoblasts.

The greatest difference in appearance between the nucleated erythrocytes of the primitive and definitive generations is in the size of the cells. The primitive erythrocytes are large and according to some investigators they are comparable in appearance with the megaloblasts of pernicious anemia.

In early embryos, all erythrocytes are nucleated cells of the primitive generation. The number of nucleated erythrocytes in the embryonic blood of man diminishes progressively during the remainder of gestation. In the latter part of fetal life all of the nucleated erythrocytes are of the definitive generation. The only figures available for the stages indicated in the question are as follows: A 362 Gm. embryo with a menstrual history of 17 weeks had counts of 12,000 nucleated erythrocytes, total red blood cells of 3½ million and 4,000 white blood cells in the cord blood. A fetus of 440 Gm. with a menstrual history of 24 weeks had counts of 3,500 nucleated erythrocytes, total red blood cell count of 2,940,000 and 3,500 white blood corpuscles.

The statement is frequently made that cord blood at birth shows an upper normal limit of 5 to 10 nucleated erythrocytes for every hundred white blood corpuscles

Reference:

Jones, O. P.: Cytology of Pathologic Marrow Cells with Special Reference to Bone Marrow Biopsies Handbook of Hematology, New York, Paul B Hoeber, Inc, 1938 p 2045

EFFLUVIUM SEMINIS AND STERILITY

To the Editor—A patient tells me that his wife never retains the semen in the vagina after sexual intercourse but expels it. Immediately after intercourse she goes to the bath room and in a short time most if not all of the semen drips down and out of the vagina into the toilet. Could this be a cause of sterility or do you think enough semen remains in the vagina to cause fertilization? They have been married for three years and have no children. What treatment is recommended for this condition?

Captain, M C, A. U. S

ANSWER.—Effluvium seminis after intercourse occurs in about 80 per cent of all married women, the fertile as well as the involuntarily childless. This fact by itself suggests that such an outflow is not necessarily associated with impaired fertility. Under normal anatomic conditions some spermatozoa arrive in the endocervix, if not at the moment of ejaculation, a few minutes thereafter at the latest. There is little likelihood that these will escape. The majority of the spermatozoa remain in the vagina, where they are promptly attacked by the acid vaginal moisture. Their period of survival is short, and it is not a matter of importance whether they are retained or lost.

The first procedure should be a postcoital examination. The wife should be seen within two hours after intercourse, preferably at the midpoint of her menstrual cycle, and several drops of endocervical mucus should be examined microscopically. If living spermatozoa are found, obviously effluvium of the vaginal pool has not interfered with the mechanics of conception. If, on the other hand, spermatozoa are not present in the cervix, the cause of this abnormality should be sought The chances of cervical insemination will be increased if the wife, instead of arising and going immediately to the toilet, lies quietly for ten minutes on her back, perhaps with a pillow under her hips. Possible disorders to be investigated include premature ejaculation, hypospadias, urethral stricture in the husband and anteflexion or anteversion of the cervix If repetition of the postcoital examination still does not show spermatozoa in the endocervix after all such conditions have been ruled out or corrected, artificial insemination may be considered.

It should not be forgotten that there are many causes of infertility other than faults in the mechanism of cervical insemination and that the average sterile mating presents a combination of several causative factors Complete diagnostic study of both husband and wife is essential

EFFECT OF ALTITUDE ON HEART WORK

To the Editor:—Is the human heart called on to perform the same work at sea level as at an altitude of 8,500 feet under the same circumstances of rest, exercise and disease? Must the human heart increase its effort when climbing in a plane to high altitudes, from sea level to 8,500 feet? If this is so, would a man with heart disease be, in effect, putting his heart at rest by descending to a sea level area from a high altitude? Are dangerous consequences to be expected from a change of altitude for a person with heart disease?

G Aroaz Fraser, M D, Bogota, Colombia

ANSWER.—Since the pressure of oxygen in the inspired air is decreased at higher altitudes because of the decrease of atmosphere at points much elevated above sea level, there is a definite increase in the work of the heart needed to supply an adequate amount of oxygen to the tissues. This statement is true under the same circumstances of rest, exercise and disease—even climbing in a plane from sea level to 8,500 feet increases the work of the heart. In persons with heart disease, if this is relatively slight and myocardial and coronary reserve are reasonably good, harm does not result from such an ascent; few instances of serious consequence, even in those who have heart disease, have ever been reported as a result of airplane flights.

Descent to sea level from a high altitude does afford some rest for the heart: it was calculated by Barcroft and his associates in 1922 that at an altitude of 15,000 feet the heart works about 20 per cent harder to accomplish 20 per cent less work than at sea level (Barcroft, J., and others Observations on the Effect of High Altitude on the Physiological Process of the Human Body, Carried Out in the Peruvian Andes, Chiefly at Cerro de Pasco, *Philos. Trans. Roy. Soc.*, London, 1921-1923, Series B **211**:351-480).

MANAGEMENT OF CONVULSIONS IN THE NEWBORN

To the Editor—What are the relative value and suitable dosage of the following anticonvulsants for the newborn baby averaging 7 pounds (3 2 Kg): phenobarbital sodium, chloral hydrate, 50 per cent solution of magnesium sulfate, and morphine? What are the relative value and dosage for the newborn of the following respiratory stimulants: caffeine and sodium benzoate, nikethamide (25 per cent solution of pyridine beta-carboxylic acid diethylamide), metrazol, alpha-lobelin, carboxygen? Are there any other respiratory stimulants or anticonvulsants that are more reliable?

M.D., New York.

ANSWER.—In the management of convulsions in the newborn, anticonvulsant drugs are frequently neither necessary nor advisable. If the convulsions are due to an asphyxia, treatment should be directed primarily at relieving the cause of the asphyxia, which is often due to some mechanical obstruction. If the convulsions are due to a hypoglycemia, the use of intravenous or subcutaneous dextrose solution is a life saving measure. In those children in whom there is an increase in the intracerebral pressure as the result of intracerebral hemorrhage or edema, a lumbar puncture may stop the convulsions. In tetany of the newborn calcium salts parenterally or by stomach tube are indicated.

Anticonvulsant Drugs and Dosages

By Inhalation
- * Chloroform
- * Vinethene
- Ether

By Intravenous or Intramuscular Route
- * Barbiturates
  - Phenobarbital sodium
  - Sodium amytal
  - Pentobarbital sodium
  - Seconal sodium

  Dosage—⅛ to ½ grain (0.008 to 0 032 Gm) but usually ¼ grain (0 016 Gm), 0 33 cc of 5 per cent solution. When given intravenously, inject slowly, and when convulsions stop, give no more
- Paraldehyde 0 75 cc. (should not be given intramuscularly).
- Magnesium sulfate 2 to 5 cc. of the 10 per cent solution intramuscularly.
- * Recommended or preferred drugs.

By Rectal Route
- * Barbiturates
  - Phenobarbital
  - Amytal
  - Pentobarbital
  - Seconal

  ½ to ¾ grain (0 032 to 0 05 Gm).
- * Solution of tribromoethanol 60 to 100 mg. per kilogram
- * Evipal sodium 1 50 to 2 cc. of 10 per cent solution
- Chloral hydrate 3 to 5 grains (0 2 to 0 32 Gm.).
- Sodium bromide 3 to 5 grains (0.2 to 0 32 Gm).
- Ether in oil 10 cc of 50 per cent ether in olive oil
- * Recommended or preferred drugs

When, however, it is found desirable to use some anticonvulsant drug, the accompanying table indicates the dosages and route of administration. Barbiturates are the drugs of choice and should be given by injection or rectally.

Although a 50 per cent solution of magnesium sulfate may be used, it is definitely not the drug of choice, since its parenteral administration may result in depression of the respiration. For the same reason morphine is contraindicated in convulsions of the newborn. The only type of convulsions of the newborn in which morphine or its related alkaloids are indicated is those occurring in children born to women who are narcotic addicts In these children the convulsions are often a manifestation of the withdrawal of morphine and are best controlled by paregoric given in oral doses of 5 to 10 drops every fifteen minutes until the spasms subside. In very severe convulsions in the newborn it may sometimes be necessary to use a whiff of chloroform or vinethene for immediate control. These are preferable to ether because of their faster action

The dosages for the respiratory stimulants for the newborn are as follows:

Caffeine and sodium benzoate 0 5 to 1 cc. of an ampule containing 7½ grains (0 5 Gm) in 2 cc.

Nikethamide 0.5 to 0 75 cc of an ampule containing 25 per cent solution in 1.5 cc.

Metrazol 0.25 to 0 5 cc. of an ampule containing 1½ grains (0 2 Gm.) in 1 cc.

Alpha lobeline 1 cc of an ampule containing $\frac{1}{20}$ gram (0 0032 Gm.).

Camphor in oil 0.25 to 0 5 cc of an ampule containing 3 grains (0.2 Gm) in 1 cc.

Picrotoxin 0.25 cc. of an ampule containing $\frac{1}{20}$ gram (0 0032 Gm) in 1 cc.

Carbon dioxide 5 per cent and oxygen 95 per cent is supplied through a nasal mask and preferably through a resuscitator.

Since there is no definite proof that any of these respiratory stimulants are responsible for the initiation of breathing in the newborn child, it would be difficult to evaluate the relative efficacy of each or of any of the numerous similar products which are on the market. It should be borne in mind that convulsions may ensue from the use of metrazol or picrotoxin in some infants.

As previously stated, the best treatment of asphyxia is that aimed at clearing the respiratory passages. The proper and judicious use of a tracheal catheter is probably of greater value than any or all of the drugs which are discussed.

"FIBERGLAS" NOT CAUSE OF PNEUMONOCONIOSIS

To the Editor:—Compartments in the service ships are being lined with mats of "Fiberglas," presumably for insulating and sound proofing purposes. Several shipworkers have had severe persisting cough, sometimes lasting for many months, which they ascribe to the "Fiberglas" dust. Some men have physical signs of bronchitis, some do not. One man who had coughed for seven months—since beginning to work with the "Fiberglas"—has no definite physical signs of silicosis, and his x-ray film is normal except for a number of Ghon shadows. Is there not an industrial hazard of silicosis? No respirators or masks are issued.

Bernhard A. Fedde, M.D., Brooklyn.

ANSWER.—Unpublished animal experiments at the Saranac Laboratory have demonstrated that "Fiberglas" is not inhalable in appreciable quantities. After exposures of three years with the maximum atmospheric concentrations that could be maintained, the lungs of guinea pigs and white rats contained practically no fiber, and no scar tissue developed. The fiber used for insulation varies from 3 to 10 microns in diameter, which is too coarse to penetrate the lungs. A specially prepared fiber, 3 microns or less in diameter, was also excluded from the lungs apparently because it carries an electrostatic charge which causes it to adhere and mat on surfaces with which it comes in contact. Annual x-ray examinations of employees manufacturing this product have revealed no signs of pulmonary reaction. While Fiberglas is irritating to the skin and upper respiratory membranes, it does not cause pneumonoconiosis.

VARIATION OF BLOOD PICTURE IN VENOUS AND CAPILLARY BLOOD

To the Editor:—Is there any difference in the determination of hemoglobin percentage and the red cell count in blood obtained from the finger tip, the ear lobe or venous blood from the cubital vein after application of a tourniquet?

Abraham A. Brauer, M.D., East Chicago, Ind.

ANSWER.—There are no differences between samples obtained from the first two sites. Differences between these and venous blood are not of great magnitude and depend more on standardized technic than on the location. Blood from the ear lobe or the finger tip is usually mixed venous and capillary blood; therefore it would be slightly less venous than that from the cubital vein, but it would still be within the range of technical variation. The best procedure would be for the technician to make simultaneous determinations from the three sites and to determine the extent to which his personal technic would introduce an error.

VAGINAL DOUCHES

To the Editor:—What is the position of the leading authorities on the douching of the vagina in girls and unmarried women for the treatment of distressing odors arising from discharges in the vagina? Is it good practice to advise both young women and little girls to douche at home?

Raymond Lublin, M.D., East Hartford, Conn.

ANSWER.—J. P. Greenhill in his chapter on vaginal douches in "Office Gynecology" (ed. 3, Chicago, Year Book Publishers, Inc., 1943) says:

"There is no unity of opinion among either physicians or women concerning the value of vaginal douches. At one extreme one finds women who take a douche every day, except during menstruation, in the belief that it is a cleansing process equivalent to brushing the teeth. At the other extreme are women who never take a douche, not even after sexual intercourse. In between are women who take douches after coitus, after the menstrual flow is over and on special occasions. Those who douche use a variety of substances in the douche water, and physicians prescribe a large number of douche preparations."

"Are douches essential, and are there any types of douche medication which may be harmful?"

"I believe that women who have a normal qualitative and quantitative vaginal secretion should not take douches at all except perhaps after intercourse and at that time only to accomplish mechanical cleansing of the vagina."

L. R. Wharton in "Gynecology" (Philadelphia, W. B. Saunders Company, 1943) says:

"Many perfectly healthy women who have no leukorrhea use douches two or three times a week for the sake of cleanliness. This is perfectly reasonable as long as one administers the douche properly, uses the proper solutions and keeps the apparatus clean. The greatest dangers that attend such hygienic douching are the possibility of causing local irritation by using solutions that are strong or too hot and the risk of introducing infection, due to a contaminated douche apparatus."

The chief obstacle to the use of douches in young girls is an intact hymen. For an unmarried woman with a dilated hymen due to coitus, the use of vaginal menstrual plugs or other reason, there is no reason not to prescribe douches just as for married women, provided there is a valid indication such as a malodorous discharge. For little girls, however, satisfactory treatment can nearly always be carried out by a physician without the necessity of douches. In some cases the hymenal orifice must be widened, but there should be no moral reason against this. However, it is best to explain to the child's mother not only the intention of partially dilating the hymen but also the necessity for the procedure. Most of the public and many physicians are of the firm opinion that no attempt should be made to insert a finger or even an instrument through a virginal hymen, but there are times when this must be done both for diagnosis and for treatment. It is time that physicians educated the public to the fact that a dilated hymenal orifice is not necessarily a sign of lack of virginity.

NEGRI BODIES NOT FORMED BY RABIES VACCINE

To the Editor:—In our community we always have mad dog scares. It has been my observation that, even though the animal does not possess any symptoms of rabies, almost invariably when it is killed and the head sent to either the state laboratory or the Texas A. & M. College Laboratory a report of rabies is given. It does not appear rational that there can be this many rabid animals almost continuously. I should like to know if, after vaccination of animals for rabies, the peculiar inclusion or Negri bodies are found within the cytoplasm of the ganglion cells of the central nervous system.

Joseph Corrigan, M.D., Conroe, Texas.

ANSWER.—As far as known, Negri bodies do not develop in dogs vaccinated against rabies even if vaccines of active virus are used. It appears that Negri bodies are formed only by "street" strains of the rabic virus and not by virus that has been passed through animals in the laboratory. At present only fixed virus is used in making vaccines, that is, virus which has been passed intracerebrally many times through animals. It should be kept in mind that, in dogs, unrecognized rabies probably greatly exceeds the recorded incidence.

HYPERTRICHOSIS OF ARMS AND LEGS

To the Editor:—A neurosis is developing in a young woman because of hypertrichosis of the arms and the legs. Any successful treatment of the neurosis will require consideration of the hypertrichosis, with permanent epilation if possible. What is the most successful and practical method of permanent epilation, if any? Have the x-rays been used in this way? If so, has the method been successful, safe and practical? What is the most satisfactory method of temporary removal and bleaching? M.D., Indiana.

ANSWER.—Permanent epilation by means of x-rays is not safe and should not be attempted. The electric needle is safe and permanent but is time consuming and expensive, and, if not carefully done, it may be followed by disfiguring scars. Bleaching by means of a mixture of hydrogen peroxide and ammonia water may reduce somewhat the visibility of the hairs. If the patient can be induced to make use of an electric razor it will be found to be the simplest and most effective method of management.

TRANSFUSION OF WHOLE AND CITRATED BLOOD

To the Editor:—Immediately following or during a persistent hemorrhage is there any difference to be expected from the use of whole blood or citrated blood in transfusion? Will the two have the same value to the patient? Will the clotting of the patient's blood be materially affected either way? I assume that there is no defect in the patient's own clotting mechanism but that the blood loss is due to trauma such as would occur following an operation. M.D., New York.

ANSWER.—Unmodified and citrated blood are equally effective in the treatment of postoperative or traumatic bleeding. Assuming that there is no defect in the patient's clotting mechanism, neither sort of blood would produce an appreciable effect on the coagulability of the blood.

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CLINICAL SIGNIFICANCE OF STAPHYLOCOCCI

WITH NATURAL OR ACQUIRED RESISTANCE TO THE SULFONAMIDES AND TO PENICILLIN

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MINNEAPOLIS

A problem of considerable importance in the chemotherapy of infectious diseases has been the development and dissemination of sulfonamide resistant strains of bacteria. Strains of micro-organisms within the different species known to be highly susceptible to the antibacterial action of the sulfonamides have acquired the characteristic of multiplying in the presence of high concentrations of the drugs. This acquired resistance appears to be a permanent property of these strains, and the resistant organisms are just as invasive as their sulfonamide sensitive progenitors. The mechanism whereby species of bacteria become relatively resistant to the sulfonamides is not completely understood, but it is related to the exposure of sensitive organisms to sublethal concentrations of the sulfonamides. Clinicians are rapidly becoming aware of the increasing incidence of gonorrhea in patients in whom the disease cannot be eradicated with intensive sulfonamide therapy. To a lesser extent this also applies to other bacterial infections such as those due to the pneumococcus and the hemolytic streptococcus. Fortunately, some strains of bacteria which develop resistance to the action of the sulfonamides may be highly susceptible to penicillin.

Our purpose in this report is to review briefly a group of investigations which have been carried out in this clinic with reference to the resistance of staphylococci to the action of the sulfonamides. More recently, further observations have been made pertaining to the problem of natural and acquired resistance of staphylococci to penicillin. These biologic phenomena may have a direct bearing on the success or failure of chemotherapy in staphylococcic sepsis. With more and more penicillin being made available for civilian use, increasing interest is being manifested in strains of staphylococci which are naturally resistant to the action of penicillin or acquire a resistance to the drug. An attempt has been made to correlate clinical results with strain resistance to the sulfonamides and, especially, to penicillin.

From the Division of Internal Medicine of the University of Minnesota Hospitals and Medical School.
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SULFONAMIDE RESISTANT STAPHYLOCOCCI

It is generally agreed that penicillin is superior to any of the available sulfonamides in the therapy of staphylococcic infections. Nevertheless, the problem of penicillin resistant strains of staphylococci may be best approached by reviewing some of the investigations which have been made relative to the antistaphylococcic action of the sulfonamides. In determining the susceptibility of staphylococci to the sulfonamides, a standard in vitro test has been employed with a chemically defined medium; the preparation of the medium and the method of testing have been described elsewhere.[1] From these observations the following have been concluded: 1. Sulfathiazole inhibited the growth of coagulase positive strains of staphylococci more consistently and completely than sulfanilamide, sulfapyradine, sulfadiazine and, more recently, sulfamerazine. The action of sulfathiazole, of all the foregoing sulfonamides, was the least inhibited by para-aminobenzoic acid.[2] 2. Strains of pathogenic staphylococci may develop resistance in vivo to the antistaphylococcic action of sulfathiazole following the administration of the compound to patients with staphylococcic infections. Subsequently this observation was correlated with the clinical results of sulfonamide therapy.[3] During the past three years, sulfonamide resistant strains have been encountered with increasing frequency, particularly in patients having infections of the urinary tract. This was attributed to the widespread and often continuous use of the sulfonamides in the treatment of patients with this type of staphylococcic infection. In several instances there was a close correlation between the in vitro resistance of a strain to sulfathiazole and the success or failure of sulfonamide therapy. 3. In studying the mechanism whereby staphylococci became resistant to the sulfonamides, the observation of Landy and his associates[4] was confirmed in that resistant strains elaborated an inhibitory substance consistent with para-aminobenzoic acid or closely related to it.[5] This has been further confirmed by Housewright and Koser.[6]

1. Spink, W. W., and Vivino, J. J.: Sulfonamide Resistant Staphylococci: Correlation of In Vitro Sulfonamide Resistance with Sulfonamide Therapy, J. Clin. Investigation **23**: 267 (March) 1944.
2. Spink, W. W., and Jermsta, J.: Effect of Sulfonamide Compounds on Growth of Staphylococci in Presence and Absence of p-Aminobenzoic Acid, Proc. Soc. Exper. Biol. & Med. **47**: 395 (June) 1941.
3. Vivino, J. J., and Spink, W. W.: Sulfonamide Resistant Strains of Staphylococci: Clinical Significance, Proc. Soc. Exper. Biol. & Med. **50**: 336 (June) 1942. Spink and Vivino.[1]
4. Landy, M.; Larkum, N. W., Oswald, E. J., and Streightoff, I.: Increased Synthesis of p-Aminobenzoic Acid Associated with the Development of Sulfonamide Resistance in Staphylococcus Aureus, Science **97**: 265 (March 19) 1943.
5. Spink, W. W.; Wright, L. D., Vivino, J. J., and Skeggs, H. R.: Para-Aminobenzoic Acid Production by Staphylococci, J. Exper. Med. **79**: 331 (April) 1944.
6. Housewright, R. D., and Koser, S. A.: A Study of the Para-Aminobenzoic Acid Requirement of Clostridium Acetobutylicum: Application to Assay Procedure, J. Infect. Dis. **75**: 113 (Sept.-Oct.) 1944.

4. Strains of pathogenic staphylococci which had acquired a high degree of resistance to sulfathiazole by either in vitro or in vivo methods remained just as invasive as the sensitive parent strains. This acquired sulfonamide resistance is apparently a permanent characteristic of the staphylococci, since in a period of two years following many subcultures the strains have not diminished in resistance.

PENICILLIN RESISTANT STAPHYLOCOCCI

In view of the foregoing experience with the sulfonamides, it appeared highly desirable to carry out a similar group of investigations with penicillin and a large number of coagulase positive strains of staphylococci isolated from patients. The information which we wished to obtain was Do strains of pathogenic staphylococci vary in their susceptibility to the in vitro action of penicillin? Is strain variation reflected in the results of therapy? Does the staphylococcus acquire a resistance to penicillin following in vitro and in vivo exposure of the organisms to the drug? If resistance may be acquired, are the resistant strains just as invasive as the sensitive parent strains, and is the resistance a permanently acquired characteristic? And, finally, may clinical failures with penicillin be correlated with the in vivo development of penicillin resistance?

In the first group of studies, 68 strains of coagulase positive staphylococci were isolated from patients none of whom had received penicillin. The in vitro sensitivity of each of these strains to penicillin was compared with their susceptibility to sodium sulfathiazole.[7] Included in these strains were 25 strains which were resistant to sulfathiazole. It was observed that 8 of the 68 strains, or 12 per cent, were relatively resistant to penicillin, requiring 0.4 to 0.8 unit of penicillin per cubic centimeter of culture medium before growth was inhibited. Many of the sulfonamide resistant strains proved to be quite susceptible to penicillin. In other words, there was no correlation between sulfonamide resistance and susceptibility of the organisms to the action of penicillin. Kirby,[8] who has also recorded the isolation of naturally resistant strains of staphylococci from patients, was able to extract a potent inactivator of penicillin from such strains but not from strains of staphylococci sensitive to penicillin. We have confirmed this observation of Kirby.

The preceding observations indicated that the mode of action of penicillin on staphylococci differed from that of the sulfonamides, and this is now generally accepted. Penicillin appears to inhibit the growth of sensitive organisms by interfering with the dividing bacterial cell or one that is about to divide.[9] The action of penicillin is assumed to be bacteriostatic and, under some conditions, bactericidal. Rantz and Kirby[10] reported that penicillin was bacteriolytic for staphylococci. Since the sulfonamides differ from penicillin in their mechanism of inhibiting growth of the staphylococci, it might be assumed that the combined use of a sulfonamide and penicillin would be desirable in the treatment of some patients with staphylococcic infections. However, experimental data as a basis for such a procedure are conflicting. Some investigators[11] have shown by in vitro methods that the bacteriostatic action for penicillin is greater in the presence of sulfonamide than with penicillin alone, but this is not in agreement with the reports of others.[12]

The studies were continued by adapting four coagulase positive strains of staphylococcus to grow in the presence of increasing concentrations of penicillin.[13] In this manner two strains developed a high degree of resistance to the antistaphylococcic action of penicillin. One strain, which required 0.04 unit of penicillin per cubic centimeter to inhibit growth before adaptation, required 80 units after a period of several weeks' exposure to penicillin. A second strain, originally inhibited by 0.06 unit, necessitated 120 units for complete inhibition of growth after adaptation. Both of these strains remained quite sensitive to sodium sulfathiazole. Two other strains, decidedly resistant to sodium sulfathiazole but sensitive to penicillin, were adapted to grow in penicillin, with the result that the strains manifested a resistance to both sodium sulfathiazole and to penicillin. This confirmed the results of others[14] that staphylococci may develop in vitro resistance to penicillin and offered further evidence that the mechanism of acquired sulfonamide resistance differed from penicillin resistance. Schnitzer and his group[15] have stated that there are three types of penicillin resistant staphylococci. The first type includes strains with natural resistance, the second embraces the strains which acquire resistance, and the third involves small colony variants (G forms) of a strain of Staphylococcus albus which exhibited a nonspecific form of penicillin resistance. Demerec[16] has presented evidence that the development of in vitro resistance of staphylococci to penicillin does not result from the action of penicillin on the organisms but originates through a selective process whereby nonresistant individuals are eliminated by the drug, and, through mutation, the more resistant cocci multiply.

We have also observed that organisms which developed resistance to penicillin by in vitro methods were killed in considerable numbers by human whole blood, whereas the sensitive parent strains and also sulfonamide resistant strains resisted this bactericidal action of blood. It is of interest that, although the penicillin resistant strains retained their ability to coagulate human plasma, they lacked the usual degree of resistance to the bactericidal action of blood exhibited uniformly by coagulase positive strains of staphylococci.[17] It has also been previously shown in this laboratory that the less invasive coagulase negative

7. Spink, W. W.; Ferris, V., and Vivino, J. J.: Comparative In Vitro Resistance of Staphylococci to Penicillin and to Sodium Sulfathiazole, Proc. Soc. Exper. Biol. & Med. 55: 207 (March) 1944.

8. Kirby, W. M. M.: Extraction of a Highly Potent Penicillin Inactivator from Penicillin Resistant Staphylococci, Science 99: 452 (June 2) 1944.

9. Gardner, A. D.: Morphological Effects of Penicillin on Bacteria, Nature, London 146: 837 (Dec. 28) 1940. Hobby, G. L.; Meyer, K., and Chaffee, E.: Observations on the Mechanism of Action of Penicillin, Proc. Soc. Exper. Biol. & Med. 50: 281 (June) 1942. Bigger, J. W.: Treatment of Staphylococcal Infections with Penicillin by Intermittent Sterilization, Lancet 2: 497 (Oct. 14) 1944.

10. Rantz, L. A., and Kirby, W. M. M.: The Action of Penicillin on the Staphylococcus in Vitro, J. Immunol. 48: 335 (June) 1944.

11. Ungar, J.: Synergistic Effect of Para-Aminobenzoic Acid and Sulfapyridine on Penicillin, Nature, London 152: 245 (Aug. 28) 1943. Bigger, J. W.: Synergic Action of Penicillin and Sulfonamides, Lancet 2: 142 (July 29) 1944. Kirby, W. M. M.: Bacteriostatic Action of Sulfonamide-Penicillin and Urea-Penicillin Mixtures in Vitro, Proc. Soc. Exper. Biol. & Med. 57: 149 (Oct.) 1944.

12. Hobby, G. L., and Dawson, M. H.: Relationship of Penicillin to Sulfonamide Action, Proc. Soc. Exper. Biol. & Med. 56: 184 (June) 1944. Garrod, L. P.: Action of Penicillin, Lancet 2: 673 (Nov. 18) 1944.

13. Spink, W. W.; Ferris, V., and Vivino, J. J.: Antibacterial Effect of Whole Blood on Strains of Staphylococci Sensitive and Resistant to Penicillin, Proc. Soc. Exper. Biol. & Med. 55: 210 (March) 1944.

14. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Observations on Penicillin, Lancet 2: 117 (Aug. 16) 1941. Rammelkamp, C. H., and Maxon, T.: Resistance of Staphylococcus Aureus to the Action of Penicillin, Proc. Soc. Exper. Biol. & Med. 51: 386 (Dec.) 1942. McKee, C. M., and Houck, C. L.: Induced Resistance to Penicillin of Cultures of Staphylococci, Pneumococci and Streptococci, ibid. 52: 33 (May) 1943.

15. Schnitzer, R. J.; Camagni, L. J., and Buck, M.: Resistance of Small Colony Variants (G Forms) of a Staphylococcus Toward the Bacteriostatic Activity of Penicillin, Proc. Soc. Exper. Biol. & Med. 53: 75 (May) 1943.

16. Demerec, M.: Production of Staphylococcus Strains Resistant to Various Concentrations of Penicillin, Proc. Nat. Acad. Sc. 31: 16 (Jan.) 1945.

17. Spink, W. W., and Vivino, J. J.: The Coagulase Test for Staphylococci and Its Correlation with the Resistance of the Organisms to the Bactericidal Action of Human Blood, J. Clin. Investigation 21: 353 (May) 1942.

strains of staphylococci were, with rare exceptions, killed in large numbers by human whole blood. This suggested, at least, that the metabolic activity of the penicillin resistant strains had undergone a change and the organisms had become less virulent. But this has little or no clinical significance, since organisms which have become resistant to penicillin in the human body are as resistant to the bactericidal action of human blood as the penicillin sensitive parent strains.

Several strains of staphylococci which had developed a high degree of resistance to the sulfonamides by in vitro adaptation have retained this resistance without diminution for almost three years. In other words, the acquisition of resistance to the sulfonamides by staphylococci appears to be a permanently acquired characteristic. It appeared at first that this also applied to staphylococci with acquired penicillin resistance, because the first few subcultures revealed that the organisms retained this insensitivity. However, further subcultures of four strains showed that the organisms had lost this acquired resistance. At the same time, these strains reverted to resisting the killing power of human whole blood to the same degree as the penicillin sensitive parent strains. Strains made resistant to both sulfathiazole and penicillin showed no decrease in sulfonamide resistance, even though the acquired pencillin resistance was lost. Further investigations in this laboratory have revealed that strains of staphylococci which have become resistant to penicillin in the human body following the administration of penicillin to patients develop a resistance which is probably permanent, and this in vivo strain resistance is associated with the production by the organisms of a potent inhibitor of penicillin activity.

The foregoing data on the sulfonamides and penicillin may be summarized as follows: Coagulase positive strains of staphylococci may be readily adapted to grow in the presence of high concentrations of the sulfonamides by laboratory methods as well as by exposing the organisms to the drugs in the human body. These sulfonamide resistant strains appear to be just as invasive as the parent strains, and sulfonamide resistance is apparently a permanently acquired characteristic. The development of sulfonamide resistance is quite likely related to the elaboration of a sulfonamide inhibitor which is para-aminobenzoic acid or closely related to it. Recently Sevag and Green [18] have taken exception to this concept and have concluded "that the development of resistance to sulfonamides is associated with the development of a sulfonamide resistant type of glucose metabolism." Confirmation of their work is highly desired and necessary. Strains of coagulase positive staphylococci may be less readily adapted to resist the action of penicillin than that of the sulfonamides. Strains highly resistant to the sulfonamides may also develop a considerable degree of resistance to penicillin. Strains of staphylococci naturally resistant to penicillin produce an inhibitor of penicillin activity. Such an inhibitor has not been obtained from sensitive strains. The development of resistance of staphylococci to penicillin by in vitro methods is only a temporary biologic phenomenon. Such strains rapidly lose this property in the absence of penicillin. An inhibitor of penicillin is not obtained from strains made resistant by in vitro methods. On the other hand, strains of staphylococci which have become resistant in vivo as a result of therapy with penicillin retain this resistance as a permanent characteristic, and these resistant strains produce a potent inhibitor of penicillin activity.

18. Sevag, M. G., and Green, M. N.: The Mechanism of Resistance to Sulfonamides: II. Absence of Correlation Between Resistance and the Formation of Arylamine by Staphylococcus Aureus; Noninterference with the Utilization of Glucose as a Critical Factor in the Development of Resistance to Sulfonamides, J. Bact. 48: 623 (Dec.) 1944.

CLINICAL CONSIDERATIONS

The crystallization of these and similar laboratory investigations with reference to an interpretation of clinical results is beset with many difficulties. However, an organism manifesting a high degree of susceptibility to penicillin in the test tube is usually sensitive to equivalent amounts of penicillin in the human body. In fact, a higher degree of bacterial destruction may be anticipated in the body, since, in addition to penicillin, there is the added factor of a natural or acquired immune mechanism. This correlation does not apply so uniformly to the sulfonamides because of the presence of factors present in the tissues and body fluids which inhibit the action of the sulfonamides. When the newer sulfonamide derivatives were introduced into medicine, more potent antistaphylococcic agents became available. And yet such compounds as sulfathiazole and sulfadiazine proved to be less satisfactory than anticipated. Among other deficiencies it appeared that strains of staphylococci developed an increased resistance to the sulfonamides and that these strains were being disseminated. Since penicillin is a superior agent in the treatment of practically all infections due to staphylococci, at the present time in this clinic sulfadiazine and sulfathiazole are being reserved principally for the treatment of some urinary tract infections in which sensitivity tests reveal that the growth of the offending strain of staphylococcus is inhibited by low concentrations of these compounds. Therapeutic failures have invariably attended the treatment of patients with sulfonamides where in vitro tests showed the staphylococci to be highly resistant to the sulfonamides. Sulfathiazole is also being employed simultaneously with penicillin for a selected group of patients with other types of staphylococcic infections.

Little data have been recorded in the literature pertaining to the clinical results with penicillin where staphylococci have manifested a natural or acquired in vitro resistance to penicillin. Bloomfield and his associates,[19] in a timely review of therapeutic failures encountered in their clinic, concluded that the development of organisms resistant to penicillin is probably of little importance but that there is very likely a correlation between initial in vitro strain sensitivity and the response to penicillin. Keyes,[20] in a discussion of the use of penicillin in ophthalmology, stated that the early treatment with inadequate concentrations of penicillin may result in the development of insensitive organisms. Under these circumstances intensive treatment with penicillin or the combined or alternate use of sulfonamides should be tried. In the treatment of chronic staphylococcic infections he suggests a preliminary in vitro test of sensitivity of the organisms. Anderson and his associates [21] have reported on the use of penicillin in the treatment of 40 cases of chronic osteomyelitis. In 5 cases there was no improvement, and in 4 of these failure to improve was considered as being due to the fact that the organisms became resistant to penicillin. In 19 of the patients the sensitivity of the organisms cultured from local lesions was tested before therapy, and then one or more weeks after therapy

19. Bloomfield, A. L.; Kirby, W. M. M., and Armstrong, C. D.: A Study of "Penicillin Failures," J. A. M. A. 126: 685 (Nov. 11) 1944.

20. Keyes, J. E. L.: Penicillin in Ophthalmology, J. A. M. A. 126: 610 (Nov. 4) 1944.

21. Anderson, D. G.; Howard, L. G., and Rammelkamp, C. H.: Penicillin in the Treatment of Chronic Osteomyelitis: Report of 40 Cases, Arch. Surg. 49: 245 (Oct.) 1944.

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In view of the foregoing experience with the sulfonamides, it appeared highly desirable to carry out a similar group of investigations with penicillin and a large number of coagulase positive strains of staphylococci isolated from patients. The information which we wished to obtain was Do strains of pathogenic staphylococci vary in their susceptibility to the in vitro action of penicillin? Is strain variation reflected in the results of therapy? Does the staphylococcus acquire a resistance to penicillin following in vitro and in vivo exposure of the organisms to the drug? If resistance may be acquired, are the resistant strains just as invasive as the sensitive parent strains, and is the resistance a permanently acquired characteristic? And, finally, may clinical failures with penicillin be correlated with the in vivo development of penicillin resistance?

In the first group of studies, 68 strains of coagulase positive staphylococci were isolated from patients none of whom had received penicillin. The in vitro sensitivity of each of these strains to penicillin was compared with their susceptibility to sodium sulfathiazole.[7] Included in these strains were 25 strains which were resistant to sulfathiazole. It was observed that 8 of the 68 strains, or 12 per cent, were relatively resistant to penicillin, requiring 0.4 to 0.8 unit of penicillin per cubic centimeter of culture medium before growth was inhibited. Many of the sulfonamide resistant strains proved to be quite susceptible to penicillin. In other words, there was no correlation between sulfonamide resistance and susceptibility of the organisms to the action of penicillin. Kirby,[8] who has also recorded the isolation of naturally resistant strains of staphylococci from patients, was able to extract a potent inactivator of penicillin from such strains but not from strains of staphylococci sensitive to penicillin. We have confirmed this observation of Kirby.

The preceding observations indicated that the mode of action of penicillin on staphylococci differed from that of the sulfonamides, and this is now generally accepted. Penicillin appears to inhibit the growth of sensitive organisms by interfering with the dividing bacterial cell or one that is about to divide.[9] The action of penicillin is assumed to be bacteriostatic and, under some conditions, bactericidal. Rantz and Kirby[10] reported that penicillin was bacteriolytic for staphylococci. Since the sulfonamides differ from penicillin in their mechanism of inhibiting growth of the staphylococci, it might be assumed that the combined use of a sulfonamide and penicillin would be desirable in the treatment of some patients with staphylococcic infections. However, experimental data as a basis for such a procedure are conflicting. Some investigators[11] have shown by in vitro methods that the bacteriostatic action for penicillin is greater in the presence of sulfonamide than with penicillin alone, but this is not in agreement with the reports of others.[12]

The studies were continued by adapting four coagulase positive strains of staphylococcus to grow in the presence of increasing concentrations of penicillin.[13] In this manner two strains developed a high degree of resistance to the antistaphylococcic action of penicillin. One strain, which required 0.04 unit of penicillin per cubic centimeter to inhibit growth before adaptation, required 80 units after a period of several weeks' exposure to penicillin. A second strain, originally inhibited by 0.06 unit, necessitated 120 units for complete inhibition of growth after adaptation. Both of these strains remained quite sensitive to sodium sulfathiazole. Two other strains, decidedly resistant to sodium sulfathiazole but sensitive to penicillin, were adapted to grow in penicillin, with the result that the strains manifested a resistance to both sodium sulfathiazole and to penicillin. This confirmed the results of others[14] that staphylococci may develop in vitro resistance to penicillin and offered further evidence that the mechanism of acquired sulfonamide resistance differed from penicillin resistance. Schnitzer and his group[15] have stated that there are three types of penicillin resistant staphylococci. The first type includes strains with natural resistance, the second embraces the strains which acquire resistance, and the third involves small colony variants (G forms) of a strain of Staphylococcus albus which exhibited a nonspecific form of penicillin resistance. Demerec[16] has presented evidence that the development of in vitro resistance of staphylococci to penicillin does not result from the action of penicillin on the organisms but originates through a selective process whereby nonresistant individuals are eliminated by the drug, and, through mutation, the more resistant cocci multiply.

We have also observed that organisms which developed resistance to penicillin by in vitro methods were killed in considerable numbers by human whole blood, whereas the sensitive parent strains and also sulfonamide resistant strains resisted this bactericidal action of blood. It is of interest that, although the penicillin resistant strains retained their ability to coagulate human plasma, they lacked the usual degree of resistance to the bactericidal action of blood exhibited uniformly by coagulase positive strains of staphylococci.[17] It has also been previously shown in this laboratory that the less invasive coagulase negative

7. Spink, W. W.; Ferris, V., and Vivino, J. J.: Comparative In Vitro Resistance of Staphylococci to Penicillin and to Sodium Sulfathiazole, Proc. Soc. Exper. Biol. & Med. **55**: 207 (March) 1944.

8. Kirby, W. M. M.: Extraction of a Highly Potent Penicillin Inactivator from Penicillin Resistant Staphylococci, Science **99**: 452 (June 2) 1944.

9. Gardner, A. D.: Morphological Effects of Penicillin on Bacteria, Nature, London **146**: 837 (Dec. 28) 1940. Hobby, G. L.; Meyer, K., and Chaffee, E.: Observations on the Mechanism of Action of Penicillin, Proc. Soc. Exper. Biol. & Med. **50**: 281 (June) 1942. Bigger, J. W.: Treatment of Staphylococcal Infections with Penicillin by Intermittent Sterilization, Lancet **2**: 497 (Oct. 14) 1944.

10. Rantz, L. A., and Kirby, W. M. M.: The Action of Penicillin on the Staphylococcus in Vitro, J. Immunol. **48**: 335 (June) 1944.

11. Ungar, J.: Synergistic Effect of Para-Aminobenzoic Acid and Sulfapyridine on Penicillin, Nature, London **152**: 245 (Aug. 28) 1943. Bigger, J. W.: Synergic Action of Penicillin and Sulfonamides, Lancet **2**: 142 (July 29) 1944. Kirby, W. M. M.: Bacteriostatic Action of Sulfonamide-Penicillin and Urea-Penicillin Mixtures in Vitro, Proc. Soc. Exper. Biol. & Med. **57**: 149 (Oct.) 1944.

12. Hobby, G. L., and Dawson, M. H.: Relationship of Penicillin to Sulfonamide Action, Proc. Soc. Exper. Biol. & Med. **56**: 184 (June) 1944. Garrod, L. P.: Action of Penicillin, Lancet **2**: 673 (Nov. 18) 1944.

13. Spink, W. W.; Ferris, V., and Vivino, J. J.: Antibacterial Effect of Whole Blood on Strains of Staphylococci Sensitive and Resistant to Penicillin, Proc. Soc. Exper. Biol. & Med. **55**: 210 (March) 1944.

14. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Observations on Penicillin, Lancet **2**: 117 (Aug. 16) 1941. Rammelkamp, C. H., and Maxon, T.: Resistance of Staphylococcus Aureus to the Action of Penicillin, Proc. Soc. Exper. Biol. & Med. **51**: 386 (Dec.) 1942. McKee, C. M., and Houck, C. L.: Induced Resistance to Penicillin of Cultures of Staphylococci, Pneumococci and Streptococci, ibid. **53**: 33 (May) 1943.

15. Schnitzer, R. J.; Camagni, L. J., and Buck, M.: Resistance of Small Colony Variants (G Forms) of a Staphylococcus Toward the Bacteriostatic Activity of Penicillin, Proc. Soc. Exper. Biol. & Med. **53**: 75 (May) 1943.

16. Demerec, M.: Production of Staphylococcus Strains Resistant to Various Concentrations of Penicillin, Proc. Nat. Acad. Sc. **31**: 16 (Jan.) 1945.

17. Spink, W. W., and Vivino, J. J.: The Coagulase Test for Staphylococci and Its Correlation with the Resistance of the Organisms to the Bactericidal Action of Human Blood, J. Clin. Investigation **21**: 353 (May) 1942.

strains of staphylococci were, with rare exceptions, killed in large numbers by human whole blood. This suggested, at least, that the metabolic activity of the penicillin resistant strains had undergone a change and the organisms had become less virulent. But this has little or no clinical significance, since organisms which have become resistant to penicillin in the human body are as resistant to the bactericidal action of human blood as the penicillin sensitive parent strains.

Several strains of staphylococci which had developed a high degree of resistance to the sulfonamides by in vitro adaptation have retained this resistance without diminution for almost three years. In other words, the acquisition of resistance to the sulfonamides by staphylococci appears to be a permanently acquired characteristic. It appeared at first that this also applied to staphylococci with acquired penicillin resistance, because the first few subcultures revealed that the organisms retained this insensitivity. However, further subcultures of four strains showed that the organisms had lost this acquired resistance. At the same time, these strains reverted to resisting the killing power of human whole blood to the same degree as the penicillin sensitive parent strains. Strains made resistant to both sulfathiazole and penicillin showed no decrease in sulfonamide resistance, even though the acquired pencillin resistance was lost. Further investigations in this laboratory have revealed that strains of staphylococci which have become resistant to penicillin in the human body following the administration of penicillin to patients develop a resistance which is probably permanent, and this in vivo strain resistance is associated with the production by the organisms of a potent inhibitor of penicillin activity.

The foregoing data on the sulfonamides and penicillin may be summarized as follows: Coagulase positive strains of staphylococci may be readily adapted to grow in the presence of high concentrations of the sulfonamides by laboratory methods as well as by exposing the organisms to the drugs in the human body. These sulfonamide resistant strains appear to be just as invasive as the parent strains, and sulfonamide resistance is apparently a permanently acquired characteristic. The development of sulfonamide resistance is quite likely related to the elaboration of a sulfonamide inhibitor which is para-aminobenzoic acid or closely related to it. Recently Sevag and Green [18] have taken exception to this concept and have concluded "that the development of resistance to sulfonamides is associated with the development of a sulfonamide resistant type of glucose metabolism." Confirmation of their work is highly desired and necessary. Strains of coagulase positive staphylococci may be less readily adapted to resist the action of penicillin than that of the sulfonamides. Strains highly resistant to the sulfonamides may also develop a considerable degree of resistance to penicillin. Strains of staphylococci naturally resistant to penicillin produce an inhibitor of penicillin activity. Such an inhibitor has not been obtained from sensitive strains. The development of resistance of staphylococci to penicillin by in vitro methods is only a temporary biologic phenomenon. Such strains rapidly lose this property in the absence of penicillin. An inhibitor of penicillin is not obtained from strains made resistant by in vitro methods. On the other hand, strains of staphylococci which have become resistant in vivo as a result of therapy with penicillin retain this resistance as a permanent characteristic, and these resistant strains produce a potent inhibitor of penicillin activity.

18. Sevag, M. G., and Green, M. N.: The Mechanism of Resistance to Sulfonamides: II. Absence of Correlation Between Resistance and the Formation of Arylamine by Staphylococcus Aureus; Noninterference with the Utilization of Glucose as a Critical Factor in the Development of Resistance to Sulfonamides, J. Bact. **48**: 623 (Dec.) 1944.

CLINICAL CONSIDERATIONS

The crystallization of these and similar laboratory investigations with reference to an interpretation of clinical results is beset with many difficulties. However, an organism manifesting a high degree of susceptibility to penicillin in the test tube is usually sensitive to equivalent amounts of penicillin in the human body. In fact, a higher degree of bacterial destruction may be anticipated in the body, since, in addition to penicillin, there is the added factor of a natural or acquired immune mechanism. This correlation does not apply so uniformly to the sulfonamides because of the presence of factors present in the tissues and body fluids which inhibit the action of the sulfonamides. When the newer sulfonamide derivatives were introduced into medicine, more potent antistaphylococcic agents became available. And yet such compounds as sulfathiazole and sulfadiazine proved to be less satisfactory than anticipated. Among other deficiencies it appeared that strains of staphylococci developed an increased resistance to the sulfonamides and that these strains were being disseminated. Since penicillin is a superior agent in the treatment of practically all infections due to staphylococci, at the present time in this clinic sulfadiazine and sulfathiazole are being reserved principally for the treatment of some urinary tract infections in which sensitivity tests reveal that the growth of the offending strain of staphylococcus is inhibited by low concentrations of these compounds. Therapeutic failures have invariably attended the treatment of patients with sulfonamides where in vitro tests showed the staphylococci to be highly resistant to the sulfonamides. Sulfathiazole is also being employed simultaneously with penicillin for a selected group of patients with other types of staphylococcic infections.

Little data have been recorded in the literature pertaining to the clinical results with penicillin where staphylococci have manifested a natural or acquired in vitro resistance to penicillin. Bloomfield and his associates,[19] in a timely review of therapeutic failures encountered in their clinic, concluded that the development of organisms resistant to penicillin is probably of little importance but that there is very likely a correlation between initial in vitro strain sensitivity and the response to penicillin. Keyes,[20] in a discussion of the use of penicillin in ophthalmology, stated that the early treatment with inadequate concentrations of penicillin may result in the development of insensitive organisms. Under these circumstances intensive treatment with penicillin or the combined or alternate use of sulfonamides should be tried. In the treatment of chronic staphylococcic infections he suggests a preliminary in vitro test of sensitivity of the organisms. Anderson and his associates [21] have reported on the use of penicillin in the treatment of 40 cases of chronic osteomyelitis. In 5 cases there was no improvement, and in 4 of these failure to improve was considered as being due to the fact that the organisms became resistant to penicillin. In 19 of the patients the sensitivity of the organisms cultured from local lesions was tested before therapy, and then one or more weeks after therapy

19. Bloomfield, A. L.; Kirby, W. M. M., and Armstrong, C. D.: A Study of "Penicillin Failures," J. A. M. A. **126**: 685 (Nov. 11) 1944.

20. Keyes, J. E. L.: Penicillin in Ophthalmology, J. A. M. A. **126**: 610 (Nov. 4) 1944.

21. Anderson, D. G.; Howard, L. G., and Rammelkamp, C. H.: Penicillin in the Treatment of Chronic Osteomyelitis: Report of 40 Cases, Arch. Surg. **49**: 245 (Oct.) 1944.

organisms which persisted in the lesions were tested again. Five strains revealed an increase in resistance, and, in 2 of the cases, cultures made a year after the completion of therapy with penicillin showed the organisms to be still resistant to penicillin. There was no correlation between the development of resistance and the dose of penicillin administered to the patients.

At the University of Minnesota Hospitals, 69 patients with staphylococcic infections have received penicillin. Thirty-one of the patients had a bacteremia. A report summarizing the results of therapy will be presented elsewhere. Whenever possible, the in vitro sensitivity of the staphylococcus to penicillin was determined before and after therapy. Among the cases of bacteremia there were nine deaths, and there was no convincing evidence that a fatal issue was associated with the development of penicillin resistant strains of staphylococci. Of the 38 patients without bacteremia, in only 2 instances was there evidence that staphylococci with acquired resistance may have prevented complete eradication of the infection; but the evidence was not conclusive. One of these patients had chronic osteomyelitis with a draining sinus, and the second had a draining sinus which followed a nephrectomy for pyelonephritis and a perirenal abscess. In analyzing all of the cases treated there was no certainty that naturally resistant strains of organisms were the cause of a therapeutic failure. Failure to eradicate infections was due to two main causes: First, the use of inadequate amounts of penicillin, owing in several instances to a scarcity of the material. In the treatment of infections caused by naturally resistant organisms, this factor of inadequate dosage may be quite important. But the degree of natural resistance is relative. The sensitivity test as used in this laboratory has failed to reveal a strain of staphylococcus not previously exposed to penicillin that was not inhibited by 1 unit of penicillin per cubic centimeter of medium, and well over 100 strains have been tested. While this concentration of penicillin in the plasma is not readily attained in patients by the administration of even large doses of penicillin, we have observed that doses of penicillin calculated to give a concentration of 0.2 to 0.3 unit per cubic centimeter of plasma have rapidly sterilized the blood when the in vitro test showed that 0.8 to 1 unit of penicillin was necessary to inhibit growth. This discrepancy may possibly be explained by the fact that the additive effect of penicillin aided the immune factors of the host in overcoming infections. In the treatment of staphylococcic infections, and particularly bacteremia, it is desirable in many instances to maintain blood concentrations of 0.2 to 0.3 unit of penicillin per cubic centimeter, especially when the sensitivity of the organisms is not known. Rantz and Kirby [22] have found that during the continuous intravenous administration of penicillin 2,500 units of penicillin per hour resulted in a concentration of 0.05 unit per cubic centimeter in the plasma; 5,000 units per hour, 0.10 unit; 10,000 units per hour, 0.2 unit; and 20,000 units per hour, 0.4 unit. We have observed that the growth of the majority of strains of coagulase positive staphylococci is inhibited in the test tube by 0.2 unit of penicillin or less. In the treatment of severe staphylococcic bacteremia we have had reasonably satisfactory results during the initial stages of therapy when we have used 200,000 to 300,000 units over a period of twenty-four hours. This means that the plasma concentration of penicillin approximated 0.2 unit per cubic centimeter during this period. On the other hand, in many instances the blood stream has been rapidly cleared of organisms when one-half this dose has been used.

The second group of causes for failures in therapy with penicillin has been the persistence of foci such as a staphylococcic endocarditis and thrombophlebitis involving the larger veins of the lower extremities; and the presence of relatively avascular infected tissues which interfere with direct contact of penicillin with the bacteria such as occurs in bone infections and in some types of infections of soft tissues. Under these circumstances surgical eradication of the foci, whenever possible, is a necessary procedure.

COMMENT

Since penicillin is now the most potent chemotherapeutic agent available for staphylococcic infections, there are only limited indications for the use of the sulfonamides. Until more information is available, in this clinic selected cases with urinary tract infections due to staphylococci are being treated with sulfathiazole or sulfadiazine. Most of the cases are chosen on the basis that the organisms manifest in vitro sensitivity to the sulfonamides. Patients having infections due to organisms which are sulfonamide resistant do not usually respond to sulfonamide therapy. While it would appear desirable to employ sulfathiazole or sulfadiazine along with penicillin in the treatment of a severe staphylococcic infection when the organisms are naturally resistant to penicillin but susceptible to the sulfonamide, there is a paucity of clinical information along these lines. Lockwood and his group [23] apparently successfully combined sulfonamide therapy with penicillin in a case of severe staphylococcic bacteremia. During the past two years we have been determining the in vitro sensitivity of staphylococci isolated from patients with staphylococcic bacteremia to both sodium sulfathiazole and to penicillin in an attempt to resolve this problem. Thus far it would appear that such a combination is probably unnecessary in the vast majority of patients, provided adequate amounts of penicillin are used.

From our observations over a period of two years, and from those of others, it is becoming more manifest that the development of penicillin resistant staphylococci during therapy is not a major problem. However, such a biologic phenomenon may influence the outcome of treatment in an occasional patient. The development of resistance is very likely dependent on the exposure of the cocci to sublethal concentrations of penicillin. Therefore the aim of therapy should be to eradicate the largest number of organisms in the shortest period of time. This implies the use of adequate doses of penicillin, particularly in the treatment of severe infections, and the eradication of any relatively avascular foci by surgical means. Since occasional strains of staphylococci appear to develop a permanent resistance to penicillin, the dissemination of these strains may be associated with therapeutic failures. Thus far this does not appear to have much clinical significance.

SUMMARY

1. Sulfonamide resistant strains of coagulase positive staphylococci are being recovered with increasing frequency from patients. This resistance appears to be a permanently acquired characteristic, and the development of resistance is not associated with a diminution in virulence.

22. Rantz, L. A., and Kirby, W. M. M.: The Absorption and Excretion of Penicillin Following Continuous Intravenous and Subcutaneous Administration, J. Clin. Investigation 23: 789 (Sept.) 1944.

23. Lockwood, J. S.; White, W. L., and Murphy, F. D.: The Use of Penicillin in Surgical Infections, Ann. Surg. 120: 311 (Sept.) 1944.

2. Coagulase positive strains of staphylococci are occasionally encountered which possess a natural resistance to penicillin. While this biologic phenomenon may be conducive to therapeutic failures with penicillin, the resistance is relative and may be overcome with adequate doses of penicillin. For this reason it is recommended that adults having severe staphylococcic infections should receive a minimum of 200,000 units of penicillin each twenty-four hours during the initial stages of therapy.

3. Coagulase positive strains of staphylococci may acquire in vitro and in vivo resistance to penicillin. The resistance to penicillin which has been developed by in vitro methods is only a temporary characteristic of the organisms. Resistance acquired in vivo as a result of therapy with penicillin appears to be a more permanently acquired property of the bacteria. Thus far the development of such resistance appears to be a minor cause of failures with penicillin.

4. Since some strains of coagulase positive staphylococci may show a resistance to penicillin but pronounced sensitivity to sulfathiazole or to sulfadiazine, it would appear desirable to utilize a combination of penicillin and sulfonamide therapy. However, more clinical evidence is required before ascertaining the merit of such a procedure.

TRAUMATIC INJURIES OF THE RECTUM

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At a previous meeting of this section I[1] discussed the operative injury of the anal sphincter. The present topic is a sort of sequel and is also apropos to current emphasis on traumatic surgery. The intraperitoneal complications of rectal injuries and concomitant damage to neighboring organs such as the bladder have been primarily stressed heretofore and rather fully reported (as their seriousness deserves) and hence will not concern us here.

On the other hand there is little to be found concerning the perineal issues alone and particularly their own essential significance in relation to devastating and even fatal sequelae. I do not have in mind the occasional unfortuitous complications of surgery in general but consequences inexorably determined by the surgeon's deliberate plan of operation and under his responsible control. These considerations not only pertain to traumatic injuries but comprise basic proctologic principles which even in their more obvious connections with commoner rectal pathologic conditions are too frequently disregarded by the surgeon. Hence my present remarks are of actually much wider import than the restricted subject implies.

The perineal complications of rectal injuries spring primarily from the innate and persistent tendency of such wounds to be fistulous in character. Now no one has reduced to anything approaching precise terms the behavior of tissues in explanation of fistula formation; in a vague and uncritical assumption that we understand this, a degree of familiarity with conditions predicating fistula formation and the bare sequence of events have been confused with actual knowledge of cause and effect. Even the conditions and sequences themselves, although well established, fail of ample cognizance.

Let us first picture a penetrating wound from the perianal skin into the rectum (fig. 1). Certainly all would recognize this without equivocation as a fistulous wound even though it is difficult to explain precisely why; wounds in general are wont to heal if their fresh edges are in such close apposition; it is infected—yes, but even infected wounds do heal, and, conversely, a fistula inaugurated in measure by fecal contamination may fail to heal even when freed from this influence; as far as that is concerned, sinuses originate (and persist) entirely apart from any fecal soiling whatever. For the moment, however, the point is to visualize the indisputable basic concept of a fistulous wound for comparison with a lacerated wound, which is the most common pattern of traumatic rectal injury (fig. 1). Unfortunately, the key to its proclivities and management is too frequently sought, perhaps unwittingly, in analogies with lacerations elsewhere in the body, both more frequent and familiar, rather than in the unrecognized imagery of the penetrating wound. To come at once to the point, such traumatic lacerated wounds of the rectum should be thought of in terms of penetrating wounds which lack only variable amounts of circumferential wall and which certain eventualities, unless deliberately opposed, almost invariably tend to complete. Thus, axiomatically, the less a lacerated wound approximates the penetrating one—in other words, the fewer walls it has—the less likely its transition to a fistula; and the fewest walls a wound may have is one—a flat wound—hence the least likely to become fistulous.

Now all of this may sound too elementary, and indeed it may be common knowledge in the abstract; but, if so, at least the practical application as evidenced by the case reports betrays distortion and misconception. For example, the suturing of traumatic rectal wounds constitutes the most obvious, the most frequent and potentially the most serious violation of principle; and yet it is not only sanctioned but advised in printed word. Tempting but fallacious is the too prevalent concept that if sutures prove ineffective by virtue of wound infection nothing has been lost by the attempt. Fallacious, for it had been proved that healing is thereby delayed not moderately but far beyond that of wounds left wide open from the start. This time differential represents, in addition to the development and alleviation of confined infection, considerable tissue degeneration and sloughing. Such, however, is but the least disservice of suturing.

The consequences may be even more adverse than the stormy course of wound disruption, for apparent uneventful healing is too frequently the deceptive and vicious union of the more superficial parts only, with concomitant separation of the depths. By such "bridging," sutures have insidiously but effectively contributed the missing wall which we designated as the essential distinction between a lacerated and a penetrating wound, a lacerated wound and a fistula. The cure of such a fistula requires in essence the recreation of the original wound with healing by granulation—this time without benefit of suture.

But mismanagement by the use of sutures may have a graver conclusion than either explosive wound disruption or unvisioned fistulas compelling reoperation. Here I refer to the formation of fistulas either totally incurable or those necessitating at best far greater mutilation for cure than simple recreation of the original wound. There is intimation of such fistulas in the literature but little as to their pathogenesis or prevention or indeed as to just why they are incurable. One thinks

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1 Blaisdell, Paul C.: Operative Injury to the Anal Sphincter, J. A. M. A. 112:614 (Feb. 18) 1939.

of the extent and relationships of a chronic fistula as being defined and limited by the pattern of the antecedent wound, of which the fistula is the direct residue. But as few traumatic wounds are in themselves incurable, whence then fistulas which transcend

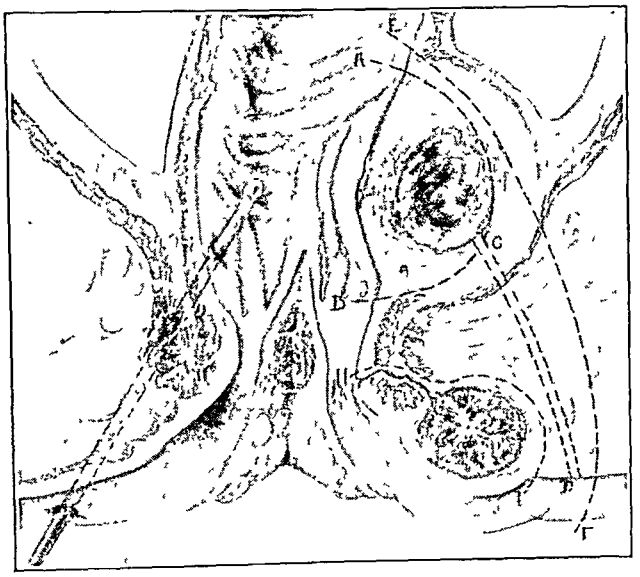


Fig. 1.—Composite drawing, illustrating several pathologic lesions: penetrating instrument and wound on the left, lacerated traumatic wound in the center with damage to the sphincter ani and perirectal abscess, right upper, such as occurred in case 1, following injury and suture of the rectal wall. Such an abscess, if taken early, should be curable by saucerizing within the arc of broken line *A B*. If, on the other hand, spontaneous pointing to the skin is awaited, or if evacuative incision is made through the perianal skin as represented by line *C-D*, as done in case 1, saucerization of the large arc *E-F* becomes necessary. This means not only a dissection of far greater magnitude but also inclusion within its scope of the whole sphincter mechanism. Perianal abscess, right lower, of daily encounter, in contrast to the rare ones of truly rectal origin, commonly misnamed "rectal" abscesses (and fistulas). Adequate saucerization following perianal evacuation, as indicated by broken line *H I*, rarely encompasses critical amounts of sphincter, again in contrast to the perirectal. This lesion is illustrated only for comparison and avoidance of possible confusion

in both extent and complexity their own inceptive wounds? And just where and how does the attribute of incurability appear from the nowhere and affix itself? The unfolding answers spring from the fact that, while wounds may resolve directly and imperceptibly into chronic fistulas, acute and fulminating abscesses are a frequent intermediary stage between either a closed or a bridged wound and the final chronic fistula. This extension of pus under pressure may expand many fold the limits of the original injury and complicate its relationships, especially by reason of delays in diagnosis and procrastination of treatment which invariably attend abscesses in this area. In the superimposed disasters of preventable abscesses, then, are the inexorable and hardy seeds of the problem fistula. The first case report well illustrates the train of events attendant on suture of the lacerated rectal wall with the resultant abscess acquiring such relationships to the sacrum as to make it virtually inoperable (figs. 1, 3, 4 and 6).

What does all of this mean then—that traumatic wounds had best be idly neglected? To the contrary, aggressively active measures are usually necessary to counteract a unique local factor which of itself subserves the same treacherous union of superficial wound edges as established by sutures. This factor resides in a sort of collapsed status of tissues in the area, less readily described by word than by comparison in a way to the closed position of an accordeon, and is dominated both by the anal sphincter and by the natural apposition of buttocks and thighs. These influences must be anticipated by the conversion of wounds to as nearly as possible flat or "saucerized" forms, if need be through sacrifice of normal tissue. Such requirement may be moderated somewhat by persistent postoperative manual separation of the wound edges and/or by extended gauze packing, their necessity increasing in direct proportion to operative conservatism. The detriments of tissue loss are obvious; but on the other hand adequate manipulations and repacking of the wound are painful ordeals for the patient, requiring anesthetics and extra hospitalization so that even short of their absolute limits of effectiveness such measures approach the unpractical. The danger of incontinence by the prolonged separation of muscle ends through continued packing must be mentioned. The proper balance between tissue sacrifice and postoperative intervention—to gain the most for the least—is exclusively in the realm of individual experience, but I emphasize that in both particulars the occasional surgeon fails far on the side of insufficiency.

There are not only reasonable and relative limits to these complementary devices in assuring sound healing but there are absolute limits, which in summation define the real meaning of incurability. The restrictions to saucerization in the ischiorectal fossa are imposed by its walls, viz. the ischial tuberosity laterally, the urogenital diaphragm anteriorly and the anal canal medially (fig. 2). It is to be noted in contrast that the posterior wall is not as restrictive; being composed largely of fat, it can be generously removed. Furthermore, the slope of the pelvic floor is such that the attachment posteriorly is at about the same level as the apex of the fossa. This means that the latter, even to its uppermost point, may be well reached with at least a gutter carried posteriorly alongside the coccyx



Fig. 2.—Anatomic structures having bearing on saucerization of wounds in the ischiorectal fossa. Restrictions are imposed by the ischial tuberosity laterally, the urogenital diaphragm anteriorly and the anal canal medially. The posterior wall, on the other hand, can be generously saucerized. Furthermore the coccyx is at about the level of the apex of the fossa, owing to the hammock shape of the levator, which relationship also facilitates saucerization carried out posteriorly. Not only are these facts pertinent to the intelligent management of traumatic injuries but they are basic in the everyday treatment of spontaneous fistulas.

Deeper in the pelvis its bony walls impose obvious and impervious limits to saucerization (case report 1 and figs. 3, 4 and 6).

INJURY TO THE ANAL SPHINCTER

How does injury to the anal sphincter affect the issues? By no amount of sophistry can it alter or negate the principles established. The severed ends are but part and parcel of a wound which has innate potentialities for harm, and any compromise of management in their behalf either lacks cognizance of these dangers or else fears that suture alone assures continence and that all other contingencies are, or should be, subordinate.

To answer this in entirety would be but repetitious, except for dispelling the misconception of muscle suture as the sole safeguard against incontinence. The mind's eye, reverting to terms of probably more familiar experience, pictures the severed muscle ends behaving as those of long muscles which retract apart even to considerable distance. Such are not the particulars here, where both constrictive and splinting forces and constraints, which I cannot here pause to analyze, incline to maintain coaptation of the severed ends. This is constantly verifiable in fistulectomies both by direct observation and by clinical result, these controls being indeed so effective that the site of severance, particularly,



Fig. 3.—Problem fistula in case 1, either incurable or at best responsive only to excessively mutilative surgery. Represents the residue of an abscess following traumatic injury to the rectum which was treated as described in text and illustrated in figure 4. The main body of the fistula, found later to have extremely firm walls a half inch thick, lies on the hollow of the sacrum. At the extreme left is the barium filled rectum, while between can be seen catheter entering tract of previous perianal incision of the postoperative abscess, now communicating with both the rectum and the main body of the fistula.

must be watched for bridging. That there is of course a limit to this reserve goes without saying. Suturing only the ends of a severed sphincter (fig. 5 and case 2) is a furtive synthesis of half-truths, combining a half-hearted open wound and recollected pictures of plastic repair. While not impossible of result by the expert, it bespeaks more likely a credulous naïveté which has stumbled onto a hard way of doing things when even the easier exceeded the surgeon's capability. Union of the *ends is the most facile contribution toward bridging*, which immediately implies (1) more radical treatment and expert management of the rest of the wound to prevent it too resolving to a fistula and (2) later severance of the union on the principle of a two stage fistulectomy. And why sutures in the classic repair of the incontinent sphincter if so ill advised in its immediate restoration? Too briefly for all the facts: (1) In the one case muscle recovery has reached equilibrium while in the other an advanced degree of improvement is in prospect and (2) the surgically created wound is controllable (*a*) in extent and (*b*) in site wholly outside of, and separated from, the anus. These admit of a more tractable pattern of nonfistulous character holding brighter prospects of sound healing and, at the worst, disruption to the status quo. Even so, this operation in such a soiled field is a compromise with the ideal, as

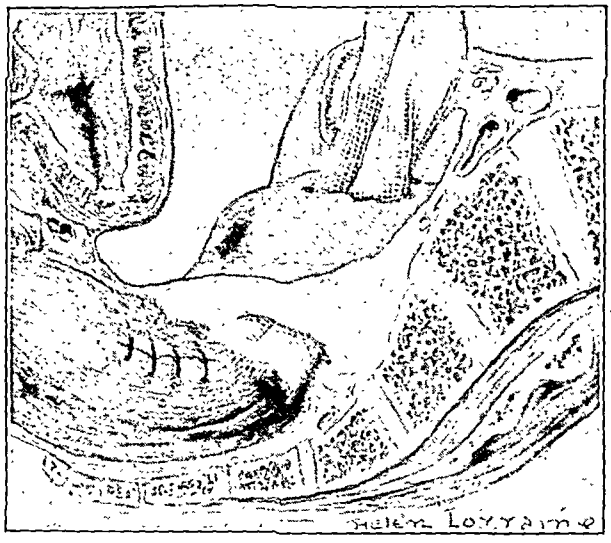


Fig. 4.—Method of treatment by surgeon in case 1. The important point is suture of the traumatic laceration of the rectum, which I hold to have been inadvisable. Drain carried from rectum through rent in peritoneum and up through abdominal wall. Several weeks later a retrorectal abscess formed which was opened through perianal skin (fig. 1), resulting in condition shown by x-ray in figure 3; such incision also is objectionable for reasons given in text and illustrated in figure 1.

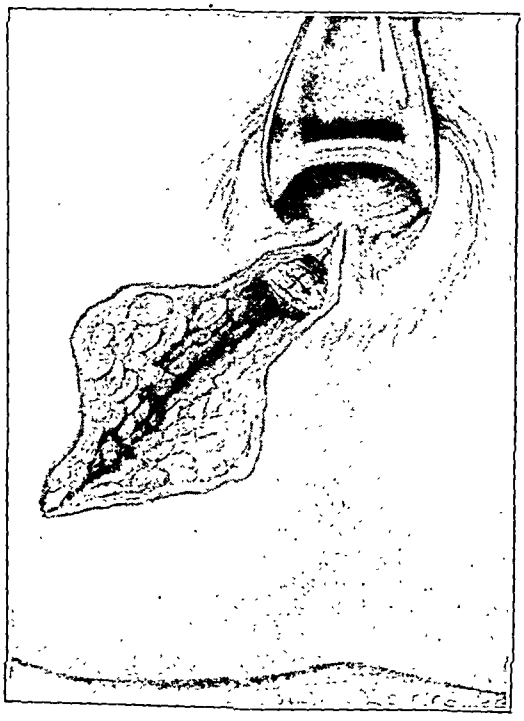


Fig. 5.—Treatment by surgeon in case 2. Only the severed sphincter ends were sutured, leaving the rest of the wound untouched. If the sutures slough, they serve no object; if not, a fistula of the whole wound is almost inevitable. If in addition the wound had been adequately saucerized, the sphincter possibly could have been severed later if the sutures held—on the principle of a two stage fistulectomy.

results compiled and reported by us elsewhere prove;[2] it is for this reason that in previous papers on elective

2. Blaisdell, Paul C.: Repair of the Incontinent Sphincter Ani, Surg., Gynec. & Obst. **70**: 692, 1940. Blaisdell, Paul C.: Repair of the Incontinent Sphincter Ani, ibid. **75**: 634, 1942.

repair I included suggestions of a vaginal approach more wholly consonant with logical principle.

The traumatically injured sphincter should be simply left alone, thereby taking full advantage of its own capacity of spontaneous recovery; if later this should prove wanting, circumstances for controlled intervention would then be far more propitious, safe and with wider choice of reparative procedure.

TEMPORARY COLOSTOMY

The establishment of a temporary colostomy in the treatment of injuries has been suggested, and, it seems to me, without critical analysis commensurate to such circuitous and radical surgery. Certainly a colostomy is not a preventive of a fistula because of the time lag of attributable effect—unless perchance one prepares the rectum by this means for an accident to happen some months later. The advocacy of colostomy has possibly evolved from the careless translation of special indication into more general terms—for example, from a

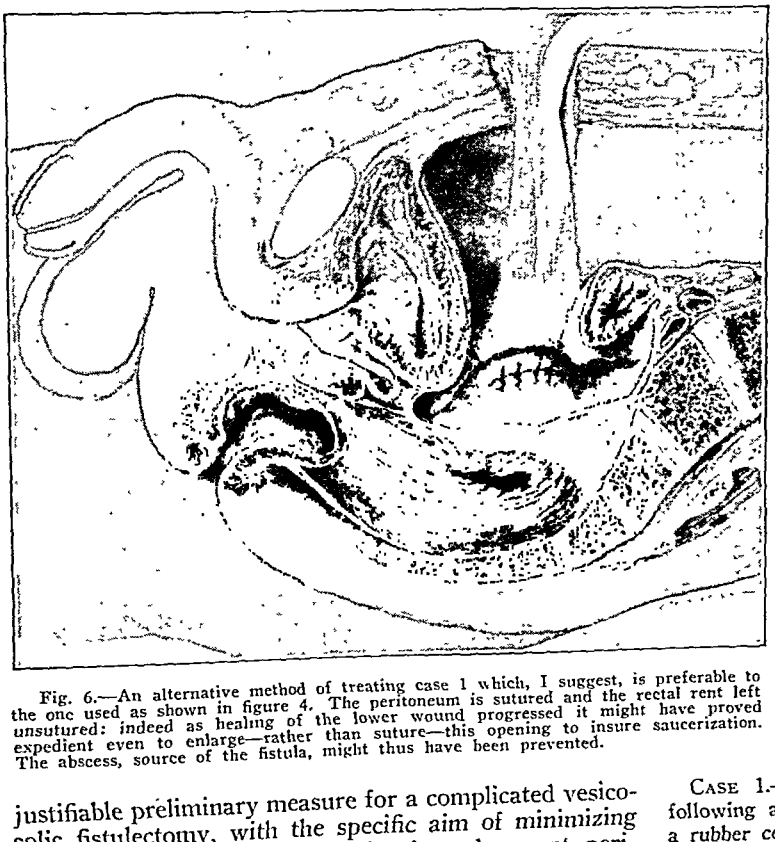


Fig. 6.—An alternative method of treating case 1 which, I suggest, is preferable to the one used as shown in figure 4. The peritoneum is sutured and the rectal rent left unsutured: indeed as healing of the lower wound progressed it might have proved expedient even to enlarge—rather than suture—this opening to insure saucerization. The abscess, source of the fistula, might thus have been prevented.

justifiable preliminary measure for a complicated vesicocolic fistulectomy, with the specific aim of minimizing the infective danger inherent in the subsequent peritoneal approach. Such an aim is entirely extraneous to any perineal issue, where, as we have seen, the sole obstacle to sound healing is restriction of adequate saucerization. I have encountered no evidence to establish that diversion of the fecal stream is a counter equivalent to such limitation—a point susceptible to experimental analysis which should have preceded clinical application. And there is considerable evidence to the contrary, such as in the behavior of recurrent pilonidal sinuses; for here, likewise, unsound healing is due far above all else to faulty wound architecture (shown by the fact that the recurrence rate is twenty times greater in sutured than in open wounds [3]) and yet devoid of any fecal stream influence, not belatedly effected either, as in the case of colostomy for wounds under discussion, but absent from the very inception.

There are objectionable possibilities in a temporary colostomy from a false sense of security induced. Indeed the test and criterion of management is the behavior and progress of the wound under what are to be its permanent environments.

TREATMENT OF THE INTERMEDIARY ABSCESS

If and when an abscess has been allowed to form (case 1), does there still exist any choice of management or should incision invariably be made perianally as well-nigh universally advised? The time element holds the key to the situation not only in minimizing both the progressive extent and the cumulatively complex relations outlined but also in offering any choice as to locus of incision. (By such choice I do not refer to direct incisional damage to the sphincter, although in a series of cases of incontinence that I compiled an incredible proportion were the result of simple incision of perianal abscesses.[4]) It must be admitted that procrastination usually settles all issues by unimpeded pointing of the abscess, but this does not prove that something better is impossible. The significance of the incisional site stems from the fact that the course of any incision becomes itself an integral part of the residual fistula, so that to this extent the relationships of the latter are determinable. With an abscess of intrarectal origin this in itself may make the whole difference as to whether the entire sphincter mechanism becomes involved or spared in the subsequent fistulectomy, with vital bearing on continence. Figure 1 portrays the theoretical background of this principle, as case 1 establishes the pragmatic and sober actuality.

This must not be construed of course as advice for the incision of the common perianal abscess of anal as distinguished from rectal origin, whose arc is so largely determined by embryonic anal ducts as rarely to include critical amounts of muscle, as also illustrated.[5]

REPORT OF CASES

The following are 4 consecutive cases of traumatic injury, with 3 illustrating points of mismanagement:

CASE 1.—A youth aged 18 entered the hospital directly following an accident in the mountains. Sliding downhill on a rubber coat he had collided with a sled, the steel runner of which penetrated upward through his rectum. Pronounced rigidity of the abdomen was the essential indication for immediate laparotomy by his attending surgeon. Through a midline incision exploration disclosed a rent in the pelvic peritoneum close to the iliac vein, and a small piece of raincoat near this opening was removed. The hole in the rectum was sutured, the pelvis cleaned, a drain carried to the rectum through the peritoneal defect and the abdomen closed around the drain (fig. 4). The latter was removed gradually over a period of days as drainage ceased.

Three months later the patient was readmitted because of septic fever of unstated duration and a large retrorectal abscess evacuated by a perianal incision lateral to the rectum (fig. 1) and the original traumatic tear of the rectum which had failed to heal was resutured. Coincident with healing of the perianal

3. In a compilation of over 4,000 cases of pilonidal sinuses submitted by members of the American Proctological Society, Kleckner found recurrence to be twenty times more in closed wounds than in those left wide open. This proves that recurrence is a matter of wound architecture and not of incomplete removal.

4. Blaisdell, Paul C.: Pathogenesis of Anal Fissure and Implications as to Treatment, Surg., Gynec. & Obst. 65:672, 1937.

5. Blaisdell, Paul C.: The Origin and Treatment of Anorectal Fistulae, California & West. Med. 49:6, 1938.

incision septic fever gradually returned, at which time the patient was referred to me. An x-ray film taken at this time is shown in figure 3.

Under gas anesthesia a belated attempt was made to saucerize the complicated fistula, leaving until later the problem of its encirclement of the whole sphincter mechanism. The patient was in good condition on leaving the table but within a few minutes became suddenly cyanotic, with labored breathing, and died within a few minutes before I reached his room. A postmortem was performed by Dr. Allvyn Foord, who ascribed death to massive collapse of the left lung. The abscess cavity in the hollow of the sacrum was found to have a wall of dense and extremely hard fibrous tissue 1 to 2 cm. in thickness, and only by sharp dissection with a heavy knife could it be stripped from the underlying bone. A far more radical operation than I had attempted would have been necessary for cure, if even possible.

Suture of the rectum was an invitation to a retrorectal abscess impossible of saucerization through the abdomen; inevitable sloughing of the sutures converted the abscess to a blind fistula. Resuture of the rectum across an abscess cavity is and was pointless, and perianal incision vastly complicated any possible cure of fistula, as explained in figure 1; instead, intrarectal saucerization should have been attempted. (See also figure 6.)

CASE 2.—A boy aged 10 years entered the hospital several hours following an impalement injury of the rectum suffered by falling on a picket fence. He was assigned to a general surgery service, where, in the absence of signs or symptoms of peritoneal encroachment, the lacerated sphincter ends were united by interrupted sutures; the remainder of the wound was simply left alone (fig. 5). After a period of several months the patient was referred to the rectal service because the wound continued to drain. On examination under anesthesia a deep fistula was found to occupy the entire original wound, necessitating fistulectomy by its recreation and saucerization, allowing it then to heal from the bottom by granulation. There was no residual muscle weakness.

This patient was forced to repeat surgery and weeks of convalescence because of mismanagement. Simply leaving the wound open was not sufficient to preclude fistula formation, additional saucerization being indicated. Suture of the muscle increased the likelihood of a fistula and served no useful purpose.

CASE 3.—A man aged 30 suffered an impalement injury of the rectum in an automobile accident, the details of which were not remembered by the patient. He was removed to a hospital near the scene and the whole wound closed with interrupted sutures, after which the patient was sent to me. After several days the wound broke down so badly that reoperation became immediately necessary; all sutures were removed and saucerization, which should have been carried out at the original operation, was now established.

If sutures hold, abscesses or fistulas and reoperation usually result as illustrated in cases 1 and 2; if ineffective, as here, they are also worse than useless, occasioning at best unnecessary surgery and delayed convalescence.

CASE 4.—A man aged 30 was thrown from a skidding motorcycle. He was assigned to the orthopedic service, where it was determined that he had suffered a broken humerus, femur and pelvis; I was consulted about a large gaping wound of the perineum entering the rectum. The patient was complaining of abdominal pain, but no rigidity was determinable. Immediate examination of the wound was carried out under anesthesia, and extension through the peritoneum was definitely ruled out. Even though it was already a large wound, much tissue was further sacrificed to obtain certain saucerization; this was particularly necessary because the other injuries would interfere with continued postoperative manipulation. Within a few days granulations made the wound quite insensitive and it required almost no care. The sphincter, although more than halfway severed by injury, healed without any loss of control.

Here is demonstration of conformity to logical principle.

102 North Madison Avenue.

LESIONS OF THE MUSCULOTENDINOUS CUFF OF THE SHOULDER

2. DIFFERENTIAL DIAGNOSIS OF RUPTURE

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NEW YORK

The most adequate present guide to the diagnosis of rupture of the short rotator cuff of the shoulder is outlined and described in detail by the late Dr. E. A. Codman in his classic text "The Shoulder." [1] In considering the diagnostic aspects of rupture he frankly admitted that he never had had the opportunity to study a fresh case. He then went on to postulate eighteen conditions which he thought ought to be fulfilled before a positive diagnosis of early rupture should be made. His clinical syndrome was a rather exacting one which, in spite of its hypothetical nature, came surprisingly close to the mark. However, since the publication of his book a considerable number of proved ruptures, both early and late, have been studied by the Fracture Service of the Presbyterian Hospital in New York and certain modifications of and additions to this syndrome seem indicated.

The requirements for diagnosis of a cuff tear differ little if any from those of a tear in any other tendon or tendon group. They include:

1. A detailed history characterized by compatible subjective symptoms.
2. Demonstration of absent or deranged function in the structure involved.
3. Supportive evidence in the form of local signs compatible with damage to the structure involved.
4. Elimination of other conditions requiring differentiation.

HISTORY AND SYMPTOMS

Codman stipulated that the patient be a laborer past 40. Sixty proved ruptures form the basis of this report. Eleven were under 40. Five were under 30. Nineteen were in women, most of whom could not be classed as true laborers. It is evident that, while most ruptures occur in well used shoulders past middle age, the incidence of the lesion is by no means restricted to this age and group. Codman's statement might well be modified to say that the cuff in any laborer past 40 is sufficiently scarred and degenerated by repeated minor traumas and attrition that it ruptures with relative ease.

He stipulated that the history include an adequate trauma, usually a fall. If by this he meant trauma adequate to rupture a weak and degenerated tendon his hypothesis has been corroborated. Almost but not

Read before the Section on Orthopedic Surgery at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1934.

From the Fracture Service of the Presbyterian Hospital in New York, and the Department of Surgery, Columbia University College of Physicians and Surgeons.

1. Codman, E. A.: *The Shoulder: Rupture of the Supraspinatus Tendon and Other Lesions In or About the Subacromial Bursa*, Boston, privately printed, 1934.

all patients date the onset or aggravation of symptoms from an injury of some sort. Few such injuries are serious in the ordinary sense of the word and many are minor enough so that they fittingly might be called inadequate. At times the most detailed history fails to uncover any trauma at all. An interesting characteristic of the pathologic condition found in the latter group is the presence of extensive fibrillation and degeneration of the tendon substance at the point of rupture not unlike that occasionally encountered in ruptures of middle aged achilles or quadriceps tendons. It seems reasonably certain that extensive degeneration at times so weakens the tendon substance that it may rupture without significant cause.

The rupture, whether spontaneous or the result of trauma, is accompanied by a sudden sharp pain in the shoulder. The patient often describes a sensation of something snapping or giving way. From this time on the history and symptoms generally follow a fairly consistent pattern. The primary pain is momentary and usually passes off, only to recur within a few hours. The quiescent period apparently represents the time necessary for the torn tissues to become swollen and inflamed so that their easy passage under the acromion and coracoacromial ligament no longer is possible. Once it is over, pain and spasm are continuous, aggravated by motion of the arm and especially those motions causing the torn portion to brush against the overlying bone or ligament. For the first few days the pain progressively increases in severity, reaches a peak and then gradually subsides. In many cases it subsides completely. In most cases it eventually reaches a level of severity at which it remains more or less constant and at which it may or may not result in sufficient disability to warrant radical therapy.

A definite diagnosis usually is impossible in the presence of acute pain which precludes adequate functional evaluation of the various muscular and ligamentous components of the shoulder. It is considered that no definite diagnosis, prognosis or radical treatment is warranted during the stage of acute pain. This is in direct variance with Codman's plea that such ruptures be diagnosed and repaired at an early date. He made this plea in the hope that early repair would be easier to do and might be followed by better and more speedy recovery. The following reasons substantiate the conviction that early repair is not warranted in the average case:

1. Early repair has been no easier to accomplish than late.

2. The results of early and late repair have been identical both for time and for completeness of recovery in comparable cases.

3. The symptoms in a large percentage of cases showing a clearcut clinical picture of rupture subside spontaneously under conservative therapy to such an extent that repair never need be done.

4. The rupture almost invariably takes place through a degenerated portion of the tendon. As a result, speedy and efficient union of the repair can be expected only after the degenerated edges of the tear are excised back to healthy tendon tissue. The rupture therefore is the equivalent of an old lesion as soon as it occurs, and whether operated on early or late excision and revision of its periphery is equally necessary.

The acutely painful stage usually commences to subside a week or so after the onset. When this occurs pain is replaced by actual weakness or inability in elevation of the arm as the predominant subjective complaint in the larger tears, and by minor derangements of function characterized by acute catches of pain in certain positions in the lesser lesions. A constant ache referred to the region of the deltoid insertion frequently persists in addition to the other symptoms. Usually at least two and not more than four weeks after the onset the painful symptoms are found to have subsided sufficiently so that a detailed functional examination is possible.

DEMONSTRATION OF ABSENT OR DERANGED FUNCTION

The function of the musculotendinous cuff is intricate and difficult to comprehend except on a basis of living anatomy. Its power of rotation is obvious. Cases with deltoid paralysis have indicated that abductor power, although present, is weak and inefficient when it acts alone. Codman has given a comprehensive description of its anatomy and physiology and emphasized its importance as a stabilizer of the glenohumeral fulcrum during abduction of the arm. Inman, Saunders and Abbott [2] emphasized and evaluated the relative importance of the various muscles with respect to their place in maintaining the muscle force couple of the shoulder mechanism. A retrospective study of a considerable number of cases with proved ruptures involving various segments of the cuff, and a correlation of the operative findings with detailed preoperative functional evaluations, have resulted in some additional useful observations.

The musculotendinous cuff consists mainly of the four intrinsic muscles of the shoulder whose origins arise from divergent points on the scapula and whose tendinous portions converge and fuse to form a continuous envelop enclosing the anterior, superior and posterior aspects of the humeral head and to insert into the bone at the region of its anatomic neck and tuberosities. The subscapularis portion of this common insertion attaches to the lesser tuberosity, the supraspinatus, infraspinatus and teres minor portions respectively to the anterior, middle and posterior facets of the greater tuberosity. The subscapularis is joined to the suprasinatus by an aponeurosis through which the fibers of the two tendons decussate.

It is a widely accepted belief that supraspinatus function constitutes an essential factor in the initiation and maintenance of abduction against gravity. Operative findings have proved this belief to be unfounded. Almost if not all patients with complete rupture of the supraspinatus alone have been able to initiate and maintain abduction of the extremity prior to repair. Larger tears involving more than one whole tendon have been found to retain these two functions in certain planes of humeral rotation and lose them in others. Complete avulsions of all the cuff insertion have shown a complete absence of power to initiate or maintain elevation in every plane of humeral rotation. Therefore it seems certain that although function of the cuff unit is essential to the initiation, performance and maintenance of elevation, that of the supraspinatus or any other individual member is not. It has been apparent that small ruptures such as those involving the supraspinatus alone are compensated for, when necessary, by the remaining intact attachments on either side, in

2. Inman, V. T., Saunders, J. B. deC. M., and Abbott, L. C.: Observations on the Function of the Shoulder Joint, J. Bone & Joint Surg. 26: 1-30 (Jan.) 1944.

the same way that intact vastus expansions compensate for the function lost with certain undisplaced patellar fractures.

The cuff, irrespective of the individual tendons involved, is divisible into anterior, superior and posterior segments as it embraces the humeral head (fig. 1). The anterior and posterior segments exert a rotary force. Their lower components exert what Inman, Saunders and Abbott have aptly termed a depresser force on the humeral head, although clinical findings do not entirely substantiate their estimate of the importance of this force in the act of elevating the arm. All three pull the humeral head against the glenoid. The superior segment has an additional mechanical advantage such that it exerts an abduction force on the humerus, acts as a depresser up to 90 degrees and past this point helps to suspend the humeral head against gravity. The particular tendon or tendons making up this superior segment depend on the rotational position of the humerus. In external rotation it is made up of the subscapularis and supraspinatus, in neutral by the supraspinatus and the anterior portion of the infraspinatus and in internal rotation by the infraspinatus and at times the teres minor (fig. 1). Operative findings correlated with preoperative functional defects have demonstrated clearly that the function of the tendons making up the superior segment in any given position of humeral rotation is the essential factor in both initiation and maintenance of abduction and that the function of the individual intrinsic muscles is interchangeable in this respect, depending on the position of the humerus and the plane of motion.

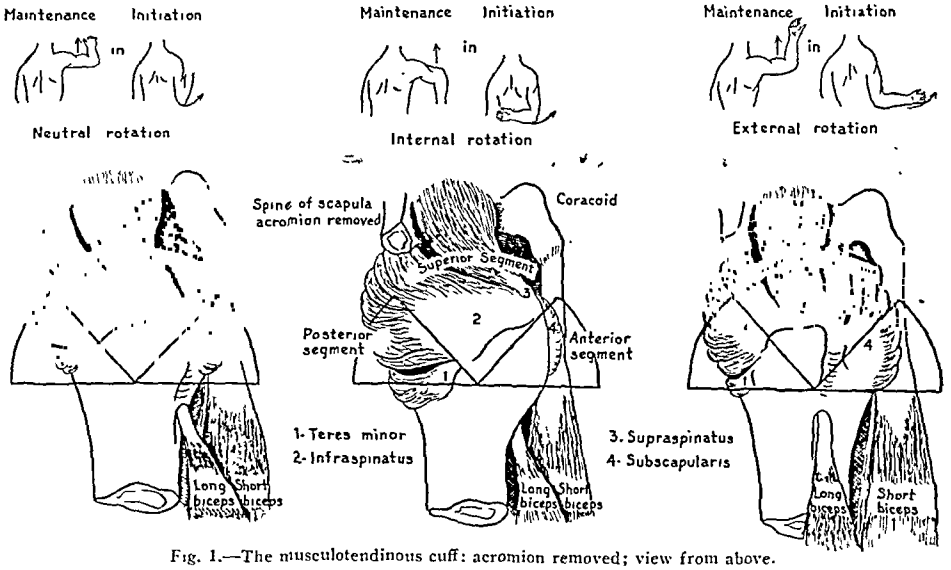


Fig. 1.—The musculotendinous cuff: acromion removed; view from above.

Knowledge of this fact makes possible an adequate functional evaluation, not only of the cuff as a whole, but also of its individual components. In the routine examination of shoulders it is considered essential that initiation and maintenance of abduction be tested in all planes of humeral rotation before deciding that the intrinsic muscle cuff is functionally intact. When a certain tendon is suspected of rupture the humerus is rotated until the suspicious area is brought into the position of greatest functional demand, i. e., brought to occupy a position in the superior segment. Evaluation of initiation and maintenance then denotes the functional efficiency of the suspected area alone. Tests for maintenance of abduction give more definite reactions and are more reliable than those for initiation, which, as Inman, Saunders and Abbott have pointed out, is quite variable.

The reactions to all functional tests are brought into sharper focus when the examiner opposes the function with manual or other resistance.

The technic of functional evaluation is simple. In order to test initiation of abduction the flexed elbow is held against the side by the examiner and the patient is required to attempt abduction against this manual resistance in one plane of rotation after another until the complete range of rotation has been covered. Maintenance of abduction is tested by passively abducting the arm to 90 degrees, following which the patient, after first relaxing all muscles, is required to maintain the abducted position against both gravity and downward pressure by the examiner. All planes of rotation must be tested.

Confirmation and support for these functional tests may be obtained by having the patient attain full elevation in the position of quadruped extension, which is always possible. Then with a little help and by straightening up from the stooped position it will be found that maintenance of complete elevation in the erect position is also possible. But as the patient commences to lower the arm, thereby creating a functional demand for glenohumeral stabilization by the cuff, it will fall helplessly to the side if a gross tear is present, again provided the plane of humeral motion is such that the torn portion occupies the superior segment.

Interpretation of the reactions to such tests is not difficult when approached with a comprehension of several facts which commonly tend to confuse the picture:

1. No functional test is valid until the acutely painful phase subsides sufficiently so that pain does not interfere with muscle action (usually a matter of about two weeks).

2. All persons suffering from rupture quickly learn to initiate and maintain elevation by rotating the arm into a position such that the remaining intact cuff occupies the superior segment.

3. No rupture, with the exception of a complete avulsion, can be identified by demonstration of localized absence or derangement of function until the arm is rotated into a position creating functional demand on the ruptured portion.

4. Incomplete and small complete tears are characterized by pain limited to those rotational positions creating a functional demand on the injured portion. Localized weakness may be present but is seldom noticeable enough to be appreciable.

5. Ruptures up to 1 inch in length frequently are compensated for by the adjacent cuff attachments. The reaction to functional evaluation under such circumstances is weakness and pain localized to the appropriate segment of the rotation arc, producing a functional demand on the injured part.

6. Localized inability to maintain abduction against two finger resistance denotes loss of function in an appreciable portion of the cuff and usually a tear of at least 1 inch or more in length.

7. Localized inability to maintain abduction against gravity denotes a large tear usually involving the equivalent of two whole tendons.

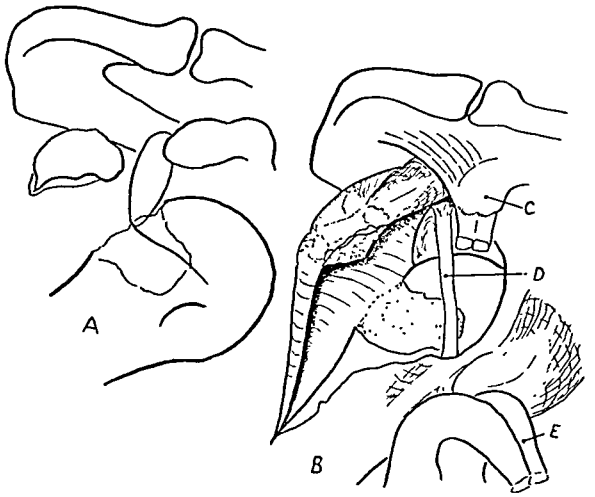


Fig. 2.—Dislocation with unretracted tuberosity fragment: *A*, x-ray; *B*, anatomic sketch; *C*, coracoid; *D*, biceps tendon; *E*, reflected coracobrachialis and short biceps head.

8. Complete inability to initiate or maintain abduction in any plane usually denotes a massive avulsion involving all or almost all of the cuff insertion.

SUPPORTIVE EVIDENCE

Most of Codman's hypothetical requirements fall into this category and are of great value, especially in equivocal cases. He has described them with such excellence that repetition would be superfluous. It has been found, however, that their evaluation is not without pitfalls for the inexperienced examiner. His "tender point" may be simulated by calcific deposit, local infection, minute fracture not apparent by x-ray, bone tumor, bursitis or minor muscle tear. The "sulcus" may be simulated by bundles of deltoid fibers, the long head of the biceps or a thickened redundant bursal roof. Palpation of the greater tuberosity through an atrophic deltoid demonstrates an excellent "eminence" even with an intact cuff. The "jog and wince on motion" are encountered frequently with subacute or chronic calcific deposits. "Palpable crepitus on motion" is an excellent and important sign but not until one learns to appreciate the difference between the crepitus produced by chronic inflammatory thickening in the bursal wall and that produced by palpation of a mobile tab of torn tendon. "Faulty scapulohumeral rhythm" is present in all painful shoulders regardless of cause. "Little if any restriction when stooping" is constantly true of ruptures but is also true of certain other minor traumas simulating the clinical picture of a tear. "No painful symptoms prior to the accident" was a constant history in Codman's cases. In about 50 per cent of the proved ruptures in the present series symptoms were complained of prior to their accident, and this was understandable in that many of them were found to have a recent extension superimposed on an old tear.

Muscle atrophy and atony constitute an important differential sign, as Codman also pointed out. General disorders of the shoulder usually result in atrophy of the deltoid. Disuse results in diffuse atrophy, most apparent in the deltoid. Rupture of the cuff results in selective atrophy of the involved intrinsic muscle or muscles unaccompanied by a corresponding deltoid myopathy. This phenomenon becomes appreciable to both inspection and palpation between the ends of the second and third weeks and contributes important evidence in support of the diagnosis. Bursal disorders produce deltoid atrophy without a corresponding change in the bellies of the intrinsic rotators.

Codman required a negative x-ray as one of the conditions to be fulfilled. Exception must be taken to the literal implications of such a flat statement. Ruptures not uncommonly occur in conjunction with other bone and joint lesions and, although they may be the most disabling lesion present, are prone to be missed when attention is distracted by the obvious bony pathologic change evidenced by the x-ray film. Roentgen examination not only is of great value in ruling out other simulating conditions but often supplies supportive and, at times, pathognomonic evidence of a torn cuff. Early ruptures, especially in younger persons, are apt to be characterized by a completely negative x-ray. Ruptures of long duration or those resulting from minor trauma in the older age group almost always are characterized by degenerative bone changes in the tuberosity at the point of tendon avulsion. Such a finding in itself means little but, when accompanied by compatible clinical signs, constitutes real evidence in support of the diagnosis.

It has been demonstrated that a positive clinical diagnosis of tear can be confirmed by roentgenography. A series of suspected cases was examined by fluoroscope immediately after injection of 50 cc. of filtered oxygen under sterile auspices into the cavity of the shoulder joint. When the arm was manipulated into the appropriate position it was possible to visualize the escape of gas from the joint cavity through the rupture into the bursal cavity. No such phenomenon was observed in the small number of controls used for comparison. All positive and some negative results were confirmed by operation, and although the number of cases in which the experiment was done was small its efficiency as a diagnostic procedure seemed reasonably certain.

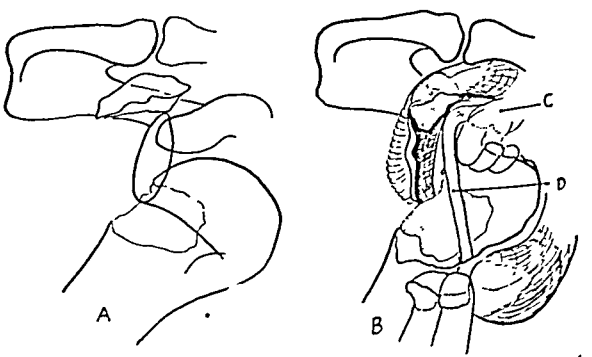


Fig. 3.—Dislocation accompanied by retracted tuberosity fragment: *A*, x-ray; *B*, anatomic sketch; *C*, coracoid; *D*, long head of biceps.

Subsequent improvement in the methods of functional evaluation have made any such test, accompanied as it is by a potential risk of infection, unnecessary.

Roentgen examination is most important in the diagnosis of ruptures associated with fracture or dislocation. Not uncommonly a torn cuff is the most disabling factor in a complex shoulder injury. Usually clinical identification of the rupture is impossible until long after

the bony lesion has healed. Frequently a positive roentgen diagnosis is possible at the first examination.

Dislocation at the shoulder accompanied by a fracture of the greater tuberosity (69 times in 439 dislocations in the records of the Presbyterian Fracture Clinic) almost always is accompanied by a torn cuff. Most such tears do not require operative repair, but others result in serious disability unless attended to.

They may be divided into three main groups, each of which can be identified by x-rays taken prior to reduction of the dislocation.

The largest group requires no operative intervention. It includes all those cases in which the tuberosity fragment conforms to the position indicated in figure 2, neither retracted up under the acromion nor pulled downward as far as the dislocated humeral head. The anterior joint capsule usually has been found to be intact and the dislocation to be essentially intra-articular. The abnormal position of the humeral head results from an avulsion of all its superior and posterior attachments as indicated in the anatomic sketch. Reduction of the dislocation results in anatomic reposition of the tuberosity fragment and also of the edges of the longitudinal cuff rent so that no repair is necessary.

The second group includes those cases with the tuberosity fragment retracted up under the acromion as depicted in figure 3. Such a film constitutes definite evidence of a large tear across the cuff (without which no such retraction is possible) and usually a massive avulsion of the cuff from the humeral head as indicated in the anatomic sketch. Early repair is essential to a good result.

The third group includes the cases wherein the tuberosity fragment is pulled downward and remains relatively unseparated from the humeral head (fig. 4). Such a lesion may correspond to the "false dislocation" described by Codman, and when this is the case a lengthy rim rent or deep surface tear commonly accompanies the dislocation and may result in delayed or incomplete recovery. At times the pathologic change of the soft parts consists of a small longitudinal rent and an avulsion of the posterior capsule or glenoid labrum as indicated in sketch 2 in addition to an anteroinferior capsular tear. Occasionally there is an avulsion of the cuff attachments from the tuberosity as in sketch 3. The latter condition may be suspected when reduction of the dislocation is accompanied by a failure of the tuberosity to resume its normal anatomic position.

Certain dislocations are reduced when first seen. Incomplete reduction or persistent subluxation of the humeral head, even if only slight in amount, usually is indicative of a large tear and in an elderly person, especially if degenerative changes are apparent in the humeral head, is almost pathognomonic of a complete cuff avulsion.

OTHER CONDITIONS REQUIRING DIFFERENTIATION

A rupture of significant size resulting in demonstrable functional derangement produces a clinical picture not closely simulated by any other condition. Small complete or incomplete tears resulting in equivocal functional defects often require differentiation from the following conditions:

1. Painful calcific deposits. These may be identified by adequate x-ray films. More than a hundred deposits have been explored. Only one was accompanied by a torn tendon. Therefore it seems reasonable to assume that the presence of a calcific deposit makes a rupture in the same shoulder highly improbable.

2. Minor fractures, especially undisplaced fissures in the greater tuberosity, which usually may be identified by x-ray.

3. Rupture of deltoid or intrinsic muscle fibers. Either may produce signs and symptoms suggestive of a small rupture in the cuff, and this seems especially true in younger persons. Four patients under the age of 30 have been subjected to exploration for the purpose of doing an early repair of a torn cuff in whom the pathologic change consisted of a hematoma in the under surface of the deltoid and in 1 case of the belly of the supraspinatus. A minimum of two weeks' delay before deciding on operative intervention greatly minimizes the risk of this mistake.

4. The so-called "frozen shoulder." No tear has been encountered in exploration of a stiffened shoulder, and none of the 60 proved ruptures presented had any significant limitation of passive motion.

5. Certain forms of chronic bursitis characterized by inflammatory thickening of the bursal roof, which is thrown into folds on motion of the arm. The result is an internal derangement of the articulation between cuff and acromion or acromial ligament, and the clinical picture produced is difficult to differentiate from that of a small tear. Exploration and excision of the bursa constitute not only the final differentiation but also the most efficient therapy for the condition.

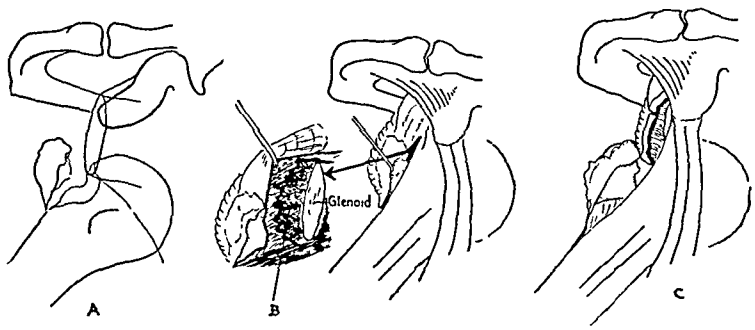


FIG. 4.—Tuberosity fragment pulled downward and remaining relatively unseparated from the humeral head. *A*, x ray; *B*, interior of joint cavity, posterior capsule avulsed from glenoid labrum allowing tuberosity to follow humeral head; *C*, avulsion of cuff tendons allowing tuberosity to follow humeral head.

INDICATIONS FOR OPERATIVE THERAPY

Establishment of a positive diagnosis does not afford adequate indication for operation. The symptoms and disability resulting from many ruptures subside spontaneously. At least half the patients in whom an early diagnosis of rupture has been made in our clinic have maintained the signs but eventually lost most of the symptoms of the lesion. Almost all have been adequately followed, and it has been apparent that, while such subsided lesions may produce occasional mild symptoms related to weather or overuse, no disabling exacerbations of pain are liable to occur unless the shoulder is subjected to another injury.

The only definite indication for operation consists of pain or disability sufficient in duration or severity to make the procedure worth while from the patient's point of view. This indication may exist in the presence or absence of a clearcut diagnostic picture. Even in the absence of definitive signs the diagnosis of internal derangement of the shoulder joint may be made and, as in the case of the knee joint, warrants exploration and eradication of existing pathologic conditions.

SUMMARY

Under the auspices of a plan for diagnosis and evaluation of the torn shoulder cuff, 64 shoulders were explored with a preoperative diagnosis of rupture. The diagnosis was incorrect in 4 cases.

180 Fort Washington Avenue.

ABSTRACT OF DISCUSSION

DR. JAMES E. M. THOMSON, Lincoln, Neb.: It is rather interesting that within the course of a single year there should have been brought into the literature and to you today such epochal discussions involving a new and revolutionary understanding of these shoulder cuff lesions. I refer to the recently published work of Inman, Saunders and Abbott and also to that of Dr. David Bosworth and now to the author of this paper: in particular, to their anatomic understanding of the function of the shoulder, in the first instance, and secondly the surgical approach and the possibilities of operative repair. Lastly this paper by Dr. McLaughlin contributes significantly to the diagnosis and indications for operation. This is one condition in which there is no hurry about operation. Usually a pathologic condition has existed for a long time prior to the injury, and we can take time to study the possibilities of its future and its repair. Dr. McLaughlin has brought out some very pointed observations with regard to the indications for operation and particularly to the fact that an early diagnosis cannot be made, that evaluation of the tear can be made by a functional rotary examination of the various movements of the shoulder. Since hearing the author's paper last year I have had the pleasure of following his procedure and approach. Those to whom it is new will find that they are viewing the shoulder from a totally different view; that is, from above and into the shoulder. The exposure is so broad that one sees much that may be confusing. In the series in which I have operated tremendous tears were found that I never would have thought possible in a shoulder. From this observation one cannot but wonder whether perhaps many of the smaller tears do not heal spontaneously and whether that is not the reason one feels that it is appropriate to wait until one makes a positive diagnosis before operating. I am still confused in trying to make an accurate diagnosis because I have not been able to demonstrate the small tears, but I have had great satisfaction in using this exposure and repairing satisfactorily massive tears of the shoulder cuff. This paper is epochal in its subject matter and the understanding of this very complex problem of internal derangement of the shoulder.

DR. EDWIN W. RYERSON, Chicago: The first thing that struck me in reading the paper was the probability that the women of Boston are a little bit tougher than the women of New York, because Codman never reported this injury in any women. Also that probably the New York women belong in the class of laborers more than the ones in Boston do. I have not seen this happen in any women except one whom I saw two weeks ago who fell from a horse and had ruptured part of her musculotendinous cuff. The other important point was the careful consideration given by Dr. McLaughlin to the nonoperability of so many of these cases, and it is true that many of them, especially in older people, are the result of a degeneration of the musculotendinous cuff due to age, occupation and arduous work. If one trie to repair these tears one does not, as a rule, get a very good result. I am less and less in favor of operating on the older people with the degenerative tendency.

DR. HARRISON L. MCLAUGHLIN, New York: Dr. Thomson has brought up the question of the diagnosis of small and incomplete ruptures. I know of no method for their certain diagnosis. This paper was based on a series of cases preoperatively diagnosed as rupture and in most of them there were fairly extensive lesions. In many other cases exploration has been done in our clinic with a preoperative diagnosis of internal derangement of the shoulder, and it has been in this group of cases that most of the small and incomplete ruptures have been encountered.

THE TREATMENT OF EMPYEMA THORACIS WITH PENICILLIN

CAPTAIN MARTIN J. HEALY JR.
AND
CAPTAIN HARRY L. KATZ
MEDICAL CORPS, ARMY OF THE UNITED STATES

The recent advances in the therapy of pneumonia with the sulfonamide compounds have reduced the frequency of the dreaded complication empyema thoracis. However, the management of this complication still remains a taxing problem to the surgeon and internist. The treatments advocated vary from the extremes of aspiration alone to the use of wide thoracotomy. Regardless of the procedure used, the aim in the management of acute empyema is essentially the same; that is, to institute efficient drainage of the pleural cavity, to permit the lung to reexpand and to obliterate the free pleural space in order to prevent the development of chronic empyema.

The therapeutic value of penicillin in the treatment of cases of pneumococcic, streptococcic and staphylococcic infections has been well established. The most recent results obtained from its use have been summarized in the detailed report by Keefer and his associates.[1] The efficacy of penicillin in the management of empyema thoracis was mentioned in the work of Lyons,[2] who reported its use in 2 cases of nonbacteremic staphylococcic empyema with improvement. Dawson and Hobby [3] report the use of penicillin intrapleurally in 2 cases of pneumococcic empyema and in 1 case of staphylococcic empyema, with gratifying results. Tillett, Cambier and McCormack [4] reported the use of penicillin intrapleurally in 8 cases of pneumococcic empyema, in 7 of which the infection was controlled by local therapy without surgical drainage. Six of the patients recovered completely, while 1 patient insufficiently treated with penicillin had a recurrence of infection necessitating surgical drainage.

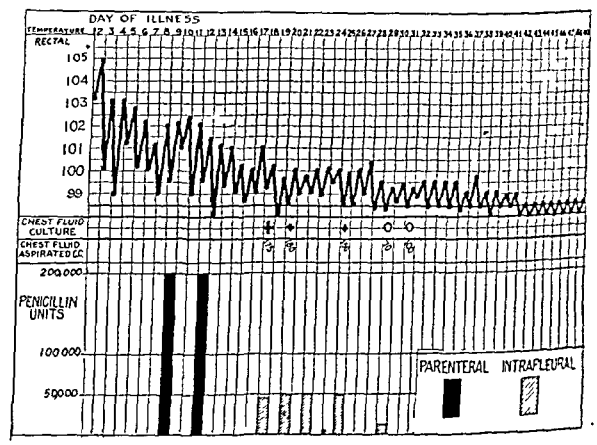


Fig. 1 (case 1).—Course in case of empyema secondary to broncho pneumonia, left lower lobe; nonhemolytic Staphylococcus aureus

From the General Surgical and Communicable Diseases Sections, Tilton General Hospital, Fort Dix, New Jersey.

1. Keefer, C. S.; Blake, F. C.; Marshall, E. K.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections, J. A. M. A. **122**: 1217 (Aug. 28) 1943.
2. Lyons, C.: Penicillin Therapy of Surgical Infections in the United States Army, J. A. M. A. **123**: 1007 (Dec. 18) 1943.
3. Dawson, M. H., and Hobby, G. L.: The Clinical Use of Penicillin, J. A. M. A. **124**: 611 (March 4) 1944.
4. Tillett, W. S.; Cambier, M. J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, Bull. New York Acad. Med. **20**: 142 (March) 1944.

This study comprises observations on 5 consecutive cases of empyema thoracis treated with intrapleural instillations of penicillin without surgical drainage. The etiologic agents varied considerably; in 2 cases the empyema was caused by nonhemolytic Staphylococcus aureus, 1 case by pneumococcus type III, 1 by a nonhemolytic streptococcus and 1 by a mixed infection containing a nonhemolytic streptococcus and hemolytic Staphylococcus aureus. In addition to the intrapleural instillation of the drug, parenteral penicillin was administered to patients who were felt to have underlying unresolved pneumonia, bacteremia or other complicating infections accessible to the blood stream.

Penicillin was supplied in the form of an amorphous powder in sealed ampules containing 100,000 units each. Solutions for parenteral or intrapleural use were prepared on the day of administration and kept constantly in the refrigerator at 5 C. For parenteral use the dry powder was dissolved in sterile saline solution so that 1 cc. contained 5,000 units. The individual dosage varied from 20,000 to 25,000 units administered every three hours by the intramuscular route. Solutions for intrapleural use contained 500 units per cubic centimeter and the usual intrapleural instillation contained 50,000 units dissolved in 100 cc. of sterile saline solution. Thoracentesis was accomplished under sterile precautions by entering the empyema cavity at the lowest possible level with a 15 or 17 gage needle. The pleural exudate was aspirated as completely as possible, sterile saline irrigations being used when necessary to thin out thick pus, which frequently obstructed the bore of the needle with fibrin plugs. Following aspiration, the penicillin solution was instilled into the pleural cavity. This procedure was repeated, usually on alternate days, and the frequency and duration of treatment depended on the response of the patient as manifested by fall of temperature, clinical appearance, bacteriology of the pleural exudate and the amount and rapidity of fluid reaccumulation.

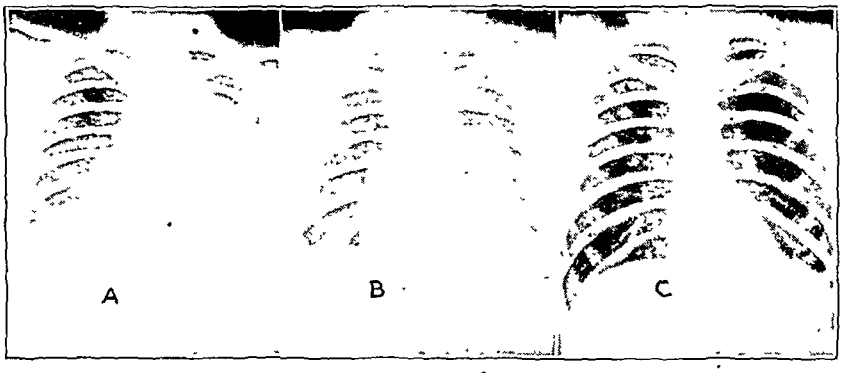


Fig. 2 (case 1).—*A*, 13th day of illness: a massive empyema on the left side with complete absence of aeration up to the second rib anteriorly. *B*, 18th day of illness: a large portion of the fluid has been aspirated; the remainder is loculated posteriorly. *C*, 92d day of illness: end result, normal chest.

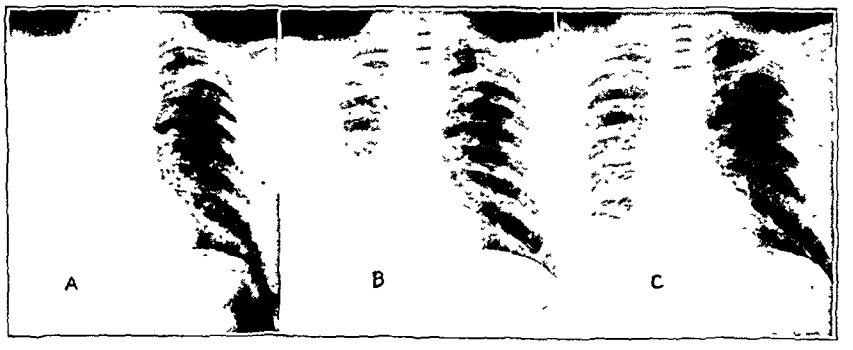


Fig. 3 (case 2).—*A*, 36th day of illness: a massive empyema on the right side, with total obliteration of pulmonary detail. *B*, 49th day: progress during therapy; much of the exudate has been aspirated; the fluid level is now at the 4th rib anteriorly. *C*, 59th day: the right diaphragmatic leaf is smooth in contour; minimal pleural thickening is noted in the region of the costophrenic sinus.

REPORT OF CASES

CASE 1.—A white man aged 23, diagnosed as having empyema secondary to bronchopneumonia, left lower lobe, nonhemolytic Staphylococcus aureus, was hospitalized on Dec. 4, 1943 because of pain in the left chest, fever, malaise, chills and cough productive of blood tinged sputum of one day's duration. Physical examination revealed signs of left lower lobe consolidation, which was confirmed by chest x-ray examination. Sulfadiazine therapy was instituted without therapeutic effect on the clinical course. The patient progressively developed dyspnea, orthopnea and cyanosis, and the temperature varied between 100 and 104.5 F., the pulse rate from 120 to 140 per minute and the respiratory rate from 30 to 40 per minute. Pneumococci could not be typed from the sputum, but many colonies of Staphylococcus aureus were present on culture. Sulfadiazine was discontinued on the ninth day of illness after a total dosage of 56 Gm. and penicillin therapy was started (fig. 1). On the ninth day of his illness he received 200,000 units of penicillin: 160,000 units intramuscularly (20,000 every three hours) and 40,000 units intravenously. The same dosage was repeated three days later, but the temperature continued to be septic and the patient appeared toxic and acutely ill. At this time a massive left pleural effusion was noted on x-ray examination (fig. 2*A*).

The patient was transferred to the hospital for surgical drainage and came under our observation on the 17th day of his illness. At that time he was acutely ill, dyspneic, orthopneic and cyanotic, and clubbing of the fingers was demonstrable. His temperature was 101 F., and the white blood cell count was 12,300 with 76 per cent polymorphonuclear leukocytes. Examination revealed the presence of fluid throughout the entire left chest. Thoracentesis was performed and 175 cc. of thick, yellow, purulent exudate was aspirated and 45,000 units of penicillin dissolved in 90 cc. of sterile saline solution was instilled into the pleural space. Aspiration and instillations were repeated on the 20th, 25th, 29th and 31st days of illness, the amount of fluid removed varying from 70 to 180 cc. and the dosage of penicillin from 15,000 to 50,000 units. The pleural exudate revealed numerous colonies of nonhemolytic Staphylococcus aureus on culture. On subsequent aspiration the fluid became progressively thinner and cultures revealed diminishing numbers of bacterial colonies. Fluid aspirated on the 29th and 31st days of illness was thin, serous and sterile on culture.

The temperature declined by lysis and the patient's general condition progressively improved. He gained 35 pounds (16 Kg.) in weight and was discharged to duty three months after the completion of treatment. X-ray studies revealed progressive diminution in the size of the empyema cavity (fig. 2*B*) and a chest plate taken three months after treatment revealed essentially normal lung fields (fig. 2*C*). Diaphragmatic excursions were normal and there was no diminution of vital capacity.

At the onset the patient apparently developed a primary atypical pneumonia, which was complicated on or about the 13th day of illness by a Staphylococcus aureus empyema. This complication was not prevented by parenteral penicillin in the dosage given. Aspiration

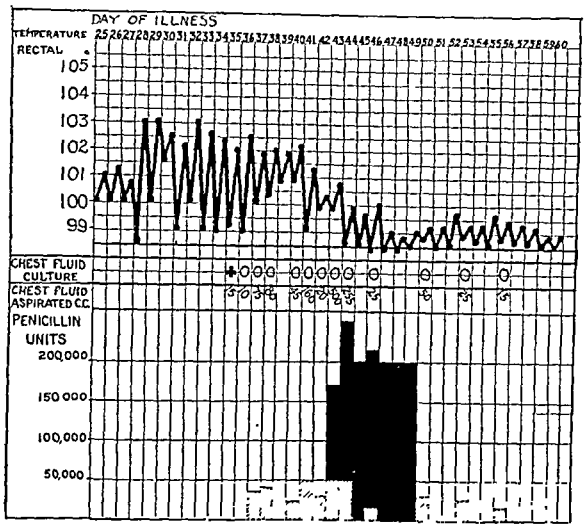


Fig. 4 (case 2).—Course in case of lobar pneumonia, empyema, pneumococcus type III. Penicillin: solid blocks, parenteral; shaded, intrapleural.

of the exudate and intrapleural instillation of penicillin resulted in an apparently complete recovery without surgical intervention.

CASE 2.—A white man aged 32, diagnosed as having lobar pneumonia, empyema, pneumococcus type III, was hospitalized on Oct. 20, 1943 because of chills, fever, malaise and cough productive of sputum of one day's duration. Examination and a chest x-ray film showed consolidation of the right lower lobe. The temperature was 104 F. and the white blood cell count was 18,000 per cubic millimeter with 80 per cent polymorphonuclear leukocytes. Sputum typing revealed type III pneumococci. He was treated with a total dose of 60 Gm.

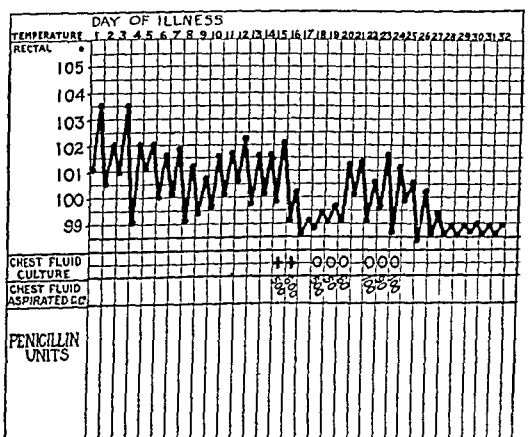


Fig. 5 (case 3).—Course in case of lobar pneumonia, empyema, mixed infection, pneumococcus type I, Staphylococcus aureus. Penicillin intrapleural.

of sulfadiazine over a period of twelve days. The temperature subsided by lysis and returned to normal after nineteen days. However, on the 22d day of illness the temperature began a gradual staircase rise and further examination revealed signs of fluid in the right chest. Thoracentesis on the 26th day yielded 500 cc. of thick, greenish exudate from which was cultured pneumococcus type III.

The patient came under our observation on the 34th day of his illness, at which time he was critically ill, cyanotic, dyspneic and orthopneic. There was clubbing of the fingers. The temperature was elevated to 103 F. and there were signs of a massive empyema of the right chest (fig. 3 *A*). Aspiration of the exudate and intrapleural penicillin instillations were instituted. Figure 4 indicates the plan of therapy and the clinical course of the patient. Thoracentesis was performed every one to two days for a period of two weeks, the amount of exudate varying from 15 to 500 cc. and the quantity of penicillin instilled from 15,000 to 50,000 units. The pleural fluid, which was at first thick, creamy and greenish, gradually became thin, clear and serous in consistency, and serial cultures were repeatedly sterile after the first instillation of 45,000 units of penicillin. Six days after the inception of local therapy the patient suddenly developed increased coughing and expectoration of mucopurulent sputum. As the temperature was still elevated, the patient was begun on parenteral penicillin

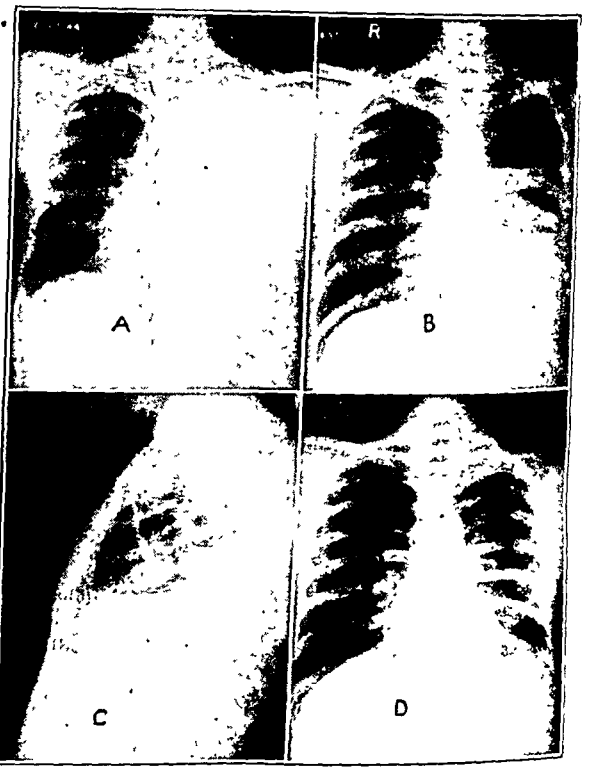


Fig. 6 (case 3).—*A*, 6th day of illness: a massive left empyema with displacement of the mediastinum to the right. *B* and *C*, 13th day: following aspiration of pleural exudate, two distinct fluid levels are present revealing anterior and posterior loculations; it was necessary to instil penicillin into each pocket. *D*, fifteen weeks after treatment: normal chest except for minimal pleural thickening.

25,000 units intramuscularly every three hours. The following day the patient coughed up 500 cc. of the same thick exudate; gas was aspirated from his chest cavity (fig. 3 *B*). Despite the development of the bronchopleural fistula, serial cultures of the pleural fluid remained sterile. Within two days the fistula closed spontaneously, as evidenced by cessation of the cough and expectoration. Penicillin was continued parenterally for three more days, but repeated aspiration and instillations of the drug were continued several days apart on four occasions to insure against reinfection. The patient made a rapid recovery, maintained a normal temperature and gained 45 pounds (20 Kg.) in weight. X-ray examination four months after the onset of illness showed the chest to be normal with the exception of slight pleural thickening in the region of the costophrenic sinus (fig. 3 *C*). Five months after illness the patient was on full active duty with no complaints.

A pneumococcus type III empyema complicated by a widely patent bronchopleural fistula recovered under parenteral and intrapleural penicillin therapy. The

pleural fluid remained sterile after the first instillation of 45,000 units of penicillin despite the presence of the fistula. Complete symptomatic recovery occurred within four weeks after the institution of penicillin therapy.

CASE 3.—A white man aged 37, diagnosed as having lobar pneumonia, empyema, mixed infection, pneumococcus type I, Staphylococcus aureus, was hospitalized on Feb. 18, 1944 with complaints of malaise, chills, fever and pain in the left chest. On admission he was acutely ill and the temperature was elevated to 102 F. Examination of the chest revealed the characteristic signs of a left lower lobar pneumonia. Chest x-ray films confirmed this diagnosis, and type I pneumococci were found in the sputum. The white blood cell count was 20,500 per cubic millimeter with 78 per cent polymorphonuclear leukocytes. He was treated with 74 Gm. of sulfadiazine over a period of twelve days without therapeutic response. He remained decidedly toxic and dyspneic and the temperature was septic, with intermittent elevations to 103 F. On the 6th day of illness he developed characteristic signs of a massive empyema of the left chest (fig. 6 *A*). Thoracenteses were done on the tenth and fifteenth days of illness, yielding on each occasion 500 cc. of thick, tenacious, creamy, greenish exudate, cultures of which revealed pneumococcus type I.

The patient came under our observation on the 16th day of his illness and was started immediately on aspiration and intrapleural penicillin therapy. At the time of the first treatment 660 cc. of thick, greenish fluid was aspirated and 50,000 units of penicillin instilled into the pleural cavity. Culture of the aspirated material revealed both type I pneumococcus and nonhemolytic Staphylococcus aureus. This and subsequent aspirations were difficult, owing to the thickness of the exudate, and irrigation with isotonic solution of sodium chloride was utilized to facilitate its evacuation. Figure 5 indicates the scheme of therapy followed and the clinical response of the patient. Ten aspirations in all were performed, yielding variously from 50 to 650 cc. of exudate. Instillations of penicillin were carried out on seven occasions, a total of 350,000 units.

Although the chest fluid was sterilized after the first instillation the patient remained acutely ill, toxic and febrile. The reason for the failure to respond promptly became apparent when subsequent chest films revealed two definite fluid levels, indicative of large fluid loculations anteriorly and posteriorly (fig. 6 *B* and *C*). Thoracenteses were now accomplished from each pleural pocket and penicillin instilled into each loculation on alternate days.

From this point on the temperature gradually subsided, the patient's general condition progressively improved and he remained afebrile. Fifteen weeks after therapy a chest x-ray taken prior to return to active duty showed a normal chest except for minimal pleural thickening (fig. 6 *D*). Fluoroscopy revealed normal diaphragmatic excursions.

A mixed type I pneumococcus and nonhemolytic Staphylococcus aureus empyema with loculations was treated with intermittent aspiration and instillation of a total of 350,000 units of penicillin intrapleurally without surgical intervention. The pleural fluid was sterilized after the first treatment with 50,000 units of the drug, but the temperature remained elevated until adequate evacuation of the exudate from both pleural loculations was accomplished.

CASE 4.—A white man aged 29, diagnosed as having empyema, nonhemolytic streptococcus, was hospitalized on Jan. 7, 1944 because of symptoms of cough, headache, malaise and sore throat of seven days' duration. On the day of admission he noted a chill and a stabbing pain in the left chest, which was aggravated on deep inspiration and coughing. The temperature was elevated to 105 F., respirations were labored and the mucous membranes were cyanotic. Physical examination and a chest x-ray film revealed evidence of consolidation of the left lower lobe. Cultures of the sputum revealed nonhemolytic streptococci. In addition to general supportive measures, which included parenteral fluid and oxygen, the patient was given 31 Gm. of sulfadiazine over a period of four days without beneficial response. It was now clinically apparent that the patient was suffering from a very virulent infection, and he continued critically ill, toxic, dyspneic and cyanotic. On the 10th day of illness he developed signs of a massive pleural effusion on the left side and a spread of the pneumonic process to the right, middle and lower lobes (fig. 7 *A*). Thoracentesis on the same day yielded 1,275 cc. of thin, blood tinged fluid which contained numerous nonhemolytic streptococci on smear and culture.

In view of the moribund condition of the patient and because of evidence of an underlying fulminating pneumonic process, sulfadiazine was discontinued and penicillin therapy was instituted both parenterally and intrapleurally. Figure 8 demonstrates the scheme of penicillin therapy and the clinical response of the patient. Eight thoracenteses were performed every one to three days during the ensuing thirteen days, the amounts removed varying from 60 to 550 cc. On each occasion 50,000 units of penicillin was instilled except on the second day of treatment, when 100,000 units was given. Over a period of fourteen days he received a total of 2,500,000 units of penicillin parenterally and 450,000 units intrapleurally. The pleural fluid, which had thickened during the first four days of the empyema, rapidly became thin and serous in consistency and remained sterile on culture following the first intrapleural instillation of penicillin. The temperature gradually subsided by lysis and his general condition progressively improved.

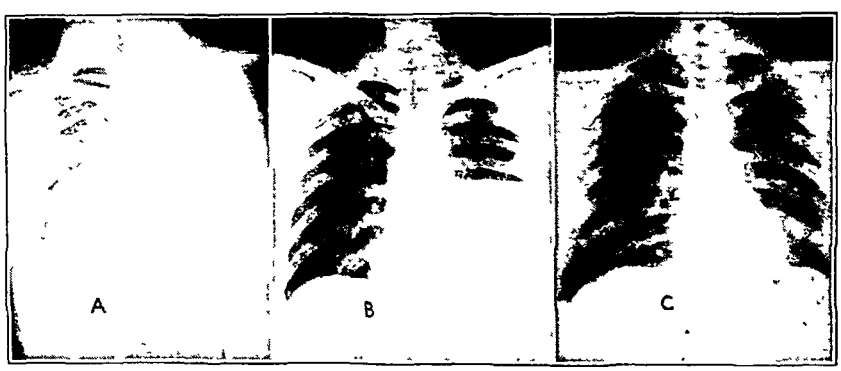


Fig. 7 (case 4).—*A*, 10th day of illness: a massive empyema on the left, with displacement of the heart and mediastinum to the right; a patchy type of consolidation involves almost the entire right lung. *B*, 34th day of illness: appearance of chest at the time of first relapse; there is a pyopneumothorax on the left with a fluid level at the 7th rib posteriorly; the heart and mediastinum are now in the midline and the right lung is clear. *C*, appearance of chest four months after onset of illness, showing a normal chest with the exception of slight pleural thickening in the left cardiophrenic angle.

On the 33d and 47th days of illness the patient had recrudescences of temperature elevation associated with reaccumulation of pleural fluid which remained sterile on culture (fig. 7 *B*). Three instillations of 50,000 units of penicillin were administered on alternate days during each of these relapses. On both occasions this treatment resulted in prompt subsidence of temperature and in clinical improvement of the patient.

Subsequently his temperature remained normal, he gained 29 pounds (13 Kg.) and he manifested no signs of decreased pulmonary function. The vital capacity was normal, there was no evidence of exertional dyspnea and the patient was returned to active duty five months after the onset of his illness. He was still on active duty and free of symptoms ten months after his illness. The final chest x-ray (fig. 7 *C*) revealed total reexpansion of the left lung and complete clearing of the

empyema with minimal residual thickening of the pleura in the cardiophrenic angle. Fluoroscopy revealed a normal range of diaphragmatic motion.

This critically ill patient with a nonhemolytic streptococcus pneumonia and empyema was treated with 2,500,000 units of penicillin parenterally and 750,000 units intrapleurally over a period of forty-one days.

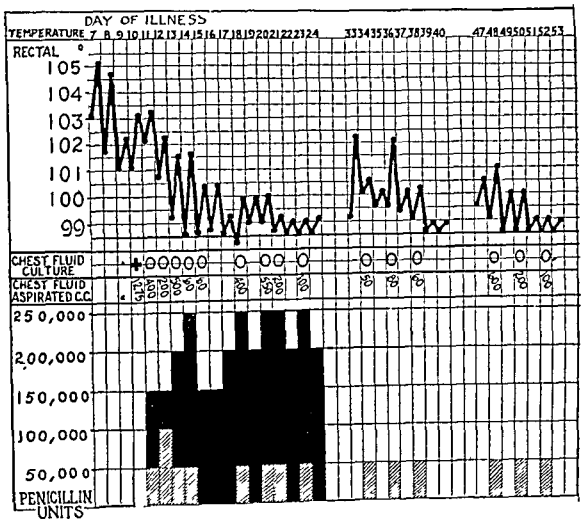


Fig. 8 (case 4).—Course in case of empyema, nonhemolytic streptococcus Penicillin: solid blocks, parenteral; shaded, intrapleural.

He recovered completely, showing a substantially normal chest, functionally and anatomically. The use of such massive doses of penicillin was considered necessary in view of the critical status of the patient. Following the first instillation of penicillin, the pleural exudate remained sterile even at the time of two subsequent relapses with reaccumulation of fluid.

Case 5.—A white man aged 20, diagnosed as having empyema, mixed infection, left chest, nonhemolytic streptococcus, hemolytic Staphylococcus aureus, was first hospitalized on April 27, 1943 with a diagnosis of bronchopneumonia of the left lower lobe. The course was febrile, the white blood cell count varied from 18,000 to 30,000 per cubic millimeter and repeated sputum cultures revealed colonies of nonhemolytic streptococci. He was treated with a total of 52 Gm. of sulfadiazine over a period of seven days without therapeutic effect. Three weeks later he developed a massive pleural effusion (fig. 9 *A*). Thoracotomy was performed with the institution of closed intercostal drainage, which was unsuccessful in controlling the infection. Three weeks later resection of the eighth rib was performed and open tube drainage established. Temporary improvement followed, but despite persistent local treatment the pleural cavity could not be obliterated and the patient went on to develop an extensive chronic empyema. Drainage was profuse, cultures of the pus showing hemolytic Staphylococcus aureus and nonhemolytic streptococci.

The patient came under our observation six months after the onset of his illness. He was considerably underweight and showed intermittent temperature elevations to 101 F. A draining sinus tract was noted at the site of the previous thoracotomy. Instillation of iodized oil revealed a well demarcated, irregular, tubular empyema cavity 2.5 cm. in diameter (fig. 9 *B*). Culture of the purulent drainage from this tract revealed many colonies of hemolytic Staphylococcus aureus.

Local therapy was instituted, consisting of daily thorough aspiration of retained exudate by means of a small catheter and instillation of penicillin solution 250 units per cubic centimeter to the capacity of the pleural pocket. The total volume varied from 25 to 70 cc. over a period of eleven days, and the total amount of penicillin instilled was 104,600 units. Serial cultures of the aspirated exudate showed a progressive diminution in the total number of bacterial colonies until, near the completion of therapy, only an occasional colony was noted. In order to facilitate reexpansion of the lung and obliteration of the pleural space an occlusive dressing was applied to the sinus opening and an oxygen lavage of the pleural pocket was performed. The sinus tract gradually healed, and the patient became afebrile and symptomatically improved. Serial chest x-rays showed progressive, complete obliteration of the empyema cavity but a zone of thickened pleura remained (fig. 9 *C*).

Except for persistent anorexia and failure to gain weight adequately, the patient remained clinically improved, afebrile and ambulatory for four months following treatment. After that time he suddenly developed pronounced malaise, pain in the left chest and a sudden rise in temperature to 103 F. Examination and a chest x-ray film (fig. 9 *D*) revealed a large reaccumulation of fluid in the left pleural space. Aspiration yielded over 100 cc. of thick, greenish exudate, which showed hemolytic Staphylococcus aureus on culture. Fifty thousand units of penicillin was instilled on three occasions two days apart for a total of 150,000 units. The temperature subsided promptly after the second treatment and clinically the patient was much improved. The pleural exudate remained sterile on culture after the second instillation of penicillin.

Although control of the acute recurrence was obtained by the use of intrapleural penicillin, it was deemed advisable that open thoracoplasty be performed in view of the protracted clinical course and the presence of advanced structural changes within the chest. Accordingly he was transferred to a thoracic surgical center for consideration of such therapy.

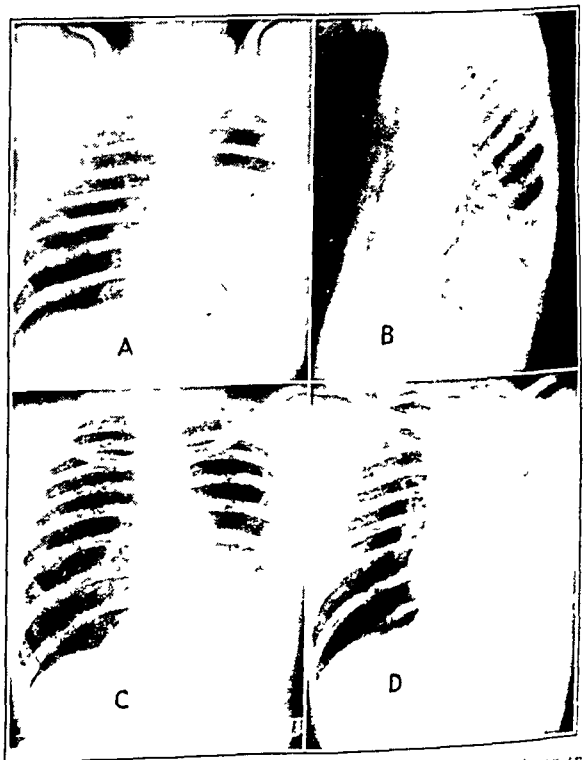


Fig. 9 (case 5).—*A*, 4th week of illness, showing pyopneumothorax on the left. *B*, end result five months after surgical drainage; iodized oil reveals a long tubular, pleural pocket extending from 3d rib posteriorly to the sinus opening in the 8th interspace. *C*, following penicillin therapy; chronic empyema cavity obliterated; a wide lateral zone of thickened pleura remains. *D*, four months after penicillin therapy: there is an extensive recurrence of fluid in the left lung.

This patient, with a mixed infection empyema containing a nonhemolytic streptococcus and a hemolytic Staphylococcus aureus, received apparently adequate surgical drainage but went on to develop an extensive chronic empyema. Intrapleural penicillin instillations resulted in closure of the pleural cavity and control of

the disease for a period of four months. At the end of this time there was an acute flare-up of the empyema, which again was controlled by intrapleural penicillin. The clinical course in this case would seem to indicate that, although a chronic empyema cavity may be sterilized and obliterated by local penicillin therapy, still recurrences of bacteriologically active infection may take place.

COMMENT

In observing the progress of these 5 cases, several points of importance in therapy became evident. It was considered important that treatment should be instituted at the earliest possible moment after the diagnosis of empyema had been established clinically and exudate obtained by aspiration. The organisms commonly causing empyema are susceptible to penicillin, and therapy need not await the bacteriologic identification of the etiologic agent.

Aspiration should be repeated at daily or two day intervals, depending on the amount and consistency of the exudate, the rate of reaccumulation of fluid and the clinical response of the patient. Thoracenteses should be performed at the lowest possible point in the empyema pocket, preferably under fluoroscopic control, using a large gage needle to facilitate aspiration. Irrigation with isotonic solution of sodium chloride was found to dilute thick, tenacious exudate and thus facilitate its aspiration. As much fluid as possible should be removed at each tapping, with the precaution that, in early cases with massive empyema, rapid removal of excessive amounts of fluid may result in mediastinal embarrassment. If a multilocular empyema exists, efforts must be made to aspirate each pocket thoroughly. Aspirations should continue until fluid does not reform. It has been observed, however, that small amounts of thin, sterile, serous fluid will be spontaneously absorbed by the patient within a short time.

Penicillin should be instilled after each aspiration at least until subsequent cultures of the fluid are proved to be sterile and the patient is clinically improved. The amount of the drug and the number of instillations necessary will vary with the clinical severity of the case and the type of organism involved. From 35,000 to 50,000 units was the dosage most frequently used and in our cases was found sufficient to effect sterilization of the exudate, even in the presence of a massive empyema.

With the therapy used the acute episode of empyema was controlled promptly in all 5 cases, as evidenced by fall in temperature, white blood cell count and sedimentation rate to normal levels, clinical improvement of the patient, rapid loss of exudate and reexpansion of the collapsed lung. In case 5 local treatment of an extensive chronic empyema resulted in arrest of the disease for four months, after which time an acute flare-up occurred. It is of interest that this secondary episode was also promptly controlled by intrapleural penicillin. However, because of the extensive underlying pleural thickening already present further radical surgery was deemed advisable to obtain obliteration of the chronic empyema cavity.

Following treatment, cases 2, 3 and 4 showed minimal pleural thickening, while the chest x-ray in case 1 was normal. In these 4 cases there was no deformity of the chest nor any diminution of the vital capacity. All showed normal diaphragmatic excursions on fluoroscopy. These patients have been followed for from three to ten months after treatment and all have returned to active military duty.

SUMMARY

Five patients with empyema of varying etiology were treated with aspiration and intrapleural instillation of penicillin. Four patients with acute empyema recovered with little or no pleural thickening and were returned to military duty within three to five months after the onset of illness. One patient with chronic empyema with an acute exacerbation responded to therapy in the acute phase of the disease but eventually required further surgery.

THE MEDICAL TREATMENT OF ACUTE EMPYEMA

REPORT OF FIVE CASES CURED WITH CHEMOTHERAPY AND THORACENTESES

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The addition of sulfonamides and penicillin to our therapeutic armamentarium has changed radically the treatment of many infectious diseases. Treatment of empyema with the newer agents was tried with varying results. According to most authorities, empyema is a disease usually requiring open or continuous closed drainage. Early thoracotomy is recommended in pneumococcic empyemas. Repeated aspirations are ordinarily performed in postpneumonic streptococcic empyemas until the underlying inflammatory process subsides and the purulent exudate becomes thickened, when thoracotomy with rib resection is performed.

The mortality of empyema varies with the etiology, the virulence of the infecting organisms and the resistance of the patient. Moschcowitz's [1] mortality figures for empyema in patients of all ages vary between 18.9 per cent and 45 per cent and he quotes Graham's figure for average mortality in army camps from empyema as 30.2 per cent. It is well known that in anaerobic infections following lung abscesses prognosis is poor. Eloesser [2] writes "Most fatal is the empyema caused by sudden rupture of a lung abscess into a defenseless virgin pleural cavity," and he compares anaerobic empyemas to the fulminating diffuse peritonitis following a ruptured bowel.

Review of the literature by Bufford and Blades [3] shows a reduction in the incidence of empyema following pneumonia from 5 per cent to 1 per cent since the introduction of sulfonamide therapy. However, when empyema does occur after the use of the sulfonamide drugs such cases are more difficult to treat. In their series of 30 cases of unselected empyemas, which occurred during or after sulfonamide treated pneumonias, two deaths occurred, in 2 cases it was necessary to perform secondary drainage operations and in 9 cases there was considerable delay in the expansion of the lung.

The poor results of the treatment of empyema reported in the literature have led to search for other methods of therapy of this serious complication. Keefer,

1. Moschcowitz, cited by Irons, E. E.: Empyema, in Cecil, R. L.: Textbook of Medicine, Philadelphia, W. B. Saunders Company, 1942, p. 983.
2. Eloesser, L.: Acute Empyema, in Christopher, F.: Textbook of Surgery, Philadelphia, W. B. Saunders Company, 1942, pp. 959-964.
3. Bufford, T. H., and Blades, B.: The Influence of Sulfonamide Therapy on Post-Pneumonic Empyema, J. A. M. A. **118**: 950-952 (March 21) 1942.

Blake and their associates[4] were among the first to report the use of penicillin in empyema. We feel that it may be of interest to report 5 consecutive cases of acute empyema of varied etiology, 2 of which followed rupture of lung abscesses into the pleural cavity, treated medically in a somewhat unorthodox manner.

REPORT OF CASES

CASE 1.—A white man aged 26 was admitted Dec. 13, 1943 to the hospital because of a sulfonamide resistant acute gonorrhea complicated by a right epididymitis. On December 20, one week after admission, the patient developed a severe lancinating pain in the right side of his chest, aggravated by deep inspiration and cough. His temperature was 99 F. orally; breath sounds were found to be diminished over the right base and no rales were heard. The patient improved subjectively during the next few days, but on December 23 he became much worse and appeared acutely ill; his temperature rose to 105 F. Signs of diffuse pneumonic involvement in the right lung were confirmed by x-ray examination of the chest, which showed a diffuse stringy infiltration throughout the right lung field. The white blood cell count on December 23 was 13,500, with 92 per cent polymorphonuclears. Sulfadiazine therapy was started the same day. The patient became cyanotic and was placed in an oxygen tent. He expectorated 3 to 4 ounces of bloody sputum daily, and his temperature fluctuated between 101 and 105 F. orally. An x-ray of the chest taken on December 27 showed a "hydropneumothorax," right side, with a fluid level reaching up to the seventh rib posteriorly, which was ascribed to a bronchopleural fistula. Blood culture was negative. The sputum showed hemolytic Streptococcus alpha on smear and culture. The patient's general condition became progressively worse in spite of sulfadiazine therapy, and he appeared to be critically ill. Seventy-four Gm. of sulfadiazine and 8 Gm. of sulfanilamide had been given orally with no apparent effect on the patient's condition.

On Jan. 5, 1944 penicillin therapy was started. On that day the red blood cell count was 3,790,000, with 80 per cent hemoglobin. The white blood cell count was 24,250, with 90 per cent polymorphonuclears and 10 per cent lymphocytes; the sedimentation rate was 52 mm. per hour. Twenty-five thousand units of penicillin was given intramuscularly every three hours. In addition, a thoracentesis was done and 350 cc. of hemorrhagic pus was removed from the right side of the chest and replaced by 100,000 units of penicillin in isotonic solution of sodium chloride. The chest fluid showed many pus cells and red blood cells with diffuse hemolysis, but no bacteria were found on smear or culture. The patient felt somewhat better the next day and his expectoration diminished. Thoracentesis was repeated January 7 and 250 cc. of reddish brown pus was removed from the right side of the thorax and replaced by 100,000 units of penicillin in 125 cc. of saline solution. Transfusion of 500 cc. of blood was given the same day because of the patient's anemia. The temperature became normal January 9 and remained normal, while leukocyte and differential counts were reported to be within normal limits. Aspiration of the right side of the chest was again performed January 13, and it was noted that the exudate changed from reddish brown to green; 210 cc. of pus was withdrawn and replaced by 50,000 units of penicillin in 100 cc. of saline solution. The patient improved and a definite decrease in the amount of sputum, with a loss of its bloody character, was noted.

On January 12 the intramuscular penicillin was decreased to 90,000 units daily and was discontinued altogether on January 17. A total of 1,850,000 units of penicillin had been administered to the patient, of which 250,000 units had been injected locally into the pleural cavity. The final thoracentesis was performed on January 21, when 50 cc. of greenish pus was removed from the chest, with no replacement by penicillin. The patient felt well; dulness on percussion at the right base with diminished breath sounds persisted. X-ray of the chest on January 29 showed increased density at the right base with no fluid level seen. A gradual clearing of the density of the right lung, ascribed to resolving fibrinous pleurisy, was noted on serial x-rays. The sedimentation rate dropped to 10 mm. per hour on February 10. The patient became ambulant early in February; he was given a convalescent furlough March 10 and was discharged to duty two and one-half months later.

CASE 2.—A white man aged 21, a German prisoner of war, gave a history of having been shot on May 4, 1943, with a shell fragment entering the left side of his chest at about the sixth rib posteriorly and leaving the left axilla in the region of the eighth rib. He was treated in a hospital in North Africa for about three months and was sent to the United States about Nov. 8, 1943.

He felt well and had no complaints until Jan. 14, 1944, when he began to have chills, fever, fatigue, weakness and pain in the left side of the chest on deep inspiration. No history of cough, sore throat or dyspnea was elicited.

He was admitted the following day to the station hospital, where on examination his oral temperature was 102 F., pulse rate 96 and respiratory rate 22. Dulness on percussion with suppression of breath sounds in the left lung, more prominent over the left base, was found. No rales were heard and no cyanosis was noted. The blood count on January 16 showed that white cells were 14,650, with 77 per cent polymorphonuclears and 21 per cent lymphocytes. The patient was given sulfadiazine therapy and his temperature subsided in a few days. He became ambulant but had a relapse January 28 with pain in the left side of the chest and rise of temperature to 104 F. X-rays of the chest taken January 17 and January 28 revealed "hydropneumothorax," left side, with fluid about the level of the fourth rib anteriorly and displacement of the heart to the right. Thickening of the pleura along the lateral chest wall was noted, with irregular defects in the left sixth and seventh ribs. Thoracentesis was performed and 30 cc. of thick, foul pus was removed from the left side of the chest. Aspiration of the chest was repeated January 30 and 300 cc. of purulent fluid was withdrawn. Culture of the pleural fluid showed gram positive cocci. The patient was transferred February 6 to this hospital for observation and treatment.

On examination in this hospital the patient appeared to be toxic and emaciated. The temperature fluctuated between 97 and 104.6 F. On physical examination signs of fluid over the right base were found and were confirmed by x-ray examination of the chest. It was felt that the patient had a pyopneumothorax secondary to osteomyelitis of the sixth and seventh ribs. A thoracentesis was performed February 8. One hundred and fifty cc. of thick, greenish, foul pus was withdrawn from the left side of the chest posteriorly and the pleural cavity was irrigated with 1:3,500 of fresh aqueous azochloramid. Sulfadiazine was given at the same time orally. Culture of the pleural fluid showed Proteus vulgaris and Staphylococcus aureus. On February 9 the white blood cells numbered 15,650, with 69 per cent polymorphonuclears and 30 per cent lymphocytes, and the sedimentation rate was 49 mm. per hour. Thoracenteses and irrigations of the pleural cavity with fresh 1:3,500 azochloramid aqueous solution were repeated approximately every other day. From 300 to 400 cc. of pus was removed each time and from 120 to 150 cc. of azochloramid solution was injected into the pleural cavity after each irrigation. The sulfadiazine level was about 9 mg. per hundred cubic centimeters. On this treatment the pus became progressively more fluid and less foul. As the patient's condition improved, aspirations were done less frequently and, on February 24, 100 cc. of clear serous fluid was removed from the left side of the chest and no irrigation with aqueous azochloramid was performed. The fluid gradually absorbed, and on the last x-ray, taken March 9, no fluid in the chest was seen and the left lung was reexpanding. The temperature became normal on February 17 and the patient remained afebrile during his stay in the hospital. A total of 45 Gm. of sulfadiazine was given to the patient. The blood count gradually subsided to normal, and the last sedimentation rate was 10 mm

4. Keefer, C. S.; Blake, F. G.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections, J. A. M. A. 122:1217-1224 (Aug. 28) 1943.

per hour: The patient had no subjective complaints during his last three weeks of hospitalization, was ambulant, and was transferred to another general hospital for administrative reasons March 15, 1944.

CASE 3.—A white man aged 25, a German war prisoner, was admitted to the station hospital Oct. 17, 1943 with a history of pain in the chest and dyspnea of twenty-four hours' duration; his temperature on admission was 104 F. Physical examination revealed irregular dulness and flatness, bronchial breathing and fine crepitant rales throughout both lower lobes posteriorly. A diagnosis of lobar pneumonia, both lower lobes, was made; x-rays of the chest showed at first a pneumonic process in the left lower lobe, with later spread of pneumonic involvement to the right lower lobe. Sulfadiazine therapy was started October 17 and discontinued October 28, with a total of 84.5 Gm. given. Oxygen therapy was administered at the same time. Sputum examinations showed Staphylococcus aureus, Staphylococcus albus and Friedlander's bacilli on various occasions. The white blood cell count varied from 6,300 to 12,250. The sulfadiazine level fluctuated between 10.8 and 17.8 Gm.

In spite of the intensive sulfadiazine therapy the patient's temperature remained elevated, fluctuating between 98.2 and 103 F. It subsided about October 27, only to rise again to 104 F. two days later, and then fever continued up to 101.4 F. Signs of fluid in the left base were elicited. On serial x-ray films an area of increased density suggestive of pneumonic involvement in the right pericardiac region was noted; in the left lung field a sharply circumscribed mass, radiating from the hilar area and extending about half way to the chest wall, suggestive of encapsulated empyema, was seen. Culture of the sputum was positive for hemolytic Staphylococcus aureus. On Jan. 4, 1944 a thoracentesis was done and 20 cc. of thick pus was withdrawn from the left side of the chest. Staphylococcus albus was isolated on smear and culture from the chest fluid. The patient was transferred January 12 to this hospital for treatment.

On admission to this hospital the patient appeared to be toxic and weak. He had a severe cough and a low grade fever with occasional rise to 102 F.; on physical examination signs of fluid at the left base were elicited. A thoracentesis was done and 400 cc. of sanguineous, purulent fluid was removed from the left side of the chest and 50,000 units of penicillin in 200 cc. of saline solution was injected into the empyema cavity. Smear and culture of the fluid showed Staphylococcus aureus. An x-ray film of chest taken the next day showed an increase in density in the left side, with apparent rupture of the encapsulated empyema into the pleural cavity. The blood count was essentially normal. On January 19 a second thoracentesis was done and 175 cc. of hemorrhagic purulent fluid was removed and replaced by 32,500 units of penicillin in 130 cc. of saline solution. Staphylococcus albus was isolated from this fluid on smear and culture. On January 28 a third thoracentesis was done and 100 cc. of pus was withdrawn and 25,000 units of penicillin in 100 cc. of saline solution was injected into the empyema cavity. The fluid withdrawn proved to be sterile on smear and culture. An x-ray film of the chest on January 26 showed an area of increased density to be smaller, with a small localized pyopneumothorax near the left side of the mediastinum, with fluid level at the anterior end of the third left rib. The patient's temperature dropped to normal January 28 and remained normal. On February 15 x-ray examination of the chest showed only slight thickening of the pleura in the left mediastinal region. The localized area of density and fluid level had apparently disappeared; obliteration of the left costophrenic sinus was noted; the right lung was apparently clear. The patient improved subjectively and had very few complaints except for occasional pains in the left side of chest. A total of 107,500 units of penicillin had been injected into the pleural cavity during the three thoracenteses. No other specific therapy was given during his stay at this hospital. The patient was discharged from the hospital for administrative reasons in the beginning of March 1944.

CASE 4.—A white man aged 25 was admitted to the station hospital Feb. 21, 1944 because of an upper respiratory infection, which was followed by a diffuse pemphiginous eruption consisting of vesicles and bullae, varying in size up to half a dollar (30 mm.) and involving the mucosa of the oral cavity and conjunctiva; the eruption rapidly spread and covered most of the body. The temperature fluctuated between 99 and 106 F. The patient was treated with 440,000 units of penicillin administered between February 27 and March 5. By March 11 the bullae disappeared with resultant macular stains and persistent fetor oris. On March 13 the patient began to complain of pain in the lower right side of the chest; his temperature rose to 103 F. Breath sounds were diminished over the right base and x-ray examination of the chest showed pneumonic involvement in the right lower lobe. Penicillin therapy was started again; 5,000 units was administered intramuscularly every two hours and discontinued on March 16. A total of 150,000 units was given in three days. A diagnosis of lung abscess, right side, confirmed by x-ray examination of the chest, was made on March 20. Rapid progressive increase in the abscess was noted, and penicillin therapy was renewed March 21 with about 120,000 units given by March 23, at which time it was discontinued. The patient was expectorating about 1 pint of foul, bloody mucopus daily. He became rapidly worse, he had chills and his temperature was fluctuating between 98 and 105.6 F. orally. A total of about 710,000 units of penicillin was given during the three periods of treatment in the station hospital. Because of a progression of the pathologic condition the patient was transferred to this hospital on March 30, 1944.

On admission to this hospital the patient appeared to be toxic, somewhat irrational and critically ill; his temperature was 104.4 F. On physical examination signs of fluid over the right base and of acute diffuse bronchitis were elicited. The white blood cells numbered 24,000, with 80 per cent polymorphonuclears; the sedimentation rate was 62 mm. per hour; blood culture was negative. X-ray examination of the chest showed diffuse irregular density throughout the middle and lower lobes of the right lung; density in the right base was noted, with a shifting fluid level in the seventh interspace posteriorly, reaching the chest wall laterally. The impression from clinical and x-ray findings was lung abscess, with rupture into the pleural cavity and resulting empyema at the right base.

The patient was placed in an oxygen tent and on postural drainage. Sulfadiazine therapy was started on admission, supplemented April 1 by 25,000 units of penicillin intramuscularly every three hours because of his presumably mixed infection. He expectorated about 6 ounces of bloody, greenish sputum daily, at times foul in character. Sputum examination showed alpha streptococci, Staphylococcus aureus and Neisseria catarrhalis.

A thoracentesis was performed April 2, and 250 cc. of sanguineous, foul pus was removed and replaced by 50,000 units of penicillin in isotonic solution of sodium chloride. Laboratory examination of the purulent exudate showed nonhemolytic streptococci on culture; the pleural fluid sugar was too low to be determined colorimetrically; the white blood cells numbered 33,000, with 86 per cent polymorphonuclears and diffuse hemolysis of red blood cells. Thoracentesis was repeated two days later and 210 cc. of greenish pus was removed from the right pleural cavity. The pleural fluid was not as foul as it was the first time, and it was negative on smear and culture for pathogenic micro-organisms, as were succeeding pleural fluids; 100,000 units of penicillin in 100 cc. of isotonic solution of sodium chloride was injected into the pleural cavity. A transfusion of 500 cc. of blood was given the same day because the patient's hemoglobin had dropped to 52 per cent. The patient continued to improve and his temperature subsided to 99-101 F. Thoracentesis was repeated April 6, with 70 cc. of greenish pus removed and replaced by 200,000 units of penicillin intrapleurally. His temperature subsided to normal April 7 and remained normal. The expectoration decreased gradually to 1 to 2 ounces daily and became greenish instead of bloody and lost its foul odor. On April 7 the red blood cells numbered 3,520,000, hemoglobin 78 per cent Sahli, white

blood cells 7,600, with essentially normal differential count. Another thoracentesis was performed April 10 and 70 cc. of greenish pus was removed and replaced by 40,000 units of penicillin in isotonic solution of sodium chloride; the same day the penicillin dosage was cut to 90,000 units intramuscularly and sulfadiazine was diminished to 4 Gm. daily. The blood sulfadiazine level fluctuated between 5.3 and 8 mg. per hundred cubic centimeters. The patient continued to improve; cough and expectoration disappeared and his appetite was good.

On April 17 the last thoracentesis was performed and 20 cc. of yellowish-brown seropurulent fluid was removed from a small empyema pocket between the eighth and ninth ribs posteriorly. The cavity was irrigated with saline solution and 8,000 units of penicillin was instilled intrapleurally. Sulfadiazine therapy was discontinued April 14, while penicillin was discontinued April 17. A total of 78 Gm. of sulfadiazine was administered; 2,445,000 units of penicillin was given to the patient intramuscularly and 398,000 units into the pleural cavity. The patient improved steadily; he gained about 35 pounds (16 Kg.) during his stay in the hospital. Serial x-ray films of the chest showed thickening of the right pleura and obliteration of the right costophrenic sinus, with progressive resolution in the pleural pathologic condition. The last x-ray examination of the chest showed elevation of the right diaphragm, but the right lower lobe appeared to be clear otherwise. The patient became ambulatory about April 25. He became progressively more active but because of a residual persistent bronchitis was discharged from the Army the beginning of August 1944.

CASE 5.—A white man aged 30 gave a history of chronic cough for about three years. He had had malaria in September 1942, with recurrence in June 1943. About March 28, 1944 he began to have severe pain in the left side of his chest, aggravated by deep inspiration; he was admitted to the station hospital April 3, 1944.

On admission his temperature was 101.4 F. orally. Physical examination of the chest revealed pneumonic involvement of the left lower lobe. The white blood cells numbered 14,100, with 84 per cent polymorphonuclears. The sedimentation rate was 55 mm. per hour. The sputum was negative for pneumococci and tubercle bacilli. The x-ray film of the chest taken April 4 showed an elliptic area of decreased density suggestive of cavity formation with fluid level, probably lung abscess, in the left lung field. The patient was placed in an oxygen tent, and sulfadiazine was given for three days, with the blood level reaching 10.2 mg. per hundred cubic centimeters. As the patient did not improve, sulfadiazine therapy was replaced by penicillin April 6; 25,000 units was given intramuscularly every three hours. An x-ray film of the chest taken April 8 showed an increase in pneumonic involvement and two areas of increased density suggestive of a double lung abscess on the left side. A thoracentesis was attempted, but no fluid was obtained. Because of rapid progression of the pulmonary lesions in spite of intensive therapy, the patient was transferred to this hospital April 8 for further treatment and observation.

On admission to this hospital the patient appeared to be seriously sick. His face was flushed and he reacted sluggishly. His temperature was 102 F. on admission and fluctuated between 98.4 and 103 F. rectally; the pulse rate was 120. Signs of fluid in the left base up to about the seventh rib posteriorly and some crepitant rales above that area were noted; many sibilant rales were heard throughout the right side of the chest. The red blood cells numbered 4,090,000, with hemoglobin 76 per cent Sahli and white blood cells 17,550, with 83 per cent polymorphonuclears. Smear and culture of the sputum showed Staphylococcus aureus and alpha streptococci; blood culture was negative. X-ray examination of the chest showed diffuse density in the left base, with a definite fluid level extending to the left axilla in the region of the seventh rib. Because of clinical and x-ray findings, it was felt that the patient had a double lung abscess which had fused and ruptured into the pleural cavity with formation of an empyema.

Because of the severity of the disease and probable mixed infection, the patient was treated with a combination of sulfadiazine and penicillin. Sulfadiazine 4 Gm. followed by 1 Gm. every four hours, with an equal amount of sodium bicarbonate, was administered orally; 25,000 units of penicillin was given intramuscularly every three hours. The patient was placed on postural drainage and he expectorated from 5 to 6 ounces of yellowish green sputum daily. A thoracentesis was performed April 10 and 75 cc. of greenish foul pus was removed from the left pleural cavity and replaced by 60,000 units of penicillin in isotonic solution of sodium chloride. Smear and culture of the pleural fluid showed gram positive cocci in chains, gram positive rods and gram negative rods. On April 12 another thoracentesis was done and 250 cc. of greenish yellow pus was removed from the left side of the chest and replaced by 100,000 units of penicillin in isotonic solution of sodium chloride.

Thoracenteses were repeated about every other day, with removal of greenish yellow pus varying in amount from 320 cc., April 17, to 70 cc. on April 26. The purulent fluid was replaced by 50,000 to 100,000 units of penicillin each time. Pus became gradually less foul until it lost its odor completely; cultures and smears of pleural fluids were persistently negative for pathogenic micro-organisms following the first positive smear and culture of pleural fluid. On April 17 416,000 white blood cells per cubic millimeter were reported on examination of the chest fluid, with 92 per cent polymorphonuclears and 8 per cent lymphocytes. Blood cell and differential count showed a mild leukocytosis with hemoglobin 94 per cent Sahli. The blood sulfadiazine level varied between 3.9 and 10.2 mg. per hundred cubic centimeters. Blood and stool cultures were negative for parasites. On May 6 the last thoracentesis was performed and 30 cc. of yellowish green purulent odorless fluid was withdrawn from the pleural cavity and replaced by 10,000 units of penicillin in saline solution. The sedimentation rate was reported as 46 mm. per hour on April 25, 23 mm. per hour on May 8, 7 mm. per hour on May 24 and 4 mm. per hour on July 8.

A total of 79 Gm. of sulfadiazine was given orally between April 8 and April 22; 2,450,000 units of penicillin was given intramuscularly and 560,000 units was injected into the pleural cavity. Serial x-rays of the chest showed progressive diminution in pleural pathologic change in the left side of the chest, and the last x-ray of the chest, taken July 8, showed a slight residual fibrosis throughout the left lower lobe, with elevation of the left diaphragm and partial obliteration of the left costophrenic sinus.

The patient has been feeling well, although he has had a cough; on examination, some sibilant and sonorous rales were heard throughout the chest, ascribed to an underlying allergic bronchitis. He was given a convalescent furlough June 26 and was sent for rehabilitation July 13. The general condition of the patient is good at the time of this report.

COMMENT

Five unselected patients with acute empyema, all seriously sick when first seen, were treated medically. Three of the cases were putrid empyemas, 2 of which followed ruptured lung abscesses with bronchopleural fistulas. We were impressed by the severity of the infection as shown by the hemorrhagic type of the purulent exudate in 4 of the cases, and the anaerobic type of infection in cases 2, 4 and 5, as evidenced by the foul odor of the pus. Lyons [5] has reported 4 cases of lung abscess, 2 of which were putrid and were not benefited by penicillin therapy, and 2 pyogenic cases in which improvement occurred after treatment with penicillin; 1 patient with hemolytic streptococcic empyema died in spite of treatment with penicillin. We feel that the cures in our 2 cases of lung abscess were probably due to the rupture into the pleural cavity, where the infection was more accessible to the effect of the therapeutic agents used.

5. Lyons, C.: Penicillin Therapy of Surgical Infections in the United States Army, J. A. M. A. 123: 1007-1018 (Dec. 18) 1943.

Keefer, Blake and their associates [4] reported 5 cases of postpneumonic empyemas, 2 of which improved after penicillin treatment; in 7 of 9 of their cases of staphylococcic empyema improvement or recovery followed treatment with the same therapeutic agent. Two of 3 cases of lung abscesses were treated by the same authors with penicillin; they reported two cures and one death, in spite of treatment.

In putrid empyemas repeated thoracenteses are considered definitely contraindicated by some writers. Maier and Grace [6] felt that aspiration in such cases was associated with considerable danger of infection of the chest wall. Four of their patients developed phlegmonous infections of the thoracic wall, and 2 of their patients, who were subjected to aspiration twice before thoracotomy, died. These authors concluded, therefore, that open thoracotomy with rib resection was the procedure of choice as soon as the diagnosis of putrid empyema was confirmed by diagnostic aspiration.

In our experience, a combination of sulfadiazine and penicillin given at the same time and associated with repeated aspirations of purulent exudate and its replacement by penicillin proved to be beneficial in cases of mixed infections, aerobic or anaerobic. No untoward effects were noted in putrid empyemas from repeated thoracenteses. We fully agree with Keefer, Blake and their associates that it is impossible at present to sterilize empyema cavities by the parenteral use of penicillin alone. Neither penicillin nor sulfadiazine, nor the combination of the two, can take the place of good medical judgment in replacing accumulations of pus with penicillin or azochloramid.

We were favorably impressed with the effect of combined sulfadiazine and azochloramid therapy in case 2, from the pleural fluid in which Proteus vulgaris and Staphylococcus aureus were isolated. It may be well worth further trial in cases not responding to penicillin therapy.

The importance of chemotherapy and antibiotics in treatment of infectious diseases is increasing steadily. We fully appreciate that the series of empyemas presented is too small to serve as the basis for definite conclusions, but the results are so encouraging that further trial with medical treatment of empyema as outlined is fully justified. The treatment of empyema, however, continues to be both a medical and a surgical problem.

SUMMARY

1. Two cases of putrid empyema due to ruptured lung abscesses were treated with combination of sulfadiazine and penicillin. Penicillin was administered intramuscularly and intrapleurally following repeated thoracenteses. Treatment resulted in rapid improvement and cure.

2. One case of postpneumonic empyema was treated with penicillin intramuscularly and intrapleurally, following repeated thoracenteses, with rapid improvement.

3. One case of postpneumonic empyema, apparently caused by Staphylococcus aureus and Staphylococcus albus, was treated with penicillin locally, following aspirations of pus, with progressive improvement and cure.

4. One case of empyema, apparently caused by Staphylococcus aureus and Proteus vulgaris, was treated with sulfadiazine orally, repeated thoracenteses and azochloramid intrapleurally, with rapid cure.

6. Maier, H. C., and Grace, E. J.: Putrid Empyema, Surg., Gynec. & Obst. 74: 69-74 (Jan.) 1942.

ADDENDUM

Since completion of this paper, one of us (H. R.) has successfully treated medically 3 more cases of empyema. Sulfadiazine orally and azochloramid instilled locally following each of repeated thoracenteses were used in 1 case. In 2 others, 1 complicating staphylococcic septicemia, local and parenteral penicillin was employed in addition to oral sulfadiazine and repeated aspirations of empyema cavities.

THE VALUE OF PENICILLIN IN THE TREATMENT OF EMPYEMA

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DETROIT

Penicillin is almost nontoxic for man, yet it exerts a powerful antibacterial action against a wide variety of micro-organisms. Unlike the sulfonamides, penicillin is not inhibited by pus or other products of tissue destruction.[1] When given intravenously or intramuscularly, it penetrates poorly into collections of pus, but if it is injected directly into an abscess it remains there for some time and may be found in considerable concentration as long as twenty-four to forty-eight hours after its injection.[2] These unusual properties of penicillin have led some workers [3] to treat empyema by aspiration of the pus, followed by instillation of penicillin. Theoretically, if this form of treatment is to be successful, the following conditions should prevail:

1. The causative bacteria must be susceptible to penicillin.
2. It must be possible for penicillin instilled in the empyema to contact all of the bacteria. Some empyemas are loculated so that it is impossible to reach all of the pockets with an aspirating needle.
3. The cavity must not contain pieces of necrotic lung or large clots of fibrin. Many empyemas of long standing, especially those caused by pneumococci, contain clots of fibrin several inches in diameter. An occasional empyema contains a piece of necrotic lung in the interstices of which bacteria are protected. Penicillin will not sterilize an empyema until these fibrin clots and pieces of necrotic lung are removed.

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From the Department of Surgery and the Department of Bacteriology, Wayne University College of Medicine, and the Division of Surgery, City of Detroit Receiving Hospital.

1. Florey, M. E., and Florey, H. W.: General and Local Administration of Penicillin, Lancet 1: 387-397 (March 27) 1943.
2. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, J. Clin. Investigation 22: 425-437 (May) 1943.
3. Bennett, T. I., and Parkes, T.: Penicillin in Sulfonamide Resistant Pneumonias with Special Reference to Staphylococcal Infection and Empyema, Lancet 1: 305-308 (March 4) 1944. Bloomfield, A. L.; Kirby, William, and Armstrong, C. D.: A Study of "Penicillin Failures," J. A. M. A. 126: 685-691 (Nov. 11) 1944. Butler, E. C. B.; Perry, K. M. A., and Valentine, F. C. O.: Treatment of Acute Empyema with Penicillin, Brit. M. J. 2: 171-175 (Aug. 5) 1944. D'Abreu, A. L.; Litchfield, J. W., and Thomson, Scott: Penicillin in the Treatment of War Wounds of the Chest, Brit. J. Surg. (supp.) 32: 179-198 (July) 1944. Dawson, M. H., and Hobby, G. L.: The Clinical Use of Penicillin: Observations in 100 Cases, J. A. M. A. 124: 611-622 (March 4) 1944. Jeffrey, J. S., and Thomson, Scott: Penicillin in Battle Casualties, Brit. M. J. 2: 1-4 (July 1) 1944. Keefer, C. S.; Blake, F. G.; Marshall, E. K.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections: A Report of 500 Cases, J. A. M. A. 122: 1217-1224 (Aug. 28) 1943. Lockwood, J. S.; White, W. L., and Murphy, F. D.: The Use of Penicillin in Surgical Infections, Ann. Surg. 120: 311-349 (Sept.) 1944. Roberts, J. E. H.; Tubbs, O. S., and Bates, M.: Pleural and Pulmonary Suppuration Treated with Penicillin, Lancet 1: 39-45 (Jan. 13) 1945. Tillett, W. S.; Cambier, M. J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, Bull. New York Acad. Med. 20: 142-178 (March) 1944.

4. The anatomic conditions such as bronchial fistulas that cause constant reinfection of the cavity and allow the penicillin to escape must not be present. Bronchial fistulas, present more often than is generally realized, not only permit constant contamination of the cavity by organisms from the mouth but make it impossible to keep penicillin in the empyema.

5. The lung must be capable of reexpanding. Since reexpansion of the lung is the means by which empyema is cured it is obvious that, if the lung is not capable of reexpanding, aspiration of pus and instillation of penicillin will not suffice to heal the lesion.

There is no doubt that penicillin when properly used will obviate the need of surgical drainage in certain cases of empyema. Those responding to penicillin are chiefly the cases that have been detected relatively early when the pus is still thin and those in which none of the complications described are present. There is also no doubt however that, even when the complications described are present, penicillin can be of considerable aid as an adjunct to surgery. By means of penicillin and aspiration a large empyema can often be transformed into a small one that the lung can obliterate more quickly after rib resection. It is also possible to tide a critically ill patient over a period during which surgical intervention is hazardous. However, if the empyema is not bacteriologically and anatomically such that it will respond to penicillin therapy, to persist with aspiration of pus and instillation of penicillin is useless. An empyema is cured by expansion of the lung. Once the pleura becomes so thick that the lung cannot reexpand, an empyema cannot be cured by any means short of an operation designed to move the chest wall in to meet the lung. Such a procedure is serious and deforming and often must be done in stages. Drainage of an empyema by resecting a small section of rib under local anesthesia is such a trivial procedure compared to the operation for obliteration of chronic empyema that one is not justified in risking the possibility of having to do the latter in hopes of avoiding the former. It is rational then to treat an empyema by aspiration of pus and instillation of penicillin as long as rapid improvement is being made. If the patient becomes afebrile and the fluid decreases in amount, becomes sterile on culture and resembles the penicillin that was injected, satisfactory progress is being made. However, if the patient has a persistent fever, if the pus continues to accumulate and if the cavity fails to decrease rapidly in size, surgical drainage should be accomplished without further temporizing.

To summarize, use penicillin:

1. To cure small empyemas without loculation, lung sequestrums or bronchial fistulas.
2. To make large empyemas smaller.
3. To tide over a critically ill patient until he can be operated on safely.

The following cases, selected from those that have been treated with penicillin at the City of Detroit Receiving Hospital, illustrate these points:

REPORT OF CASES

CASE 1.—C. M., a Negro aged 39, was admitted on April 15, 1944 with multiple stab wounds, one of which involved the left chest wall, the diaphragm and the stomach. Because the patient had consumed a large meal and considerable alcohol shortly before injury, his stomach was full and there was extensive soiling of the peritoneum. The wounds were repaired, and the chest and abdomen were closed without drainage. Postoperatively a pleural effusion developed on the left. On the fifth day following injury the abdominal wound disrupted. This was resutured under general anesthesia. The temperature, which had been elevated from the time of the first operation, remained elevated. On May 8, twenty-two days after admission, 60 cc. of pus was obtained from the left pleural cavity. Nonhemolytic streptococci and unidentified anaerobic cocci were recovered from the pus. The streptococci were sensitive to 0.04 unit per cubic centimeter of penicillin in vitro; the sensitivity of the anaerobic cocci to penicillin was not tested. Beginning on May 12 the empyema was aspirated daily and each aspiration followed by the instillation of 50,000 units of sodium penicillin in a few cubic centimeters of saline solution. The pus maintained its purulent character but gradually decreased in amount. On June 10, only 1 cc. could be obtained, and no further aspirations were done. The temperature became normal after thirteen days of therapy, and the patient has remained well to date.

Cultures of the pus were as follows:

May 8 and 13, nonhemolytic streptococci and unidentified anaerobic cocci.

May 14, aerobic gram positive spore forming bacilli.

May 17 and 25, nonhemolytic streptococci and unidentified anaerobic cocci.

June 4 and 9, no growth.

In this instance the empyema was small, was not loculated, was easily aspirated and was caused by organisms susceptible to penicillin. Aspiration of the pus followed by instillation of pencillin was therefore sufficient to cure the lesion. However, it required twenty-three days to sterilize the empyema and thirty days of therapy in spite of the sensitivity of the streptococcus to penicillin. The morbidity was about equal to that which would have accompanied surgical drainage; hence, while the treatment was successful, it had no great advantage over surgery. If, on the seventeenth day, it had been decided to do a rib resection because the pus had not yet been sterilized, the period of morbidity would have been longer than thirty days. Often during the treatment of empyema with penicillin it is difficult to decide whether the therapy is effective. Sometimes the patient improves clinically but the pus does not become sterile. At other times the pus becomes sterile but the patient remains febrile. Under such circumstances it is difficult to decide whether persistence in the treatment will result in a cure or whether rib resection will ultimately be necessary. If one resorts to rib resection after three weeks of penicillin therapy, the period of morbidity is prolonged. However, if one persists for many more weeks, one is risking the occurrence of chronic empyema if the treatment is not effective. The next case illustrates these difficulties:

CASE 2.—J. B., a white man aged 51, was admitted on Feb. 18, 1944 with type II pneumococcic pneumonia involving the right lower lobe. Treatment with sulfamerazine resulted in a slight improvement, but the patient's temperature remained elevated. On March 1 250 cc. of thick pus yielding a type II pneumococcus was aspirated from the right pleural cavity. Following removal of the pus, the patient's temperature fell to normal and remained normal until March 6, when it rose again to 102-103 F. On March 6 the empyema was aspirated and 50,000 units of penicillin was instilled into the cavity. Aspiration and instillation were repeated twice daily for three days and then once daily for sixteen more days until March 25. Cultures of the pus during this period were as follows:

March 6 and 7, type II pneumococci.

March 8, 9, 10, 12, 13, 14 and 15, sterile.

March 24, type II pneumococci.

Although the pus appeared to become sterile shortly after the instillation of penicillin, the patient did not improve clinically. His temperature remained elevated and pus continued to

accumulate. In spite of the large amount of pus that was present, it was often difficult to withdraw much with a syringe because, as was subsequently shown at operation, large clots of fibrin blocked the needle. Since the patient failed to improve, it was decided to supplement the local instillation of penicillin with penicillin given intramuscularly. From March 14 to March 25 the patient received 10,000 units of penicillin intramuscularly every two hours in addition to the daily injection of 50,000 units in the empyema. During this regimen his temperature approached but did not reach normal, and the pus continued to accumulate. On March 24, after six negative cultures, pneumococci were again recovered from the pus. Accordingly it was decided to do a rib resection. Operation on March 28 disclosed a large cavity containing almost a liter of thick pus in which were many huge clots of fibrin. The pus obtained at operation was sterile. The character of the pus and the presence of fibrin apparently had prevented aspiration of the cavity.

This patient required rib resection after three weeks of very intensive penicillin therapy. The cavity was unilocular and easily accessible but contained so much thick material that it was impossible to aspirate the pus properly. The probable location of the pneumococci in the protected meshes of the fibrin was perhaps responsible for the positive culture on March 24, after twenty days of therapy, and for the continued accumulation of pus. Sixty-five days were required for healing. In this case reliance on penicillin prolonged rather than shortened the period of morbidity.

Case 3 illustrates the improvement that penicillin therapy can bring about in putrid empyema, but it at the same time illustrates one of the dangers of this form of treatment. The patient, feeling so much better because of the therapy, refused operation and left the hospital while viable streptococci could still be recovered from the pus in his chest. He may well develop chronic empyema.

CASE 3.—H. W., a white man aged 64, was admitted complaining of pain in his right chest of three days' duration. He had signs of right lower lobe pneumonia, but no pneumococci were found in the sputum. His temperature ranged between 100 and 102 F. He developed fluid in the right pleural cavity, and on Oct. 19, 1944 the chest was aspirated and a large quantity of pus obtained. Alpha hemolytic streptococci were recovered on culture. Unfortunately no anaerobic cultures were made, but the foul character of the pus indicated that anaerobes must have been present. There was some delay in obtaining penicillin, so the chest was not aspirated again until October 25, when 1,500 cc. of very foul pus resembling pea soup in appearance was obtained. Following the aspiration, 50,000 units of penicillin in about 80 cc. of saline solution was instilled in the empyema. On October 27 550 cc. of pus, which was no longer foul, was obtained. The temperature fell to normal on this day and remained normal for the rest of the hospital stay. Aspiration of pus and instillation of 50,000 units of penicillin was done daily until November 9. Although the fluid decreased in amount, only about 100 cc. being obtained the last few times it remained purulent and, except for an isolated sterile culture on November 2, always contained viable streptococci. On November 9, after two weeks of therapy, rib resection was advised, but the patient felt so well that he refused operation. Penicillin therapy was stopped. Aspiration on November 23 yielded 50 cc. of thin, brown, odorless fluid from which streptococci were grown on culture. Aspiration on December 4 yielded only 4 cc. of fluid, but on December 7 30 cc. was obtained. X-rays still revealed an encapsulated empyema.

On December 8 the patient left the hospital against advice. Although the empyema may in this case go on to resolution, the patient left the hospital with fluid which still contained streptococci in his pleural space. It is well known that such lesions may remain quiescent for months or even years and then flare up. We are inclined to believe, therefore, that eventually the patient will develop chronic empyema. There is no doubt that penicillin improved this patient's condition by reducing the size of the empyema and by killing the anaerobes, which were apparently originally present in the pus. If rib resection had been done when his chest contained 1,500 cc. of foul pus, a long time would have been required for reexpansion of the lung. However, if rib resection had been done after reduction in the size of the empyema cavity by one to two weeks of penicillin therapy, expansion would have occurred rapidly. Used to reduce the size of an empyema before operation, penicillin is of considerable value.

CASE 4.—O. H., a white man aged 47, was admitted on Oct. 9, 1944 with multiple stab wounds, one of which had entered the peritoneal cavity, lacerating the omentum and the liver. The patient had consumed sufficient alcohol to make him very uncooperative, and it was necessary to use general anesthesia in order to keep him quiet enough to permit repair of his wounds. Postoperatively he developed pleural effusion on the right. On October 20 aspiration of the right pleural cavity yielded 1,100 cc. of thin, brown fluid. No culture was made. The patient's temperature at this time was 101-102 F. Treatment with sulfadiazine was begun, the initial dose of 4 Gm. being followed by 1 Gm. every four hours. The temperature declined over a three days period to 99-100 F., where it remained until November 1, when the chest was again aspirated. Only a small amount of very thick pus was obtained. Type VIII and type XV pneumococci were recovered from the pus; 50,000 units of penicillin was injected into the empyema. Aspiration followed by injection of 50,000 units of penicillin was repeated daily until November 6, The cultures became negative after twenty-four hours of therapy. The temperature also fell to normal after twenty-four hours of therapy and remained normal. The patient has remained well to date.

This patient was treated successfully by only a few injections of penicillin. The good response in this case, as in the following one, was probably due to the small size of the empyema and the susceptibility of the organisms to penicillin.

CASE 5.—E. S., a white man aged 42, was admitted on March 28, 1944 for treatment of peritonitis caused by perforation of a peptic ulcer three days previously. Although his temperature was only 99-100.6 F. the patient was critically ill. On April 5 his temperature rose to 103 F. and he developed signs of a subdiaphragmatic abscess. On April 8 the posterior subdiaphragmatic area was explored; no definite pus was encountered, but the entire area contained fresh fibrinous adhesions between which were collections of clear fluid. There was no improvement following the operation, and by April 12 pleural effusion had developed. The temperature remained elevated. Fluid was aspirated from the right chest on April 14, but it clotted rapidly and no cultures were made. On April 17 the anterior subdiaphragmatic space was opened and a large abscess drained; beta hemolytic streptococci and Escherichia coli were recovered. Following drainage the patient's condition improved somewhat, but his temperature continued to rise and it was obvious that another collection of pus was present. On May 1 200 cc. of thin pus was aspirated from the right pleural cavity. Beta hemolytic streptococci, which were sensitive to 0.01 unit of penicillin per cubic centimeter, were recovered from the pus. On May 5 aspiration was repeated and 40,000 units of penicillin was instilled in the cavity. Aspiration and instillation were repeated daily for three days, and then 50,000 units of penicillin was injected daily for four days. The pus became sterile after the first twenty-four hours of treatment and decreased rapidly in amount. The last attempt at aspiration on May 15 yielded only a few cubic centimeters of fluid. The empyema has not recurred.

CASE 6.—V. B., a white woman aged 26, admitted on May 15, 1944, had had a pelvic operation three weeks prior to admission at another hospital, following which some sort of pulmonary complication occurred. This had not subsided, and she was acutely ill when she was admitted to the Detroit Receiving Hospital. On May 17 200 cc. of very foul, green pus was aspirated from the right pleural cavity. An anaerobic nonhemolytic streptococcus and alpha hemolytic streptococci were cultured from the pus. On May 20 the patient suddenly became critically ill. She was cyanotic and dyspneic and on physical examination exhibited not only signs of hydropneumothorax on the right but also numerous moist rales throughout the left lung. Her temperature was 104 F. It was believed that she had developed a bronchopleural fistula and had soiled the left lung with pus from the empyema. The empyema was completely aspirated and 50,000 units of penicillin was injected. Aspiration and instillation were repeated daily for thirteen days and the patient was also given 10,000 units of penicillin intramuscularly every hour for twenty-two days in order to control the soiling of the left lung. The patient's general condition improved slowly. Twenty-four hours after the onset of therapy the temperature fell to 100-101 F., where it remained for nine days before leveling off at normal, 100 F. The pus that was aspirated decreased steadily in quantity, lost its foul odor and changed to a thin brown fluid. The cultures were as follows:

May 19 and 20, 1944 alpha hemolytic streptococci and anaerobic nonhemolytic streptococci.

May 23, aerobic gram positive spore forming bacilli.

May 24, 25 and 27, sterile.

Although the empyema decreased in size, the bronchopleural fistula prevented the lung from reexpanding completely, and the patient continued to have a low grade fever. On May 8 a rib resection was done. This disclosed a small empyema into which there were several bronchial openings. Cultures from the walls of the cavity yielded anaerobic nonhemolytic streptococci.

In this instance penicillin therapy apparently saved the life of a critically ill patient. The penicillin that was given intramuscularly controlled the infection in the left lung, while further soiling was prevented by a combination of aspiration of the empyema and instillation of penicillin. By these means the patient's condition was improved and the size of the empyema was greatly reduced. When rib resection was finally done it was a simple procedure in a patient who was in good condition.

The next case illustrates a similar but more complicated problem:

CASE 7.—E. S., a white man aged 39, was admitted on Oct. 21, 1944 with type II pneumococcic pneumonia involving the right lower and middle lobes. He had been ill at home for seven days. At the time of admission his temperature was 105 F. and he was comatose. Because of his serious condition he was treated with penicillin, receiving an initial dose of 30,000 units intravenously and 20,000 units intramuscularly. This was followed by 15,000 units intramuscularly every three hours for fourteen days. Over the course of a week the temperature gradually fell to levels of 99-100 F. and considerable improvement had occurred. On November 4, when penicillin was discontinued, his temperature rose abruptly to 102 F. and remained at about this level until November 10, when it again fell almost to normal. In spite of the lowered temperature he continued to show anorexia, lethargy, a cough and weakness. During the next few weeks he improved slightly but had periods with a relatively normal temperature alternated with periods of fever. Because of the persistent signs of infection, consolidation of the right lower lobe, the absence of demonstrable empyema and x-ray evidence suggestive of multiple abscess formation, it was decided to reinstitute systemic penicillin therapy. On November 29 an initial dose of 20,000 units was given intramuscularly followed by 15,000 units every three hours. Penicillin was continued until December 17. On December 2 fluid was detected in the right pleural space and aspiration yielded 30 cc. of thick pus from which Staphylococcus aureus was recovered. Following aspiration 50,000 units of penicillin was instilled into the empyema. This procedure was repeated daily until December 11. Considerable difficulty was encountered in aspirating the empyema. At times 20 to 30 cc. of pus was obtained, while at other times nothing could be aspirated. It was apparent that a bronchial fistula existed, since the patient coughed and expectorated some of the solution each time it was injected.

In spite of systemic administration and the instillation of penicillin directly into the empyema, the patient failed to improve, and on December 12 a rib resection was done. The findings at operation were adequate to explain both the difficulties encountered at aspiration and the failure of the patient to improve. The empyema was fairly large, extending from the posterior axillary line to the paravertebral region and from the seventh to the ninth rib. There were several bronchial fistulas opening into the cavity, which contained a piece of necrotic lung about 3 inches in diameter. Traversing the cavity were several large vessels that could have given rise to a fatal hemorrhage at any time. Aspiration had been difficult for two reasons: (1) bronchial fistulas had provided sufficient drainage to prevent the accumulation of any great quantity of pus; (2) a lung sequestrum had covered the needle, making it impossible to aspirate either air or pus through it. Under such circumstances penicillin therapy could not have been expected to cure the lesion. Furthermore, the constant hazard of severe hemorrhage from the vessels traversing the cavity made it dangerous to delay surgical treatment.

The next case demonstrates the seriousness of delaying surgical drainage when large vessels traverse an abscess cavity.

CASE 8.—E. B., a Negro woman aged 23, admitted on Oct. 29, 1943 with an abscess near the base of the left upper lobe, had had a tonsillectomy six weeks previously. Pleural effusion developed; the patient became extremely dyspneic and had frequent small hemoptyses. On November 9 200 cc. of foul, thin, purulent fluid was aspirated from the left pleural cavity. Anaerobic hemolytic streptococci, anaerobic nonhemolytic streptococci and several unidentified anaerobic bacilli and cocci were recovered from the pus. Penicillin therapy was initiated on November 10. Ten thousand units was injected into the empyema daily, and 50,000 units was given intramuscularly every hour for twelve hours. The dose was then reduced to 10,000 units intramuscularly every hour. This was continued for fifteen days.

Improvement was slow but progressive. The amount of sputum decreased, the patient was able to dispense with the oxygen tent, and her appetite improved. The foul odor promptly disappeared from the fluid aspirated from the chest, and anaerobic streptococci were not recovered from it after the fourth day of therapy. Because of a shortage of penicillin the dose was decreased on the morning of the twelfth day to 5,000 units per hour. On November 22, the thirteenth day of treatment, only a small amount of sterile fluid was obtained on aspiration, and the temperature became normal. On November 23, the fourteenth day, it was necessary to decrease the dose again, and from this time until her death she received only 2,500 units every two hours. On November 25, the sixteenth day, she felt worse, and her temperature rose. That evening she had a fatal hemoptysis. At autopsy the empyema was found to be completely obliterated. An abscess about 1 inch in diameter was present in the left upper lobe and was surrounded by considerable consolidated lung containing many small abscesses. A large eroded vessel traversed the cavity.

This case might be considered a success so far as treatment of the empyema was concerned, and it illustrates the remarkable improvement that can be obtained in critically ill patients through the use of penicillin. It also illustrates, however, that penicillin cannot be

expected to correct certain anatomic changes; when these are present, surgical intervention should be prompt.

CASE 9.—G. G., a white man aged 63, who had been a tramp all his life, admitted to the hospital on Nov. 15, 1944 with a massive pleural effusion, had been ill for over a month, but he could not give a satisfactory account of his illness. He was very malnourished. On November 20 1,650 cc. of rather thin, foul, purulent fluid was aspirated from the right chest. More fluid was present, but the patient became so weak that aspiration had to be discontinued. Cultures of the fluid yielded beta hemolytic streptococci. On November 22 930 cc. of foul pus was aspirated and 50,000 units of penicillin instilled in the empyema. Aspiration and instillation were repeated daily for three days and then every other day for twenty-three days. The amount of fluid that could be aspirated decreased from 1,440 to 250 cc., and the cultures became negative on the tenth day of therapy. The patient did not improve a great deal, however. He continued to have a temperature of 99 to 100 F., his appetite was poor and he developed diarrhea. No cause for the diarrhea could be found.

Because of the persistent accumulation of pus after twenty-three days of therapy, failure of the cavity to decrease significantly in size during the last week of therapy and the patient's persistent poor condition and low grade fever, rib resection was done under local anesthesia on December 16. The cavity held about 250 cc. and was unilocular. Following operation beta hemolytic streptococci were again recovered from the empyema. The patient's course after operation was progressively downhill, and he died on Jan. 6, 1945. Death was due to multiple pulmonary infarcts. The empyema itself was progressing well.

This patient was in extremely poor condition when he was admitted to the hospital, and the delay of seven days between admission and the onset of therapy did not improve it. Whether the outcome would have been different if treatment had been instituted earlier or if surgical drainage had been done is not pertinent to this discussion. The point is that in an empyema of this size and duration twenty-three days of penicillin therapy were not adequate to effect a cure. During the last week of treatment pus continued to accumulate, and the cavity did not decrease in size.

CASE 10.—B. W., a white girl aged 2 years, was admitted on Jan. 3, 1944 with postpneumonic empyema, bronchopleural fistula and tension pneumothorax. Intercostal drainage was done the next day, releasing purulent fluid under pressure. Cultures showed type III pneumococci. Sulfamerazine therapy for the next fifteen days resulted in little or no improvement, and on January 18 penicillin was begun. Cultures yielded a coagulase positive Staphylococcus albus, which was sensitive to 0.156 unit of penicillin per cubic centimeter. Four thousand units of penicillin was injected intramuscularly every hour, and 40,000 units of calcium penicillin was instilled into the empyema cavity every twelve hours. The intercostal catheter was clamped off after each instillation of penicillin and was opened again one hour before the next injection. When there was no change in the patient's condition after six days of penicillin therapy a rib resection was done. Immediately the temperature fell to normal, and improvement was steady thereafter. Penicillin was discontinued three days after the operation.

In this case penicillin was of no value as far as could be determined. Failure to cure the lesion was to be expected in the presence of a bronchial fistula, but one would have expected some improvement in the child's general condition as a result of the therapy.

CASE 11.—J. C., a white man aged 67, was admitted on Dec. 15, 1944 with a putrid empyema known to be of at least three weeks' duration. On December 16 550 cc. of foul pus was removed. There was no growth aerobically, but a smear of the pus showed that it contained staphylococci, streptococci and diphtheroids. No anaerobic culture was made. On December 18 900 cc. of pus was removed and 100,000 units of penicillin was instilled. At this time the patient's temperature was 102 F. Aspiration of pus was repeated on December 19, 20, 21 and 23, 100,000 units being instilled on December 19 and 50,000 units thereafter. The pus lost its foul odor but did not decrease in amount, and the patient continued to have a temperature of 101-102 F. He developed abscesses in the chest wall at the sites of aspiration, so penicillin was discontinued and the empyema was drained.

It is possible that the patient might have responded to penicillin if treatment had been continued. However, his course during the first five days did not seem to indicate that this would occur, and in view of the infection in the chest wall it seemed safer to resort to surgical treatment.

CASE 12.—L. R., a colored woman aged 20, admitted on Jan. 20, 1944 suffering from disseminated lupus erythematosus, developed pneumonia of undetermined etiology in the left lower lobe on February 10. This improved somewhat with sulfamerazine therapy, but an effusion occurred and persisted. On March 2 1,500 cc. of green pus was aspirated from the left pleural cavity. Alpha hemolytic streptcocci, which were inhibited by 0.02 unit of penicillin per cubic centimeter, were recovered from the pus. On March 9 and for sixteen days thereafter the empyema was aspirated daily, and 50,000 units of penicillin was instilled after each aspiration. The pus became sterile after two days of therapy, and the amount of fluid that could be aspirated decreased rapidly. Small loculated collections of fluid formed that could be seen in the x-ray films for a month after treatment had been stopped, but these slowly disappeared. The patient died on June 30 from other causes. At autopsy the empyema cavity was found to be obliterated except for one very small collection of 8 to 10 cc of purulent appearing material. This was sterile on culture.

This case was successfully treated probably because of the extreme sensitivity of the infecting organism to penicillin. If the organism had been more resistant, it would have persisted in the loculation that formed and would have prevented a successful outcome.

CASE 13.—E. W.,[4] a white woman aged 26, was first admitted to the hospital in October 1943 with bilateral pulmonary tuberculosis and a large cavity on the right. Attempts to collapse the lung and obliterate the cavity were unsuccessful, so an intrapleural pneumolysis was done in two stages soon after the patient's admission. On December 13 x-rays for the first time showed fluid collected at the right base. On Jan. 19, 1944 the temperature suddenly rose to 104 F. and the patient experienced frequent chills. There was concurrent increase in the amount of fluid, and the patient became very ill. Aspiration and culture revealed no organisms, but anaerobic cultures were not done. The cavity in the lung was well collapsed, and the patient was responding well as far as the tuberculosis was concerned. Because of this good response and also because the disease was bilateral, her physician did not want to give up the pneumothorax. Consequently it was maintained, and the pleural cavity was aspirated frequently. The fluid became foul and increased in amount until 1,500 cc. was being aspirated every few days. At each aspiration the cavity was irrigated with saline solution and 50 cc. of hexylresorcinol was instilled.

On February 19 1,000 cc. of fluid was aspirated and 50,000 units of calcium penicillin was instilled. The fluid at this time was particularly foul, and cultures yielded an anaerobic streptococcus, unidentified anaerobic cocci and organisms resembling diphtheroids. Penicillin was injected twice daily for the next nine days, during which time the fluid became odorless and decreased in amount. From February 28 to March 6 the patient

4. This case is reported with the permission of Dr. W. A. Hudson.

received intravenously 100,000 units of sodium penicillin daily and then 50,000 units intravenously every day to March 13, when all medication was stopped. During this time the temperature came down and the patient gained weight and felt very well; the temperature remained normal with only occasional rises to 100 F. On March 21 the phrenic nerve was crushed. The temperature again rose on April 3 and the fluid became purulent. On April 14 225 cc. of thick greenish pus was aspirated, and after saline irrigation 50,000 units of sodium penicillin was instilled in 100 cc. of saline solution. This amount was repeated daily until April 24, then 50,000 units every two days to June 2, and then once weekly until June 26. During this time the amount of fluid aspirated varied between 150 and 200 cc. Cultures yielded anaerobic cocci and diphtheroids. The temperature at the time penicillin was started on April 14 was varying from 100 to 101 F. During the rest of April the temperature varied from normal to 100 F., with occasional rises to 101 F. and one to 103 F. Through May, however, the temperature was higher than 99 F. on only two occasions.

After penicillin was stopped, 100 to 150 cc. of fluid was aspirated occasionally through July 24. Cultures were sterile until this date, when an anaerobic nonhemolytic streptococcus was again found. The cultures are listed as follows:

Feb. 19, 1944, anaerobic diphtheroids; gram-positive rods.
February 21, anaerobic gram-positive rods.
February 25 and March 1, 4, 6, 8, 10 and 13, sterile.
March 27, anaerobic cocci.
April 11, anaerobic gram-positive rods.
April 15, anaerobic cocci; diphtheroids.
April 17 and 22, sterile.
April 24, anaerobic cocci.
May 1, anaerobic gram-positive cocci; anaerobic streptococci.
May 8, sterile.
May 15, anaerobic gram-positive rods and diphtheroids; aerobic alpha streptococci and diphtheroids.
May 22, sterile.
May 29, anaerobic cocci; Alcaligenes sp.
June 5, 6, 19 and 26 and July 3, sterile.
July 24, anaerobic nonhemolytic streptococci.

During the next six months the patient improved slowly. Penicillin in doses of 25,000 units to 50,000 units intrapleurally was necessary biweekly to prevent the reaccumulation of fluid. During this time it was finally decided to do an upper stage thoracoplasty; this was done in September 1944. The wound healed by first intention and at present, February 1945, the patient has only a small empyema cavity remaining and is about to be discharged to her home.

This case illustrates the value of penicillin in holding a putrid empyema in check, but it also illustrates the fact that an empyema is cured only when the cavity is obliterated. This may be accomplished by reexpansion of the lung or, as in this case, by moving the chest wall in to meet the lung. Any chemotherapy that is not accompanied by obliteration of the empyema is bound to fail.

Poisonous Spiders.—Tarantulas of the United States cannot be accepted as a menace. They are slow to attack a human being, are not numerous, and their poison lacks potency sufficient under normal circumstances to produce permanent or even serious harm. Mankind has reacted in some instances to poison secreted by certain species, as the giant Mygales of South America, but simple, local treatment is usually all that is necessary to offset the temporary effects. The bite of Atrax robustus of Australia, however, may cause serious symptoms and, under certain conditions, death to man. Fortunately this species is limited in its range; hence few instances of this kind are on record. The most universally distributed "dangerous" spiders are those of the genus Latrodectus, and it is they, more than all others, which are responsible for serious cases of spider bite.—Thorp, Raymond W., and Woodson, Weldon D.: Black Widow—America's Most Poisonous Spider, Chapel Hill, University of North Carolina Press, 1945.

OCULAR MALDEVELOPMENT IN EXTREMELY PREMATURE INFANTS

RETROLENTAL FIBROPLASIA: VI. GENERAL CONSIDERATION

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In 1941 it was recognized that a massive growth of embryonic connective tissue occurring in the meshwork of a persistent tunica vasculosa lentis is linked with prematurity.[1] To my knowledge there are at least 162 cases at the present time. Dr. Stewart Clifford[2] has found that 12 per cent of the infants weighing 3 pounds (1,360 Gm.) or less at birth develop this disease. This percentage, based on less than 50 cases of prematurity, can be considered only a trend. If the true percentage of infants developing this disease is about 10, approximately 600[3] cases are to be expected in this country each year, which, if some prophylaxis is not found, will add materially to the 175,000 blind.

Typical well developed cases show seven characteristic findings:

1. There is opaque vascularized tissue behind the crystalline lens in which the vessels tend to radiate from a central point.
2. The eyes are abnormally small and as a result the eyelids, especially the lower, are sunken.
3. The anterior chambers are shallow, if not completely absent.
4. The irises retain their fetal-blue color, changing slowly to an abnormal gray-blue or dirty brown color.
5. Thin ciliary processes, appearing like teeth of a comb, can be seen in front of the opaque tissue when one looks through the dilated pupils from the extreme periphery.
6. The eyes have a searching nystagmus.
7. There is an apparent photophobia characterized by the infants covering the eyes when exposed to a brilliant light.

Frequently openings are seen in the opaque tissue through which one can observe the persistent hyaloid artery crossing the eye from the nervehead to the back of the lens. In some instances the opaque tissue seen at one side, through partially uninvolved vitreous, appears to have appreciable depth, extending posteriorly, often reaching the retina itself. Retinal separation may be and, at times, is the most obvious ocular disturbance.

Attempts to produce the disease in pouch young of the opossums and in newborn rats have failed, as have measures calculated to cause precocious closure of the hyaloid artery and tunica vasculosa lentis system. Although the pouch young of the opossum and newborn rats furnish immaturely developed eyes, it is possible

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1. Terry, T. L.: Fibroblastic Overgrowth of Persistent Tunica Vasculosa Lentis in Premature Infants: Preliminary Report, Am. J. Ophth. 25:203 (Feb.) 1942; II. Report of Cases, Arch. Ophth. 29:36 (Jan.) 1943; III. Embryological Studies, Am. J. Ophth. 29:1409 (Dec.) 1942.
2. Clifford, Stewart: Personal communication to the author.
3. The number of cases is necessarily an estimated figure. Of the 125,671 premature births yearly in this country, as indicated from Vital Statistics (19:2 [Dec.] 1943), approximately 22,888 are extremely premature. If the true survival rate is represented by that of Hess and his associates at 43 per cent, then 11,131 should survive. If even 10 per cent of the survivors develop fibroplasia there should be over 1,000 cases per year. Because this statistical approach is founded on relatively meager numbers of reports of survival and of development of fibroplasia, subtracting 40 per cent for possible gross errors there would still be at least 600 per year.
4. Commonwealth of Massachusetts, Division of the Blind: Personal communication to the author.

that the failures to produce the disease can be attributed to eye characteristics different from those of the human being.

The hyaloid vascular system ceases to carry blood eight and a half months after conception,[5] and infants born earlier than this have a functioning hyaloid vascular system. In this meshwork the embryonic connective tissue can develop, thus producing retrolental fibroplasia. Because the disease process is not present at birth, developing from two to six months later, some factor resulting from premature birth must be responsible. It should be noted, however, that occasionally this condition, or one similar to it, usually unilateral, may be found at birth in the full term infant, having developed during intrauterine life. The ratio, since 1941, of fibroplasia in the premature and in the full term infants has been 162:4. Formerly, eyes involved with this disease were frequently considered to be eye cancers (retinoblastomas), thus warranting enucleation. The rarity of fibroplasia in the full term infant over the years is further shown by only 5 laboratory specimens in the collection of 12,000 enucleated eyes at the Massachusetts Eye and Ear Infirmary.

Many factors have been considered the probable cause of fibroplasia. These include heredity, intraocular inflammation, precocious exposure to light, precocious closure of the ductus arteriosus and the foramen ovale, an increase or decrease of oxygen in the blood, the lower temperature of the premature infants in the incubator in contrast to intrauterine fetal temperature, lack of adult maternal endocrine environment, precocious elevation of blood pressure, complications arising from the Rh factor differences in the mother and infant, inability to digest and assimilate food including vitamins, trauma or intraocular hemorrhage introducing the process, intraocular inflammation or infection, physiologic anemia of prematurity, changes in the blood such as premature establishment of the characteristic blood group and, finally, the causes of prematurity itself.[6]

Certain trends in biologic experiments indicate, but by no means prove, that the precocious exposure to light[7] may be the most important factor. The effects of light in exciting the disease process would more probably be related to the motor responses to light than to the stimulation of the retinal receptors. Animals whose eyes are extremely undeveloped at birth have their eyes sealed for a varying period after birth, and often light is further excluded by hair, usually dark, on the lids.[8] In the adult human being a pupillary response is obtainable in one opened eye when the light is carefully flashed so as to fall on the other closed eye, thus showing that sufficient light transilluminates the closed lid to produce a consensual pupillary reaction. Fibroplasia appears to occur more frequently in some places than in others. For example it is often found in one premature nursery, while other nurseries in the same city will have few if any cases. Similarly, 1 of twins, and in 1 instance 2 of triplets, have been known to develop the disease. The exposure to light varies with the frequency of examination and position in the nursery in relation to the location of the lights. Precocious light exposure as a possible cause can be determined most effectively if a fairly safe technic is worked out which will permit keeping the infants in the dark, or perhaps under a red light, and adequately covering the eyes while the infants are being examined or given nursing care under normal lighting conditions. Fibroplasia appears to be frequent enough to warrant bold measures, and it is my feeling that it is worth the risk to use a mydriatic or a miotic as a possible preventive measure. Which is better is open to conjecture, because the eyes in the dark have dilated pupils while in sleep the pupils are small. The status of the pupils in the fetus asleep and awake in the dark uterus can be different from the status of the pupils of the premature infant asleep and awake in the nursery, where it is in the light as much as or more than in the dark. That the pupil can react long before birth is indicated by the presence of small pupils and response to a mydriatic in premature infants weighing less than 2 pounds (907 Gm.). Ida Mann[9] states that the sphincter pupillae morphologically appears capable of activity in the four months fetus. The use of a mydriatic, preferably atropine because its effect is more permanent, would be the easier. In the use of both drugs, however, there is danger of favoring the development of complications, such as glaucoma with atropine or posterior synechia with pilocarpine. If, in using atropine in one eye only, no difference in the frequency of development of fibroplasia is observed in the two eyes of 50 or more premature infants so handled, this drug could be discarded as a preventive measure. The same procedure could be tried with miotic drugs, but one should remember that their effect is temporary, lasting perhaps not over two hours at best.

Treatment through direct surgical attack, through use of radiation or through an attempt to seal the hyaloid artery with diathermy has ended disastrously. If no treatment is given, in some instances there is a spontaneous reduction in amount of opaque tissue, but the eyes usually fail to grow normally. At times cataract and corneal opacities develop in addition to glaucoma and posterior synechia, which have been previously mentioned. Despite the ability in all extremely premature infants to see these fetal vessels of the hyaloid artery and tunica vasculosa lentis, which should normally disappear, it has not been possible as yet to determine which of the premature infants will develop the disease. As the fibroplasia develops after the infant has completed its incubator life and has been discharged to its home, many stages of the development have not been observed.

To prevent the development of glaucoma after the disease has arisen, a miotic, usually 1 per cent pilocarpine, is used daily. As there is a tendency for posterior synechia to develop, a combination of powerful synergistic mydriatics[10] which keeps the pupil dilated only a few hours is used once weekly. One drop of this medicine suffices. The parents are advised to observe the eyes after mydriasis to see if the pupil fails to dilate or to note any tendency of the pupil to be unround, an evidence of synechia formation. These preventive measures appear to lessen the frequency of two dangerous complications.

		Gm. or Cc.
10. ℞	Homatropine hydrobromide	0.15
	Epinephrine bitartrate	0.30
	Cocaine hydrochloride	0.075
	Paredrine hydrobromide 1%	15.000

The operation, calculated to establish a new vascular connection between the episcleral vessels outside the eyeball with the ciliary body, has been performed on

5. Mann, Ida: The Development of the Human Eye, Cambridge University Press, 1928, p. 212.
6. Terry, T. L.: IV. Etiologic Factors, Arch. Ophth. **29**: 54 (Jan.) 1943.
7. Terry, T. L.: V. Further Studies, to be published.
8. Snyder, F. F.: Personal communication to the author.
9. Mann: Development of the Human Eye, p. 128.

several severely involved eyes, with probable beneficial effects in about half.

In giving guidance and advice to the parents, the following points are brought out: First, they must adjust themselves to the probability that their baby will not see; that blind people are happy people and can become normal, healthy, useful citizens. Second, the child should be given normal affection but should not be pampered, being treated as though normal. Third, toys that are interesting from the standopint of shape and sound should be provided. Fourth, companionship with other children of the same age should be sought. This can be obtained at blind baby nurseries. Fifth, music, which has been found almost invariably to be enjoyed and appreciated, should be given to these children, in some instances with music lessons. Sixth, school, on advice from the Perkins Institution for the Blind, is to be delayed until the seventh year.

As there is no suspicion that this is a hereditary disease, the parents are told that they should not be hesitant about having more children.

SUMMARY

Over 10 per cent of the infants born very prematurely, weighing 3 pounds or less at birth, can be expected to be blind from retrolental fibroplasia. If this percentage remains, at least 600 cases will occur annually, thus increasing the blind census materially.

The typical characteristics of the disease are opaque vascularized membrane behind the lens, microphthalmia, shallow anterior chambers, fetal-blue color of the iris, thin ciliary processes in front of the opaque tissue, searching nystagmus, apparent photophobia, persistent hyaloid artery and often retinal separation.

The basis of the disease lies in the presence of a functioning hyaloid artery and tunica vasculosa lentis system in all infants born even three or four weeks prematurely.

Of all the probable causes listed, precocious exposure to light is considered the most tenable, and preventive measures should be taken.

For prevention, mydriatics and miotics could be used but if considered too drastic the infants should be kept in a dark room with a red light and the eyes covered adequately during examinations and nursing care.

Treatment consists in preventing the most common complications glaucoma and posterior synechia by use of miotics and mydriatics. Surgical and radiation therapy have proved unsuccessful. A surgical attempt, however, to establish a new vascularization of the ciliary body with the episclera is being done with some beneficial results.

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ABSTRACT OF DISCUSSION

DR. HEYWORTH N. SANFORD, Chicago: No doubt those who have worked many years with the premature infant have been wondering why they never observed this eye dyscrasia. I observed 1 instance of retrolental fibroplasia in a premature infant weighing 2 pounds (907 Gm.) about two years ago. Since then Dr. Justin Donegan has also examined the eyes of all our premature infants, but we have failed to observe any more. This is not surprising and I would emphasize that Dr. Stewart Clifford observed that they occur in only 10 per cent of premature infants weighing 3 pounds (1,360 Gm.) or less. While the average obstetric service will run about 10 per cent of premature infants, the majority of these infants will be over 3 pounds in weight, as were those that we studied. As only about half a dozen of these were under 3 pounds, this would agree with Clifford's estimate of 1 in 10 premature infants of 3 pounds or less. When Dr. Ethel Dunham made her survey on the premature mortality in hospitals throughout the United States in 1930 she found that the average premature mortality was about 26 per cent. In Chicago from 1931 to 1937 Dr. Edith Potter reported that the premature mortality for Lying-In Hospital was 20.7 per cent. Since 1938 there has been a drive in Chicago as in many other cities to lower the premature mortality. Certainly the premature mortality now in those hospitals in Chicago which offer adequate premature care is well below 20 per cent. This means a reduction in ten years of approximately 8 per cent, and most of this decreased mortality has been in premature infants under 3 pounds. Premature infants that once were born in hospitals with no facilities for premature care or in the home and would thus die shortly are now removed to hospitals with facilities for premature care and are saved. I wonder if we are not having more of these very small premature infants to study, which prior to this time we did not have an opportunity of seeing under the conditions that we have today. While this is undoubtedly a new disease, it is one that has not before been apparent because the type of child carrying such a deformity has not herctofore been saved in sufficient numbers to demonstrate this condition. By increasing the span of life of the average adult through the last decades we have increased the incidence of some diseases. Here by saving the lives of very small premature infants that heretolore have perished we have likewise added another condition that we must now endeavor to find a therapeutic means of combating.

DR. E. V. L. BROWN, Chicago: Incubator care has saved many lives, but as a result of it, apparently, there are several hundred blind babies in the country. Previous to 1935 some sixteen eyes had been removed by me for glioma retinae—neuroblastoma—and all were gliomas. But in the next five years I was responsible for the removal of six more, four of which proved to be retrolental fibroplasia and not glioma and need not have been removed at all. Dr. Terry postulates that this condition may be due to faulty development of the ciliary body basically. The mother is almost always the one who discovers this condition. She usually, it seems, finds it while she is bathing the child and the light happens to strike the pupil just right and she sees the mass behind the pupil. Ordinary observation by other members of the family or by the family doctor or pediatrician may not corroborate what she has seen. We should give every mother who has a premature child, at least before the seventh month or of only 3 or 3½ pounds (1,360 to 1,587 Gm.) of weight instructions to watch carefully the child's eyes throughout the first year. I do not know of cases that have occurred later than the first year in which there is any evidence that the condition was not present before that. It is occurring in our large centers of population certainly in a considerable number of cases. The number that Dr. Terry has seen, around 100 in the neighborhood of Boston, seems to be huge, but the late Dr. S. R. Gifford had seen 15 or 20 cases. Dr. Gradle told me that he had seen some 15 cases. My colleague Dr. J. M. Donigan and I have seen between 15 and 20 cases. Dr. Richard Gamble has seen some 5 cases. So we are up to around 75 or 80 just among five or six of us here in Chicago, in the last couple of years.

DR. A. J. STRICH, Chicago: I should like to report briefly on a negative series of experiments on the etiology of fibroplasia conducted at the Children's Memorial Hospital in Chicago by Dr. Gamble and myself. We have seen in the past few years 16 cases of fibroplasia, and Dr. Terry has been in consultation on 2 of them. Working on the presumption that this disease, which used to be rare, suddenly became quite frequent in the last few years and on the presumption that these children are not born with fibroplasia but show it after a few months of their lives, we have surveyed several Chicago nurseries from which our 16 patients came, looking for the factor which made the disease common. We thought of sulfonamides, but only a few of our patients had had them. We thought of vitamin K, but only 1 or 2 of them had had it. But with only 1 exception all of these babies came from nurseries where the so-called germicidal lamp was employed. This is an ultraviolet ray producing lamp and it has been used for the past few years to

sterilize the air in nurseries. We decided to investigate this point experimentally. We received 12 female pregnant rats and used ten families as an experimental group which was exposed to the germicidal lamp. We set two families aside in a dark room. The germicidal lamp is a powerful lamp. Some of the families which received more irradiation were burned to death. The ones that received a little less irradiation survived but developed cataracts. Rats seemed to be animals which would be suitable for that experiment because rats are being born with a hyaloid system still present and they have blood vessels around the lens and these blood vessels disappear in from two or three weeks. The blood vessels continued to disappear in two or three weeks in our working group just as fast as in our control group, which might prove the point that either the germicidal lamp is not the cause of fibroplasia or that rats do not develop fibroplasia. However, we shall not give up and we intend to find out how many of the children throughout the country having fibroplasia were kept in nurseries where they were exposed to continuous light, be it germicidal or not.

DR. T. L. TERRY, Boston: Some of the points brought up are answered in previous publications, and others can be based on poorly supported conjecture.

INFLUENCE OF NEOSTIGMINE METHYLSULFATE ON PREECLAMPTIC PATIENTS

AND CHOLINESTERASE ACTIVITY OF PLACENTAS FROM NORMAL AND PREECLAMPTIC PATIENTS

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A number of reports [1] state that the normal pregnant woman has some substance in her blood which will neutralize posterior pituitary injection and that an injection of this substance into preeclamptic patients will occasionally initiate the onset of convulsions. The investigations of Schockaert and Lambillon [2] and of Dieckmann and Michel [3] demonstrated that approximately 65 per cent of preeclamptic and eclamptic patients show abnormally great and prolonged blood pressure elevations and antidiuretic responses to pitressin. Since the studies of Necheles and Neuwelt [4] indicate some antagonism between acetylcholine and pitressin, the question arose whether acetylcholine activity is altered or abnormal in eclamptic toxemia.

There are some data which suggest that a relative decreased acetylcholine activity may occur in preeclampsia. Human placentas contain large amounts of acetylcholine, as was shown by Chang and Gaddum,[5] who reported 28 micrograms per gram of fresh placenta. Hofbauer [6] reported acetylcholine values for five whole placentas of eclamptic patients and though no placental weights were given he concluded that these values were significantly lower than the normal values of Chang and Gaddum. Hofbauer [6] also quoted investigations at Harvard University to show that the cholinesterase activity of preeclamptic placentas was higher than normal. However, personal communication from the Harvard laboratory [7] indicated that the work which was quoted was incomplete and was not ready for publication. Therefore cholinesterase activity was determined in placentas from normal and preeclamptic patients.

The naturally occurring acetylcholine can be potentiated by inhibiting cholinesterase, the enzyme which destroys it. Neostigmine methylsulfate has this action. It seemed worth while to investigate the effects of this drug on preeclamptic patients, since preparations of veratrum viride, another parasympathomimetic drug, are useful in treatment of preeclampsia.

METHODS AND MATERIAL

Eight patients, pregnant seven to nine months, have been studied. Five were diagnosed preeclamptic and showed edema, proteinuria, visual disturbances and hypertension of recent origin. Two were hypertensive without evidence of any toxemias of pregnancy and 1 was a normal control.

The blood pressure studies were accomplished with the hypodermic manometer.[8] Neostigmine methylsulfate was administered until definite effects occurred. One to three intramuscular injections of 0.25 mg. at intervals of ninety minutes were followed at hourly intervals by one or two intravenous injections of 0.02 to 0.25 mg. The drug was discontinued whenever uterine activity started or whenever either the systolic or the diastolic pressure was elevated an additional 20 mm. of mercury. This method of administration was selected with four important facts in mind: (1) The susceptibility to the drug might vary greatly, (2) as with physostigmine [9] there might be an appreciable latent period even after intravenous injections, (3) the interference with the destruction of acetylcholine might allow liberation of sufficient amounts from the placenta to cause excessive and dangerous uterine activity and (4) preeclamptic patients might be abnormally susceptible to the stimulative action of the drug at prepostganglionic synapses of the sympathetic nervous system (nicotinic action).

Cholinesterase activity was determined in placentas of 8 normal and 13 preeclamptic patients by Torda's modification [10] of Glick's method.

RESULTS AND COMMENT

Individual susceptibility to neostigmine appeared to vary greatly. Pronounced effects were produced in 1 case with 0.25 mg. intramuscularly and 0.023 mg. intravenously, while in another case 1.00 mg. intramuscularly and 0.75 mg. intravenously was necessary to produce definite effects.

In the preeclamptic and the control patients uterine activity and vascular effects appeared rather suddenly

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The neostigmine methylsulfate used in this study was supplied by Hoffmann-La Roche, Inc.
From the Department of Pharmacology and the Department of Obstetrics and Gynecology, University of Georgia School of Medicine.
Read before the Section on Experimental Medicine and Therapeutics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

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after a definite latent period of ninety to one hundred and twenty minutes even after intravenous injections. In 1 normal patient and in 1 hypertensive patient neostigmine failed to lower the blood pressure though uterine activity was initiated. In the second hypertensive patient neostigmine elevated the arterial pressure. These observations indicate that small to moderate amounts of neostigmine do not lower the arterial pressure in control noneclamptic gravid patients even though hypertension may be present. They suggest that the drug may initiate labor during the seventh and eighth months, which differs from the reported absence of effect on the uterus when used as a pregnancy test early in pregnancy.[11]

In 3 of the 5 gravid preeclamptic patients neostigmine, after initially elevating the blood pressure 10 to 20 mm. of mercury, produced chill, a temperature elevation of 1 to 2 degrees F. and a reduction of the arterial pressure from 185/105 to 143/83, from 220/125 to 124/92 and from 145/82 to 100/60 (see plot of the arterial pressure of 1 case in figure 2). The arterial pressure remained low for four to eight hours until the action of the drug had diminished and until the excitement, activity and pain associated with labor had increased the blood pressure. In the other 2 preeclamptic gravid patients neostigmine not only failed to lower the blood pressure but in 1 of these it raised the pressure 20 mm. of mercury. These elevations could result from the stimulating action of acetylcholine on autonomic ganglions and of course are not beneficial to the patient. The fact that neostigmine sometimes lowers and sometimes increases the arterial pressure may be taken as indicating that there are several different types of preeclampsia; sometimes one altered physiologic process is important, while in other patients different processes may be altered to a larger extent.

One of the preeclamptic patients who showed a pronounced reduction in blood pressure from neostigmine was again tested ten hours post partum. At this time neostigmine failed to lower the arterial pressure (fig. 2). Adequate dosage had been administered, since 0.32 mg. of acetylcholine administered intravenously over a period of twenty seconds lowered the arterial pressure 40 mm. of mercury, while in the absence of neostigmine only minimal effects are produced by doses twenty to sixty times as large.[12] These data are interpreted to show that pronounced effects can be obtained from moderate amounts of neostigmine when administered ante partum. This is apparently due to the fact that a large depot of acetylcholine is present in the placenta. The neostigmine inhibited its destruction and allowed greater acetylcholine activity.

Preeclamptic placentas had a significantly greater cholinesterase activity than those of normal women. Values expressed as micrograms of acetylcholine chloride hydrolyzed per milligram of dried placenta per second were for normal women 6.0 ± S. E. of 0.15 and for preeclamptic patients 9.4 ± S. E. of 0.19. Statistical evaluation showed that $t = 4.0$, which indicates that the probability of this difference occurring by chance is 1 : 12,000. The presence of the high cholinesterase activity in the placenta may be a protective mechanism or may be a contributing factor to the condition of preeclampsia.

As shown in figure 1, neostigmine increased the standing waves in the radial pressure pulses. This change of the pulse contour indicates that peripheral vasoconstriction occurred in the vessels of that arm.[13] Apparently muscular and cutaneous vessels were constricted. Intensive widespread cutaneous vasoconstriction could account for the chill but cannot account for the pronounced reduction in arterial pressure in these patients.

This generalized vasoconstriction should increase arterial pressure and retard blood outflow from the arterial tree. Since the blood pressure is reduced and since the rate of descent of pressure during the last part of systole is increased (figure 1) the outflow of blood from the arterial tree must actually be rapid. This rapid flow can be and probably was into the uterus and placenta.

Provided this flow is augmented, any sudden interference with it would be expected to cause a definite increase in maternal arterial pressure. Each uterine contraction constitutes an interference with maternal uterine placental blood flow, since these hinder maternal blood flow into the uterine placental area and squeeze maternal blood from the uterine sinusoids.[14] The fact that in these patients at this time uterine contractions elevate the maternal arterial pressure 40 to 50 mm. of mercury during systole and 20 mm. of mercury during diastole provides proof that maternal uterine placental blood flow and volume are large. Control postpartum neostigmine administrations did not significantly alter the arterial pressures in these patients.

These data can be interpreted as evidence that neostigmine administered to preeclamptic gravid patients decreases the blood flow to muscle and cutaneous areas and in some patients increases blood flow to the uterus

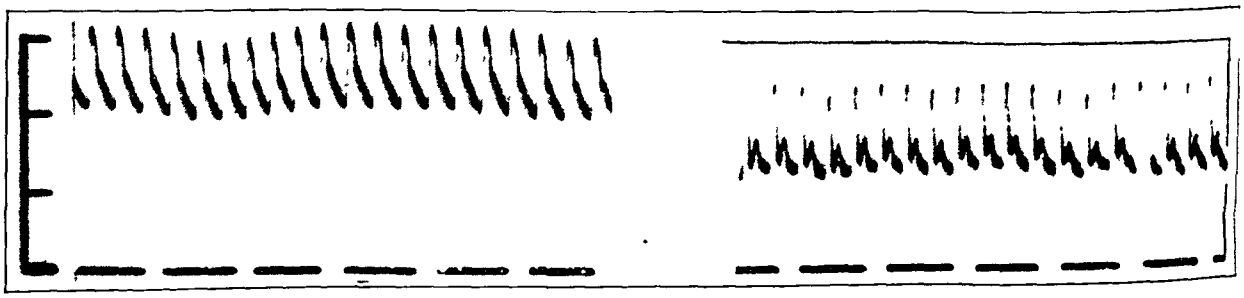


Fig. 1.—Radial pressure pulses from preeclamptic patient. Blood pressure scale is shown in units of 50 mm. of mercury. Base line is interrupted at intervals of two minutes. Tracing at left was recorded at 12 o'clock noon. Neostigmine methylsulfate was injected intramuscularly 0.25 mg. at 12: 15 p. m. and intravenously 0.023 mg. at 1: 15 p. m. Chill and uterine activity were present at 2: 10 p. m. Tracing at right recorded at 2: 30 p. m.

11. Soskin, S.; Wachtel, H., and Hechter, O.: Treatment of Delayed Menstruation with Prostigmine: A Therapeutic Test for Early Pregnancy, J. A. M. A. 114: 2090 (May 25) 1940.

12. Weiss, S., and Ellis, L. B.: Comparative Effects of Intravenous Administration to Man of Acetylcholine and Acetyl Beta Methyl Choline, J. Pharmacol. & Exper. Therap. 52: 113, 1934.

13. Hamilton, W. F.: The Patterns of the Arterial Pressure Pulse, Am. J. Physiol. 111: 235, 1944.

14. Reynolds, S. R. M.: Physiology of the Uterus, New York, Paul B. Hoeber, Inc., 1939, p. 147.

and placenta. This increased uterine blood flow in the presence of a lowered arterial pressure can occur only when resistance within the uterine circulation is decreased. Prior to neostigmine administrations the maternal placental resistance was evidently high and maternal placental blood flow may have been adequately maintained only because the blood pressure was elevated. The fact that acetylcholine [15] and neostigmine [11] produce uterine hyperemia constitutes evidence to support the contention that neostigmine reduces the resistance within the uterine vascular bed. The cutaneous effects differ from those observed in normal and vasospastic patients in whom neostigmine increased the skin temperature and dilated small arteries but did not produce flushing.[16]

Neostigmine appeared to induce labor in these 8 patients who were pregnant seven, seven and one-half, eight, eight and one-quarter, eight and three-quarters, nine, nine and nine months. Uterine activity was normal and delivery was uncomplicated in 6 of the 8 patients, although 1 infant, seven months premature, died four hours post partum. In the other 2, who were multiparous eclamptic patients and who each received 1 mg. intramuscularly and 0.75 mg. intravenously, the uterus became hyperactive and cervical effacement and dilatation were delayed. Labor was dangerously prolonged to thirty-six and forty-eight hours. One of these

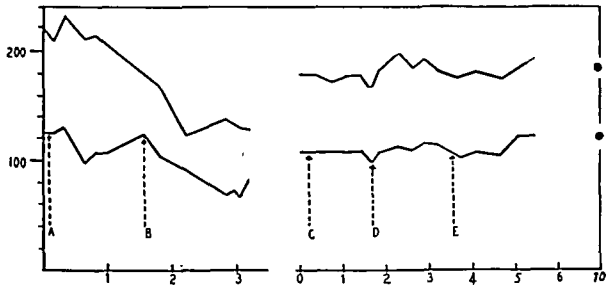


Fig. 2.—Plot of systolic and diastolic blood pressure of a preeclamptic patient who received neostigmine methylsulfate. Time indicated in intervals of one hour. At left, ante partum: At two hour intervals three intramuscular injections of 0.25 mg. of neostigmine methylsulfate were administered prior to *A*. The arterial pressure was increased 30 mm. of mercury during systole and 20 mm. of mercury during diastole. Two hours after the last intramuscular injection, an intravenous injection of 0.25 mg. of neostigmine methylsulfate was administered at *A*. Chill occurred and uterine contractions were initiated at *B*. The reduction of arterial pressure continued for four hours and then slowly rose as labor progressed. The baby was delivered nine hours after point *B*. At right, post partum: Seven hours after delivery at *C*, 0.5 mg. of neostigmine methylsulfate was administered intramuscularly. At *D* 0.25 mg. was administered intramuscularly. At *E* 0.25 mg. was administered intravenously. The arterial pressure was determined every half hour. No significant reduction was observed.

infants, seven and one-half months premature, died seventeen hours post partum. The death of these 2 infants can probably be ascribed to prematurity and the presence of toxemia. Neostigmine administrations probably were not a contributing factor. Used with caution and with proper allowance for its latent period, it may be less dangerous in some patients and no more dangerous in others than present medical methods of inducing labor. If used without discretion it would be expected to produce more detrimental effects than those observed with careless use of other methods.

The influence of neostigmine on convulsions of eclamptic patients has not been determined.

The observation that some preeclamptic gravid patients respond differently to neostigmine than normal gravid patients suggests that in preeclampsia (*a*) the tissues respond abnormally qualitatively or quantitatively to acetylcholine or, less likely, (*b*) the placenta and other tissues produce a slightly different choline derivative than is normally present.

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SUMMARY AND CONCLUSIONS

Individual susceptibility to neostigmine seemed to vary greatly, and even when administered intravenously a latent period of ninety to one hundred and twenty minutes was present. In all of the gravid patients it seemed to induce labor. In 2 of the patients in whom administrations were continued for twelve hours or longer the uterus became hyperreactive and hypertonic, resulting in a prolonged labor.

The presence of preeclampsia influences the type of response to moderate amounts of neostigmine. The drug does not lower the blood pressure of gravid patients unless they are preeclamptic. It does lower the arterial pressure of some but not all preeclamptic patients. The reduction in arterial pressure was always preceded or accompanied by chill, slight temperature elevation and initiation of labor. Preeclamptic patients have high resistance in the maternal placental vascular bed, and the reduction of blood pressure seems to be caused by decreased peripheral resistance in the uterine vascular bed. It seems to be accompanied by vasoconstriction of muscular, cutaneous and possibly renal vessels.

The observation that different preeclamptic patients may respond differently to moderate doses of neostigmine contributes additional support to the belief that there may be several different types of preeclampsia.

The cholinesterase activity of placentas from preeclamptic patients is greater than from normal patients.

ABSTRACT OF DISCUSSION

DR. A. R. ABARBANEL, Washington, D. C.: The work of Dr. Woodbury and his associates has apparently opened up a relatively new field in the possible treatment of toxemias of pregnancy. But, as they emphasize, neostigmine can be a double edged sword. They did mention that, but in 1 case the blood pressure did rise. That, of course, will depend on whether or not its action on the ganglion predominates over the peripheral action. The point that interested me in particular was the finding of a high cholinesterase in the toxemic placenta as compared to the normal. Cholinesterase is present in such superabundance in the tissues that it is hard to explain why there should be an actual increased amount in the placenta, except possibly that the placenta was putting out more acetylcholine in order to offset the toxic substance which was producing the unit of pathologic functioning, which most obstetricians now believe to be angiospasm. Whether this substance comes from the posterior pituitary, as many men, notably Dr. Hofbauer, believe is difficult to prove. There may be another factor in the increased cholinesterase, and that is the question of ions. We know that the cell is influenced by its ionic content and its ionic environment. It is quite possible that either a high calcium or a high potassium might have been a contributory factor. Early in pregnancy the uterus is relatively high in magnesium and low in calcium, but as term approaches the ratio of calcium and magnesium changes so that calcium becomes high, accounting for its increased irritability, and magnesium becomes low. Hyperirritability and hypertonicity of the uterus lead to many complications. One of the most severe of these is tetany of the uterus, in which we may get fetal anoxemia and eventual death or even actual rupture of the uterus. It is possible that in these 2 cases in which hyperirritability or hypertonicity was encountered atropine might have been effectual. There is another drug which is extremely effectual and which will abolish tetany of the uterus practically within thirty to sixty seconds. This drug is magnesium ion. Administered either as the sulfate or the gluconate intravenously, it prolongs the conduction rate

in the uterus so that it gives the uterus more of a restorative or recuperative phase following a muscular contraction. Magnesium will work against every type of oxytocic I have tried, including posterior pituitary injection, pitocin, pitressin, ergonovine, quinine and also when Bandl's ring contracture was encountered.

DR. R. A. WOODBURY, Augusta, Ga.: The suggestion made by Dr. Abarbanel that magnesium might be included with the treatment of neostigmine is excellent. We did not give these patients magnesium with neostigmine because it would have confused the story as to the action of the neostigmine, and yet it may well be that the administration of magnesium or some of the parasympatholytic drugs along with the neostigmine may remove the danger of the use of neostigmine in preeclamptic patients. It may protect the fetus from the hyperirritable uterus that neostigmine can produce.

Clinical Notes, Suggestions and New Instruments

COMPLETE URETERAL DUPLICATION TERMINATING IN THE SAME URETEROCELE AND RESULTING IN SEVERE HYDRONEPHROSIS

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AND
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Of all the congenital abnormalities of the urinary tract, ureteroceles are among the most amenable to successful surgical treatment.

As reported by Thompson and Greene,[1] the majority of ureteroceles are congenital in origin, occur twice as frequently among women as they do among men, are most reliably diagnosed by cystoscopy and are best treated transurethrally by simple fulguration of the small ureteral orifice or a combination of ureteromeatotomy and fulguration of the walls of the ureterocele. These authors recognized that the presence of destroyed renal function or urinary calculi which could not be removed transurethrally necessitated open operation. While in the case that we are reporting there were features characteristic of moderate obstruction of the vesical neck, such as pronounced dysuria, a large atonic bladder, urographic evidence of a left nonfunctioning kidney and pyeloureterectasis of the other kidney and ureter, there have been numerous cases in which the ureterocele prolapsed through the urethra to cause intermittent complete urinary retention. Such a case was recently reported by Emmett and Logan.[2]

The case reported here presents several interesting features. First, it demonstrates how rapidly an obstructive lesion caused by a congenital ureterocele can result in severe hydronephrosis. Second, it is unique in that there was complete ureteral duplication with the two ureters opening into the same ureterocele. Finally, in this case a rather extensive surgical procedure was necessitated which was attended by a successful result.

REPORT OF CASE

A white girl aged 3½ years was brought to the Mayo Clinic in August 1944. A letter from the referring physician stated that the child, who had been the product of a full term normal spontaneous delivery and weighed 8½ pounds (3.8 Kg.) at birth, had first been taken ill with fever, urinary frequency, dysuria and pyuria at 11 months of age. A course of sulfanilamide therapy caused successful arrest of symptoms, though pyuria persisted. In the two years preceding this admission the child had suffered from several similar attacks, all responding symptomatically to sulfanilamide except for persistent pyuria, which frequently was grossly noticeable. Three days before admission to the clinic the patient had a severe attack with elevated temperature and dysuria, which was so intense that it caused the patient to avoid micturition even though the bladder was apparently overdistended.

A review of systems made by questioning the patient's mother gave negative results. The patient was the only child of two healthy parents. The past medical history was negative except for an attack of infantile eczema, which had been absent for the past year. The child's developmental history was entirely normal.

Physical examination revealed that the child was well developed but obviously acutely ill. The patient's oral temperature was 102.8 F. The pulse rate was 120 per minute. The respiratory rate was 28 per minute. The results of laboratory analyses were as follows: Erythrocytes in the urine were graded 1 and leukocytes were graded 3 (on the basis of 1 to 4, in which 1 represents the smallest and 4 the largest number of formed elements). Staphylococcus aureus and Streptococcus fecalis were cultured from the urine. The concentration of urea was 26 mg. and that of hemoglobin was 10.6 Gm. per hundred cubic centimeters of blood. Erythrocytes numbered 3,620,000 and leukocytes numbered 9,600 in each cubic millimeter of blood. A flocculation test for syphilis gave negative results. The first strength of the tuberculin test was negative. A roentgenogram of the thorax appeared normal. An excretory urogram was largely obscured by gas but did show moderate right pyeloureterectasis and a vesical outline which was larger than normal. Accurate evaluation of the left kidney and ureter was impossible because of greatly reduced function, with only questionable visualization of the upper calix.



Double ureter and hydronephrotic kidney with only thin shell of atrophic renal cortex remaining. Both ureters are much dilated and terminate within the same small segment of ureterocele.

On cystoscopy performed with the patient under ether and nitrous oxide anesthesia, a large volume of urine was found in the bladder, which was greatly distended and slightly trabeculated. Neither ureteral orifice could be seen. In the region of the left ureteral orifice was a large soft structure which the cystoscopist believed probably represented a ureterocele and which he thought might be producing obstruction at the vesical neck. Because the exact nature of abnormality within the bladder could not be accurately determined cystoscopically and because the function of the left kidney seemed to have been destroyed, suprapubic exploration was advised.

With the patient under ether and nitrous oxide anesthesia, and through a primary low midline incision, the bladder was opened. It appeared greatly enlarged and was the seat of a moderate amount of inflammation. The left side of the bladder was occupied by a large ureterocele and it was found to contain two ureteral orifices. The right ureteral orifice appeared to be normal. On transvesical excision of the ureterocele it was apparent that one orifice led into a much dilated ureter while the other orifice led into a large pocket, which on further exploration proved to be a hydroureter. The original incision

From the Division of Surgery, Mayo Clinic (Dr. Counseller).

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was extended transperitoneally and both of these dilated ureters were found to join a hydronephrotic left kidney in which more than 90 per cent of the renal substance had been destroyed. Both dilated ureters as well as the hydronephrotic left kidney were removed transperitoneally. The right kidney was found to be normal and had a normal ureterovesical opening. One small 18 F. bivalved catheter was inserted into the bladder as a cystostomy tube and a 4 F. ureteral catheter was left in the right ureter with its upper end in the renal pelvis and its lower end extending through the urethra. The peritoneum was closed after 5 Gm. of sulfanilamide had been left in the peritoneal cavity; 2.5 Gm. of sulfanilamide was left in the incision, which was closed with double continuous number 1 chromic catgut with single interrupted chromic sutures in the fascia. A split rubber tube was left in the incision. The patient was given a transfusion of 250 cc. of compatible blood at the completion of the operation.

The removed specimen consisted of a kidney, double ureter and a portion of the bladder. The kidney was considerably hydronephrotic, with almost complete destruction of the renal substance. One ureter, believed to be the functional one, was dilated throughout with a diameter slightly more than 1 cm. Parallel to the ureter was another one measuring approximately 25 cm. in length and approximately 4 cm. in diameter.

The split rubber tube was removed on the second day after operation. The ureteral catheter was withdrawn from the right ureter on the fourth postoperative day. The cystostomy tube was removed on the fifteenth day and thereafter the suprapubic fistula remained dry and healed rapidly. The patient was dismissed from the hospital on the twenty-third postoperative day. At this time the dysuria was reduced by more than 50 per cent but Streptococcus fecalis was cultured from the urine. The patient was dismissed with instructions to receive alternate courses of sulfathiazole and a mandelic acid preparation. She was taken home to the care of her home physician, who sent her back to us one month later for a routine follow-up visit. Examination at the time disclosed that the patient appeared and felt perfectly well. Streptococcus fecalis was again cultured from the urine, which now appeared to be crystal clear. A further course of mandelic acid therapy was prescribed for the patient.

The patient was reexamined in January 1945. Her parents volunteered the information that she was enjoying perfect health and was voiding normally. No residual urine was present in the bladder. An excretory urogram revealed that the right kidney was functioning well with minimal pyelocaliectasis. The vesical outline appeared normal. Because Streptococcus fecalis was still present in the urine, mandelic acid therapy was continued.

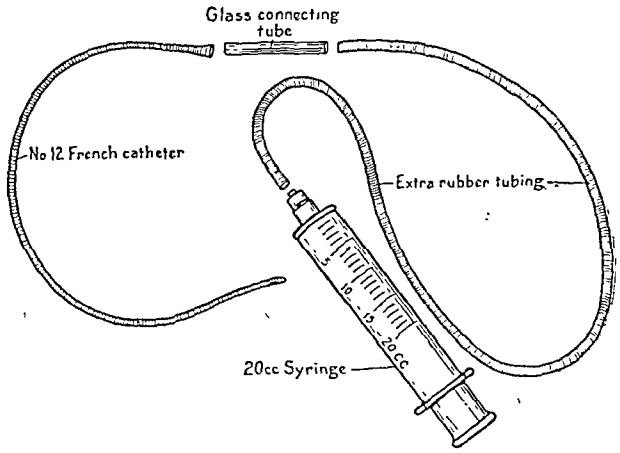
RECTAL INSTILLATION OF AMINOPHYLLINE IN INTRACTABLE ASTHMA

ALVAN L. BARACH, M.D., NEW YORK

Intravenous injection of aminophylline in patients with intractable asthma has become recognized as an exceedingly valuable therapeutic remedy following its introduction in 1937.[1] Since termination of bronchial spasm has been satisfactorily accomplished in more than 200 patients by rectal instillation of this drug, it has been repeatedly employed by nurses and by patients themselves in a program of bronchial relaxation.[2] The relief of bronchial spasm takes place in ten to thirty minutes, more gradually than with intravenous injection, but the side effects on the circulation, such as dizziness and faintness, are rarely encountered and have in no instance been troublesome. Nausea and vomiting may take place after large doses, as in intravenous injection, but are much less apt to occur if the patient is in the reclining position for one hour after its administration. The intravenous ampule of 20 cc. containing 0.48 Gm. of the drug has been employed, but it is much less expensive to use powders of 0.5, 0.6 or 0.7 Gm., dissolved at the time of administration in 20 cc. of tap water. There is admittedly less uniformity in absorption from the rectum than from the intravenous injection, but the availability of the method to the patient outweighs this relatively minor disadvantage.

The apparatus consists of a 20 cc. glass syringe, a No. 12 French rubber catheter and a connecting rubber tube attached to the open end of the catheter, approximately 18 inches in length and ⅛ inch in diameter.

At the time of treatment a powder of 0.6 Gm. is dissolved in 20 cc. of tap water and drawn into the glass syringe. The syringe is placed on the bedside table prior to introduction of the rubber catheter. Lubrication of both the anal mucosa and the rubber catheter is important to prevent irritation from long continued use. The catheter is then easily inserted into



Apparatus for rectal instillation of aminophylline.

the rectum for a distance of 2 or 3 inches; the rubber tube connection is brought forward in front of the patient, the syringe attached and the aminophylline delivered into the rectum. The catheter is then pinched tightly, to prevent drops of the solution from wetting the bed, and withdrawn. Other advantages of the method are that (1) the anal canal is not dilated by a large enema tube, (2) there is a minimal introduction of air, which may take place with the use of a tube and funnel, and (3) there is no irritation whatever if properly employed.

Although aminophylline is by far the most valuable drug in restoring sensitiveness to epinephrine, it must be borne in mind that patients will at times become refractory to aminophylline also. The treatment of this unfortunate complication is beyond the scope of the present paper, but it may be pointed out that the drug must then be discontinued and recourse had to other methods of bronchial relaxation, such as helium-oxygen therapy or colonic ether, in order to restore the patient's responsiveness to aminophylline.

SUMMARY

Rectal instillation of aminophylline by means of a No. 12 French catheter, a rubber tube connection and a 20 cc. glass syringe has certain advantages over intravenous injection in the treatment of intractable asthma. The procedure has been carried out by nurses, relatives and patients themselves without delay or difficulty. Circulatory side-effects of rapid intravenous injection, such as dizziness and faintness, were rarely encountered and never troublesome.

From the Department of Medicine, Columbia University College of Physicians and Surgeons, and the Presbyterian Hospital.

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Council on Foods and Nutrition

SPECIAL ARTICLE

This is the eighth of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication.

GEORGE K ANDERSON, M D, *Secretary.*

SELECTION OF PROTEIN CONTAINING FOODS TO MEET PROTEIN REQUIREMENTS

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In planning a dietary regimen appropriate in protein content for different health and socioeconomic conditions, several factors must be considered. Some evaluation must be made of the nutritive efficiency of proteins in a mixed dietary; selections must be made of the proper kind and amount of protein containing foods which may be used for various dietary prescriptions; and, finally, adaptations will have to be made to correspond with the patient's food habits, income and rationing allowances.

Space has not been given to itemizing numerous meal plans, but rather a procedure has been outlined whereby it will be possible to make up a dietary appropriate for each individual patient by making simple adaptations of a basic pattern of food intake.

THE NUTRITIVE EFFICIENCY OF PROTEINS IN A MIXED DIETARY

Is a quantitative appraisal of the amino acid content of the mixed dietary now in order? If so, this would be the most direct way to assess the nutritive efficiency of the food intake. While an approach has been made to an approximation of the amino acid requirements and to the selection of the appropriate quantities and combinations of food proteins which will meet these needs, the dietitian is not as yet adequately prepared to calculate accurately the amino acid content of the diet. As Block and Bolling [1] have stated, "It should be recognized that the methods used for estimating amino acids are not of equal precision. Errors are introduced by the formation of inhibiting substances or the partial destruction or modification of certain amino acids during hydrolysis. Mechanical and solubility losses also play a part." Nevertheless, present methods are of special use in comparative investigations and, if employed in conjunction with biologic experiments, are of value in suggesting the nutritional evaluation of proteins and the choosing of proteins which will be mutually supplementary.

The various methods of determining the relative values indicate that proteins of animal origin, i. e. milk, eggs, meat, poultry, fish and cheese, are superior in nutritive efficiency to most vegetable proteins. Furthermore, while these animal proteins are much alike in the value of their proteins, the same is not true of the vegetable proteins.[2] Thus, oats rank higher in biologic value than white wheat flour, but wheat is superior to corn in biologic value. Although beans, peas and lentils are considered of rather low biologic value, Everson and Heckert [3] have found that heating for forty-five minutes at 15 pounds pressure improved the nutritive value of mature soybeans, pinto beans, navy beans and kidney beans. Two varieties of peas were lowered in biologic value by the heating. In contrast, immature unheated peas appeared to supply an unusually high grade of protein. Peanuts rank high in biologic value. White wheat flour has been found to be decidedly lower in nutritive efficiency than the whole grain. Chick [4] has investigated the nutritive efficiency of the protein in three flours, from the same sample of grain, representing the 100 per cent whole grain, 85 per cent extractions and 75 per cent extraction. The third flour was that used for making ordinary white bread. The superior biologic value of the protein of the 100 per cent whole grain was striking and conclusive.

In spite of the lower biologic value of legumes and grains, it is well known that, when combined together in the diet, mutually supplementary relationships exist. Furthermore, it is recognized that a relatively small amount of animal protein will enhance considerably the value of the grains and legumes.[5]

From a practical point of view a quantitative evaluation of the supplementary relationship of proteins of mixed dietaries is needed. However, comparatively little is known about the biologic value of proteins making up a mixed diet. Recently Macrae, Henry and Kon [6] reported a study of the biologic value of mixed proteins in food served in Royal Air Force stations in England. The protein consumed per man daily varied from 83 to 101 Gm., and the proportion of the protein which was animal in origin ranged from 42 to 45 per cent. The results revealed that the diets had a high biologic value and a high degree of digestibility.

While more research is needed on the biologic value of the whole diet, it would appear that the current dietetic practice, that of providing one half of the protein from animal sources,[7] will insure a satisfactory factor of safety for the levels of protein intake recommended by the Food and Nutrition Board of the National Research Council [8] for the adult maintenance diet. In therapeutic diets, and in diets in which growth is a factor, it is a common practice to provide one half to two thirds of the protein from animal sources.

THE ORGANIZATION OF PROTEIN CONTAINING FOODS INTO PATTERNS OF FOOD INTAKE

The actual combining of protein containing foods into patterns of food intake may be organized most simply by noting the relative amounts of protein contributed by various food groups in a basic dietary pattern. From this basic plan it will then be possible to make adaptations in the protein intake suitable for various dietary prescriptions. An example of such a basic plan is presented in table 1.

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8. Food and Nutrition Board, National Research Council: Recommended Dietary Allowances, Handbook of Nutrition, Chicago, American Medical Association, 1943, pp. 333-338.

This basic pattern of food intake might be outlined in innumerable meal plans. Two examples of possible combinations of these foods which would give the approximate protein intake listed in table 1 are given in table 2.

The basic pattern of food intake supplies approximately 60 per cent of the protein from animal sources and approximates also the recommended dietary allowances for minerals and vitamins outlined by the Food and Nutrition Board of the National Research Council.[8]

In addition to the valuable amounts of protein supplied by these foods, other nutrients are present which in some respects differ either in kind or in relative amount. For example, the milk contributes the major portion of calcium and phosphorus in the diet as well as the vitamins of the B complex. While 2½ ounces of cottage cheese would be an equivalent protein substitute for 1 pint of milk, the cottage cheese [9] would supply less than one tenth of the calcium, phosphorus, iron, vitamin A, thiamine and riboflavin supplied by the milk. Two and one-half ounces of American Cheddar cheese [9] would supply calcium equivalent to 1 pint of milk but would be much lower in the vitamins of the B complex. In this case the addition of liver or other glandular meat one or two times a week would be desirable to augment the iron, vitamin A and B vitamins in the diet; pork would enrich the thiamine intake. Eggs will supply a significant amount of vitamin A and iron. Legumes and whole grains will also contribute iron and vitamins of the B complex. Table 3 is a comparative table of nutrients in some of the protein containing foods.

TABLE 1.—*Basic Pattern of Daily Food Intake for an Adult Man (70 Kg.)*

Daily Food Intake	Approximation of Protein Content,* Gm.
16 oz. (1 pint) of fluid milk or 8 oz. of evaporated milk or 1½ oz. (5 tablespoons) of dried skim milk (1 serving [4 oz.] of milk pudding or ice cream may be approximately equivalent to 3 oz. of fluid milk)	15
3 oz. serving of meat or poultry or fish (cooked, edible portion) or 1½ oz. of soybean flour or 5 oz. (¾ cup) of cooked soybeans	18
1 oz. of American cheddar type cheese or 1 oz. of cottage cheese or 1 egg	6
3 oz. serving (one half cup) of cooked peas, navy beans, or lima beans, or ¼ cup cooked soybeans, or ⅔ oz. (1½ level tablespoons) of peanut butter	6
3 oz. serving (½ cup) of potatoes	2
Other vegetable—3 servings, of which 1 is green leafy or yellow	3
Fruits—2 servings, of which 1 is citrus or tomato	2
Six slices of bread, enriched or whole grain, or equivalent grain product (The approximte protein equivalent of one slice of bread is a 1 oz. (dry weight) serving of cereal or ½ cup of cooked spaghetti or noodles or 6 soda crackers or 1 small piece of cake or a 2 inch cube of cornbread or 3 graham crackers)	18
Total	70

* Meat, poultry, fish, cheese and nuts range between 10 and 30 per cent protein. Grain products (dry weight), fresh peas and beans contain between 7 and 15 per cent protein. Eggs contain approximately 12 per cent protein. Milk is about 3 per cent protein. For more detailed figures on the percentage composition of protein in foods see Chatfield, C., and Adams, G.: Proximate Composition of American Food Materials, Circular No. 549, U. S. Dept. of Agric., June 1940.

9. Cheese may be roughly divided into two classes, one in which the curd is formed through the action of the enzyme rennet, the other in which the curd is formed through the action of lactic acid. When the curd is formed through the action of rennet, as in American Cheddar cheese, the calcium is retained in the curd. When lactic acid is used to produce the curd, as in cottage cheese, the calcium is lost in the whey.

ADAPTATIONS OF THE BASIC PATTERN

Considerable elasticity is possible in the selection of protein foods from the basic pattern. From this basic plan, adaptations can be made suitable for the diet for the normal adult woman and the diet for pregnancy and lactation, for the needs of children and for high protein diets. Innumerable combinations of the foods on the basic plan are possible in making up satisfactory outlines for meals. However, only a few examples follow, since a specific dietary prescription will need to be integrated with the individual patient's food habits and his social and economic problems.

TABLE 2.—*Combinations of Foods Embodying Basic Pattern*

Breakfast	Noon Meal	Evening Meal
Citrus fruit 1 egg 2 slices of toast Coffee with milk or cream	Sandwich (peanut butter or cheese or meat) Vegetable salad 1 glass milk Fruit Cake	Meat Potato Cooked vegetable Mixed green vegetable salad 1 glass milk 1 slice bread Ice cream
	or	
Banana Whole grain cereal with milk 1 slice toast Coffee with milk or cream	Baked navy beans with pork Cabbage salad 1 glass milk Fruit custard 1 slice bread	Soup with crackers Chicken Sweet potato Cooked greens Grapefruit and orange salad Ice cream Cake 1 slice bread

Diet for the Adult Woman.—If 1 Gm. of protein per kilogram of body weight is used as a guide in setting up the level of protein in the diet, the dietary prescription may range between 50 and 75 Gm. of protein daily. A sample plan containing 50 Gm. of protein is given in table 4. Again, if less than 1 pint of milk is used in the dietary plan, it will be necessary to make an effort to replace not only the protein but also the calcium, phosphorus and vitamins of the B complex which milk supplies in major amounts.

TABLE 3.—*Nutrients in Certain Protein Containing Foods* *

Amount of Food	Protein, Gm.	Minerals: Calcium, Gm.	Minerals: Iron, Mg.	Vitamins: Vitamin A, I. U.	Vitamins: Thiamine, Mg.	Vitamins: Riboflavin, Mg.	Vitamins: Niacin, Mg.
Milk, 1 pint	15	0.60	1.0	850	0.20	0.90	0.55
Cheese, cottage, 2½ oz.	15	0.06	0.1	(50)†	(0.01)†	(0.10)†	
Cheese, American cheddar, 2½ oz.	15	0.65	0.8	1,070	0.03	0.36	0.02
Beef, roast, 3 oz.	18	0.01	2.6		0.05	0.18	3.62
Pork, roast, 3 oz.	18	0.01	2.5		0.60	0.24	3.07
Liver, fried, 3 oz.	18	0.01	8.2	27,500	0.27	2.16	12.07
Peanut butter, ⅔ oz.	6	0.01	0.4		0.04	0.02	3.20
Navy beans, cooked, 3 oz.	6	0.04	2.5		0.10	0.08	0.50
Soybean flour, ½ oz.	6	0.05	2.0		0.09	0.06	0.60
Whole wheat bread, 2 oz. (2 slices)	6	0.04	1.6		0.18	0.08	2.10
Egg, one	6	0.02	1.3	450	0.07	0.18	0.03

* Tables of Food Composition Giving Proximate, Mineral and Vitamin Components of Foods, Committee on Food Composition of the Food and Nutrition Board, National Research Council March 1, 1944; Tables of Vitamin Losses in Cooking of Foods, June 1, 1944.
† ( ) Imputed values.

Diet for Pregnancy and Lactation.—Between 85 and 125 Gm. of protein may be recommended during this period, two thirds of which can easily be provided as animal protein. Extra needs for calcium, phosphorus, iron and vitamins have been indicated in the recommended dietary allowances of the Food and Nutrition Board of the National Research Council.[8] These extra needs can be supplied to excellent advantage simply by

adding milk to the basic pattern of food intake. Skim milk (defatted milk solids) or buttermilk may be used. When the patient is not accustomed to drinking milk, it may be desirable to provide suggestions for the use of milk in soups, desserts or flavored beverages. The most inconspicuous and, in many cases, the most acceptable way in which to add milk is in the form of dried milk. Approximately 1½ ounces (5 tablespoons) of dried skim milk (defatted milk solids) will equal

TABLE 4.—*Sample Plan Containing 50 Gm. of Protein*

	Protein, Gm.
1 pint of milk or milk equivalent	15
1 egg	6
2 ounces meat or poultry or fish	12
3 vegetables	3
2 fruits	2
4 slices of bread or equivalent grain product	12
Total	50

1 pint of fluid milk. This dried milk may be incorporated as a dry ingredient in the preparation of meat loaf, mashed potatoes, sandwich spreads, cooked cereals, hot breads, cookies, pastries or puddings with little difficulty. Also a palatable drink may be prepared by adding approximately 2½ tablespoons of dried skim milk to 1 glass (8 ounces) of fluid milk. This will provide approximately 15 Gm. of high quality protein per glass. In some parts of the country, dried milk may be obtained from the retail grocery store. In other places it may be necessary to depend on the courtesy of a bakery shop or hospital, or dairy.

Where cheese is substituted for milk, due attention must again be given in order to compensate for the large decrease in minerals and vitamins which would otherwise result. In this case the increased use of glandular meats and pork will be useful in augmenting these nutrients. Where milk or American Cheddar type cheese is not tolerated it is unlikely that the calcium and phosphorus will be met with other foods. Further attention will then have to be given to compensate satisfactorily for the protein and for other nutrients provided in milk. An example of a diet containing 100 Gm. of protein and meeting the recommended allowances of the Food and Nutrition Board of the National Research Council [8] for minerals and vitamins during lactation is presented in table 5.

Diet for Children.—Relatively more protein is recommended per unit of weight during the growth period. Recommended daily allowances vary between 40 and 100 Gm. of protein daily, depending on the age and "ideal" size of the child. The actual food selection will be similar to that outlined in the basic pattern of food intake, but the relative amounts of each food will vary during the child's developmental period. In younger children the 30 Gm. of protein provided in 1 quart of milk will insure a surplus of animal protein. With an egg daily and a small serving (2 ounces) of meat or cheese in addition, it will be possible to provide two thirds of the protein as animal protein on levels up to 65 Gm. of protein daily. When levels of 100 Gm. of protein daily for adolescent children are to be provided, a plan similar to the one suggested for pregnancy and lactation will supply the high levels of minerals and vitamins needed.

High Protein Diets.—When it is desirable to increase the protein content of the diet to levels as high as 150 Gm. daily, it may be difficult from the patient's point of view to increase further the protein containing foods enumerated on the basic pattern of food intake. The patient may have objections to the bulk, to the cost or to the flavor of these foods. In this case, use may be made of concentrated food sources of protein, particularly dried milk, which contains 25 per cent protein in dried whole milk and 35 per cent protein in defatted milk solids (dried skim milk). Other protein rich foods may be used, such as soybean flour, which ranges between 37 and 45 per cent protein, peanut flour, which may be 50 to 60 per cent protein, or dried yeast, which is approximately 45 per cent protein. Corn germ and wheat germ also have possibilities for use as valuable protein foods. Plain, dried gelatin contains 85 per cent protein.

As already mentioned, dried milk is one of the concentrated food sources of protein which may be used the most successfully. It may readily be incorporated as a dry ingredient in hot breads, cookies, cake, sandwich spreads, mashed potatoes, meat loaf, milk beverages and desserts, hot cereals and cream sauces, resulting in a decided increase in the protein intake. As stated previously, 2½ tablespoons of dried skim milk may be added to one glass (8 ounces) of fluid milk, thus providing 15 Gm. of high quality protein per glass of milk. This is a low cost product which supplies excellent quality proteins.

Soybean flour is another mild flavored, low cost product which can be successfully incorporated in cooking. Tabulations of comparative digestibility coefficients, amino acid analyses and results of growth promoting animal feeding tests all contribute to the conclusion that the protein of the soybean is of high biologic value. Soybean products are generally available at the present time and can be used in such prepared foods as pancake and muffin mixes, cereal products, macaroni and other paste goods, meat products, soups, breads and pastry products.[10] Approximately 500 tested recipes in both large quantity and family size have been collected from various agencies by the Diet Therapy Section of the American Dietetic Association.[11]

Since the production of peanut flour has increased as the result of priority allowances by the War Production

TABLE 5.—*Diet Containing 100 Gm. of Protein*

Daily Food Intake	Protein, Gm.
40 oz. fluid milk	30
3 oz. serving of legumes or 1½ tablespoons butter	12
1 serving of potatoes	6
3 servings of vegetables	6
2 servings of citrus fruit or tomato	2
5 slices bread, whole grain or enriched	2
Total	10
	100

Board, the use of this product is appropriate at this time.[12] As peanut flour contains approximately 50 to 60 per cent protein, an effective increase can be made in the protein intake with this product. It may be blended with cereals such as wheat, cornmeal, hominy grits, rolled oats, farina and various prepared dry cereals to increase their food value, and with cereal flour used in baked products. It can also be used as an extender and binder in meat loaves, sausage and

10. Leaming, Betty G.: Soya Products—Availability, Nutritional Values, and Utilization, J. Am. Dietet. A. **19**: 824-827 (Dec.) 1943.
11. Note: Soya Products, J. Am. Dietet. A. **20**: 307 (May) 1944.
12. Peanut Flour, editorial, J. Am. Dietet. A. **19**: 640-642 (Sept.) 1943.

other meat products and as a base in dry soup concentrates.[13]

Another low cost product which has considerable merit is dried brewers' yeast, which contains approximately 45 per cent protein. The advantages of yeast, have been appreciated not only because it is an inexpensive source of recognized vitamins and protein but also because many experiments indicate that it contains essential factors that have not been isolated and recognized. Yeast makes pleasing combinations with syrup or peanut butter. It can also be used in baked products such as bread, cookies and doughnuts. Heller, McCay and Lyon [14] incorporated significant amounts of yeast successfully in meat loaves, stews, cheese dishes, baked beans and meat balls. These products were all accepted favorably in an industrial cafeteria serving 1,500 people daily. Carr [15] has published recipes for the use of yeast in home cookery.

Use may also be made of wheat germ which contains approximately 35 per cent good quality protein. It may be added directly to meat dishes, sandwich mixes, soups, cereal dishes or fruit mixtures. It has not been incorporated successfully in significant amounts in breads or cakes because of the change made in the texture of the baked product. Corn germ, another vegetable product with possibilities for becoming a valuable protein food, contains 20 per cent protein of a quality comparable to milk, meat and soybean protein.

Commercial products are available which combine dried milk, dried egg, wheat germ, whole grains and synthetic vitamins. Certain of these may be incorporated in milk beverages, thus being of especial value when liquid or soft diets are recommended. Bauman [17] has suggested a formula for a high protein beverage to increase the protein intake. Gelatin also may be incorporated in significant amounts in hot beverages or soups.

OTHER CONSIDERATIONS

In order to make the dietary plan acceptable to the patient it will be necessary to take into consideration the economic factors, the social and emotional problems of the individual patient and nowadays the rationing of foods.

An appraisal of protein containing foods in terms of cost usually shows that meat, poultry and fish are the most expensive items in the menu. While the current ceiling prices have a leveling effect on price at the present time, the usual factors of cost of production and marketing still need to be considered. The relative importance of these factors will vary in different parts of the country. Thus, if fish or poultry is more readily available they can be used, since these foods are of equal protein value with meat. At the present time the more select cuts of meat are scarce. More of the range fed, utility grade beef is available for civilian use. The utility grade beef contains less fat and a slightly higher percentage of protein than the choice cuts. Thus, on the basis of nutritive value no discrimination need be made against the lower grade meats or the less popular cuts. These meats are less tender, however. Tenderness may be obtained by a somewhat longer cooking period with moist heat, which brings about a hydrolysis of the collagen in the connective tissue to gelatin. To effect the greatest economy in both money and rationing allowances, it may be necessary to recommend to the patient that he (1) buy kinds and cuts of meats not used before, as less tender cuts and organ meats, (2) learn the suitable preparation for each cut, using low temperature cooking for all methods, (3) extend the flavor of meat with bland foods such as spaghetti, noodles and corn meal, (4) select recipes which combine the best elements of appetite appeal with nutritive value and (5) avoid kitchen waste, table waste and waste from improper storage. Furthermore, it is not necessary to use large amounts of meat even in the high protein diet.[18] Adequate substitutions may be made for meat by the selection of equivalent amounts of other protein containing foods. Thus the equivalent of 1 ounce of meat might be 1 ounce of poultry or fish, or 1 egg, or 1 glass of milk, or 1½ tablespoons of peanut butter or 1 serving of legumes. In addition such low cost, unrationed products which are concentrated sources of protein may be used advantageously as dried milk, soya products, peanut flour, dried brewers' yeast and wheat or corn germ. At the present time it is not difficult to obtain adequate amounts of protein containing foods from the unrationed list.

Among the less expensive protein containing foods, milk is the most important not only in terms of good quality protein but in terms of other nutrients as well. Furthermore, the valuable supplementary protein relationships between milk and vegetable proteins will enable the patient to make greater use of the low cost legume and grain proteins with safety.

The patient's acceptance of protein foods to which he has not been accustomed will depend on satisfactory adaptations of the dietary plan to the different national, regional, religious or racial backgrounds of each patient.[19] Furthermore, the instructions of the food clinician become increasingly effective as psychologic factors are taken into account in teaching nutrition. Behavior in relation to food is often an interplay between the physical and the emotional life. As in other phases of medicine, the patient must be considered as a "whole" if the therapy is to be effective.

13. A booklet containing recipes for the use of this flour may be obtained from the National Peanut Council, Inc., Atlanta, Ga.
14. Heller, Christene A.; McCay, C. M., and Lyon, C. B.: Adequacy of the Industrial Lunch and the Use of Brewers' Yeast as a Supplement, J. Nutrition **26**: 385-390 (Oct.) 1943.
15. Carr, R. E.: Vitamin Rich Baked Products, Michigan State Bull. 178, 1941.
16. Corn Germ, a Valuable Protein Food, Nutrition Rev. **2**: 212-213 (July) 1944.
17. Bauman, Louis: A High Protein Beverage, J. A. M. A. **121**: 1283 (April 17) 1943.
18. Johnson, Doris: High-Protein Diets, J. Am. Dietet. A. **20**: 666-667 (Nov.) 1944.
19. Report of the Committee on Food Habits 1941-1943: The Problem of Changing Food Habits, Bulletin of the National Research Council, No. 108, October 1943.

ACCEPTED FOODS

The following additional foods have been accepted as conforming to the Rules of the Council on Foods and Nutrition of the American Medical Association for admission to Accepted Foods.

GEORGE K. ANDERSON, M.D., *Secretary.*

PREPARATIONS USED IN THE FEEDING OF INFANTS (*See* Accepted Foods, 1939, p. 156)

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT STRAINED PEACHES WITH LEMON JUICE.

Analysis (submitted by manufacturer).—Total solids 15.66%, moisture 84.34%, ash 0.44%, fat (ether extract) 0.20%, protein (N × 6.25) 0.69%, crude fiber 0.24%, carbohydrates (other than crude fiber) 13.91%, calcium (Ca) 0.027%, phosphorus (P) 0.026%, iron total 0.68 mg. per hundred grams, iron "available" (Bipyridyl method) 0.40 mg. per hundred grams, copper (Cu) 0.11 mg. per hundred grams.

Calories.—60 per hundred grams, 17 per ounce.

Vitamins.—

Vitamin A	350 U. S. P. units	per hundred grams
Thiamine	0.015 mg.	per hundred grams
Riboflavin	0.012 mg.	per hundred grams
Niacin	0.63 mg.	per hundred grams
Ascorbic acid	3.3 mg.	per hundred grams

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SATURDAY, JUNE 23, 1945

ENZYMIC DETOXICATION OF POISON IVY

During recent years Hill,[1] Mason [2] and others have isolated and identified certain skin irritants from poison ivy, poison oak and related plants. Keil [3] has shown that these substances are phenols or catechols characterized by long unsaturated side chains attached to the phenolic ring. The toxic properties are in large part due to the presence of OH groups in this ring. On exposure to air a slow auto-oxidation of these toxic groups takes place. This has suggested that a logical method of preventing or treating poison ivy dermatitis would be by the use of strong oxidents such as ferric chloride and potassium permanganate.

In their search for a less irritating therapeutic agent, Sizer and Prokesch [4] of the Massachusetts Institute of Technology tested whether or not a similar oxidative detoxication can be effected by the use of enzymes. Since phenolic oxidases are not highly specific,[5] Sizer selected mushroom tyrosinase for his oxidation tests. The isolated toxic principle of poison ivy was mixed with tyrosinase and the rate of oxidation determined by measuring the rate of oxygen consumption in the Barcroft respirometer. The mixture consisted of 1 cc. of poison ivy extract, 0.1 cc. of tyrosinase and 3.2 cc. of buffer (p_H 7.3). The consumption of oxygen proceeded rapidly to 60 per cent completeness during the first four hours and with increasing slowness for five days, when the oxidation was practically complete. Additional evidence that the toxic molecules had undergone catalytic oxidation was furnished by a gradual darkening of the color of the mixture.

The dermatitis producing properties were greatly reduced. This was shown by parallel patch tests on both human and sensitized [6] guinea pig skin. In all cases a much more severe dermatitis was noted in the control area covered with the untreated toxin than in the area covered with the oxidized toxin. In many cases dermatitis was not noted with the oxidized product.

The therapeutic efficiency of tyrosinase was tested by applying simultaneously to human skin a poison ivy concentrate and tyrosinase, control test being made with boiled or inactivated tyrosinase. In all cases the area treated with the active enzyme gave much less dermatitis than the control, indicating sufficiently rapid oxidation to be of therapeutic promise. If equally successful results can be obtained by applying tyrosinase some time after the toxicant has reached the skin or, preferably, after erythema has developed, then a new method of treating poison ivy dermatitis will be available. Clinical tests of the latter possibilities are now in progress.

1. Hill, G. A.; Mattacotti, V., and Graham, W. D.: J. Am. Chem. Soc. **56**: 2736, 1934.
2. Mason, H. S., and Schwartz, L.: J. Am. Chem. Soc. **64**: 3058, 1942.
3. Keil, H.; Wasserman, D., and Dawson, C. R.: J. Exper. Med. **80**: 275, 1944.
4. Sizer, I. W., and Prokesch, C. E.: Science **101**: 517 (May 18) 1945.
5. Nelson, J. M., and Dawson, C. R.: Advances Enzymol. **4**: 99, 1944.
6. Simon, F. A.: J. Immunol. **30**: 275, 1936.

NUTRITION AND CANCER

The nutritional state of the patient assumes an important role in curing disease. In both experimental and spontaneous tumors the influence of energy intake, fat consumption per se, protein content of the diet and deficiency of certain vitamins have been shown to influence the course of development of the tumor. Many investigations have shown that mere restriction of food consumption in animals will reduce the incidence of both spontaneous and artificially induced tumors. Tannenbaum [1] has demonstrated with statistics gathered from the life insurance companies that an increased incidence of cancer occurs among persons who were overweight at the time the insurance policy was issued. On the basis of such evidence Potter [2] has even advocated ample exercise and a minimum food consumption as a measure for the prevention of human cancer.

Recently Morris [3] has shown that in mice on a restricted calory regimen, so that the weanlings did not gain weight and adult animals lost up to 45 per cent of their weight, the incidence of spontaneous mammary tumors was reduced from a control value of 38 per cent to 0 per cent. However, he noted that this diet also inhibited estrus and delayed mammary development. With regard to ample exercise and the number of transplanted tumors which developed, Kline and Rusch [4] have not observed difference between rats which had been forced to exercise and the controls.

Diets which are deficient in protein also influence the occurrence and growth of tumors. White and Andervont [5] have shown that there is a lowered incidence of spontaneous mammary tumors in mice on either a

1. Tannenbaum, Albert: Relationship of Body Weight to Cancer Incidence, Arch. Path. **30**: 509 (Aug.) 1940.
2. Potter, V. R.: Science **101**: 105 (Feb. 2) 1945.
3. Morris, H. P.: Science **101**: 457 (May 4) 1945.
4. Kline, B. E., and Rusch, H. P.: Cancer Research **4**: 762 (Dec.) 1944.
5. White, Julius, and Andervont, H. B.: J. Nat. Cancer Inst. **3**: 447 (June) 1943.

lysine or cystine deficient diet. Here again the mammary glands were infantile in development even in mice old enough to be mature. Also there have been studies showing that rats on diets deficient in biotin or pyridoxine show a decreased incidence of tumor formation.

The important question raised by Morris is "To what extent would the dietary regimens found effective in delaying or preventing mouse mammary cancer be effective in delaying or preventing the same disease in man." He concludes that the diets that seem to reduce the incidence of cancer are too drastic, even if they could be applied, to be of any practical value for the prevention of human cancer. Also the effect of exercise was not adequately investigated even in animals, so that definite conclusions cannot be drawn concerning its applicability to human cancer.

Current Comment

VITAMIN C IN HAY FEVER

About three years ago the administration of vitamin C was suggested for the treatment of hay fever and other allergic conditions. Generally this therapy has been viewed with skepticism, but nevertheless some have given it fair trial. Most recent of the reports is that of Friedlaender and Feinberg,[1] who found that hay fever patients have a normal level of vitamin C; although large doses of this vitamin produce saturation blood levels, they do not change the course of hay fever or asthma. In view of this and previously published evidence vitamin C therapy for hay fever and other allergic conditions may be considered useless and wasteful.

RADIOCYSTITIS

Chronic actinic injury following the therapeutic use of roentgen rays and radium is most thoroughly studied and most often noted in the skin, but it occurs not infrequently in internal organs incidentally exposed to radiation. The delayed and insidious development of such reactions, obscuring the causal interrelations, and the inaccessibility of the internal organs to direct inspection are responsible for the smaller degree of attention these lesions have received. Since the urinary bladder is situated within the beam of roentgen and radium rays used for the treatment of neoplastic and other conditions of the uterus, prostate, bladder and rectum, acute and late actinic injuries to this organ are relatively common.[1] Dean [2] noted that all patients receiving more than 3,500 mghrs. of radium therapy, or its equivalent by high voltage roentgen rays, would very likely develop injury of the bladder from the therapy itself, that 27 per cent of all patients treated in this region with actinic rays required prolonged care for vesical distress and that 14.5 per cent had serious lesions of the bladder, such as ulcers and necroses. The therapeutically important actinic injury to the bladder is of the delayed type, appearing six to twelve months after treatment, or the late type, one to nine years after treatment. Such injury is associated with anatomic changes in the vesical wall, namely bullous edema, congestion, telangiectasis, superficial or deep ulcerations, calcareous incrustations and deposits, and causes severe pain, burning sensation on urination, polyuria, tenesmus and hematuria. The functional and anatomic phenomena may resemble closely those in tuberculosis or primary or secondary cancer of the bladder. Biopsy may be necessary at times for differential diagnosis. In the bladder are degenerative and proliferative changes in the epithelium, with swollen and often grotesquely distorted cells, forming not infrequently syncytial masses with large nuclear bodies. There occur ulcerative defects and fibrosis of the submucosa with telangiectasis. Since obliterative endarteritic lesions are not prominent they do not explain the degenerative lesions. Experimental studies on roentgen cystitis in dogs [3] have shown that the injured bladder tends to become infected by fecal bacteria. This infection is refractory to the usual treatment. For this reason patients subjected to actinic therapy involving the bladder should be kept under close urologic supervision so that adequate therapeutic measures may be started on the first signs of radiocystitis, as the control of the fully developed condition is usually protracted and often unsatisfactory.

ANTIBIOTICS

The terms "antibiotics" and "antibiotic effect" were suggested by Waksman and his co-workers in the Department of Microbiology, New Jersey Agricultural Experiment Station, Rutgers University. Waksman, Horning and Spencer [1] isolated sixteen strains of Aspergillus fumigatus and three strains of Aspergillus clavatus from stable manure. These two organisms produced, when grown on synthetic mediums, active substances that differed greatly in their chemical nature and biologic activity. They were designated by the authors as "fumigacin" and "clavacin" respectively. Clavacin was found to be particularly active against gram negative bacteria. The distinguishing characteristic of this substance is that it is both bacteriostatic and bactericidal. Subsequently these substances were crystallized [2] and their chemical nature determined. When gliotoxin, present in fumigacin, is removed, the

1. Friedlaender, Sidney, and Feinberg, S. M.: Vitamin C in Hay Fever: Therapy and Blood Levels, J. Allergy **16**: 140 (May) 1945.

1. Chydenius, J. J.: Irradiation Lesions in Radium Therapy of Cancer of Collum Uteri, Acta radiol. **23**: 1, 1942. Farell, D. M., and Hahn, G. A.: Late Injuries Following Treatment of Carcinoma of Cervix, Urol. & Cutan. Rev. **48**: 165 (April) 1944. Goldblatt, M. E.: Postradiation Effects on Bladder and Ureters Following Use of Deep Roentgen Ray and Radium Therapy for Relief of Pathologic Conditions Affecting Uterus and Its Appendages, ibid. **47**: 632 (Nov.) 1943.

2. Dean, Archie L.: Injury of the Urinary Bladder Following Irradiation of the Uterus, Am. J. Obst. & Gynec. **25**: 667 (May) 1933.

3. Hueper, W. C.; Fisher, C. Virginia; DeCarvahal-Forero, J., and Thompson, M. R.: The Pathology of Experimental Roentgen Cystitis in Dogs, J. Urol. **47**: 156 (Feb.) 1942.

1. Waksman, S. A.; Horning, E. S., and Spencer, E. L.: The Production of Two Antibacterial Substances, Fumigacin and Clavacin, Science **96**: 202 (Aug. 28) 1942.

2. Waksman, S. A.: Purification and Antibacterial Activity of Fumigacin and Clavacin, Science **99**: 220 (March 17) 1944.

purified substance retains its antibacterial activity and only a limited toxicity to animals. At about the same time the English workers Chain, Florey, Jennings and Williams [3] isolated the same substance from a strain of Aspergillus fumigatus and described it as helvolic acid. These investigators believed that helvolic acid was not identical with fumigacin because of certain well defined chemical differences, in particular that of containing nitrogen. The nitrogen content is presumably gliotoxin, mentioned by Waksman. However, Waksman believes that helvolic acid is identical with fumigacin in chemical composition, anti-bacterial action and in vivo activity. He also points out that the isolation of claviforme by Chain and his associates was announced simultaneously with that of clavacin. Waksman stresses that much confusion has arisen in this field from the fact that various micro-organisms are capable of producing the same type of antibiotic substance and that many organisms are capable of producing more than one type of substance. Thus Aspergillus fumigatus has the capacity of forming four different antibacterial compounds—spinulosin, fumigatin, fumigacin and gliotoxin. The three different organisms Aspergillus clavatus, Penicillium claviforme and Penicillium patulum produce the same antibiotic substance. Research has revealed a high degree of cell activity by various antibiotic substances on different bacteria. As pointed out by Schatz and Waksman,[4] Mycobacterium tuberculosis is subject to bacteriostatic action of a variety of antibiotic substances, streptomycin, isolated by them, being promising. This substance is effective also against various related organisms, namely Erysipelothrix and Actinomyces griseus, first described by Schatz and Waksman.

PENICILLIN AS A FOOD PRESERVATIVE

In pasteurization of milk and nonpressure canning of fruits and vegetables all vegetative forms of bacteria are usually killed. The residual bacterial contaminants usually consist solely of heat resistant spores. On germination these spores are the main source of toxins and other forms of food spoilage. Since the use of strong chemical antiseptics is not feasible with food products, Curran and Evans [1] of the Division of Dairy Research, U. S. Department of Agriculture, tested the possible efficacy of penicillin as a food preservative (sporicide). Washed bacterial spores, entirely free from vegetative cells, were suspended in sterile water or milk. The suspensions were heated to 95 C. for fifteen minutes to precondition the spores for later germination. Previous tests [2] had shown that many aerobic spores remain latent for a long time without such heating. A measured amount of pencillin was then added to each mixture and the mixture incubated at the optimum temperature for germination. At the end of five to twenty-seven hours' incubation the residual penicillin was inactivated by the addition of penicillinase. The mixtures were then plated. The difference between the number of viable spores thus determined and the original spore count was taken as a measure of sporicidal activity. In a typical test an initial milk count of 256 Bacillus subtilis spores per cubic centimeter was reduced to 1.6 spores per cubic centimeter by the end of five hours and to 0.04 spore per cubic centimeter by the end of twenty-seven hours. Five Oxford units of penicillin per cubic centimeter was used in this test. Similar though less rapid sporicidal action was recorded with the spores of all other aerobic bacteria thus far tested. Effect on anaerobic spores has not yet been reported. The extraordinary effectiveness of pencillin in low concentrations against bacterial spores, together with its nontoxic nature, led Curran to suggest the use of penicillin in numerous nonmedical fields, including that of food preservation. Relatively inexpensive crude penicillin presumably would be satisfactory for such uses.

3. Chain, E.; Florey, H. W.; Jennings, M. A., and Williams, T. I.: Helvolic Acid, an Antibiotic Produced by Aspergillus Fumigatus, Mut. Helvola Yuill, Brit. J. Exper. Path. 24: 108 (June) 1943.

4. Schatz, A.; Bugie, E., and Waksman, S. A.: Streptomycin, a Substance Exhibiting Antibiotic Activity Against Gram Positive and Gram Negative Bacteria, Proc Soc. Exper. Biol. & Med. 55: 66 (Jan.) 1944.

1. Curran, H. R., and Evans, F. R.: Proc. Soc. Exper. Biol. & Med. 58: 262 (March) 1945.

2. Curran, H. R., and Evans, F. R.: J. Bact., to be published.

IN VITRO GROWTH OF THE MALARIA PARASITE

The growth of the infective agent in vitro is an important achievement in the investigation of a disease. Whether the emphasis is immunologic, biochemical, nutritional or chemotherapeutic, growth of the parasite in vitro eliminates many secondary or masking effects which the body of the host produces. Recently Ball and his associates [1] have grown the monkey malaria parasite Plasmodium knowlesi in vitro; the medium consists of one-third whole blood and two-thirds purified nutrient solution. Under these conditions it is possible to have the number of organisms increase three or four fold in a twenty-four hour period. With this new method of attack the distribution of phosphorus among the various types of compounds and the oxygen consumption of the organism were determined. Stimulated by the early success, work is in progress on the growth of the human malaria parasite under these conditions. The increasing importance of this disease in the nation's health emphasizes the need for more knowledge regarding the life processes of the infective agent; hence the foregoing experimental device merits further attention.

FOURTH OF JULY FIREWORKS ACCIDENTS

For many years annual summaries of the injuries from fireworks occurring throughout the nation in celebration of the Fourth of July were published in THE JOURNAL. These summaries were influential in bringing about legislation in many states which sharply reduced the frequency of these unnecessary accidents. The fine record of recent years in this respect should be continued. Every effort should be made to curb the use of fireworks on this holiday in order to keep the inevitably attendant injuries at a minimum.

1. Ball, E. G.; Anfinsen, C.; Geiman, Q. M.; McKee, R. W., and Ormsbee, R. A.: Science 101: 544 (May 25) 1945.

MEDICINE AND THE WAR

ARMY

GERMANY'S TECHNIC IN SURGERY LAGGING

Germany, once the world's acknowledged leader in surgery and medicine, is twenty years behind American methods in the handling and healing of war wounded, according to Col. Edward D. Churchill, Allied Mediterranean forces' surgical consultant, who recently inspected the wounded in former German hospitals. A German army colonel indicated that he regarded the outcome of wounds in this war to be identical with conditions he observed in the first world war. American recoveries, on the other hand, improved phenomenally, such as field operating tents up at divisional clearing stations, the highly developed use of blood transfusions and the high standard of antisepsis in the field.

In the six German hospital areas inspected by Colonel Churchill he found that of forty serious chest wounds picked at random thirty-seven showed infection, while the American patients' average was well below 10 per cent. For blood transfusions the Germans used an antiquated syringe type apparatus discarded years ago by the Americans. The Germans had not realized the possibilities of transfusion and would not believe, until the Americans gave a demonstration, that one man could successfully receive more than 600 cc.

The fundamental difference found between the American and the German system is that the Americans have a systematic, continuous routine from the moment of wounding until the highest possible degree of restoration to health. Infected chest wounds, which after the first world war left hundreds permanently hospitalized with great gaping wounds, can now be handled so that within a few weeks the men are completely restored with normal respiratory systems. The Germans' methods, on the other hand, were characterized by a lack of direction or any general and definite policy in professional methods. Colonel Churchill stated that individual surgeons carried on "just about as they pleased" and field surgeons were inclined to pass over extremely serious cases with the idea that the injured men would die anyway.

LOCAL APPLICATION OF CRYSTALLINE SULFONAMIDES DISCONTINUED

The War Department Technical Bulletin of Medicine (TB MED 147), March 1945 (distributed to general and field hospitals and other medical units), announced the general policies regarding the local use of chemotherapeutic agents. Experience in wound management justifies the abandonment of local use of any chemical agent in a wound for its supposed antiseptic effect in the prevention or treatment of infection. The practice of routine local application of crystalline sulfonamides to wounds as an emergency aid measure and prior to initial wound surgery will be discontinued. The local application of these compounds to wounds not involving serous cavities following wound surgery will also be discontinued, and their local use in wounds involving serous cavities is not recommended.

ARMY AWARDS AND COMMENDATIONS

Colonel Cornelius P. Rhoads

Award of the Legion of Merit was recently bestowed on Col. Cornelius P. Rhoads, formerly of New York. He was cited for the development of methods for combating poison gas and other advances in chemical warfare. Dr. Rhoads was head of the Chemical Warfare Service's Medical Division from June 1943 to April of this year, and he established the Toxicological Research Laboratory at Edgewood Arsenal, Md., and the Medical Research Laboratory at the Dugway Proving Ground, Tooele, Utah. "He developed new methods of diagnosis and treatment for relief of injuries due to toxic chemicals and perfected a compound to counteract the effects of blister gas. At Bushnell, Fla., and San Jose Island, Canal Zone, he established medical testing stations. He also developed equipment for detecting the presence of war gases in air, food and water." Dr. Rhoads graduated from Harvard Medical School, Boston, in 1924 and entered the service June 15, 1943.

Captain Douglas Lindsey

The Silver Star was recently awarded to Capt. Douglas Lindsey, formerly of Minden, La., "for gallantry in action against the enemy in Germany. On . . . during the assault across the . . . River, Capt. Lindsey, battalion surgeon, braved heavy small arms and artillery fire to reach and administer medical treatment to a helpless wounded rifleman. His courageous conduct and professional skill throughout the early stages of this attack were material factors in the prompt treatment of casualties. Capt. Lindsey's exemplary devotion to duty under hazardous conditions reflects great credit on himself and the military service." Dr. Lindsey graduated from Yale University School of Medicine, New Haven, Conn., in 1943 and entered the service Jan. 12, 1944.

Captain Edwin S. Kessler

The Bronze Star was recently awarded to Capt. Edwin S. Kessler, formerly of Cleveland Heights, Ohio, for "heroic achievement in connection with military operations against the enemy during his division's historic reduction of Metz." He directed operations of a battalion aid station in a highly distinguished manner, despite continuous exposure to enemy fire, and his heroic performance of duty was instrumental in saving many lives. Dr. Kessler graduated from Western Reserve University School of Medicine, Cleveland, in 1942 and entered the service July 16, 1943.

Major Sylvan W. Simon

Major Sylvan W. Simon, formerly of Chicago and now with the Air Service Command in Italy, was recently awarded the Bronze Star after he led his medical detachment in stamping out a civilian smallpox epidemic before it reached the thousands of combat airmen of the 15th Air Force who were on duty at nearby airfields. Dr. Simon graduated from Rush Medical College, Chicago, in 1926 and entered the service in October 1940.

Captain John J. Goldsberry

Capt. John J. Goldsberry, formerly of Worcester, Mass., recently received a letter of commendation from the Surgeon General for his origination of the basic idea of a furlough pamphlet as an aid in the prevention of venereal disease in soldiers while on furlough. The commendation read "To the knowledge of this office, Capt. Goldsberry was the first station venereal control officer to organize an effective program aimed at reducing the incidence of venereal disease acquired on furlough and is to be commended for his initiative and originality." Dr. Goldsberry graduated from Howard University College of Medicine, Washington, D. C., in 1926 and entered the service May 12, 1941.

Major James J. Whitsitt

Major James J. Whitsitt, formerly of Houston, Texas, who was with the Airborne troops in the Normandy invasion, was recently awarded the Bronze Star, the Presidential Unit Citation and the Purple Heart, the latter for mortar fire wounds in the leg and thigh. He is now in Germany. Dr. Whitsitt graduated from the University of Tennessee College of Medicine, Memphis, in 1932 and entered the service Aug. 18, 1942.

Major E. Charles Powell Jr.

The Bronze Star and the Meritorious Service Unit Plaque was recently awarded to Major E. Charles Powell Jr., formerly of Goldsboro, N. C. The citation accompanying the Bronze Star read "For meritorious service in connection with military operations against the enemy in Belgium and Germany, November 18, 1944 to March 5, 1945. As regimental surgeon during this period Major Powell, by his display of outstanding administrative ability, technical knowledge and loyalty, supervised the treatment and evacuation of wounded and sick personnel of his regiment under the difficulties of combat conditions and adverse weather in a manner which has insured prompt and efficient medical care. The preventive measures instituted by him during the months of winter warfare were largely responsible for the reduction of frostbite casualties within his unit. The skill, exemplary action and commendable conduct exhibited by Major Powell reflect high credit on himself and the military service."

The citation accompanying the Meritorious Service Unit Plaque read "The Medical Detachment, 334th Infantry, is awarded the Meritorious Service Unit Plaque for superior performance of duty in the accomplishment of exceptionally difficult tasks, Nov. 19, 1944 to March 18, 1945. During this period the members of the unit, maintaining a high standard of discipline and displaying courage despite heavy enemy fire and adverse conditions, administered medical aid and evacuated casualties from the field of battle in a manner which resulted in saving the lives of many soldiers and contributed materially to the success of the regiment's military operations. The brave, unselfish action and commendable conduct of the members of the Medical Detachment, 334th Infantry, reflect high credit on the unit and the armed forces of the United States." Dr. Powell graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1935 and entered the service Sept. 15, 1940.

Major Samuel H. Flowers

The Bronze Star was recently awarded to Major Samuel H. Flowers, formerly of Middlesboro, Ky., "for meritorious service in direct support of combat operations during the period Feb. 10, 1944 to Nov. 20, 1944. Serving Air Force combat units, Major Flowers as surgeon of this hospital (34th Field Hospital) was on call twenty-four hours a day to administer surgical aid to wounded personnel of returning combat crews. Through his devotion to duty and his unstinting efforts beyond the call of duty, Major Flowers has contributed substantially to the combat efficiency of the units served by this organization, and his outstanding service reflects great credit on himself and the Armed Forces of the United States." Dr. Flowers graduated from the University of Louisville School of Medicine in 1931 and entered the service June 20, 1943.

Lieutenant Colonel Noah Barysh

Lieut. Col. Noah Barysh, formerly of New York City, was recently awarded the Bronze Star. The citation accompanying the award read "For meritorious achievement in connection with military operations against the enemy in the North African theater of operations from Nov. 8, 1942 to May 17, 1943. The professional skill, personal courage and untiring energy with which Colonel Barysh performed his duties as regimental surgeon contributed immeasurably to the prompt and efficient treatment of battle casualties throughout the North African campaign. Colonel Barysh's outstanding devotion to duty reflects great credit on the Army of the United States." Dr. Barysh graduated from Rush Medical College, Chicago, in 1933 and entered the service Dec. 21, 1940.

Lieutenant Colonel Julius Sandhaus

Lieut. Col. Julius Sandhaus, formerly of Lancaster, Pa., was recently awarded the Bronze Star for developing what was originally designed as a 40 bed crash ward at an Air Service Command depot in England into a modern, fully equipped hospital, capable of meeting the medical needs of an American city of 35,000 people. Dr. Sandhaus graduated from Jefferson Medical College of Philadelphia in 1936 and entered the service in January 1941.

Captain Harvey L. Rittenhouse

The Bronze Star was recently awarded to Capt. Harvey L. Rittenhouse, formerly of Albany, N. Y. The citation read, in part, "Capt. Harvey L. Rittenhouse, . . . while serving with the Army of the United States, distinguished himself by meritorious service in France. Captain Rittenhouse has been fulfilling his combat mission as medical officer in charge of Ward Section, Second Platoon, from the time the company began operations under combat conditions, Aug. 10, 1944, to the present. During this time he has repeatedly demonstrated his skill and devotion to duty, which has resulted in superior medical service to the patients." Dr. Rittenhouse graduated from the College of Medical Evangelists, Los Angeles, in 1943 and entered the service Aug. 7, 1943.

Colonel Julius M. Blank

The Legion of Merit was recently awarded to Col. Julius M. Blank, formerly of New York City, "for exceptionally meritorious conduct in the performance of outstanding service in New Guinea from Oct. 7, 1942 to April 3, 1943." The citation accompanying the award stated that Colonel Blank "planned, recommended and executed policies for American medical supply, sanitation, hospitalization and evacuation and greatly assisted in the coordination with Allied forces of these matters, which were very important in this area." Dr. Blank graduated from Long Island College of Medicine, Brooklyn, in 1916 and entered the service July 17, 1942.

Major George L. Seifert

The Air Medal with an Oak Leaf Cluster was recently awarded to Major George L. Seifert, formerly of Philadelphia, "for meritorious achievement while participating in sustained operational flight missions to areas where hostile contact was probable and expected." Dr. Seifert graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1934 and entered the service in August 1942.

Captain Robert W. Leibold

Capt. Robert W. Leibold, formerly of Pittsburgh, was recently awarded the Bronze Star for meritorious service in Germany. During a series of operations against the enemy he assisted materially in the treatment, care and evacuation of a large number of wounded men. Dr. Leibold graduated from the University of Pittsburgh School of Medicine in 1941 and entered the service Aug. 1, 1942.

Captain Jesse B. Caldwell Jr.

Capt. Jesse B. Caldwell Jr., formerly of Cramerton, N. C., was recently awarded the Bronze Star "for meritorious service in connection with military operations against an enemy of the United States in France, Belgium, Luxembourg and Germany from Nov. 6, 1944 to March 22, 1945." Dr. Caldwell graduated from McGill University Faculty of Medicine, Montreal, in 1941 and entered the service July 1, 1942.

Major John S. Bralliar

Major John S. Bralliar, formerly of Rockford, Ill., and now commanding officer and chief surgeon of a portable surgical hospital in the Philippines, was recently awarded the Bronze Star "for meritorious service on Luzon." Dr. Bralliar graduated from the University of Tennessee College of Medicine, Memphis, in 1939 and entered the service Dec. 4, 1940.

Captain Paul A. Nierling

Capt. Paul A. Nierling, formerly of Cresco, Iowa, was recently awarded the Bronze Star for meritorious achievement in connection with military operations against the enemy at Luzon. Dr. Nierling graduated from the State University of Iowa College of Medicine, Iowa City, in 1932 and entered the service Nov. 3, 1942.

Captain Lyle B. Putnam

Capt. Lyle B. Putnam, formerly of Wichita, Kan., has been awarded the Silver Star, a Presidential citation and the Purple Heart. Dr. Putnam graduated from the University of Kansas School of Medicine, Kansas City, in 1936 and entered the service in June 1942.

NAVY

NAVY INTERN TRAINING OUTLINED IN NEW BOOKLET

A booklet entitled "Essentials of Internship and Residency-Type Training in United States Naval Hospitals" (Navmed 762) has been prepared by the Professional Division, Bureau of Medicine and Surgery, and is now available for general distribution. This outline was initiated by the Honorary Consultants to the Surgeon General of the Navy. It describes the educational standards and program including uniform hospital libraries necessary to maintain official approval for internship training and for residency-type training in the specialties.

Its foreword by Vice Admiral Ross T. McIntire, Surgeon General of the Navy, states that "junior medical officers assigned to specialty services in naval hospitals will not be termed residents, nor will such services be designated formally as residencies. However, as far as the educational program for such services and assignments conforms with approved residency-type training standards, residency credits will be obtainable by junior medical officers for time engaged in such work while in naval service."

It is possible also for many medical officers assigned to larger dispensaries and other activities to obtain similar residency credits before the American colleges and the American boards.

NEW BRANCHES CREATED IN PROFESSIONAL DIVISION

Vice Admiral Ross T. McIntire, Surgeon General of the Navy, recently approved a reorganization of the Medicine and Surgery Branch of the Professional Division creating two branches of the specialties, namely a Medicine Branch and a Surgery Branch. Capt. F. R. Hook (MC), U.S.N., will head the Surgery Branch, and Comdr. J. R. Miller (MC), U.S.N.R., will head the Medicine Branch. The latter branch is composed of a General Medicine Section and a Tropical Medicine Section.

Functions of the Professional Division are defined as follows: "The Professional Division shall (*a*) consult with medical activities ashore and afloat in order to determine the professional needs and problems arising in the field; (*b*) study, evaluate, advise and make recommendations on the professional needs, policies, standards, practices and performances of the Medical Department, particularly as these relate to medicine, surgery, neuropsychiatry, rehabilitation and hospitalization, and (*c*) maintain liaison with such other military and civilian agencies as may be required in the prosecution of the functions of this division. The term 'professional' as used is interpreted to include all phases of clinical practice as well as the technical services and facilities required to make such practice effective."

HOSPITAL CORPS OFFICER AWARDED LETTER OF COMMENDATION

A Letter of Commendation was recently awarded to Lieut. (jg) William A. Breathwit (HC), U.S.N. The citation, which was signed by Admiral Harold R. Stark, U.S.N., read "Your performance of duty while serving at a large naval base hospital in southern England prior to and after the invasion of the coast of France in June 1944 has been brought to my attention. You were instrumental in the organization and efficient operation of this hospital from its very inception. During the formative period you carried the responsibility for much of the detail work involved in the transfer of the hospital from the U. S. Army. You effectively assisted in the organization of the facilities established for the reception and evacuation of casualties. In addition to your regular duties, which were complex and skilfully carried out, you were invariably present during the admission and evacuation of large groups of casualties, to render what services you could in the interest of efficiency. Your work in the personnel department and in charge of the expeditious and correct reporting of casualties was of high order and contributed materially to the successful work of the hospital. For your devotion to duty and administrative ability you are hereby commended. This commendation carries with it the privilege of wearing the commendation ribbon."

RHEUMATIC FEVER UNIT ESTABLISHED

The Secretary of the Navy has approved a 400 bed expansion of hospital facilities and the establishment of a rheumatic fever research unit at the U. S. Naval Hospital, Dublin, Ga. Commissioned earlier this year, the hospital at Dublin is of permanent type construction, as will be the buildings under the expansion program. However, the building to house the research unit will be a temporary structure. It is slated to begin at once and to be completed about August 30. The hospital at Dublin is used almost exclusively for rheumatic fever cases, and officials in charge of the research project there will work closely with the hospital authorities.

ESTABLISHES ASSISTANT FOR DENTISTRY

Vice Admiral Ross T. McIntire, Surgeon General of the Navy, recently announced the establishment of the post of assistant for dentistry in the Bureau of Medicine and Surgery under whom the functions of the Dentistry Division and the Office of Inspector of Dental Activities will be carried on in accord with a new organizational plan for dental activities in the bureau. Rear Admiral Alexander G. Lyle (DC), U.S.N., has been named the assistant for dentistry and has served for some months in the bureau as inspector of dental activities.

The functions of the assistant for dentistry were defined as follows: The assistant for dentistry shall be responsible for the performance of all dental functions but shall adopt no major policies, methods or procedures without the approval of the chief of the Bureau of Medicine and Surgery. The assistant for dentistry may have on his personal staff such other personnel as may be required to assist him in the general administration of his duties.

The organizational plan announced included, besides establishment of the assistant for dentistry, a Dental Professional Office, a Dental Personnel Office and a Dental Inspections Office.

WAVE HOSPITAL CORPS TRAINING SCHOOL

Camp Moffett, one of the larger units of the Naval Training Center at Great Lakes, Ill., is being converted for use as a Hospital Corps School to accommodate 1,500 Waves under plans approved by the Bureau of Medicine and Surgery. It is expected that conversion will be completed in time to take the first increment of recruits from Hunter College the latter part of July.

Beginning with the first class, the Hospital Corps will receive 500 girls each two weeks for training. One hundred and twenty-five of these will be given eight weeks' training at Bethesda and 375 will be sent to the new unit at Great Lakes for their schooling. At the end of an eight week period both schools will have reached their full capacity: 500 at Bethesda and 1,500 at Great Lakes. This schedule is slated to continue through a period of ten months, at the end of which time the Hospital Corps will have trained 10,000 additional Waves.

NAVY AWARDS AND COMMENDATIONS

Commander DeWitt K. Burnham

The Legion of Merit was recently awarded to Comdr. DeWitt K. Burnham, formerly of San Francisco. He was cited for "exceptional performance of duty, clearly above that normally expected" while on duty in the South Pacific. Through his "untiring efforts in maintaining sanitary standards, he has reduced the incidence of sickness and disease to a remarkably low degree and provided necessary medical attention for all personnel at the base," the citation said, adding that Commander Burnham had instituted a "highly efficient system for handling large numbers of patients and casualties from hospital ships." Dr. Burnham graduated from Stanford University School of Medicine, San Francisco, in 1930 and entered the service Dec. 18, 1941.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

June 18, 1945.

Possible Release of Doctors and Dentists from Armed Forces

Major Gen. George F. Lull, Deputy Army Surgeon General, has estimated here that 2,000 to 3,000 doctors and several hundred to 1,000 dentists should be available for discharge from the Army by the end of this year. General Lull said the peak load on the Army Medical Corps will be reached in the fall. He explained that the wounded must still be transported home from Europe and soldiers scheduled for redeployment or discharge must be given physical examinations. He expects that most of the doctors and dentists released will return to civilian practice. The Veterans Administration has sought medical men, but its most urgent requirements were met by assignment of about 300 medical officers to the agency, he said. Most of these were assigned last year on active status, and 112 had previously served with the Veterans Administration. However, no Army doctors are now being assigned to the Veterans Administration unless they desire it. General Lull said that "as the size of the Army is reduced under the partial demobilization plan, it will be possible to release certain numbers of doctors and dentists. However, the shrinkage in the number of medical officers will not be in proportion to the reduction of the Army as a whole, since the Army will still have many wounded in hospitals. Moreover, we never filled our quota of 48,000 doctors, as only about 45,000 were obtained. Dental officers number about 15,000. We probably can release 2,000 to 3,000 medical officers and a proportionate number of dental officers by the end of the year."

General Bradley to Take Veterans Administration Post August 11

Although he conferred with members of the House Veterans Committee on proposed veterans' legislation and has already started a study on how to correct shortcomings in the administration of veterans' hospitals, General Bradley has returned to Europe to serve in the absence of General Eisenhower. He will take over as Veterans Administration chief about August 11. Meanwhile Committee Chairman Rankin has reported that hearings on proposed legislation to reorganize the medical staff of the Veterans Administration will be postponed until General Bradley returns. "We will continue with the investigation to have a full record for General Bradley and the committee," he said. "It will serve as a basis for corrective legislation." Before adjournment the committee heard Col. Louis Verdel, manager of the veterans' hospital at Northport, N. Y., where it was alleged that the Army had assigned physically and mentally unfit soldiers to attend mental patients, deny that Northport was the worst hospital in the service. He claimed that two of five army doctors attached to the institution were on prolonged sick leave, one of them diagnosed as neurotic by army examiners. "Maybe we'd better investigate the War Department," said Mr. Rankin. "I bitterly resent the War Department's attitude toward these veterans' hospitals."

Naval Medical Chief Lauds Care of Wounded on Okinawa

Vice Admiral Ross T. McIntire informed civilian and service personnel of the Navy Bureau of Medicine and Surgery that navy medical men caring for troops wounded on Okinawa "have lacked nothing" in supplies and equipment. His comment was made during presentation of awards to personnel for beneficial suggestions and achievement.

Capital Notes

Sister Elizabeth Kenny told a press conference that the purpose of her two months trip to England and Sweden was to "stimulate research" in infantile paralysis in these two countries rather than to set up clinics.

Gallinger Hospital plans to take an active part in the postgraduate education of doctors returning from the armed forces, Dr. Daniel L. Seckinger, acting superintendent, announces.

District of Columbia's new mental hygiene clinic has reached a stalemate through the sudden resignation of Dr. John F. Owen of Raleigh, N. C., after only a month, because of inadequate office and clinic space provided.

Council on Medical Service and Public Relations

PREPAID MEDICAL CARE NEWS

Washington Medical and Hospital Service Plan

In reviewing the history of medical bureaus in Washington it has been noted that in 1931 and 1932 several service bureaus were started in counties throughout the state where population would warrant. As there was a close relationship of one county bureau to another and a reciprocal agreement between their physician members, the Washington State Medical Bureau was set up as a coordinating and parent body. While the local county bureaus, of which there are now seventeen, exercise certain local autonomy to meet the needs of their respective communities, the plan as a whole is statewide and is referred to as the "Washington Plans." It is under the supervision and guidance of the Washington State Medical Association and is administered by the Washington State Medical Bureau.

Medical service bureaus have carried out the service policy, and in order that they may be legal in every respect to meet requirements of the insurance code the physician members of the bureaus personally organized and financed an insurance company, which places the Washington State Medical Bureau and its component county bureaus under the supervision of the state insurance department, which in turn certifies as to the financial stability through adequate reserves deposited with it. The sole purpose of the insurance company is to legalize and guarantee the fulfilment of the medical service contracts issued by the bureaus.

Many unions, realizing the benefits to their members, have contracts covering their membership. The relationship between the unions and the medical service bureaus is one of real cooperation to the mutual benefit of the bureaus and the recipients of the service. The assistance rendered by the committees of the unions has been of great value in determining policy and coverage.

Last year the bureaus provided hospital coverage for the family, but it was realized that this was only partially solving the problem. The family of the wage earner should also be provided with professional care if he is to have medical economic security.

With the approval and endorsement of their many thousands of subscribers, the bureaus are now writing a family coverage that not only provides hospitalization for all medical and surgical cases but also pays for the doctor's services in all accident cases, major and minor operations, fractures, dislocations and other surgical procedures. This leaves the subscriber to pay only for the occasional office or house calls, which do not constitute an economic problem. The wage earner really has medical economic security, and the doctors of the state of Washington have found a way to provide it on a voluntary basis free from government intervention or at the expense of the taxpayer.

In 1935, when the need of providing medical care to recipients under the general assistance program was recognized, the state department of social security appointed the medical service bureaus as administrators of the medical and dental program in their respective counties. In 1941, when legislation was enacted providing complete, adequate medical care to recipients of old

age assistance, the medical service bureaus were again appointed administrators for that program.

The doctors through their medical service bureau have demonstrated their ability to manage all programs pertaining to medical care and its allied service. What they have done in Washington can likewise be done elsewhere. So say the progressive physicians of Washington.

Liberalization of Michigan Medical Service

Increase of benefits to subscribers with no increase in rates has been announced by Michigan Medical Service. The additional benefits were made effective April 1 and were enabled by the unusually strong financial position of the Michigan plan. Nearly 800,000 subscribers are entitled to the new benefits.

Among the liberalizations are removal of the previous limit of $150 for surgical service provided under the schedule of benefits and performed at the same time or for the same purpose, elimination of the waiting period on other obstetric services and provision for emergency surgical services for doctors in hospital outpatient departments.

Michigan Medical Service is sponsored by the Michigan State Medical Society. Its companion organization, Michigan Hospital Service, also instituted an increase in benefits on April 1, but an increase in subscriber rates was necessary to provide for the hospital service increase.

Ohio Medical Indemnity, Inc., Organized

Additional steps toward the organization of a medical, surgical and obstetric expense insurance company were taken by the officials of the Ohio State Medical Association on May 23, when articles for the incorporation of a company, to be known as "Ohio Medical Indemnity, Inc.," were filed with the secretary of state.

Negotiations with the superintendent of insurance for approval of its policy, schedule of benefits and rates, preliminary to the issuance by the superintendent of a certificate of authority to operate in Ohio, will be opened as soon as the company receives its charter from the secretary of state.

According to Dr. L. H. Schriver, Cincinnati, president of the Ohio State Medical Association and one of the incorporators, the new company plans to work closely with the prepaid hospital service—the Blue Cross—organizations of Ohio, making use of the sales, promotion, clerical and certain administrative facilities of the Blue Cross plans.

Two Savings Banks Subscribe to United Medical Service

Two more savings banks have subscribed to the expanded plan of United Medical Service, Inc., for the payment of doctors' bills in addition to surgeons' and obstetricians' bills in hospitals, it was announced on May 31 by Frank Van Dyk, vice president. They are the New York Savings Bank, with 120 employees, and the South Brooklyn Savings Bank, with a personnel of 132. Both banks are paying the cost of this service and of hospitalization under the Associated Hospital Service of New York for employees and their families.

Illinois Insurance Committee Makes Study

Dr. Charles H. Phifer, chairman of the Illinois committee, reports that "this committee has been currently engaged in making a special study of all prepayment plans for medical, surgical and hospital care in the United States. The committee has interviewed representatives of industrial organizations, railroads, insurance carriers, agricultural organizations, charitable hospitals and institutions in the state of Illinois. It likewise interviewed the medical representatives of the neighboring states regarding prepayment plans for medical, surgical and hospital care that are operating in their states or are in the process of formation."

Indiana Subdivides Committee Duties

Dr. W. U. Kennedy of New Castle, chairman of the Committee on Prepayment of Medical and Surgical Care, has divided his committee into three subcommittees each studying separate phases of the insurance problem. These subcommittees are ready to make their reports to the parent committee, which in turn will report to the House of Delegates.

New York Group Health Plan Adds Visiting Nurse Service

Group Health Cooperative, 70 Wall Street, announced on June 1 that, through the cooperation of the Visiting Nurse Service of New York, the Visiting Nurse Association of Brooklyn and the Visiting Nurses Association of Staten Island, it will provide visiting nurse service for subscribers to its medical care insurance plan at no increase in premiums. This is the first time that visiting nurse service has been included in a voluntary health insurance plan.

Subscribers will be entitled to the amount of service their doctors consider necessary in any illness covered by the medical plan. The group health plan provides insurance against doctors' services for any surgical care rendered in the home or doctor's office. The plan also covers maternity care.

The visiting nursing agencies in New York City have welcomed the opportunity offered by Group Health Cooperative to demonstrate the value of nursing services in connection with voluntary prepaid medical plans.

Missouri Medical Service Plan Launched

Missouri Medical Service, the nonprofit medical service plan through which Missourians may voluntarily enroll to obtain medical and surgical care in hospitals, was launched Monday, March 12, according to Dr. Carl F. Vohs, St. Louis, president of the new medical plan and chairman of the Medical Economics Committee of the Missouri State Medical Association. The plan is sponsored by the state medical association and local county medical societies throughout Missouri, comprising 3,250 doctors.

Enrolment in the plan will be offered through Blue Cross of St. Louis. The two organizations are separate, but considerable economy will be effected through management of the medical and surgical care plan by the Blue Cross.

At the outset, enrolment in the plan will be open only to the 480,000 employees of firms in Missouri which are members of the Blue Cross. Those belonging to Blue Cross will now have available a complete program for care while in hospitals.

Dallas Service Plan Expands

The recent appointment of Mr. Millard J. Heath as full time executive director of the Dallas County Medical Plan marks the first step in a program of expansion. For about five years this prepaid plan, which is sponsored by the Dallas County Medical Society as a nonprofit medical care plan for low income groups, has been operating on a limited basis with three industrial groups. It is now believed that the time has come to make the service available to a much larger group, and a survey is being made of major industries to determine their interest and possibility of participation. Enrolment is being offered only to employed persons, but the extended services include a consideration of wives and other dependents as soon as practicable. Subscribers are being offered complete medical care in the home, office or hospital, including surgery, x-ray and laboratory work.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Medical and Dental Corps

Senator Downey, California, has submitted S. Res. 134, proposing that the Senate Committee on Military Affairs or a subcommittee thereof be directed to make a complete investigation as to the relative needs of the armed forces and the civilian population for the services of medical personnel with a view to ascertaining (1) whether such personnel can be released from the armed forces for civilian service without impairment of the war effort, (2) the speed with which demobilization of medical personnel in the armed forces can be accomplished as the needs of the armed forces diminish and (3) whether further action is necessary to insure an adequate supply of trained medical personnel to meet the future needs of the armed forces and the civilian population.

A bill to remove the limitation on the right to command of officers of the Dental Corps of the Army which limits such

officers to command in that corps, S. 916, has passed the Senate and has been favorably reported by the House Committee on Military Affairs.

A bill has been favorably reported to the House, H. R. 2477, proposing that during the present war and for six months thereafter an enlisted man of the Army who is entitled to wear the Medical Badge shall be paid additional compensation at the rate of $10 a month.

Dental Health

The Pepper Subcommittee on Wartime Health and Education has scheduled hearings for June 26, 27 and 28 on S. 190, proposing the establishment of a National Institute of Dental Research, and on S. 1099, proposing assistance to states in developing and maintaining dental health programs.

Veterans Administration

A bill has been introduced in the House by Representative Voorhis, California, H. R. 3463, proposing the creation of a National Veterans' Hospital Board with the following duties: (*a*) to advise the Administrator of Veterans' Affairs on all matters pertaining to the hospital or outpatient care of veterans and concerning the appointment of a National Executive Director for all veterans' hospitals; (*b*) to conduct a complete survey of all veterans' hospitals and to recommend to the Administrator and the National Executive Director such changes in personnel, such hospital construction and such other action as may be necessary; (*c*) to consult with the Administrator and the Director on the appointment of chief medical officers for all veterans' hospital units in the United States; (*d*) to provide adequate arrangements and facilities for continuous research on improved methods in the fields of medicine, psychiatry and all other types of care required by veterans; and (*e*) to prepare a schedule of proposed salaries, grades and classifications for all types of employees, professional or otherwise, in veterans' hospitals with a view to obtaining competent and qualified personnel.

A bill introduced by Representative Holifield, California, H. R. 3253, proposes to facilitate the receipt of hospital treatment and domiciliary care by former members of the armed forces at institutions nearest to their places of residence.

Three recent bills provide for the construction of new veterans' hospitals. One, H. R. 3428, introduced by Representative Latham, New York, contemplates the construction of such a hospital in the borough of Queens, city of New York, and the other two, H. R. 3475 and H. R. 3476, both introduced, by request, by Representative Rankin, Mississippi, provide for the construction of veterans' hospitals in central and southeastern Alaska, respectively.

Scientific Research

A bill introduced by Representative May, Kentucky, H. R. 3440, proposes an appropriation not to exceed $8,000,000 for each fiscal year to enable the National Academy of Sciences, through a research board for national security consisting of representatives of the Army, of the Navy and civilians of outstanding accomplishments, to provide for scientific research and advancement determined by the board to be desirable in the interest of national security.

Food, Drug and Cosmetic Act

The bill providing for the certification of batches of drugs composed wholly or partly of any kind of penicillin or any derivative thereof, H. R. 3266, has been reported to the House by the Committee on Interstate and Foreign Commerce with the recommendation that it pass. The committee report on this bill, H. Report No. 702, contains a letter from the Council on Pharmacy and Chemistry of the Association in support of the bill.

Miscellaneous

Senator Thomas, Oklahoma, has introduced S. 1123, proposing an appropriation of $1,000,000,000 per year for each of three fiscal years to enable the Federal Works Administrator to make loans and grants to public agencies for the construction of public works projects, including schools, hospitals, nurses' homes, sewerage systems and garbage and refuse disposal facilities.

STATE LEGISLATION

Alabama

Bill Introduced.—H. 448 proposes to enact a separate practice act for vocational nurses and to create a board of six, to be composed ultimately of three physicians and three vocational nurses, to examine and register applicants desiring to designate themselves as vocational nurses.

California

Bill Introduced.—A. 2211 proposes to prohibit a hospital having available facilities from refusing to render emergency medical care to any person who has been injured in an accident and is in need of immediate care. If the individual receiving such services is indigent and unable to pay therefor, the reasonable costs of the services are to be paid by the county.

Connecticut

Bills Passed.—The following bills have passed the house and senate: S. 865 proposing that nothing in the medical practice act shall prevent any student in or graduate from any school or institution giving instruction in the healing arts, approved as provided in the act, from taking supplementary training with any regularly licensed and reputable practitioner or from serving as an intern in a hospital. The present law provides such an exemption for any student in or graduate from any legal and reputable professional school; and Sub. for S. 879 proposing that any resident who has served in the armed forces of the United States and whose moral and educational qualifications are approved by the board of chiropractic examiners shall be licensed to practice chiropractic without examination; and Sub for H. 1031 proposing to direct the legislative council to make a comprehensive inquiry into the methods of professional and vocational licensing in the state. H. 402 has passed the house, to amend what in effect is the basic science act, proposing to change some detail in connection with the appointment of members of the state board of healing arts. It is proposed that the governor appoint one member of that board before July 1 to serve for six years and that on May 1, 1947 and biennially thereafter the governor shall appoint, *with the advice and consent of the general assembly*, one member to serve for six years. It is proposed also to provide compensation of ten dollars a day for each day of service for members of the board.

Bill Introduced.—Sub. for S. 84, to amend the charter of the Connecticut State Medical Society, proposes that its house of delegates be composed of (1) its president, president-elect, treasurer and secretary, (2) delegates elected annually by the several county medical associations and (3) the members of its council.

Florida

Bill Enacted.—H. 883 became a law without the approval of the governor on June 11, authorizing the creation and operation of corporations to operate nonprofit medical and/or surgical and/or hospital service plans.

Bills Introduced.—S. 704 proposes to authorize the governing board of any governmental hospital to prescribe the qualifications and standards of the physicians who may use its facilities, which qualifications shall require at least two years of service as a hospital intern as a prerequisite to the right to perform surgery. S. 806 proposes to prohibit, except on the prescription of a licensed physician, the retail sale of any sulfonamide drug, penicillin drug or any preparation for the treatment, alleviation or cure of gonorrhea, syphilis or chancroid.

Illinois

Bills Introduced.—H. 719 proposes to enact a practice act for professional chemistry and to authorize the department of registration to appoint an examining committee of nine professional chemists. A person practices professional chemistry within the meaning of the bill "who applies the principles and data of chemistry in any of its branches or phases in determining, governing or regulating the welfare of individual or of industry, or in the exposition of such principles in any oral or written report or in any procedure." H. 749 proposes to enact a bill to regulate the practice of professional bacteriology and to authorize the department of registration to appoint a committee of nine professional bacteriologists to examine applicants

cants for licenses to practice that profession. A person practices professional bacteriology within the meaning of the bill "who makes laboratory examinations in connection with the diagnosis of bacterial or viral diseases of man or animals, who prepares vaccines and antisera, who tests water, milk and other foods for evidence of contamination or the presence of disease producing micro-organisms, who tests surgical sutures and bandages, vaccines, antisera and pharmaceutical drugs for contamination with micro-organisms, who tests antiseptics, disinfectants and other drugs for their killing properties of micro-organisms, who prepares or tests cultures of nitrogen fixing bacteria, who prepares or tests antibiotics, who prepares organic substances by the action of micro-organisms and who assays vitamins, amino acids or other substances by microbiological methods."

Massachusetts

Bills Introduced.—H. 2029 proposes to prohibit the operation of a hospital, sanatorium or convalescent or nursing home without a license from the department of public health. H. 1980 proposes to make Middlesex University School of Medicine an approved medical school until July 1, 1949 and, in effect, to permit its graduates to be examined for licenses to practice medicine.

Ohio

Bill Introduced.—Sub. for H. 62 proposes that the practice of Christian science by a member in good standing of the Christian Science Church shall be lawful.

Official Notes

DOCTORS LOOK AHEAD

Remaining programs in the series of network broadcasts by the NBC and the American Medical Association will be on the air June 23 and 30 except in Chicago.

Doctors Look Ahead is broadcast each Saturday at 4:30 p. m. Eastern War Time (3:30 p. m. Central War Time, 2:30 p. m. Mountain War Time and 1:30 p. m. Pacific War Time) except in Chicago, where each week's program as broadcast on the network will be heard on the next Saturday afternoon at 3 p. m. Central War Time.

June 30. Health in Schools: A program devoted to health education and related topics in our schools, where doctors look ahead to greater progress in the next decade. Speaker Dr. Charles C. Wilson, Teachers College, Columbia University, speaking from New York.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

At its meeting on Sunday, June 10, the Council on Medical Education and Hospitals of the American Medical Association voted to place on probation the Hahnemann Medical College of Philadelphia. This action was based on a detailed survey of the school carried out by the Secretary of the Council and the Secretary of the Association of American Medical Colleges April 3-6, 1945.

A medical school is placed on probation when significant but correctable deficiencies are judged to exist in the educational program. Such an institution remains on the list of approved schools maintained by the Council, with its probationary status indicated by a footnote. Hospitals approved by the Council may appoint graduates of such a school as interns, residents or fellows, and all otherwise qualified students entering or attending a school on probation are considered acceptable to the Council. In fact, so far as the students in residence are concerned, even if a school should be removed from the list of approved schools such action by the Council would become effective only after all students in the school at the time of the announcement of the action have had time to graduate.

The Council will give every assistance to this school in its efforts to improve the educational program sufficiently to warrant removal of the probation.

VICTOR JOHNSON, M.D., Secretary.

Bureau of Information

SUMMARY SHEETS FROM MINNESOTA AND WEST VIRGINIA

Completed county summary sheets have been received from the Minnesota State Medical Association through Mr. R. R. Rosell, executive secretary, and from the West Virginia State Medical Association through Mr. Charles Lively, executive secretary.

The accompanying table gives data from counties in each of these states. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. They are not included in computing physician population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

Minnesota

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Aitkin		12,856	3	4,285	8
Anoka		23,771			
	Anoka	6,426	6	3,962	17
	Columbia Heights	6,035			
Clay		22,733	9	2,526	9
	Moorhead	9,491			
Dodge		11,173	4	2,793	8
Hubbard		8,783	2	4,392	10
	Park Rapids	2,643			
Lac-qui Park		13,472	5	2,694	9
Lake of the Woods		3,994	1	3,994	10
Mille Lacs		13,212	4	3,303	6
Roseau		12,820	4	3,205	9
Yellow Medicine		15,302	9	1,700	8

West Virginia

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Barbour		16,457	8	2,057	41
Calhoun		8,839	1	8,839	10
Fayette		71,635	27	2,653	32
	Oak Hill	3,213			
	Montgomery	3,231			
Grant		7,424	3	2,475	81
Jackson		13,948	3	4,649	9
Lincoln		18,487	4	4,622	212
Mason		20,630	5	4,126	28
	Point Pleasant	3,538			
Mineral		19,779	9	2,198	17
	Keyser	6,177			
	Piedmont	2,677			
Wirt		4,935	1	4,935	17
Wyoming		29,700	9	3,300	92
	Mullens	3,026			

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, American Telephone & Telegraph Company.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Compulsory Hospitalization Bill Killed.—The compulsory hospitalization bill, assembly bill 2201, actively supported by Governor Warren, the C. I. O., the A. F. of L., the Parent-Teachers Association and the League of Women Voters, was killed in the assembly June 5. By a vote of 45 to 32 the assembly refused to override the recommendation of its public health committee and withdraw the bill from that committee. The opposition to the bill was presented by Howard Burrell, chief counsel for the Association of California Hospitals, who declared that the measure would "sovietize" the hospitals of California. Dr. Chester L. Cooley, San Francisco, presented the opposition of the California Medical Association and pointed out that the bill was similar to the original compulsory health insurance bills which had been killed by the assembly. Opposition of business groups was presented by Charles Bayer of the Los Angeles Chamber of Commerce and Pat Merrick of the California State Chamber of Commerce.

Activities of Hastings Foundation.—The Charles Cook Hastings Home for the study and treatment of tuberculosis, located north of Pasadena, is expected to open about August 1. Dr. Edward Kupka is medical director of the Hastings Foundation for Tuberculosis Research, Pasadena, set up by the will of Charles H. Hastings, and of the Charles Cook Hastings Home (THE JOURNAL, Dec. 30, 1944, p. 1158). *Science* reports that agreement has been made with the Veterans Administration Facility, San Fernando, to treat 20 veterans of the war who have developed tuberculosis, the entire cost of care to be paid by the Hastings Foundation. Dr. Horace R. Getz, research associate of the Henry Phipps Institute, Philadelphia, is director of the laboratories and will continue research on nutrition heretofore carried on by him in Philadelphia, which will include an attempt to learn the effect of nutrition on the course of tuberculosis. *Science* further reports that objective nutrition tests on the blood and biomicroscopy of the eyes, tongue and gums will be a part of the routine examination of the subjects, all of whom will receive a good standard sanatorium diet with one half being given food supplements. Progress of the disease in the two groups will then be carefully compared.

DISTRICT OF COLUMBIA

Dr. Owen Returns to North Carolina.—Dr. John F. Owen, who on May 1 became director of the new bureau of mental hygiene in the health department of the District of Columbia, has resigned to return to his position as superintendent of the State Hospital, Raleigh, N. C., according to the Washington *Times-Herald,* June 5. Dr. Owen's appointment to the new position was reported in THE JOURNAL, May 19, page 216.

Surveyor Board Named for Hospital Study.—A board of surveyors consisting of Charles E. A. Winslow, Dr.P.H., Col. Ira V. Hiscock, S.C., New Haven, and Dr. Claude W. Munger, New York, was recently named and charged to direct the health and hospital survey sponsored by the Washington Metropolitan Health Council, a division of the Council of Social Agencies, for the Washington Metropolitan area. The survey is expected to be completed within four months starting September 1 and will involve a study of facilities and activities of health agencies, hospitals and clinics, both public and private, in the metropolitan area lying in the District of Columbia, Prince Georges County, Montgomery County, Arlington County, Fairfax County and Alexandria City. The survey has the endorsement of the Community War Fund, the Washington Board of Trade, the Medical Society of the District of Columbia the six health officers of the area and the state commissioners of health of Maryland and Virginia. The Washington Metropolitan Health Council was recently created under the sponsorship of the Council of Social Agencies (THE JOURNAL, January 20, p. 173). Vice Admiral Ross T. McIntire, Surgeon General of the Navy, is chairman of the survey committee and Dr. Herbert P. Ramsey is head of the health division of the Council of Social Agencies.

ILLINOIS

Personal.—Dr. Charles E. Riseling was given a dinner May 2 in honor of his fifty-two years' service to Murphysboro and of forty-eight years' service as a member of the staff of St. Andrew's Hospital, of which he became one of the original members when it was founded in 1897.——Dr. George W. Ross was installed as mayor of Watseka on May 14.

Chicago

Medical Group Practice Council Holds Meeting.—A meeting of the Western section of the Medical Group Practice Council was held at the Palmer House, Chicago, June 6-7, with Dr. Samuel Bradbury, Philadelphia, as chairman. At the luncheon meeting on June 7 Dr. Kingsley Roberts of the Medical Administration Service, New York, presided. Drs. Morris Fishbein and Victor Johnson of the American Medical Association were guests, and Clarence Rufus Rorem, Ph.D., director of the Hospital Plan Commission of the American Hospital Association, also attended. This council is organized under the auspices of the Medical Administration Service, Inc., to promote the extension and improvement of medical group practice by preparing and disseminating publications regarding the standards, procedures, problems and values of this method of distributing medical care.

MARYLAND

Council on Medical Care Created.—A council on medical care has been created by authority vested in the state board of health by act of the 1945 session of the general assembly to provide consultation and advice in connection with the program to be administered by the newly established bureau of medical services (THE JOURNAL, May 12, p. 143). The following have been chosen members of the council to represent the organizations indicated:

Dr. Page C. Jett, Medical and Chirurgical Faculty of Maryland.
Dr. Earle Paul Knotts, Medical and Chirurgical Faculty of Maryland.
Dr. Jacob W. Bird, state board of health.
A. G. DuMez, Maryland Pharmaceutical Association.
Dr. James Douglass Shepperd, Maryland Medical Association.
F. Noel Smith, Maryland State Dental Association.
P. J. McMillin, Maryland District of Columbia Hospital Association.
Dorothy F. McBride, Maryland State Nurses Association.
Dr. Alan M. Chesney, Johns Hopkins University School of Medicine.
Dr. George Carroll Lockard, University of Maryland School of Medicine and College of Physicians and Surgeons.
Dr. Robert H. Riley, director of the state department of health.
Dr. George H. Preston, state commissioner of mental hygiene.
Dr. Victor F. Cullen, superintendent of Maryland state tuberculosis sanatoriums.
J. Milton Patterson, director of the state department of welfare.

Dr. Dean W. Roberts, chief of the bureau of child hygiene of the state department of health, was appointed chief of the bureau of medical services, which will administer a program furnishing medical care for indigent and medically indigent persons and will conduct and operate the chronic disease hospitals to be constructed in the postwar period.

MINNESOTA

Changes in Health Officers.—Dr. Rolv S. Hegge, Austin, has been named health officer of Mower County to succeed Dr. James J. Morrow, Austin.——Dr. Roland F. Mueller, Two Harbors, has been appointed health officer of Lake County.

Health and Medicine in War and Peace.—On June 5 Vice Admiral Ross T. McIntire, Surgeon General of the U. S. Navy, and James L. Morrill, LL.D., president-elect of the University of Minnesota, discussed "Health and Medicine in War and Peace" at a dinner meeting held under the sponsorship of the committee of founders of the Mayo Memorial.

The Johnston Lecture on Neurology.—Dr. Olof Larsell, professor of anatomy, University of Oregon Medical School, Portland, gave the first J. B. Johnston Lecture on neurology, May 11, at the University of Minnesota Medical School, Minneapolis. His subject was "Comparative Neurology and Our Present Knowledge of the Cerebellum." The lecture was endowed by Mrs. Johnston in memory of her husband, John B. Johnston, Ph.D., who served as professor of comparative neurology in the medical school from 1908 to 1915 and dean of the College of Science, Literature and the Arts from 1914 to 1937 (THE JOURNAL, February 3, p. 287).

NEW HAMPSHIRE

State Medical Election.—Dr. Richard W. Robinson, Laconia, was named president of the New Hampshire Medical Society at its annual meeting in Manchester, May 15. Other officers include Drs. Ralph W. Tuttle, Wolfeboro, vice president and Carleton R. Metcalf, Concord, secretary-treasurer.

NEW JERSEY

Ill Award Goes to Dr. Sprague.—The Edward J. Ill Award of the Academy of Medicine of Northern New Jersey was presented to Dr. Edward Wharton Sprague, Newark, during the annual meeting of the academy, May 17, "in recognition of his attainments as a surgeon and his contribution to the public welfare through his service in many civic and social welfare organizations." Dr. Harrison S. Martland, Newark, professor of forensic medicine, New York University College of Medicine, gave the principal address, on "Oh Why Should the Spirit of Mortal Be Proud?"

NEW YORK

Prevalence of Spotted Fever.—In 1944 17 cases of Rocky Mountain spotted fever, 4 of which terminated fatally, were reported in the state, exclusive of New York City, more than in any previous year on record. Although the disease was first recognized in this state in 1912, it has been only in the past decade and particularly in the last six years that a noticeable increase in incidence has been observed. This fact, coupled with the occurrence of sixteen deaths among the total of 86 cases reported from the area, plus what appears to be a gradual extension of the infection from the initial focus discovered in 1912, gives the health authorities in the state some cause for concern, according to *Health News*. Except for a single infection acquired accidentally in a Rockland County laboratory experimenting with the disease, all the cases on record in the New York State Department of Health have been confined to the Long Island area. Since the first 3 cases on record in the state were reported in Gardiner's Island, 2 with onset in 1912 and 1 in 1913, no cases were recognized until 1924, when 1 case was reported at the eastern end of Long Island proper in Suffolk County. Subsequent cases were confined to this county until 1939, when the first infections contracted in Nassau County were reported. In the group of 17 cases in 1944 the ages ranged from 3 to 72 years, about equally divided as to sex. Onsets of illness were confined to the period May through September, 6 in May, 3 in June, 3 in July, 4 in August and 1 in September. In 7 there was a definite history of tick bite and in 6 others evidence of contact with a tick. It is significant that in 8 cases the disease apparently was acquired through contact with tick-infested domestic animals: dogs in 7 cases and a cat in 1 case.

New York City

Marvin Thompson Resigns at Warner Institute.—Marvin R. Thompson, Ph.D., has resigned as president and director of the Warner Institute of Therapeutic Research, effective July 1.

Kellogg Grant to Train Hospital Executives.—The W. K. Kellogg Foundation, Battle Creek, Mich., has given Columbia University a grant of $60,000 to establish a course of training for hospital administrators, the New York *Times* reported June 5. The work will be carried out in the DeLamar Institute of Public Health and will be available for graduate students. The *Times* stated that plans already had been made for the Columbia faculty of medicine to carry out the training program in cooperation with hospitals and other organizations throughout the country.

OHIO

Industrial Commission Adopts Revised Medical and Surgical Fee Schedule.—The Ohio Industrial Commission has adopted a revised medical and surgical fee schedule, effective May 1, after a series of conferences with the committee on workmen's compensation of the Ohio State Medical Association and a similar committee of the Ohio State Dental Society. A new rule on physical therapy was inserted stating that fees for physical therapy will not be approved for more than ten treatments unless authorized. Under the old rule, fees for such treatment were not allowed unless the treatment was authorized in advance by the commission. The period of after-care covered by a flat fee in surgical procedures, dislocations, fractures, amputations and ophthalmologic procedures was reduced from ninety days to sixty days. This means that additional fees may be paid for services in extended cases—services required after sixty days. A period of three weeks was established as the period covered by the flat fee in ear, nose and throat surgical procedures. The fee for treatment at office after the first treatment was increased from $1.50 to $2, and the fee for treatment at the hospital after the first treatment was increased from $2 to $2.50. Fees were increased in eleven surgical procedures, in six items involving dislocations, in seventeen procedures involving fractures, in five types of amputations, for five ophthalmologic procedures, for two ear, nose and throat procedures and for three x-ray items. The fee for administration of anesthesia in prolonged operations was increased. Under the new schedule the anesthetist is allowed a fee of $10 for the first thirty minutes or fraction thereof and an additional $5 for each succeeding thirty minutes or fraction thereof. The old fee was $10 regardless of the time consumed by the operation. A new item was inserted in the schedule providing a fee of $3 for affidavits furnished by the physician on request of the commission and containing information used as a basis for adjudication of the claim. An entirely new section was inserted in the schedule entitled "Reconstructive Surgery." Such cases (mostly difficult orthopedic and reconstructive surgical cases) must have the authorization of the commission. The schedule provides for six months' after-care under a flat fee which includes the cost of the first cast.

PENNSYLVANIA

District Meeting.—The Tenth and Eleventh Councilor Districts medical societies held their annual meeting at the Penn-Albert Hotel, Greensburg, June 21. Among the speakers were:

Dr. George W. Ramsey, Washington, Facts Regarding the Rh Factor.
Dr. Howard G. Schleiter, Pittsburgh, Identification of Certain Forms of Heart Disease.
Dr. William Bates, Philadelphia, Segmental Pain Suggesting Visceral Disease.
William S. Livengood Jr., Harrisburg, Governmental Paternalism and Inefficiency.

A feature of the meeting was the presentation of testimonials to members who have completed fifty years of practice by Dr. William L. Estes Jr., Bethlehem, president-elect of the state medical society. Those honored included Drs. Albert H. Aber, Dravosburg; Francis J. Madden, Duquesne; Thomas G. Simonton, Pittsburgh; John D. Sin[illegible] liam J. K. Snyder, Avalon; Nathan [illegible] John M. Davis, Darlington; Milton L. [illegible] John B. Lowman, Johnstown; Bryant E. Sankey, New Castle; Kate W. Leatherman, Greensburg; Mary L. Montgomery-Marsh, Mount Pleasant, and Harry J. Stauffer, Jeannette.

Philadelphia

Personal.—James P. Lackey, Ph.D., has been named editor of the undergraduate subjects in the sciences for the Blakiston Company.

Fiftieth Anniversary of Laboratory.—On May 20 the laboratory of the Philadelphia Department of Health observed its fiftieth anniversary. Features included a broadcast over WPEN May 19 and an open house the following day.

Dr. Schaeffer Receives Strittmatter Award.—The 1944 Strittmatter award was presented to Dr. Jacob Parsons Schaeffer, professor of anatomy at Jefferson Medical College of Philadelphia, during a special meeting of the Philadelphia County Medical Society May 16 "in recognition of his long and distinguished career as a teacher, author and scientist in the field of anatomy and his sincere and untiring devotion and constructive efforts to safeguard high standards of medical research." This is the twenty-second presentation of the award, which consists of a gold medal and scroll and was made possible in 1923 through the generosity of Dr. Isidor P. Strittmatter. The DaCosta Oration was presented on this occasion by Col. James Barrett Brown, M. C., on "Plastic Surgery in the Military Service."

RHODE ISLAND

Pawtucket Society Observes Fiftieth Anniversary.—On June 6 the Pawtucket Medical Association observed its fiftieth anniversary with a day's celebration at the Pawtucket Golf Club.

Dr. Mowry Retires as Treasurer.—Dr. Jesse E. Mowry, Providence, has retired as treasurer of the Rhode Island Medical Society, concluding twenty-two years' service in the position. Dr. Mowry was president of the Providence Medical Association in 1903, delegate to the American Medical Association in 1916-1917 and president of the Rhode Island Medical Society in 1920.

State Medical Election.—New officers of the Rhode Island Medical Society include Drs. Herman C. Pitts, Providence, president-elect; John F. Kenney, Pawtucket, president; Joseph H. Ladd, La Fayette, vice president; Charles J. Ashworth, Providence, treasurer; Alfred L. Potter, Providence, assistant secretary, and George Raymond Fox, Pawtucket, assistant treasurer. Dr. William P. Buffum, Providence, is secretary.

Surgical Plan Committee Named.—The state medical journal announces a new eleven member committee of physicians and laymen who will study voluntary programs to provide for prepaid medical and surgical insurance similar in operation to the Blue Cross Plan. Lay members of the new committee elected by the six physicians previously chosen by the house of delegates of the state medical society include:

Roderick Pirnie, Providence, insurance executive and state director of the War Finance Committee.

George C. Davis, Providence, lawyer and a member of the board of directors of the Blue Cross.

Charles H. Baker, Providence, head of the industrial firm of Charles H. Baker, Inc.

Ralph Kenyon, Pawtucket, president of the Pawtucket Institution for Savings and a member of the board of trustees of Memorial Hospital.

Harold L. Amrhein, Woonsocket, vice president of the American Paper Tube Company and a trustee of Woonsocket Hospital.

The physicians are Drs. Samuel Adelson, Newport; Hartford P. Gongaware, Westerly; Leo V. Conlon, Woonsocket; George Raymond Fox, Pawtucket, and Herman C. Pitts and Arthur E. Martin, Providence. Dr. Pitts is chairman of the new committee and John E. Farrell, executive secretary of the state medical society, is secretary. Present plans call for a complete review of distribution of medical and surgical services in Rhode Island and also a study of existing medical service plans in other parts of the country that might be adaptable to Rhode Island. The state journal, in its announcement, stated that in the final day of the legislative session the general assembly passed in concurrence an act providing for the incorporation of nonprofit medical service corporations and defining their powers.

TENNESSEE

Waller Leathers Retires.—Dr. Ernest W. Goodpasture, since 1924 professor of pathology, and also associate dean, Vanderbilt University School of Medicine, Nashville, has been appointed dean to succeed Dr. Waller S. Leathers, who will retire June 30. Dr. Sam L. Clark, professor of anatomy at the medical school, has been named associate dean, and Dr. William W. Frye, associate professor of preventive medicine and public health, has been designated professor and head of the department of preventive medicine and public health. The announcement concerning these changes was made during a meeting of the university's board of trust. Dr. Goodpasture received his A.B. in 1907 at Vanderbilt University and graduated at Johns Hopkins University School of Medicine, Baltimore, in 1912. He has been associated with the school since 1924, following years of service at institutions that included Johns Hopkins, Harvard and the University of the Philippines. Dr. Leathers, who graduated at the University of Virginia Department of Medicine, Charlottesville, Va., in 1895, has been dean of Vanderbilt school of medicine and head of the department of preventive medicine and public health since 1928.

UTAH

Personal.—Dr. David C. Budge, medical director of the William Budge Memorial Hospital, Logan, since it was organized in December 1914, has resigned. Dr. Scott M. Budge, associate medical director, was named to succeed him. The latter has been succeeded as associate medical director by Dr. Oliver Wendell Budge.——Dr. Clay B. Freudenberger, professor and head of the department of anatomy, University of Utah School of Medicine, Salt Lake City, is spending the spring quarter as visiting professor of anatomy at the Louisiana State University School of Medicine, New Orleans.

VERMONT

The Osler Lectures.—Dr. Wesley Bourne, lecturer in pharmacology, McGill University Faculty of Medicine, Montreal, will deliver the Osler Lectures at the University of Vermont College of Medicine at the Fleming Museum, Burlington, July 5-7. His subject for the three lectures will be "Anesthesia: Some Contemplations."

WASHINGTON

New Building for Blood Bank.—Plans will soon be completed for construction of a $100,000 one story reinforced concrete building in Seattle to house the central blood bank (THE JOURNAL, Aug. 5, 1944, p. 982). The project will be financed by contributions, which already total $150,000, to cover construction, equipment and maintenance for a limited period. The blood bank was established a year ago by contributions from twenty business men under the inspiration of Mr. Emil G. Sick, according to *Northwest Medicine*. The land for the blood bank was donated by Dr. Simon Maimon Samuels, Seattle.

Portrait of Physicians.—A portrait of Drs. Walter C. Woodward and Homer D. Dudley, Seattle, was unveiled at the Rainier Club during a dinner meeting of the Seattle Surgical Society and the Puget Sound Surgical Society, April 27. The portrait was presented by the Seattle Surgical Society to the King County Medical Society, May 7, and will be hung permanently with portraits of other physicians in the society's rooms at the Medical-Dental Building auditorium. For the past fifteen years the surgical group has presented an annual two day program, one half of which was serious. The other half is a "high jinks" consisting of a script written and directed by Dr. Woodward and Dr. Dudley and usually devoted to "take-offs" on characteristic traits of their fellow physicians, according to the Seattle *Times*. The portrait shows the two physicians in informal pose and is the work of Neale Ordayne, formerly of Seattle and now located in Texas.

WEST VIRGINIA

Advisory Committee for Legislative Interim Committee.—Governor Clarence W. Meadows has appointed eight physicians as members of an advisory committee which is being set up under the provisions of a concurrent resolution (H. C. R. 4) adopted by the legislature for the purpose of consulting with a legislative interim committee in an investigation and study of public health problems in West Virginia (THE JOURNAL, May 5, p. 44). Members of the advisory committee are Drs. Delivan A. MacGregor, Wheeling; Edwin A. Trinkle, Weston; George O. Martin, Martinsburg; Newman H. Dyer, Bartley; Robert J. Wilkinson and Ray M. Bobbitt, Huntington; Richard O. Rogers, Bluefield, and George F. Grisinger, Charleston.

GENERAL

National Farm Safety Week.—July 22-28 has been designated the National Farm Safety Week, according to Presidential proclamation.

Safety Council Seeks Editorial to Reduce July Fourth Accidents.—An award of $200 for a Fourth of July editorial to help cut down the Fourth of July accident toll is announced by the National Safety Council.

Twenty-Five Years of Hospital Progress.—The twenty-fifth anniversary of *Hospital Progress*, the official journal of the Catholic Hospital Association of the United States and Canada, was observed with its May issue.

Activity Group Therapy for Children.—A training institute in activity group therapy for children will be conducted in New York City under the direction of the American Group Therapy Association. Additional information may be obtained from the association, 228 East Nineteenth Street, New York 3.

Louis Dublin Returns to Metropolitan.—Louis I. Dublin, Ph.D., second vice president and statistician of the Metropolitan Life Insurance Company, has completed his assignment as full time assistant to Basil O'Connor, chairman of the American Red Cross, and as chairman of the organization's administrative committee and has resumed his activities with the insurance company. Dr. Dublin will continue to assist Mr. O'Connor in the long-term policies and plans of the Red Cross and will be active in relation to the operation of the New York City chapters.

Chemical Awards.—The American Chemical Society has awarded the $1,000 Eli Lilly & Company prize for research in biochemistry to Max A. Lauffer Jr., Ph.D., associate professor of physics at the University of Pittsburgh, and the $1,000 Borden Company prize for research in the chemistry of milk to Ben H. Nicolet, Ph.D., senior chemist of the bureau of dairy industry, U. S. Department of Agriculture, Beltsville, Md., the New York *Times* reported June 3. Dr. Lauffer, a former associate at the Rockefeller Institute for Medical Research, was cited for "significant contributions to the study of the physical chemistry of viruses, the kinetics of virus protein denaturation, and the size and shape of macromolecules." Dr. Nicolet was cited for fundamental chemical investigations in the chemistry of milk proteins.

Life Insurance Fund Proposed for Research.—Plans to establish a life insurance fund that would advance more than $500,000 each year for the promotion of medical research were disclosed May 31 by Mr. M. Albert Linton, Philadelphia, chairman of a joint committee of the American Life Convention, Chicago, and the Life Insurance Association of America, New York, according to the New York *Times*. The funds at first would be devoted to diseases of the heart and arteries, it was stated. Foundation grants in 1940 for research into this group of diseases amounted to only 17 cents per

death from these causes against $2.18 per death in cancer, the *Times* states. The life insurance medical research program is to support existing research rather than to establish new research centers. It proposes to extend grants to institutions equipped for research in the chosen field and support carefully selected men who had completed their medical studies and shown special ability in research. Most of these men are now in the armed forces and unless they are helped they may turn to other fields. The new project proposes to assign them as research associates with experienced men already working on cardiovascular diseases.

Science Talks Feature Symphony Intermission.—Edwin J. Cohn, Ph.D., professor of biochemistry, Harvard Medical School, Boston, on May 27 gave the first in a new series of science talks which now feature the intermission of the New York Philharmonic program sponsored by the U. S. Rubber Company. Dr. Cohn's subject was "Blood and Blood Derivatives." The theme of the series is "Science Looks Forward" and the talks in the current group include:

Philip R. White, Ph.D., associate in the department of animal and plant pathology, Rockefeller Institute, Princeton, N. J., Roots, Nerves and Kidneys, June 3.
Charles K. Leith, Sc.D., head of the metals and minerals branch, Production Research and Development, War Production Board, Madison, Wis., Metals in War and Peace, June 10.
Robert M. Yerkes, Sc.D., professor of psychobiology, Yale University School of Medicine, New Haven, Conn., Chimpanzees as Servants of Science, June 17.
Henry N. Russell, Ph.D., research professor of astronomy, Princeton University, Princeton, N. J., Are the Other Planets Habitable? June 24.
John G. Kirkwood, Ph.D., Ithaca, N. Y., associate editor of the *Journal of Chemistry and Physics*, What Is a Liquid? July 8.
Isaiah Bowman, LL.D., president, Johns Hopkins University, Baltimore, The New Geography, July 15.
Dr. George R. Minot, Boston City Hospital, Anemia, July 22.
George R. Harrison, Ph.D., professor of physics, Massachusetts Institute of Technology, Cambridge, Atoms, July 29.
Robert C. Murphy, Sc.D., zoology, ornithology, American Museum of Natural History, New York City, subject not announced, August 5.
George B. Cressey, Ph.D., geology, geography, Syracuse University, Syracuse, N. Y., Our Northern Neighbor, China, August 12.
Charles E. K. Mees, Sc.D., director of research and development of the Eastman Kodak Company, Rochester, N. Y., Cows, Movies and Color Photography, August 19.

The Lasker Awards for Fertility Research and Maternal Care.—The Planned Parenthood Federation of America announces two $500 Lasker Awards for significant contribution to the improvement of maternal health care and for research in human fertility. The awards will be given to the scientist making the most significant contribution in research in human fertility, either in the control of conception or in the correction of infertility and to the public health service in a state or community for meritorious action in developing a complete program of maternal health care, including child spacing. The individual recipient of the award will be the executive officer most responsible for the development of the program. The fertility award will be given in honor of the late Dr. Hannah M. Stone, first medical director of the Margaret Sanger Research Bureau. The public health award will be in honor of Mrs. Margaret Sanger, founder of the birth control movement and at present honorary chairman of the federation. The awards will be presented at the annual dinner of the Planned Parenthood Federation of America in New York in January 1946. Deadline for submission of entries for the awards will be December 1. Two similar awards were presented last January to John MacLeod, Ph.D., of the department of anatomy, Cornell University Medical College, New York, and to Dr. Felix J. Underwood, Jackson, Miss., executive officer of the Mississippi State Board of Health. Any individual wishing to qualify for the awards or to suggest the name of a scientist, physician or public health official who might do so should address the medical committee, Planned Parenthood Federation of America, 501 Madison Avenue, New York 22.

Special Committee to Study New Approach on Cancer.—A special committee on growth consisting of fourteen experts has been appointed at the request of the American Cancer Society and in cooperation with the division of medical sciences of the National Research Council to project an "unprecedented approach" to the cancer problem. Authorities from fields as scattered as plant biology and genetics agreed to consolidate their information and plans in one organization, which will in turn encourage research through widespread grants of merited fellowship. The approach differs from all others heretofore in that cancer sometimes has been regarded as a distinct field, a tendency which many experts regard as a fallacy. The new program will attempt to advance the basic knowledge about cancer as well as encourage the fuller usage of what is known already, although in this second respect considerable gains are being made. The committee on growth will seek "to support institutions and individuals whose research work is related to finding new methods of treating cancer." Other objectives will be:

To make grants of such magnitude that individual researchers will be able to appoint subordinates for long training periods.
To arrange for the economic long-range security of researchers interested in the field.
To arrange for conferences of competent groups to interchange reports.
To make surveys to analyze the problems and progress relating to cancer.
To initiate and plan broad or specific programs of research.

The committee on growth expects some of the later nominees for fellowships to be men currently in the armed services. Rather than make the selections itself, the National Research Council will designate certain institutions with whose activities it is familiar, to make the awards in turn. Just as the committee membership has not been limited to cancer specialists, the research council pointed out the fellowships would be available to a diversity of candiates, in even such fields as engineering. Funds for research will come from the $5,000,000 campaign which has been under way recently. Members of the executive committee include Dr. Cornelius P. Rhoads, medical director of Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York; Clarence C. Little, Sc.D., Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine; Dr. James B. Murphy, Rockefeller Institute for Medical Research, New York, and Dr. Milton C. Winternitz, Yale University School of Medicine, New Haven, Conn. Others on the committee on growth are:

Dr. Alphonse R. Dochez, Columbia University College of Physicians and Surgeons, New York.
Dr. A. Baird Hastings, Harvard Medical School, Boston.
Dr. Charles B. Huggins, University of Chicago.
Donald F. Jones, Sc.D., Connecticut Agricultural Experiment Station, New Haven.
Carl R. Moore, Ph.D., University of Chicago.
Dr. John J. Morton Jr., University of Rochester School of Medicine and Dentistry, Rochester, N. Y.
Dr. Eugene P. Pendergrass, University of Pennsylvania School of Medicine, Philadelphia.
Dr. Florence R. Sabin, Denver.
Dr. Howard C. Taylor Jr., Bellevue Hospital, New York.
Merle A. Tuve, Ph.D., Johns Hopkins University, Baltimore.

FOREIGN

Albert Szent-Györgi in Moscow.—Dr. Albert Szent-Györgi, professor of medical chemistry, Szeged University, Szeged, Hungary, who won the Nobel Prize in 1937 for his work with vitamin C, is reported to have arrived safely in Moscow from Budapest, according to the New York *Times*. It was stated that the Swedish legation in Budapest managed to save Professor Szent-Györgi from the Nazis by employing him as a chauffeur.

Egypt Approves Birth Control.—The Grand Mufti of Egypt, highest judicial authority under Moslem religious law, has sanctioned the practice of contraception in marriage under a wide variety of circumstances ranging from ill health to economic hardship. The approval was contained in a "fatwa," or judgment, which also permits abortion prior to the "quickening of the embryo" in cases in which the life of the mother, the "prospective child" or a child already born may be threatened. The announcement of the sanction was released through the Planned Parenthood Federation of America, New York.

Death Rate Increases.—During the four week period starting March 1 the death rate in Amsterdam was three times as high as during the corresponding period in 1939, according to the Netherlands Information Bureau. The very young and the very old whose resistance had been lowered by years of undernourishment were the groups hardest hit. The report indicates that there has been considerable increase in communicable diseases. Diphtheria, which in prewar years showed a rate of 400 to 600 annually, assumed epidemic proportions during 1944, when 7,800 cases were reported in Amsterdam alone. From 20,000 to 30,000 persons were found to be suffering from hunger edema, while tens of thousands of others were at the brink of starvation, it was stated. Netherlands health authorities were startled by a report from the chief of Allied Supreme Headquarters public health branch that "health conditions in Holland were not as bad as expected." The statement at SHAEF by Major General Warren F. Draper, U. S. Public Health Service, declared that the special feeding teams that had been alerted for action "were not needed." In reply to this, Dutch health authorities who had just returned from an eye witness tour of the western provinces declared that even two weeks after liberation people were still dying of starvation, while many were too weak even to reach the new distribution centers. Far from being "not needed," the twenty-nine feeding teams operating in the western provinces have been increased to forty-three. Eight of these teams are operating in Amsterdam, four in The Hague, six in Rotterdam and the others in various towns where large numbers of starvation victims have been found.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 19, 1945.

The British Council of Rehabilitation

As shown in previous letters to THE JOURNAL, war injuries have led to the concentration of attention on the problem of rehabilitation. A British Council of Rehabilitation has been established (1) to act as a coordinating center for the various interests concerned in the widest aspects of rehabilitation, (2) to promote and correlate courses of study, (3) to invite the active cooperation of government departments, hospitals, universities, training colleges, educational institutions and research foundations in promoting the study and practice of rehabilitation, (4) to secure the active cooperation and participation of commerce, industry and professional bodies in the problems of resettlement, (5) to encourage the formation of follow-up schemes for the rehabilitated and (6) to consider, promote or oppose legislation which may affect the interests of the disabled and to make such representations as may be desirable. The council will comprise two representatives from each of its member organizations, elected members and such others as the council may from time to time appoint. The member organizations are the Association of Industrial Medical Officers, the Association of Occupational Therapists, the Board of Registration of Medical Auxiliaries, the British Federation of Social Workers, the British Hospitals Association, the British Legion, the British Medical Association, the British Orthopedic Association, the Central Bureau for Insurance Nursing, the Central Council for the Care of Cripples, the Chartered Society of Physiotherapy, the Industrial Orthopedic Society, the Institute of Labor Management, the Miners Welfare Commission, the National Association for the Prevention of Tuberculosis, the National Institute for the Blind, the National Institute for the Deaf, the National Institute of Industrial Psychology and the Research Board for the Correlation of Medical Science and Physical Education.

Accidents from Gas Cylinders Used with Anesthetic Apparatus

The serious risk that the pipe line used with anesthetic apparatus may in error be connected with the wrong cylinder, e. g. to a cylinder containing nitrous oxide instead of oxygen, has led the Ministry of Health to send a circular to hospitals. A number of fatal accidents have occurred. The minister of health is advised that where it is the practice for any person other than the anesthetist to replace gas cylinders on anesthetic apparatus or to connect such apparatus to a pipe line installation, the risk of accidents would be minimized if arrangements were made for a second person, preferably a doctor, to examine the connections to ensure that a mistake has not been made. It is suggested that the person responsible for the examination might on each occasion also be required to make a note of the fact by signing a record book especially kept for the purpose.

The Treatment of Starvation Under the Germans

The treatment of cases of advanced starvation in German concentration camps and in occupied countries robbed of their food supplies, especially the Netherlands, is a grave problem. Impressed with the evidence of the value of hydrolysates for alimentation by the intravenous or oral route, the military authorities are providing this treatment. They are also testing the efficacy of plasma and serum, which have been supplied from the Lister Institute in large quantities. Glucose is also given in large quantities to spare the amino acids for purposes of repair, and vitamins. The results are not yet available.

A less serious problem was that of Dutch children, aged 7 to 15 years, brought to England from the Netherlands. They had been living for a long time on bread, potatoes and cabbage. They did not appear much wasted but were undersized. The extent to which they were underweight is shown by the fact that they gained up to 6 pounds 6 ounces (2,900 Gm.) in three weeks on a proper diet. But in the starvation areas of the Netherlands there are children whose diet has fallen to 300 calories a day and who will present a more serious problem.

English Books to Be Translated and Produced for Russia

An agreement has been signed at the Soviet embassy in London between Mezhdunarodnaya Kniga of Moscow and Hutchinson, the English publisher, by which the former will distribute Russian translations of English books. These books will be translated and produced in England by the English publisher and exported to Russia. The agreement will hold for a minimum period of three years. The books to be translated have not yet been announced, but no doubt medical books will figure largely among them. This is further evidence of the looking of the European nations to London for a lead after the war and the desire that the British capital should succeed to the hegemony formerly held by Berlin, which were mentioned in previous letters to THE JOURNAL.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, May 2, 1945.

The Sanitation Projects of the Amazon and the Rio Doce

Dr. George C. Dunham, director of the medical division of the Bureau of the Coordinator of Inter-American Affairs, recently spent a few days in Brazil to inspect the work of some of the projects of the Special Service of Public Health (the SESP, as it is called in Brazil), a medical organization run in cooperation by the governments of the United States and Brazil. Dr. Paulo Antunes is the director of the Amazon project, with headquarters at Belem, state of Pará, and Dr. Ernani Braga is the director of the Rio Doce project, with headquarters at Vitoria, state of Espirito Santo. Dr. H. V. Markham, director of the Central Hospital at Belem, and two more doctors are the only Americans at present connected with the two projects, the rest of about 3,000 officials and workers being Brazilians. Almost 50 Brazilian physicians are now studying in the United States, through fellowships awarded by the Institute of Inter-American Affairs, to work, after their return, in the two projects. The Schools of Nursing of São Paulo and Belem are training more than 50 young women to be used as nurses in the same work. In the vast region of the Amazon basin, where rivers are almost the only means of communication, many scattered treatment stations have been established for the campaign against malaria. Small steamers and launches are used to transport doctors, nurses and other workers, some of these small vessels being employed as mobile clinics. Several district laboratories have been established, where simple entomologic work is performed in coordination with the central laboratory at Belem, Pará. The International Health Division of the Rockefeller Foundation transferred to the SESP its specialized personnel who had been previously used in the campaign to eradicate the anopheline Gambiae imported from Africa, as well as an important bulk of equipment suitable to this kind of work. Since August 1942 the Institute Evandro Chagas of Belem, a branch of the Oswaldo Cruz Institute of Rio de Janeiro, has been closely cooperating in the Amazon project, with a modern hospital, a great laboratory and a training school. There are other hospitals at Manaos, Breves and Santarem, which are the principal cities of this section of the country.

Treatment of Pulmonary Tuberculosis with Thoracoplasty

Dr. Eduardo Etzel of the Vicentina Aranha Sanatorium at São José dos Campos, state of São Paulo, has just published a report on 122 consecutive cases of pulmonary tuberculosis treated with thoracoplasty. In 22 cases the treatment was not completed. Dr. Etzel points out the futility of attempting the thoracoplasty in patients whose pulmonary condition does not permit a good surgical collapse. Of the 100 cases in which the treatment was completed, there were unilateral lesions in 65 and bilateral lesions in 35. In the first group, 57 cases were cured, or 87.6 per cent. Etzel believes that the minimum period of six months is absolutely necessary to appraise the good results of thoracoplasty. The poor results in the 8 unilateral cases were caused by late hematogenic dissemination (1), by contralateral postoperative dissemination (1), by tracheobronchial tuberculosis (2), by residual tuberculous process (2), by residual cavity (1) and by secondary open cavity (1). In the group of bilateral cases 19, or 54.2 per cent, were cured. The poor results in the 16 bilateral cases were caused by contralateral cavity (7), noncavitary extensive fibrous lesions (3), contralateral pneumothorax with cavity (2), contralateral pneumothorax and residual cavity (2), contralateral pneumothorax with exudative lesions (1) and contralateral exudative lesions (1). A careful selection of cases must be made to determine the efficiency of the respiratory function, to avoid the operation on patients who may later present chronic dyspnea, causing permanent infirmity and even death. The stability of the lesion that has to be collapsed and the degree of fibrosis or the degree of productive reaction must be taken into consideration, as thoracoplasty is contraindicated in cases in which there are progressive and "soft" lesions without fibrous reaction. In cases with bilateral involvement the thoracoplasty must be performed only if the contralateral lesions are regressive, arrested or controlled through pneumothorax. Tracheobronchial tuberculosis is a contraindication to thoracoplasty if the disease is advanced or bilateral. In case of fibrous stenosis of a main bronchus, dilation is necessary before the thoracoplasty. In cases of tracheobronchial tuberculosis treatment of the pulmonary lesion must be performed first.

Brief Items

Dr. Pasteur Valéry-Radot of Paris, head of the French cultural mission to South America, is now in Rio de Janeiro. At the Medical School of the university he delivered a lecture on "French Medicine During the War."

Dr. George K. Strode, director of the International Health Division of the Rockefeller Foundation, spent a number of days at Rio de Janeiro, where he was invited to attend a special meeting held by the Brazilian Society of Hygiene in his honor and a luncheon, during which he was greeted by Dr. Afranio Peixoto, professor emeritus of hygiene at the Rio de Janeiro University. Dr. Strode was the head of the staff of the International Health Division in Brazil from 1921 to 1926.

A model health center has been inaugurated at Petropolis, the summer capital of Brazil (population 40,000). The building has been erected by the federal government and equipped by the state of Rio de Janeiro to be used as a training center for health officers and for public health nurses as well as a special demonstration of modern public health administration. The director of the center, Dr. Oswaldo L. Da Costa, has a diploma in public health from the Johns Hopkins University.

Dr. Francisco Gugliotti has been appointed director of the Hospital São Sebastião of Rio de Janeiro, the institution in which the acute cases of transmissible diseases are isolated.

The Legião Brasileira de Assistencia is now building a hospital for tuberculous children at Fortaleza, state of Ceará.

Dr. Antonio Murtinho Nobre, a practitioner of medicine in the city of São Paulo, died at Rio de Janeiro, aged 66.

MEXICO

(From Our Regular Correspondent)

MEXICO CITY, May 25, 1945.

United States Physicians Excluded

United States physicians are virtually excluded from practicing in Mexico under the terms of a new and rigid federal law designed to eliminate foreign influences from the Mexican scientific professions. The legislation, which was announced on May 26 by publication in the *Official Daily*, a government organ, took effect two days later. Although it lays down a complete system of control for a number of professions, the most important section of the law, as far as doctors of the United States are concerned, is that declaring "no foreigner can practice, in the Federal District and territories, the scientific professions covered by this law." The medical profession is specifically named as one of the fields which have been closed to foreigners. Nevertheless, government sources indicated that physicians already practicing here will probably not be affected. While this point has not as yet been clarified by an official legal opinion, it is reported that such practitioners, who constitute some of the country's leading medical authorities, will merely be required to register their qualifications with the General Bureau of Professions, the government agency which will administer the legislation. Another exception will be made for refugee physicians, who, the statute provides, will be conceded "temporary permits" to practice, provided they are able to "prove themselves to be the victims of political persecution in their own country." Further exemptions will be granted to "professors of specialties still not taught (in Mexico)" or to those "who display unquestionable and outstanding competence," to "consultants or instructors dedicated to the establishment, organization or installation of institutions of public or military instruction, laboratories or institutes of essentially scientific character" and to "technical directors." Following is a partial text of the law:

"No foreigner can practice, in the Federal District and territories, the scientific professions covered by this law.

"Naturalized Mexicans who have conducted all their studies in authorized higher institutions can enjoy the same privileges of professional practice as Mexicans by birth.

"Only in exceptional cases can the General Bureau of Professions, in agreement with the respective institutions and in accordance with legal requisites, grant temporary permission to practice to foreign professional men and women, resident in the Federal District and territories, who prove themselves to be victims of political persecution in their own country.

"Degrees issued abroad to Mexicans by birth can be registered with the Ministry of Education, provided the course of studies leading to the professional degree is the same as or similar to those in institutions recognized by the Mexican government.

"In cases where it is impossible to establish the similarity of the studies, a system of examination will be set up to subject candidates to tests to prove their training.

"Foreigners and naturalized Mexicans who possess a degree in any of the professions embraced by this law must:

"1. Be professors of specialties still not taught or display unquestionable and outstanding competence in the opinion of the General Bureau of Professions.

"2. Be consultants or instructors dedicated to the establishment, organization or installation of institutions of public or military instruction, laboratories or institutes of essentially scientific character.

"3. Be technical directors in the development of the country's natural resources.

"The activities authorized for foreigners and naturalized Mexicans in the foregoing will in any case be temporary.

"The Ministry of the Interior will authorize the entry of foreign professional men and women into national territory, subject to the preceding conditions."

BUENOS AIRES

(From Our Regular Correspondent)

May 24, 1945.

Preventive and Curative Medicine

A law was recently passed giving the Instituto Nacional de Previsión Social charge of administering preventive and medical care to workers and employees who are protected by social insurance. Special attention will be given to patients with chronic diseases of great social importance, such as tuberculosis, cardiovascular diseases, syphilis, rheumatism, industrial diseases and their complications, as well as to industrial invalidism and physical and technical readaptation of workers after illness or accidents. The institute will carry out periodic examination of socially insured workers. No insured worker will be allowed to go without examination for more than one year. An individual clinical record book will be prepared and filed. Workers who are in need of rest will be instructed to reduce the number of working hours or to discontinue work for a certain time. Employers must give workers necessary rest or even a leave of absence for six consecutive months. Employees who are taking a partial or complete rest period will obtain a portion of the regular salary from the employer and the remainder from the Instituto Nacional de Previsión Social. A certain amount will be given to socially insured workers with illness of more than six months' duration. On returning to work an employee is to be given his former job with the regular salary or work better suited to his physical or mental capacity as determined by the institute. Retired invalids are given hospitalization up to a period of not more than six months. When expenses of hospitalization of retired invalids last for several months, 20 per cent of the allowance given to retired workers with a family and 50 per cent of the allowance of retired workers without any family is applied to the expenses of hospitalization. The insured are to obey medical orders. They are not allowed to work with or without payment during a treatment of preventive or curative rest. A budget will be prepared within two years in accordance with expenditures. An insured person is to pay 2 pesos ($0.50) every year for his general medical examination.

Congress of Ophthalmology

The second Pan American Congress of Ophthalmology will be held in Montevideo in November. The officers of the congress are Dr. H. S. Gradle of Chicago, president, Dr. Alberto Vázquez Barrière of Uruguay and Dr. Francisco Belgeri of Argentina vice presidents and Dr. Moacyr E. Alvaro of Brazil executive secretary. At a recent congress in Buenos Aires it was resolved to hold the second congress on Nov. 26, 1945 in Montevideo. Subjects on the program include diagnosis and therapy of preglaucoma, gonioscopy in view of newer knowledge of glaucoma, evaluation and mechanism of destructive effects of ocular hypertension, need of early operation in glaucoma, duration of medical therapy in glaucoma surgery of paralytic strabismus and surgery of heterophoria and concomitant strabismus. Two new topics, contact lenses and gonioscopy, appeared in the most recent program. These subjects will be presented by Drs. Baudilio Courtis of Buenos Aires and H. S. Sugar of Detroit and will be discussed by Drs. D. G. Cogan of Boston and A. Urretz Zavalia of Cordoba. Dr. Alberto Vázquez Barrière of Uruguay will preside. The session on prevention of war will open on the afternoon of November 26. Dr. Francisco Belgeri will preside. Dr. Correa Mayer of Porto Alegre will preside over the session on trachoma.

Dr. Gradle of Chicago recently stated that no ophthalmologic or other scientific news can be reported from Europe because of war conditions. The progress of ophthalmology rests with American centers. Postgraduate studies of the specialty are now receiving proper attention. The Kellogg Foundation offers twenty-five fellowships for postgraduate studies. The second Pan American Ophthalmologic Congress will be a scientific event of great importance to Pan American ophthalmologists. Probably more than one hundred and fifty American ophthalmologists will attend the congress.

Cinematographic Medical Films

Cinematographic equipment was recently obtained by the library of the Faculty of Medicine of the University of Buenos Aires for the purpose of illustrating certain chapters of medicine by means of films. The faculties of medicine as well as other scientific and educational centers of the country will receive copies of the names of the films which are available from the National Center Archivo Gráfico. The films requested from the Archivo Gráfico may be kept at the given educational center as long as they are needed. An apparatus providing the proper phonographic records for the film is lent with the film.

Electrocardiographic Action of Mate Tea

Dr. Enrique Moisset de Espanés recently reported to the Sociedad de Biología of Cordoba the results of electrocardiograms of 15 young men which were taken after ingestion of tea made from 200 Gm. of mate leaves. In the majority of the subjects the voltage of the electrocardiogram increased, especially in the T and R waves and moderately in the P wave. The increase of the voltage persisted in electrocardiograms which were taken one hour after ingestion of the tea.

Control of Exportation of Drugs

A law was recently enacted by the government of Argentina to the effect that custom houses will not permit exportation of drugs without the authorization of the National Department of Public Health. Permits will be issued only when the national needs for the drug in question have been satisfied. Production of certain drugs to be exported will be authorized by the National Department of Health.

Personal Items

Dr. Aloysio de Castro of Rio de Janeiro was recently invited to visit the medical societies of Buenos Aires. The Ateneo de la Historia de la Medicina held an extraordinary meeting in honor of Dr. de Castro, who was appointed honorary member of the academy. Dr. Castro presented to the academy a bust of Dr. Oswaldo Cruz which was made and given by Dr. Phocion Serpa of Rio de Janeiro, and Dr. Castro also awarded to some Argentine members of the academy the diplomas of honorary membership in the Sociedad Paulista de Historia de la Medicina.

Marriages

Robert Jackson Wetmore, Durham, N. C., to Miss Jane Carlton Evans of Washington, D. C., in Chevy Chase, Md., May 11.

Reuben L. Chrestman Jr., Memphis, Tenn., to Miss Deanne Henson of Meridian, Miss., in West Memphis, Ark., recently.

Thomas Fitz-Hugh Jr., Wynnewood, Pa., to Miss Bernice Rowe of Philadelphia in Washington, D. C., March 26.

Mary Charlotte Van Gundy, Beverly Hills, Calif., to Mr. Campbell E. Holmes of Los Angeles, April 5.

Henry V. Guhleman Jr., Jefferson City, Mo., to Miss Mary Florence Laws of Snow Hill, Md., April 7.

William Mahon Myers, Philadelphia, to Miss Jane Louise Mather of Latrobe, Pa., March 17.

Bernard Frank Joseph Fetter to Miss Anna Lee Hinton, both of Durham, N. C., May 11.

Carol H. Konhaus, Mechanicsburg, Pa., to Miss Frances M. Flickinger of Harrisburg, April 21.

Herbert S. Hunter, Latrobe, Pa., to Miss Lois Augusta Anderson of Greensburg, April 6.

Charles F. Taylor to Miss Jeanne N. Klinepeter, both of Harrisburg, Pa., April 1.

Deaths

Charles Goodman ⊕ New York; Western Reserve University Medical Department, Cleveland, 1892; formerly clinical professor of surgery at the University of Bellevue Hospital Medical College; fellow of the American College of Surgeons and the New York Academy of Medicine; member and past president of the Harlem Medical Association; past president of the Eastern Medical Society, the Park West Hospital Medical Board and the Beth Israel Hospital Medical Board; first vice president of the International Medical Club; formerly secretary of the Alumni Association of Mount Sinai Hospital; member of the International Surgical Society, Metropolitan Medical Society, American Public Health Association, Physicians' Mutual Aid Association, Military Order of the World War and the Reserve Officers' Association; volunteered and commissioned a captain in the medical reserve corps of the U. S. Army in May 1917; later organized and commanded a reinforcement group for the Presbyterian Hospital unit abroad, which was General Hospital number 1 of the American Expeditionary Forces; after his promotion to major headed an operating team during the British Expeditionary Force Paschendale offensive; later was director of a field hospital section of the Rainbow division of the American Expeditionary Forces and consulting surgeon to other American divisions; honorably discharged in April 1919; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; director of the typhus research fund of New York University; consultant in vascular surgery, Veterans Administration; in 1936 a member of the Nobel Prize nominating committee in medicine; for twenty years chief of the surgical division of the outpatient department of Mount Sinai Hospital; consulting surgeon and for twenty years attending surgeon at the Beth Israel Hospital; served as attending surgeon at the Montefiore Hospital, Park West Hospital and the Sydenham Hospital; for two years director of surgery and for two years director of vascular surgery at the Broad Street Hospital; consulting surgeon at the Rockaway Beach (N. Y.) Hospital, Home for Daughters of Jacob and the New York Polyclinic Hospital; member of numerous scientific groups and extensive contributor to the literature; credited with performing in 1906 the first successful blood transfusion; died May 23, aged 73, of heart disease.

Richard Slee, Stroudsburg, Pa.; Long Island College Hospital, Brooklyn, 1891; member of the American Medical Association and the Medical Society of the State of New York; in 1908 among the first to be commissioned in the newly created medical reserve corps of the U. S. Army as a first lieutenant; in 1916 he was sanitary officer at the medical officers training camp at Tobyhanna, Pa.; in command of Camp Crane, Allentown, Pa., 1918-1919; on Sept. 7, 1922 organized and served as commanding officer in charge of General Medical Laboratory number 1, Slee Laboratory Unit at Swiftwater; first National Commander of the United States Army Ambulance Service Association, 1920-1921; colonel, medical reserve corps, U. S. Army, not on active duty; first deputy health commissioner of Westchester County, N. Y., from 1930 to Oct. 1, 1937, when he retired; formerly district health officer of the state health department of New York; at one time assistant bacteriologist and medical inspector, Pennsylvania State Health Department; founder of the Slee Antitoxin and Vaccine Laboratories, Swiftwater; died April 8, aged 78, of cerebral hemorrhage.

Philemon Edwards Truesdale ⊕ Fall River, Mass.; Harvard Medical School, Boston, 1898; member of the founders group of the American Board of Surgery; member of the American Surgical Association, New England Surgical Society and the American Association for Thoracic Surgery; fellow of the American College of Surgeons; served as vice president of the Massachusetts Medical Society; joined the medical corps of the U. S. Army in 1917 and sailed for France with the rank of captain in the Yale Mobile Hospital unit; in October 1918 promoted to the rank of major; on his return to the United States assigned as director of surgery at Camp Devens and honorably discharged on March 15, 1919; member of the House of Delegates of the American Medical Association in 1929; awarded a gold medal in 1929 in the Scientific Exhibit of the American Medical Association for exhibit showing experimental demonstration of the mechanism of transposition of abdominal viscera following rupture of the diaphragm; medical director of the Truesdale Hospital, which he had founded and where he died June 12, aged 70.

Charles Johnson Smith ⊕ Portland, Ore.: Starling Medical College, Columbus, 1888; Bellevue Hospital Medical College, New York, 1890; member of the House of Delegates of the American Medical Association in 1905, 1910 and 1911; past president of the Oregon State Medical Society; for two terms mayor of Pendleton; state senator from Umatilla County from 1902 to 1910; for eighteen years a member of the school board of Pendleton; a member of the Industrial Welfare Commission and chairman of the board of curriculums from 1912 to 1930; one of the organizers and past president of the state board of health; fellow of the American College of Surgeons; for eight years Democratic state chairman for Oregon; president of the Ohio Society of Oregon; surgeon for the Western Division of the Northern Pacific Railroad Company; died April 19, aged 80, of angina pectoris.

William Litterer, Miami, Fla.; Vanderbilt University School of Medicine, Nashville, 1901; formerly professor of bacteriology and assistant professor of preventive medicine and public health at his alma mater, director of laboratories for the Tennessee Department of Public Health for many years; member of the American Medical Association, Tennessee State Medical Association, Southern Medical Association, American Chemical Society, Society of American Bacteriologists and the American Association for the Advancement of Science; did special government research in lethal gas during World War I; died May 1, aged 67, of cerebral thrombosis.

Hyman John Rubenstein ⊕ New York; Tufts College Medical School, Boston, 1927; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; Littauer Pneumonia Research Fellow at Harlem Hospital, 1929-1930; served as instructor of otorhinolaryngology at the New York Polyclinic Medical School and Hospital; on the staffs of the Beth Israel and Metropolitan hospitals; consultant to the Home of the Daughters of Israel; formerly on the staffs of the Polyclinic Hospital and the Mount Sinai Hospital, where he died April 30, aged 41, of leukemia.

Earle B. Stokes ⊕ East Orange, N. J.; Jefferson Medical College of Philadelphia, 1914; specialist certified by the American Board of Urology, Inc.; member of the American Urological Association; fellow of the American College of Surgeons; served during World War I; member of the Selective Service System; on the staffs of the Essex County Hospital, Cedar Grove, Essex Mountain Sanatorium, Verona, East Orange General Hospital, Dover (N. J.) General Hospital and the Orange (N. J.) Memorial Hospital, where he died April 29, aged 53, of coronary thrombosis.

Jesse Wolfenden Battershall, Attleboro, Mass.; Tufts College Medical School, Boston, 1916; member of the American Medical Association; since 1925 medical examiner for North Bristol District; served as school physician; since October 1943 health officer; past president of the Medico-Legal Association of Massachusetts and the Doctors Club of Attleboro; director of the Bristol County Health Association; interned at the Robert Brigham Hospital in Boston; on the staff of the Sturdy Memorial Hospital, where he died May 4, aged 51, of embolism following a major operation.

Arnold Frederick Sydow ⊕ Cleveland; Ohio State University College of Medicine, Columbus, 1926; fellow of the American College of Surgeons; demonstrator of surgery at the Western Reserve University School of Medicine; on the staffs of the City and St. Luke's hospitals; physician in charge of the medical staffs at the Cleveland works of the Aluminum Company of America, the Jones and Laughlin Steel Corporation and many smaller Cleveland firms; served on draft board number 30; died in West Palm Beach, Fla., April 28, aged 44, of malignant retroperitoneal tumor.

William Frederick Bennett ⊕ Verona, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; in 1923 joined the Essex Mountain Sanatorium, where since 1928 he served as first assistant physician; formerly on the staff of the Pennsylvania State Sanatorium for Tuberculosis in Hamburg, Pa.; died in the Mountainside Hospital, Montclair, May 2, aged 67, of cerebral hemorrhage and suppurative cholecystitis.

Simon William Brownstein, Chicago; Barnes Medical College, St. Louis, 1899; served during World War I; for eighteen years chief of clinics for the city board of health; died May 7, aged 78, of coronary thrombosis.

Orlo Solomon Canright, Columbus, Ohio; Rush Medical College, Chicago, 1884; died May 1, aged 87, of coronary thrombosis.

Etienne Pascal Crowe, Cleveland; University of Wooster Medical Department, Cleveland, 1889; a founder of the Cleveland Academy of Medicine; until his retirement in 1920 had been medical examiner for the John Hancock Life Insurance Company for thirty years; died May 6, aged 86, of disease of the coronary artery.

yellow urine or water, were found to give false positive tests for bilirubin. Since any deep yellow or light red solution exhibits this green color when mixed with methylene blue, there will probably be many more reports on the nonspecificity of this methylene blue test for bilirubin. (See also communication by Watson, Meads and Castle in THE JOURNAL, May 26, p. 308).

FRANK H. J. FIGGE, PH.D.
Department of Anatomy, University of Maryland School of Medicine, Baltimore 1.

THE TERM "WHOLE BLOOD"

To the Editor:—May I presume on your kindness to call to the attention of the members of the medical profession the difference between the term "whole blood" and "citrated blood," also called "modified blood."

The term whole blood is used incorrectly so often when citrated blood is meant that it seems to me that this error should be corrected.

Whole blood and citrated blood are as different as black and white. By far the most important life saving therapeutic agent we have today is properly matched whole blood, and it is my firm conviction that it is never going to be replaced by a substitute.

Citrated blood is a substitute for whole blood, and it should be used only in emergencies and when it is not practical to use whole blood. Severe reactions following the use of citrated blood are far more frequent than when whole blood is used.

Since we adopted the plan to determine the Rh factor on all recipients and give only Rh negative blood to Rh negative recipients, reactions have been eliminated when whole blood is used.

JOHN M. SCANNELL, M.D., Jamaica, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, June 16, page 540.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, July 16-18. Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Chicago, June 27-29. San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Fall, 1945. Final date for filing application is Aug. 1. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, October 24. Final date for filing application is Aug. 1. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Tearing of Esophageal Wall in Attempt to Remove Pork Bone.—The plaintiff swallowed a small pork bone, which became lodged in her esophagus. Within an hour thereafter, because of severe distress, she visited the defendant physician, a general practitioner, for treatment. According to the physician, he first examined her throat by using an illuminated tongue depressor but was unable to detect any foreign body. He then put on a head mirror and with an electric mirror in back and one in front of him and holding the patient's tongue with a sterile pad he thought he detected a foreign body in the throat. By means of a pair of laryngeal forceps about 10 inches long, with a piece of surgical cotton on the end, he proceeded to try to wipe this foreign body from the throat with a sweeping motion from below upward. He was unsuccessful in removing it and informed his patient that he could do nothing further and that the case was one for a specialist who could use an esophagoscope. He then called Dr. Carmody, a specialist, who instructed him to take roentgenograms and to send the patient to a hospital where the specialist could attend her. The defendant physician testified positively that he did not insert the forceps down the patient's esophagus and that it would have been physically impossible for his forceps to have reached the spot in the esophagus where Dr. Carmody testified he found the pork bone—namely, on the left side of the esophageal wall about opposite where the first rib makes a junction with the clavicle. The plaintiff and her husband, on the other hand, testified that the forceps the physician claimed he used and which were introduced in evidence were not the instrument used by the defendant. Their testimony seemed to indicate that the defendant wrapped some cotton around the end of a probe, which seemed about 14 inches long, longer than the forceps the defendant claimed he used, and that the defendant then put the instrument down the plaintiff's throat as far as he could. According to the plaintiff, the use of the probe "caused a sharp pain. Then the bone in my throat slipped. I didn't have that choking. Then he took the probe out and went over and wrapped it with cotton again" and then said if he was unsuccessful he would have to resort to a specialist. Prior to the defendant's operations, so the patient testified, there had been no hemorrhage but about the time she left his office to go to the hospital—approximately ten or fifteen minutes after the probing—some hemorrhage occurred. Dr. Carmody, the specialist, testified that later in the night in question by means of an esophagoscope he located and removed the pork bone. This operation involved placing the patient under an anesthetic and then inserting the instrument gradually down the esophagus. Basically, the instrument is a hollow tube within which run two wires; at the end of one of these is a small electric lamp with which the operator, by means of a reflector, can see the area just ahead of the esophagoscope; at the end of the other wire is a set of diminutive forceps with which the operator may take hold of objects. Dr. Carmody stated that he first located some cotton on the left side of the esophageal wall, about opposite where the first rib makes a junction with the clavicle, and that it was the cotton that led him to the foreign body. "I couldn't," he said, "see the foreign body. I saw the cotton. The cotton was on the foreign body. . . . The bone came out with it." Subsequent examination disclosed a tear in the esophageal wall and the bone or cotton, at the time of its removal, was inside, and not outside, the wall. No damage apparently was occasioned by the use of the esophagoscope itself. On account of the tear in the esophagus, the patient became ill; fluid developed in the pleural cavity; mixed infection—streptococcus empyema and also staphylococcus—occurred, and it was necessary to resort to liquid feeding for two weeks to prevent any solid food material working into the pleural cavity. Drainage of that cavity became imperative and the drainage tube remained in her side for approximately three months.

Subsequently the patient instituted an action for malpractice against the defendant physician, alleging apparently that the tear in the esophageal wall and her subsequent disability was occasioned by his negligence. At the trial, in addition to the testimony of the patient and her husband, the defendant physician, and Dr. Carmody, there was medical testimony that the piece of surgical cotton which was firmly adhering to the bone at the time of its removal by Dr. Carmody might have been swallowed by the plaintiff during the procedures instituted by the defendant and in its journey down the esophagus might have come into contact with the bone and adhered thereto There was also medical testimony that the adherence of the cotton to the bone was so firm that the impact between the bone and the cotton must have been with more force than that involved in the act of swallowing. Although the defendant physician had testified that the plaintiff complained of the foreign object being in the upper reaches of the throat, Dr. Carmody testified that when the defendant physician telephoned him he stated that he had a patient in his office who had a bone in her esophagus Several medical witnesses, called by the patient, in answer to hypothetical questions, testified that, assuming the existence of a bone in the esophagus and a probing for it in a manner related by the patient, such a procedure was not good medical practice under present standards in the profession for a general practitioner and would be dangerous to the patient. The defendant's evidence went to the point of showing that he did not insert any instrument in the patient's esophagus; that the forceps he used did not and could not reach beyond the cricoid constrictor located at the entrance to the esophagus, while the plaintiff's evidence went to the point that without preliminary examination, either by way of x-ray or esophagoscope, the defendant physician introduced a probe into the patient's esophagus causing the injury described. After a series of motions the court submitted the case to a jury, which returned a verdict in favor of the patient and judgment was entered thereon. The defendant physician appealed to the Supreme Court of Colorado.

The defendant physician at appropriate times during the trial moved for a nonsuit, directed verdict and for a new trial, all of which motions were denied. These motions, said the Supreme Court, involved the one question as to whether or not there was sufficient competent evidence to warrant the submission of the case to the jury. We believe that there was and the trial court's denial of the motions was proper.

The following instruction was given by the trial court to the jury:

> You are instructed that in judging the proper degree of skill to be exercised by a physician or surgeon in any given case, regard is to be had to the advanced state of the profession at that time, and that a physician or surgeon by holding himself out to the world as such impliedly contracts that he possesses the reasonable degree of skill, learning and experience which good physicians and surgeons of ordinary ability and skill, practicing in similar localities, ordinarily possess, and that he will use his skill with ordinary care and diligence according to the circumstances of the case, and if you find that the defendant in this case did not use ordinary care and diligence then you will find for the plaintiff.

The defendant contended that this instruction was improper because it failed to state that the defendant, as a general practitioner, was not expected to have or to exercise the skill of a specialist in treating cases of the kind involved here. This instruction, answered the court, is a proper one as relating to a physician in general practice. The standard to which he is held is ordinary ability and skill to be applied with ordinary care and diligence according to the circumstances of the case There is nothing in the language of the instruction complained of suggestive of a specialist.

The physician complained of the instruction just quoted on the additional ground that it contained no statement that to justify a finding for the patient there must, in addition to a finding of lack of ordinary care and diligence on the part of the physician, also be a finding that such lack of ordinary care and diligence was the proximate cause of the injuries complained of. This instruction, said the court, was proper when read in connection with all the other instructions, including one instruction which is a standard instruction relating to the burden of proof and still another instruction which stated that a physician "does not warrant success and is not responsible for want of success unless that want results from failure to exercise that reasonable care, diligence and skill" previously referred to in instructions tendered the jury.

The court accordingly affirmed the judgment in favor of the patient.—*Dixon v. Norberg, 157 P. (2d) 131 (Colo., 1945).*

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form. (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment]

Allan's Red Wash Combination.—Allan & Co, Inc, St Louis, and John G Ayars Shipped between Sept 18 and Oct 1, 1941. Consisted of a bottle of "Red Wash" and one of "Sa Ura Emulsion." The "Wash" was essentially small amounts of cresol, boric acid, glycerin, water and compounds of aluminum, ammonium and zinc sulfates The "Sa Ura Emulsion" contained chiefly castor oil and volatile oils, including sandalwood, turpentine and balsam of copaiba Both products misbranded because falsely represented as effective in curing, mitigating, treating or preventing social diseases—[*D. D. N J., F. D. C 855, May 1944*]

Be Plex Vitamin B Complex with Minerals and Iron.—Hale Drug Company, Birmingham, Ala. Shipped Jan 9, 1942. Composition: product contained not more than 25 per cent of the 669 International units of vitamin B_1 per fluid ounce declared on label. Adulterated for this reason Misbranded because of false and misleading label representations that in cases of vitamin deficiency product would be valuable as an aid to promote appetite and a protection to the body against "nerve disorder," and a help in certain cases of retarded growth, constipation, migraine, head aches and some other things, whereas it would not be efficacious for such purposes—[*D. D N J, F. D. C. 878, May 1944*]

Crab Orchard Concentrated Mineral Water.—Crab Orchard Mineral Water & Crystal Company, Inc, Crab Orchard, Ky Shipped March 23, 1940. Composition: dissolved mineral matter, chiefly magnesium and sodium sulfates, with smaller amounts of other salts Misbranded because labeling falsely represented that the water would be an effective treatment and alleviation of conditions usually calling for a sojourn at a mineral spring, that it would relieve inveterate chronic diseases, cleanse the system of toxins and waste matter, and remove the dangers of constipation; that it would benefit conditions arising from disordered liver and kidneys, prevent attacks on the blood corpuscles by toxins engendered in the system from defective filtration or cleansing; that it would prevent depletion of the nerve cells, safeguard beauty in women and keep men fit; that it would be beneficial in treating constipation, rheumatism, headaches, influenza, colds and some other disorders, keep the blood stream pure, help skin blemishes and eruptions, maintain a clean system, improve the appetite and enable one to sleep and feel better—[*D. D. N. J., F D C. 889, May 1944*]

Glendage—Joseph A. Piuma, Los Angeles Shipped August 1, 1941. Composition: tablets, each containing glandular material, including ½ grain of thyroid, with nux vomica extract (containing strychnine), a phosphide such as zinc phosphide, and a laxative drug, such as cascara sagrada extract Misbranded because of false representation of glandular substance present, since such substances were not physiologically or therapeutically active when taken by mouth as directed—[*D. D. N. J., F D. C. 890, May 1944*]

McBrady's Hair Pomade—Bernard McBrady, trading as J. E McBrady & Company, Chicago Shipped July 28 and 29 and Dec 12, 1941 Composition: essentially a small amount of a fatty acid such as stearic acid, incorporated in a base of petrolatum and wax. Misbranded because label falsely represented that product was an effective cure or preventive of stubborn and falling hair, would give the hair a better chance to grow, cause it to grow faster, and soften and limber it—[*D. D. N. J., F. D C. 887, May 1944*]

Real's Antiseptic Medicated Skin Cream—Baker Drug Corporation, Norfolk, Va Shipped Feb 12 and March 21, 1942, the earlier shipment being made in the name of Joseph Friedberg Composition essentially small amounts of potassium hydroxide, volatile oils, including menthol, eucalyptol and oil of bergamot, and a trace of phenol in a base of stearic acid, petrolatum and beeswax Bacteriologic examination showed article devoid of antiseptic properties Adulterated because strength and quality fell below represented antiseptic standard, and misbranded for the same reason—[*D D N. J, F D C 864, May 1944*]

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Anesthesiology, New York

6:113-224 (March) 1945

Recent Developments in Respiratory Physiology Related to Anesthesia. C. F. Schmidt.—p. 113.
Clinical Observations on Use of Curare in Anesthesia. R. J. Whitacre and A. J. Fisher.—p. 124.
Blast Injuries and Their Anesthetic Management. S. J. Martin and J. M. Schwab.—p. 131.
Action of Morphine in Slowing Heart Rate of Unconditioned Dogs. C. R. Allen, Q. Murphy and W. J. Meek.—p. 149.
Spinal Anesthesia for Cesarean Section. A. M. Torrie.—p. 154.
Anesthesia: XVII. Cardiac Effects and Blood Gases under Anesthesia with Propethylene. W. E. Evans Jr. and J. C. Krantz Jr.—p. 159.
Effect of Varying Moisture Content of Soda Lime on Efficiency of Carbon Dioxide Absorption. J. Adriani.—p. 163.
Experiences with Anesthesia in an Army Hospital in New Guinea. L. J. Hampton and H. H. Hammett Jr.—p. 173.
Selection of Anesthesia for Physiologic Experiments: Use of Oxford Ether Vaporizer. A. D. Foster Jr., C. Neumann and E. A. Rovenstine.—p. 181.
Apparatus for Administering Pentothal Sodium. R. C. Adams.—p. 191.

Journal of Clinical Endocrinology, Springfield, Ill.

5:61-118 (Feb.) 1945

*Cushing's Syndrome Without Adenomatous or Hyperplastic Changes in Pituitary Body or Adrenal Cortices and Complicated by Alkalosis: Report of Case with Necropsy. H. E. Cluxton Jr., W. A. Bennett, M. H. Power and E. J. Kepler.—p. 61.
Relationship of "Crooke's Changes" in Basophilic Cells of Anterior Pituitary Body to Cushing's Syndrome (Pituitary Basophilism). E. J. Kepler.—p. 70.
Studies on Renal Excretion of Water and Electrolytes in Cases of Addison's Disease. J. Reforzo-Membrives, M. H. Power and E. J. Kepler.—p. 76.
Hypoparathyroidism of Probable Encephalopathic Origin. N. J. Winer.—p. 86.
*Review of 100 Cases of "Diabetic Neuropathy" Followed from One to Ten Years. A. Rudy and S. H. Epstein.—p. 92.
Relationship of Normal and Hyperactive Ovary to Menstruation and Endometrial Hyperplasia. C. G. Hartman.—p. 99.

Cushing's Syndrome.—Cluxton and his associates report the clinical history and necropsy of a woman, aged 27, who came to the Mayo Clinic presenting most of the features of Cushing's disease. The absence of adenomas, neoplastic or hyperplastic changes in the pituitary body, thymus or adrenal cortices and the associated alkalosis that was present during the life of the patient are elements of additional interest. The patient's illness could not be attributed to any demonstrable anatomic abnormality if one excepts the hyaline changes that were found in the basophilic cells of the anterior lobe of the pituitary body. The physiologic significance of these changes is not known, but one of the authors believes that these changes are secondary or retrograde rather than an alteration of fundamental significance in the causation of the syndrome and that the clinical manifestations of the patient's illness were an expression of an abnormal adrenal cortical function of a hypersecretory character in spite of the fact that there was no histologic evidence to support this view. This case also presents one more instance of alkalosis and low potassium occurring in Cushing's syndrome, 3 cases having been previously reported from the Mayo Clinic. In some cases alkalosis occurs solely as the result of abnormal adrenal cortical function.

Diabetic Neuropathy.—Rudy and Epstein review 100 cases of diabetic neuropathy followed from one to ten years. The incidence according to clinical localization was neuritis 54, myelopathy 26, encephalopathy 4, encephalomyelopathy 5 and neurogenic bladder disturbances 11. Diabetic neuropathy is a generalized neurologic disturbance. It is observed not only in the acute stage of diabetes but also soon after the control of the glycosuria and hyperglycemia and in the chronic and even mild cases of diabetes. This neuropathy develops most frequently in patients over 50 years of age and is preceded or accompanied by considerable loss of weight. Symptoms and signs of a vitamin B complex deficiency are frequently associated with it. The vitamin deficiency is secondary, and it appears to be caused by the disturbed metabolism and at times by an associated chronic infection or other complication. A demonstrable dietary insufficiency is a factor only in certain cases. Complete recovery from the neuropathy is uncertain and slow, but it occurs following prolonged therapy with vitamin B and control of the glycosuria and hyperglycemia.

Journal of Experimental Medicine, New York

81:315-404 (April) 1945

Studies on Flexner Group of Dysentery Bacilli: I. Specific Antigens of Shigella Paradysenteriae (Flexner). W. F. Goebel, F. Binkley and E. Perlman.—p. 315.
Id.: II. Chemical Degradation of Specific Antigen of Type Z Shigella Paradysenteriae (Flexner). F. Binkley, W. F. Goebel and E. Perlman.—p. 331.
Id.: III. Antibody Response in Man Following Administration of Specific Antigen of Type V Shigella Paradysenteriae (Flexner). E. Perlman, F. Binkley and W. F. Goebel.—p. 349.
Nutrition of Host and Natural Resistance to Infection: I. Effect of Diet on Response of Several Genotypes of Mus Musculus to Salmonella Enteritidis Infection. H. A. Schneider and L. T. Webster.—p. 359.
New Virus Disease of Pigeons: I. Recovery of Virus. J. E. Smadel, E. B. Jackson and J. W. Harman.—p. 385.
Cirrhosis of Liver in "Donor" Dogs Fed High Fat Diet and Subjected to Repeated Bleedings. R. L. Holman.—p. 399.

Journal National Malaria Society, Tallahassee, Fla.

4:1-76 (March) 1945. Partial Index

Entomologic Problems in Malaria Control. G. H. Bradley.—p. 1.
*Suppressive Treatment of Malaria in Military Forces. O. R. McCoy.—p. 9.
Inhibitory Effect of Pyridoxine on Activity of Quinine and Atabrine Against Avian Malaria. A. O. Seeler.—p. 13.
Relation of Plants to Malaria Control on Impounded Waters, with Suggested Classification. A. D. Hess and T. F. Hall.—p. 20.
*Importation of Exotic Anophelines into United States. J. A. Mulrennan.—p. 56.
Recent Advances in Epidemiology of Malaria. R. B. Watson, H. W. Brown and D. S. Ruhe.—p. 58.
Statement of Progress, Kentucky Reservoir Malaria Control Program. F. E. Gartrell.—p. 63.
Malaria Mortality and Morbidity in United States for Year 1943. E. C. Faust, J. A. Scott and G. E. McDaniel.—p. 66.

Treatment of Malaria.—According to McCoy, atabrine has proved much more effective than quinine for suppression of malaria and, in general, is better tolerated and preferred by troops. A most important experience gained is the demonstration of the effectiveness of atabrine in preventing the development of falciparum malaria. When atabrine is taken in doses of 0.6 or 0.7 Gm. per week during and for several weeks following exposure to falciparum infection, appearance of symptoms is consistently prevented not only during suppressive treatment but also after medication is discontinued. Suppressive doses of atabrine apparently act as curative doses in this type of malaria. In this respect atabrine is far superior to quinine. As a result of the extensive use of atabrine for suppressive treatment, falciparum malaria has been much less of a problem in the military forces than was anticipated at the start of the war. Vivax malaria, on the other hand, is suppressed but not cured by atabrine. Relapses of vivax malaria experienced after the cessation of suppressive medication constitute a major portion of the Army's malaria problem. In units heavily seeded with vivax malaria it may be necessary to continue suppressive treatment in order to maintain military effectiveness even though no further exposure to infection occurs.

Importation of Exotic Anophelines.—According to Mulrennan and his associates the present emergency has greatly increased the possibility of exotic species of insects gaining ingress and becoming established in North America. This can be partially demonstrated by the fact that alien anophelines have been collected in two localities in Florida, with the infer-

ence on aircraft importation, since the specimens were collected adjacent to air fields. Emphasis is placed on the insecticiding of aircraft at the port of debarkation and a second application and inspection at the port of entry.

Journal of Nervous and Mental Disease, New York

101:205-310 (March) 1945

Healing Mechanisms in Shock Treated Neurotic Patient. J. D. Moriarty and A. A. Weil.—p. 205.
War Strains and Mental Health. A. B. Stokes.—p. 215.
Syphilitic Hepatitis and General Paresis Occurring Simultaneously: Report of Case. R. F. Gayle Jr. and W. B. Quisenberry.—p. 220.
Psychiatry and Propaganda. W. Eliasberg.—p. 225.
Observation on Interrelationship of Group and Individual Psychotherapy. J. W. Klapman.—p. 242.
Shock Treatment in Psychopathic Personality. H. F. Darling.—p. 247.
Fatigue as Precipitating Factor in Latent Epilepsy. M. H. Weinberg.—p. 251.
Problems of Orphanhood. S. Schryver.—p. 257.
Work of Chaplain in State Hospital for Mental Disorders. A. W. Scully.—p. 264.
New Approach to Problem of Hysteria. F. Pollak.—p. 268.
Frost Bites and Effects on Human Body. H. K. Craig.—p. 272.

101:311-400 (April) 1945

Electroencephalographic and Neurologic Studies of Homosexuals. D. Silverman and W. R. Rosanoff.—p. 311.
Persistence of Symptoms in Psychoneurotic Ex-Soldier. D. Pratt.—p. 322.
Cerebrospinal Fluid After Electric Convulsive Therapy. J. F. Maddux and C. K. Aldrich, with technical assistance of J. J. Blair.—p. 330.
Insulin, Cardiazol and Electroshock Treatment in Palestine During the Last Five Years. K. Blumenthal.—p. 332.
Psychiatric Factors Influencing Learning. G. N. Thompson.—p. 347.
Different Forms of Diffuse Sclerotic Process—Pelizaeus-Merzbacher Disease, Struempell's Familial Spastic Spinal Paralysis, Leukodystrophy—in One Family. M. Kastan.—p. 357.
*Hemiballismus: Clinicopathologic Study of 2 Cases. H. Kelman.—p. 363.
*Intraspinal Thiamine Chloride in Treatment of Gastric Crisis or Lightning Pains in Tabes Dorsalis: Report of 8 Cases. B. H. Kesert and M. O. Grossman.—p. 372.
Patient's Reaction to "Lunacy" Charge. L. Kerschbaumer.—p. 378.

Hemiballismus.—According to Kelman, hemiballismus is a syndrome characterized by violent uncontrollable, purposeless, throwing (ballistic) movements of one upper extremity or of the entire half of the body. The lesions in the corpus luysi are mainly due to hemorrhages, softenings or emboli, but they may also be due to infections, toxins and degenerative conditions. The author presents the clinical and pathologic aspects of 2 cases of hemiballismus. The first patient, a man aged 66, died within three months of the first attack. The episodic nature of the attacks suggests that they were due to an irritative process within the corpus luysi. In this case a destructive lesion was found. The destructive process is evidence of the previous existence of a dysphysiologic state. Such transitory states might occur and lead to attacks of hemiballismus without leaving significant evidence in the form of cellular changes in the corpus luysi or of degeneration in its afferent or efferent tracts. The nature of the attacks, at times involving only the hand, at others including also the face, finally to affect the lower extremity, confirm clinically that somatotopic localization exists in the corpus luysi. The second patient, a man aged 56, lived eight months after the onset of the abnormal movements. It has been stated that volition and psychic factors do not affect the movements. When this man was at rest the movements were least. When he made attempts to use his extremities spontaneously or on command as well as when he became emotionally disturbed, the movements became exaggerated. Neither of the 2 patients could voluntarily control the movements. In the second patient a metastatic nodule invaded and destroyed the tip of the oral pole of the corpus luysi. At necropsy the major lesion was so placed as to affect essentially the subthalamicotegmental fibers. This seems to indicate that a lesion limited to afferent tracts might cause hemiballismus. It also tends to prove the passage of most of the fibers contralaterally but also indicates that some pass homolaterally. The major movements were on the right side, but some were also present on the left.

Intraspinal Thiamine Hydrochloride in Tabes Dorsalis.—Kesert and Grossman say that in 1942 Stone reported good results from the use of intraspinal and oral vitamin B in cases of tabes dorsalis. Not only were the shooting pains in tabes relieved, but improvement in gait, bladder control and muscular tone was noted. The authors proceeded to try this form of therapy in all of their cases of tabes dorsalis, mainly for relief of shooting pains and gastric crisis. Up to the present, 8 patients have been followed. They were given from one to six intraspinal injections in doses ranging from 50 to 100 mg. The pains were intensified for a period of twelve hours after the injection, but then relief followed, which was partial or complete and lasted from several weeks to months, sometimes longer. Some of the patients were receiving thiamine hydrochloride orally or subcutaneously, but immediate relief of the intractable pains was due to the action of the thiamine hydrochloride given intraspinally. The use of narcotics and chordotomy can be avoided when thiamine hydrochloride is injected for tabetic and gastric crises.

Journal of Neurophysiology, Springfield, Ill.

8:77-134 (March) 1945

Electric Excitability of Nerve-Muscle Fiber Preparations. S. W. Kuffler.—p. 77.
Choreiform Movements in Dog Suffering from Corticostriatal Disease. Hsiang-Tung Chang.—p. 89.
Electroencephalogram of Different Cortical Regions of Normal and Anesthetized Cats. S. L. Clark and J. W. Ward.—p. 99.
Action of Veratrine on Nerve-Muscle Preparations. S. W. Kuffler.—p. 113.
Projection of Retina on Superior Colliculus of Cats. Julia T. Apter.—p. 123.

Journal of Nutrition, Philadelphia

29:155-222 (March) 1945

*Effects of Variations in Dietary Vitamin C on Physical Well Being of Manual Workers. R. E. Johnson, R. C. Darling, F. Sargent and P. Robinson with the technical assistance of M. Bartlett and A. Kibler.—p. 155.
Effect of Chain Length of Dietary Fatty Acid on Fatty Liver of Choline Deficiency. D. Stetten Jr. and J. Salcedo Jr.—p. 167.
Fatal Myocarditis in Choline Deficient Rats Fed Ethyl Laurate. H. D. Kesten, J. Salcedo Jr. and D. Stetten Jr.—p. 171.
Observations on Riboflavin Excretion by Adult Male. Dorothy R. Hagedorn, Emma D. Kyhos, O. A. Germek and E. L. Sevringhaus.—p. 179.
Niacin (Nicotinic Acid), Essential Growth Factor for Rabbits Fed Purified Diet. J. G. Wooley and W. H. Sebrell.—p. 191.
Effect of Sunshine on Ascorbic Acid and Riboflavin Content of Milk. A. D. Holmes and C. P. Jones.—p. 201.
Citrate Metabolism of Preschool Children. Esther R. Metcalf and Milicent L. Hathaway.—p. 211.
Further Studies on Cystine, Methionine and Choline in Chick Diets. H. J. Almquist and C. R. Grau.—p. 219.

Dietary Vitamin C and Physical Well Being of Manual Workers.—Johnson and his associates report experiments conducted during the summer in Civilian Public Service Camp 32, Campton, N. H. The 24 volunteer subjects were engaged in a variety of jobs associated with the work schedule of the camp, which included clerical work, kitchen work, camp maintenance, farming, clearing trails and road building. The range of daily caloric expenditures, depending on the subject's job, was estimated to be 2,400 to 5,000. There were four groups of subjects. The "deficient group" was to demonstrate the effects of total deficiency, the "supplemented deficient group" the effects of 75 mg. of ascorbic acid daily, the "normal control group" the effects of a good normal diet and the "supplemented normal control group" the effects of a normal diet supplemented with 75 mg. of ascorbic acid daily. If the previous diet has been good, total deprivation of vitamin C for two months does not lead in manual workers to detectable deterioration in physical vigor, to inefficiency in the day's work or to unpleasant symptoms, provided the daily diet is adequate in all nutrients other than vitamin C. Such deprivation may occasionally lead to minimal changes in the gums and does produce severe desaturation as measured by serum and urinary levels of vitamin C and by tolerance tests. When given in doses of 25 mg. three times daily, 75 mg. of ascorbic acid a day appears adequate to maintain or even to increase the body stores of the vitamin in a majority of men held for two months on a diet totally deficient in ascorbic acid. Supplements of 75 mg. of ascorbic acid a day when added to a good normal diet are of no detectable benefit to manual workers over a period of two months with respect

to general well being, physical vigor for hard work and efficiency in the day's work. Such supplements do lead to increased stores of vitamin C, as evidenced by serum and urinary levels and by tolerance tests.

Journal of Pediatrics, St. Louis

26:209-312 (March) 1945. Partial Index

Rheumatic Fever and the American Academy of Pediatrics: General Purpose and Scope. A. T. Martin.—p. 209.
*Salicylate Therapy in Acute Rheumatic Fever. R. Wégria and Katharine Smull.—p. 211.
Acute Salicylate Poisoning. A. F. Hartmann.—p. 214.
Sulfonamide Prophylaxis for Prevention of Rheumatic Recurrences. Ann G. Kuttner.—p. 216.
Rheumatic Heart Disease and Physical Fitness of Nation as Seen by Selective Service. L. G. Rowntree.—p. 220.
Plan for Rehabilitation for Rheumatic Subjects. J. G. F. Hiss.—p. 230.
Mobilization Against Rheumatic Fever. G. M. Wheatley.—p. 237.
General Statement Regarding State Rheumatic Fever Programs. Betty Huse.—p. 245.
Rheumatic Fever and American Academy of Pediatrics: Public Health Aspects; Epidemiology. T. D. Jones and B. E. Massell.—p. 262.
Indications for and Limitations of Treatment of Poliomyelitis. J. A. Key.—p. 265.
Paroxysmal Tachycardia in an Infant the Fourth Day of Life: Recovery with Digitalis. P. J. Howard.—p. 273.
Asphyxia Neonatorum: An Evaluation—Etiology and Treatment. H. R. Litchfield.—p. 279.
Penicillin Therapy of Pneumococcic Meningitis: Report of Case with Recovery Following Intraspinal, Intracisternal and Intraventricular Administration of Penicillin. Katharine H. Baird.—p. 287.
Correlation of Symptomatology with Enterozoic Parasitism in Children. R. L. Brown.—p. 291.
*Blood Plasma in Treatment of Encephalitis Lethargica and Polioencephalitis: Preliminary Report. P. Nicholson.—p. 298.

Salicylate Therapy in Acute Rheumatic Fever.—Wégria and Smull compared the course of acute rheumatic fever in two groups of patients, one "adequately" treated according to Coburn's standards and one with smaller doses. In the adequately treated group the serum salicylate levels ranged between 350 and 500 micrograms. The other group received such doses of salicylate that serum levels in most patients were constantly below 250 micrograms per cubic centimeter and in a few patients reached "optimal" levels only for short periods. The course of the disease was not shorter in the adequately treated group.

Blood Plasma in Treatment of Encephalitis.—Nicholson reports a case of lethargic encephalitis and a case of polioencephalitis in both of which pooled adult plasma was given intravenously with favorable results. He suggests that this method of treatment might be used in epidemics of poliomyelitis, because the case presented here was one of a severe encephalitic type and gave the use of blood plasma a severe test.

Journal of Urology, Baltimore

53:427-506 (March) 1945

Preventive Treatment of Calcium Urolithiasis: Important Role of Early and Frequent Roentgenographic Examinations. R. H. Flocks.—p. 427.
Urolithiasis in Soldier. A. H. Milbert and I. Gersh.—p. 440.
Relationship of Epithelial Buds to Carcinoma of Pelvis of Kidney, Ureter and Bladder. A. E. Bothe.—p. 451.
Endometriosis of Bladder. H. L. Kretschmer.—p. 459.
End Results of Prostatectomy: Five Year Survey. Lowrain E. McCrea.—p. 466.
Simplified Suprapubic Prostatectomy. D. K. Rose.—p. 470.
Transurethral Resection for Men 80 or More Years of Age. C. W. Latchem and J. L. Emmett.—p. 482.
New Suprapubic Drainage Apparatus for Use with Suction. R. L. Smith.—p. 486.
Role of Urologist in Military Service. G. J. Thompson.—p. 491.
Studies Concerning Renotropic Action of Pituitary Extracts. H. Selye and Charlotte Hollett.—p. 498.
Chancroid Disease in Female. G. G. Allison.—p. 503.

Kentucky Medical Journal, Bowling Green

43:61-94 (March) 1945

Surgical Aspects of Chronic Dyspepsia. I. Abell.—p. 70.
Medical Aspects of Tropical Diseases. A. McMahon.—p. 76.
Nutrition: Its Relation to Deficiency Diseases. J. B. Youmans.—p. 83.

43:95-118 (April) 1945

Chemotherapy (Penicillin). D. G. Anderson.—p. 99.
Concerning Commencement of Things Medical. W. D. MacNider.—p. 103.
Ablatio Placentae. J. L. Keyes.—p. 106.
Historical Notes on *Penicillium Notatum*. H. P. Morgan.—p. 109.
Poliomyelitis. J. A. Toomey.—p. 111.

Medical Annals of District of Columbia, Washingto

14:141-192 (April) 1945

Psychiatrist Looks at Constitution and Environment and Is Puzzled. I Karpman.—p. 141.
*Treatment of Gonococcal Vaginitis in Children with Penicillin. L. I Sweet and L. E. Putnam.—p. 148.
Allergic Nose. H. H. Diamond.—p. 151.
Unusual Case of Dissecting Aneurysm of Aorta. S. A. Steiner.—p. 15

Penicillin for Gonococcic Vaginitis of Children.—Swe and Putnam used the sodium salt of penicillin in the treatmer of 15 children with gonococcic vaginitis, 1 with vaginitis an conjunctivitis and 1 with conjunctivitis. The diagnosis in 1 cases was established by culture. The penicillin was given i multiple injections over a period of from twelve to twenty seven hours. The exact schedule of dosage remains to be determined, but the authors think that children of 7 years or under probably will respond to a dose of 50,000 units given over twelve hours, while older patients should be given approximately 100,000 units of penicillin. A single large dose of regular sodium penicillin is not effective, although it is possible that two or three injections of 25,000 to 50,000 units each at intervals of two or three hours may be curative. This regimen will be investigated, since, if satisfactory, it would greatly simplify the office or clinic treatment of such patients.

Public Health Reports, Washington, D. C.

60:317-344 (March 23) 1945

Comparison of Effect of Penicillin and Immune Serum in Treatment of Experimental Leptospirosis in Young White Mice and in Hamsters C. L. Larson and J. J. Griffitts.—p. 317.
*Penicillin Treatment of Leprosy: Clinical Note. G. H. Faget and R. C. Pogge.—p. 324.

60:345-372 (March 30) 1945

Titration of Clostridium Perfringens (Welchi) Antitoxin by Its Anti hemolytic Activity. Sarah E. Stewart.—p. 345.
Preliminary Report on Identification of 2,2 Bis (p-Chlorophenyl)-1,1,1 Trichlorethane (DDT) in Excreta of Poisoned Rabbits. E. F. Stohl man.—p. 350.
Psittacosis: Occurrence in United States and Report of 97 per cent Mortality in Shipment of Psittacine Birds While Under Quarantine. G. L. Dunnahoo and B. C. Hampton.—p. 354.

60:373-400 (April 6) 1945

Experimental Chemotherapy of Burns and Shock: VIII. I. Effects of Potassium Administration, of Sodium Loss, and Fluid Loss in Tourniquet Shock. H. Tabor and S. M. Rosenthal.—p. 373.
Nuisance Complaints and Municipal Health Department Practices. M. A. Pond.—p. 381.

60:401-428 (April 13) 1945

Experimental Chemotherapy of Burns and Shock: VIII. II. Electrolyte Changes in Tourniquet Shock. H. Tabor and S. M. Rosenthal.—p. 401.

Penicillin in Leprosy.—According to Faget and Pogge, penicillin was tried at the National Leprosarium in the treatment of 7 cases of leprosy in doses of 50,000 to 100,000 units daily, which were continued in some cases for a month's time. No specific beneficial effect could be attributed to this treatment. Subsequently two of the previously treated patients and 2 new patients were given much larger doses of penicillin without effect.

Union Médicale du Canada, Montreal

74:421-570 (April) 1945

Pericoronary Neurectomy Associated with Ligature of Great Coronary Vein in Treatment of Some Forms of Coronary Disease. M. Fauteux.—p. 424.
Cutaneous Allergy. A. Marin.—p. 432.
*Roentgenotherapy in Treatment of Inflammatory Lesions. O. Dufresne.—p. 439.
Bronchoscopy at Bed of Patient. V. Latraverse.—p. 448.
Atypical Case of Miliary Tuberculosis. Y. Laurier.—p. 452.
Hypertrophic Stenosis of Pylorus. A. Pettigrew.—p. 458.
Hypertrophic Stenosis of Pylorus in the Newborn. J. C. Côté.—p. 461.

Roentgenotherapy in Inflammatory Lesions.—Dufresne says that experimental studies justify the conclusion that x-rays in small doses activate the proliferation of lymphoid tissues, augment the mobilization of lymphocytes, increase the bacteriolytic power of the blood and improve the local defense. His clinical experiences with x-rays cover a period of fifteen years. The majority of acute infections in which Dufresne has employed roentgenotherapy have been superficial, such as ery-

sipelas, furunculosis, anthrax, sycosis and herpes zoster. The only cases of deep acute infections in which irradiation was used were pelviperitoneal ones associated with cancer of the uterus. The number of subacute and chronic infections treated with x-rays has been comparatively larger than that of acute infections, they include among others acne, mycosis fungoides, cholecystitis, rectitis, adenitis, tuberculous adenitis and epididymitis, poliomyelitis, myositis and osteoarthritis. In acute infections two or three small doses of from 25 to 75 roentgens each are usually sufficient to abort the attack. In subacute infection six to eight doses of from 100 to 125 roentgens each are administered at intervals of two or three days. In chronic infections irradiations extend over a long period and may reach a total of from 2,000 to 2,500 roentgens. The more superficial the infection, the lower should be the voltage and the lighter the filtration, the deeper the infection, the higher should be the voltage and the stronger the filtration.

War Medicine, Chicago

7:71-142 (Feb.) 1945

*Tsutsugamushi Fever: Clinical Observation in 195 Cases. M. G. Berry, A. S. Johnson Jr., and S. E. Warshauer.—p. 71
*Cardiac Complications of Tsutsugamushi Fever (Scrub Typhus): Investigation of Their Persistence. H. D. Levine.—p. 76
Experimental Human Burns: Partial Report. W. F. Ashe Jr. and L. B. Roberts.—p. 82
Interservice Consultations in One Army General Hospital: Comments, with Particular Reference to Section on Gastroenterology. S. Morrison.—p. 84
*Typhoid in Previously Immunized Subjects: Report of 7 Cases, with Discussion of Diagnosis, Clinical Course and Complications. J. L. Tullis.—p. 95
Sensitivity of Bacteria from Infected Wounds to Penicillin. II. Results in 112 Cases. E. Gallardo.—p. 100
Hemoglobinuria: Report of 10 Cases of Its Occurrence in Negroes During Convalescence from Malaria. H. E. Swantz and M. Bayliss.—p. 104
Paracolon Bacilli: Study of Fifty Three Isolated Strains, with Note on Pathogenicity. M. Michael Jr. and V. T. Harris.—p. 108

Tsutsugamushi Fever.—Berry and his associates present the clinical aspects of tsutsugamushi fever among 195 patients admitted to two station hospitals in New Guinea between December 1942 and June 1944. Eighty-five of these patients were admitted directly to the hospitals early in the course of their illness, the remainder were transferred from other hospitals for convalescent management. They stress that tsutsugamushi fever is an acute infectious systemic disease in which the most striking features are pronounced toxemia and widespread damage to the capillaries and arterioles. The physician may be inclined to attribute low blood pressure, cyanosis and tachycardia to myocardial failure when in fact they are due to peripheral vascular collapse. The clinical picture is more analogous to shock than to heart failure. Clinically there is no severe irreversible damage to the myocardium. The asthenia and tachycardia which occur in convalescence are no more pronounced than those which may be expected to follow any prolonged severe illness. One must carefully avoid giving the patient the impression that he has heart disease, because in patients with psychoneurotic tendencies a "cardiac neurosis" may result, and when this occurs it is extremely difficult to return the patient to duty. Although the pathognomonic pulmonary lesion is vascular, atelectasis is of clinical importance and occurs more frequently than has been recognized and apparently is secondary to the pneumonitis and bronchiolitis that are part of the disease. The rapid shallow respiration which one sees in severely ill patients is of pulmonary rather than cardiac origin. The pathologic changes found in the brain and leptomeninges, like the myocardial changes, are reversible, and if the patient survives his illness permanent sequelae are not to be expected.

Cardiac Complications of Tsutsugamushi Fever.—Levine says that an investigation of the cardiovascular status of 130 patients convalescent from tsutsugamushi fever, made at a United States Army general hospital, showed no evidence of persistent myocardial damage. In its effect on the heart this disease seems to resemble diphtheria. If the patient survives the acute phase his heart eventually shows complete return of function. The disability following the acute phase of the disease is largely that of neurocirculatory asthenia. The disease is associated in its acute phase with a generalized vasculitis, which is followed by a state of poor vascular tone. The latter, rather than cardiac involvement, is believed to account for the poor response to exercise in the convalescent stage.

Typhoid in Immunized Subjects.—Tullis states that protection against typhoid by immunization is relative. The typhoid he observed in the 7 previously immunized subjects was atypical and difficult to diagnose. Abdominal pain was a prominent admission complaint. The Widal test was of limited diagnostic value, owing to the universal immunization of all subjects. Four patients in whom falsely positive (anamnestic) reactions were repeatedly demonstrated were also studied. The presence of a rising titer of agglutination was of no aid in differentiating the true from the false positive Widal reactions. Separation of the agglutination into the flagellar and somatic fractions was of limited diagnostic import. Positive flagellar agglutination occurred in both the patients with and the patients without typhoid. Somatic agglutination occurred in only the patients with typhoid. The clinical course seemed mild; the complication rate, however, was high. Complications included (1) transient icterus, (2) colon bacilluria, (3) clinical relapse and (4) perforation of the gallbladder, with peritoneal abscess formation and peritonitis. The treatment of all patients was symptomatic and consisted in high caloric diet and good nursing care. The recovery rate was 100 per cent.

7:143-208 (March) 1945

Influence of Crowding on Respiratory Illness in Large Naval Training Station. B. B. Breese, J. Stanbury, H. Upham, A. J. Calhoun, R. L. Van Buren and A. S. Kennedy.—p. 143
Absence Without Leave: Psychiatric Study of 100. D. B. Davis, H. M. Wolman, R. E. Berman and J. E. Wright.—p. 147
Physiologic Abnormalities and Pathologic Changes Following Exposure to Simulated High Altitudes. A. F. Goggio and G. H. Houck.—p. 152
Nervous System Dysfunction in Adaptation to High Altitude and as Postflight Reactions. G. A. Brown, C. H. Cronick, H. L. Motley, E. J. Kocour and W. O. Klingman.—p. 157
*Acute Heart Failure Following "Blast Injury." B. S. Leavell.—p. 162
*Stability and Activity of Penicillin in Solution and in Ointment. J. S. Gots and A. M. Glazer.—p. 168
Penicillin Program at the United States Naval Hospital, Portsmouth, Va.: Observations and Results. H. J. Fox.—p. 170
*Visceral Leishmaniasis: Report of 3 Cases of Its Occurrence in Members of the Armed Forces of the United States. J. H. Burchenal and R. P. Woods.—p. 173
Simple Technic for Outlining the Sweat Pattern. J. J. Silverman and V. E. Powell.—p. 178
Healing of Wounds in New Guinea. R. V. Byrne.—p. 181

7:209-274 (April) 1945

Cornell Service Index: Method for Quickly Assaying Personality and Psychosomatic Disturbances in Men in Armed Forces. A. Weider, B. Brodman, Bela Mittelmann, D. Wechsler and H. G. Wolff, with technical assistance of Margaret Meixner.—p. 209
Id: Report of Its Use in Evaluation of Psychiatric Problems in Naval Hospital. N. Warner and Margaret W. Gallico.—p. 214
Three Years of Naval Selection: Retrospect. C. L. Wittson and W. A. Hunt.—p. 218
Field Nutritional Laboratory. R. E. Johnson.—p. 222
Assessment of Nutritional and Metabolic Condition in Field: General and Clinical Aspects. R. E. Johnson, F. Sargent, P. F. Robinson and F. C. Consolazio.—p. 227
Notes on Care of Battle Casualties: War Department Technical Bulletin.—p. 234

Heart Failure Following "Blast Injury."—In the Italian campaign the majority of blast injuries in patients admitted to evacuation hospitals were due to land mines and high explosive shells, while only a small percentage developed from bombs. Most of these men had penetrating wounds, usually compound fractures of an extremity. Leavell observed 3 patients with blast injury presenting unexplained heart failure. All 3 were healthy young adults who had performed strenuous work until they were wounded. In none was there evidence of valvular disease, hypertension, renal disease or urinary suppression. The amount of fluid administered parenterally did not appear to be excessive. The fact that all 3 patients received a blast injury at the time of wounding and that heart failure developed several days later suggested the possibility that the two might be related. In an attempt to determine the factors responsible for the heart failure 35 other patients with blast injury were studied from a cardiovascular point of view. Two of these had abnormal venous pressures without obvious cause, and 3 additional

patients manifested electrocardiographic abnormalities. No adequate explanation can be offered for these observations. It is suggested that, when pulmonary edema develops following blast injury, digitalization and venesection may be indicated.

Stability of Penicillin in Solution and Ointment.—Gots and Glazer studied the activity and stability of penicillin in solution and in ointment bases by means of modifications of the agar plate assay and the serial dilution turbidity method. A solution and ointments of penicillin containing equal numbers of units showed practically the same activity. When the solution and the ointments were kept at refrigerator temperature there was no significant loss of activity at the end of sixty days. At room temperature and at incubator temperature there was complete loss of activity in approximately a month.

Visceral Leishmaniasis in the Armed Forces.—Burchenal and Woods draw attention to the occurrence of kala-azar among troops returning from the Mediterranean area. Kala-azar is characterized by the invasion of the reticuloendothelial system by a protozoon parasite, Leishmania donovani. The symptoms are long continued fever, oftentimes with a double daily elevation of temperature, and progressive splenomegaly followed by hepatomegaly, loss of weight, leukopenia and anemia. Generalized lymphadenopathy is occasionally noted. The authors present the histories of 3 patients whom they treated during the past three months. The first case is notable for the acuteness and severity of the disease and of the difficulty in establishing the diagnosis by demonstration of the parasite. The second shows a more chronic course but again illustrates the difficulty in finding the parasites. The third case presents an entirely different clinical picture, with moderate enlargement of the posterior cervical lymph nodes as the only sign of the disease. The first 2 patients responded to what is usually considered adequate treatment, but both relapsed shortly thereafter and required further therapy. The third patient is still undergoing treatment. Sternal aspiration is probably the safest method of demonstrating the leishmania parasites and should be tried first, but in some cases it may be necessary to resort to splenic puncture. Early diagnosis and institution of treatment before the occurrence of granulocytopenia is most important. Visceral leishmaniasis was first treated with antimony and potassium tartrate, and this agent may still be used where less toxic drugs are not available. The pentavalent antimony derivatives, such as neostibosan, neostam and sodium antimony gluconate, are less toxic.

Western J. of Surg., Obst. & Gynec., Portland, Ore.

53:93-134 (April) 1945

Penicillin in Treatment of Infections. C. S. Keefer.—p. 93.
*Sodium Penicillin in Treatment of Presumably Sulfonamide Resistant Female Gonorrhea. Paula Horn and H. H. Cowper.—p. 108.
Analysis of Unusual Rh Antibody. Joan Howard, Barbara C. McIvor and S. P. Lucia.—p. 113.
Radical Duodenopancreatectomy in One Stage for Carcinoma of Ampulla of Vater: Report of Case with Successful Outcome. J. R. Broun.—p. 118.

Sodium Penicillin in Sulfonamide Resistant Gonorrhea.—Horn and Cowper administered penicillin to 71 women with gonorrhea. All except 1 had received but had failed to respond to one or more courses of sulfonamide treatment. The remaining patient had been started on penicillin because she had nonspecific hepatitis. The sodium penicillin was administered at three hour intervals by intramuscular injection in sterile distilled water or in isotonic solution of sodium chloride. The individual doses varied between 20,000 and 50,000 units and the total doses ranged from 100,000 to 200,000 units. More than one fifth of the women failed to respond to the penicillin therapy. Among the 43 women who had involvement of only the lower genital tract 5 failed to respond to penicillin, but of the 31 with associated upper genital tract infection 11, or more than a third, failed to respond. The authors also observed the trend that the older was the infection, the poorer was the chance of success with penicillin in the dosages used. They stress that early diagnosis and early institution of penicillin therapy are paramount considerations in the control of gonorrhea. In the female, in whom diagnosis and cure are difficult to establish and time consuming, delay caused by a preliminary trial with the sulfonamide drugs may diminish the possibility of cure.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

57:1-44 (Jan.-Feb.) 1945

*Skin Eruptions Due to Local Application of Sulfonamides. G. A. G. Peterkin.—p. 1.
Incidence and Localization of Acne. E. L. Cohen.—p. 10.

Skin Eruptions from Local Application of Sulfonamides.—Peterkin directs attention to the skin eruptions that have been known to follow the local application of the sulfonamides. He observed a number of these cases in 1942 in England and 65 cases in North Africa in 1943, many of them of much greater severity than those seen in England. In 61 of the 65 cases sulfanilamide powder was the first sulfonamide drug to be applied. The eruption is invariably preceded by application of the powder, and it is suggested that the patient becomes sensitized to the drug by its inhalation. It is recommended that powdered sulfonamides should not be applied to the skin for minor conditions. Over 200 patients, including 183 with impetigo or impetiginized seborrheic dermatitis, were treated in North Africa with 5 per cent sulfathiazole in Lassar's paste or Lanette wax cream, and the skin freely exposed to light. Only 1 patient (with respirator dermatitis) developed an eruption; this was mild and soon subsided. It is considered that 5 per cent sulfathiazole in a suitable base is probably as safe as ammoniated mercury for dermatologic therapy and gives better results.

British Journal of Venereal Diseases, London

21:1-46 (March) 1945

Venereal Diseases in Soviet Union. J. A. Scott.—p. 2.
Secondary Reaction in Twenty Day Intensive Arsenotherapy. R. H. Grede.—p. 9.
Social Aspect of Venereal Diseases: I. Work of Almoner. Dorothy M. Manchée.—p. 12.
Id.: II. Contact Tracing and Prostitute. Margaret A. Wailes.—p. 15.
Id.: III. Contact Tracing. Hilda M. Johns.—p. 17.
"Middle East Granuloma": Is it Granuloma Venereum? W. R. S. Cowe.—p. 34.

British Medical Journal, London

1:285-318 (March 3) 1945

*Cross Infection Risks in Hospitalization of Measles Patients. J. Wright.—p. 285.
Changes in Personality After Cerebrospinal Fever. M. N. Pai.—p. 289.
Psychiatric Casualties in Women's Service. S. I. Ballard and H. G. Miller.—p. 293.
Ludwig's Angina. J. Farr and E. D. Stanhope.—p. 295.
Inguinal Hernia in Merchant Navy: Analysis of 200 Consecutive Cases. P. P. Cole.—p. 296.

Cross Infection Risks in Hospitalization of Patients with Measles.—Wright found that almost three fourths of 65 patients with measles in one group became cross infected with type 6 hemolytic streptococci. Twelve of these patients developed middle ear suppuration and 4 were subjected to mastoid operations. More than a fourth of the patients developed skin infections, mainly impetigo. In another group analysis was made of the occurrence of middle ear suppuration among all the patients with measles hospitalized between December 1942 and May 1943. Among 496 patients 3.6 per cent suffered from "early" and 13.3 per cent from "late" middle ear suppuration. In view of the findings in the first investigation it could be assumed that the great majority of the late middle ear complications were due to cross infection. The late middle ear suppuration rate was considerably lower among patients admitted in April and May than among those admitted in the winter months. The percentage incidence of ear complications was not higher among children under 3 years of age, but the seriously damaging effects of cross infection fell most heavily on them. Of the 238 children in this group, 11 underwent mastoidectomy and 1 died. Infants under 1 year of age suffered particularly severely; 6 of the 45 infants developed late middle ear suppuration, and in 4 cases this was followed by further complications. In view of the high complication rate due to cross infection, treatment at home rather than in the hospital is advocated for patients with uncomplicated measles. For the

protection of measles patients who must be admitted to the hospital recommendations are made for the control of cross infection and for improvements in administrative and nursing procedures.

Edinburgh Medical Journal

12:1-48 (Jan.) 1945

Prophylaxis from Obstetric and Gynecologic Standpoint. R. W. Johnstone.—p. 1.
Traumatic Ulnar Neuritis: Results of Anterior Transposition of Ulnar Nerve. R. L. Richards.—p. 14.
Comparison of Pathogenicity Tests for Staphylococci. R. Salm.—p. 22.
Thiouracil in Treatment of Thyrotoxicosis. D. M. Dunlop.—p. 30.

Lancet, London

1:263-294 (March 3) 1945

Value of Work in Treatment of Tuberculosis. F. Heaf.—p. 263.
Exfoliative Dermatitis Treated with Cystine. Report of 2 Cases. B. A. Peters.—p. 264.
Nitrogen Loss After Thermal Burns: Effects of Adding Protein and Methionine to Diet of Rats. P. B. Croft and R. A. Peters.—p. 266.
Uterine Graft Operation for Genital Prolapse. T. C. Clarke.—p. 272.
Fatigue Fracture of Fibula: Report of 2 Cases. D. A. Richmond.—p. 273.

1:295-326 (March 10) 1945

Medicine and the State. L. Horder.—p. 295.
Dehydration. D. A. K. Black.—p. 298.
*Experimental Nephrosclerosis: Prevention with Ammonium Chloride. H. Selye, O. Hall and E. M. Rowley.—p. 301.
Reaction After Pneumoperitoneum Treatment. E. Aslett and T. F. Jarman.—p. 304.
Periarteritis Nodosa Possibly Due to Sulfadiazine Sensitivity. B. D. Rosenak and R. H. Maschmeyer.—p. 305.

Ammonium Chloride for Experimental Nephrosclerosis.—Selye and his associates point out that desoxycorticosterone acetate produces nephrosclerosis and hypertension in many animal species, especially if given to unilaterally nephrectomized animals kept on a high sodium chloride intake. The authors report experiments on rats which indicate that ammonium chloride is highly effective in preventing some of the most serious toxic effects of overdosage with desoxycorticosterone acetate. Since there is reason to believe that nephrosclerosis with renal hypertension, periarteritis nodosa and perhaps also some of the manifestations of "rheumatic fever" are due to intoxication with excessive amounts of an endogenous cortical substance resembling desoxycorticosterone acetate, it seemed desirable to examine the efficacy of ammonium chloride in patients with such diseases. This salt may also make it possible to use desoxycorticosterone acetate more extensively in adrenal cortex deficiency without incurring the danger of overdosage. This would be a new application of a remedy which has been used in large doses as an expectorant and diuretic and would not necessitate the extreme caution necessary with a new drug.

1:327-358 (March 17) 1945

*Decortication in Clotted and Infected Hemothoraces. C. P. Thomas and W. P. Cleland.—p. 327.
X-Rays in Diagnosis and Localization of Gas Gangrene. F. H. Kemp.—p. 332.
Iron Oxide Dust and Lungs of Silver Finishers. A. I. G. McLaughlin, J. L. A. Grout, H. J. Barrie and H. E. Harding.—p. 337.
Mite Borne Typhus in Anglo-Egyptian Sudan. R. W. Stephenson.—p. 341.

Decortication in Clotted and Infected Hemothoraces.—According to Thomas and Cleland, hemothorax is by far the commonest complication in chest injuries. The compound hemothorax which is associated with injury to the lung, diaphragm or chest wall requires surgical treatment, and the associated hemothorax if removed at the time of operation rarely causes further serious trouble. The simple hemothorax presents a different problem. Its mortality and morbidity depend almost entirely on infection or clotting. The increased incidence of massive clot formation observed in casualties from the Western European campaign may possibly be due to the employment of intrapleural penicillin, but in vitro experiments have lent no support to this view. The extensive use of intrapleural penicillin has unfortunately been associated with a tendency to disregard the principles of early and frequent aspiration of blood from the pleural cavity, so that many cases remain virtually unaspirated for a considerable period. An additional factor may be the high proportion of mortar wounds resulting in increased tissue damage. Among the 750 patients with chest injuries observed by the authors, 526 had hemothoraces. Of these, 30 per cent became infected and in 9 per cent clotting resulted. Earlier methods of treating clotted hemothoraces were attended by incomplete or considerably delayed lung expansion; at the best such methods led to considerable respiratory embarrassment. Less fortunate cases were left with severe and prolonged pleural infection. The employment of decortication with suction drainage fulfils the basic principle of early and complete reexpansion of the lung. Results in a limited series of hemothoraces have been considerably better than those of earlier procedures. A small series of both drained and undrained empyemas following hemothoraces have also been treated successfully by decortication and suction drainage.

Medical Journal of Australia, Sydney

1:129-164 (Feb. 10) 1945

Sterility. F. A. Bellingham.—p. 129.
Effort and Result in Sterility: Audit of 407 Cases. A. Grant.—p. 134.
General Aspects of Sterility in Female. J. W. Johnstone.—p. 138.
Hysterosalpingography in Sterility. C. MacDonald.—p. 142.
Examination of Semen. H. F. Bettinger.—p. 144.

1:213-240 (March 3) 1945

Intestinal Intubation. J. Devine.—p. 213.
Further Report on Treatment at Children's Hospital, Melbourne, of Influenzal Meningitis with Sulfonamides and Type Specific Serum. Elizabeth K. Turner.—p. 219.
"Found Dead," "Dead in Bed," and "Collapsed and Died." J. B. Cleland.—p. 221.
*Hemiaplasia of Thyroid Gland. H. R. G. Poate and S. L. Spencer.—p. 223.
*Case of Chronic Solid Subdural Hematoma. R. A. Money.—p. 224.

Hemiaplasia of Thyroid.—Poate and Spencer report 2 cases of hemiaplasia of the thyroid. The anomaly occurs often enough to require the surgeon to expose both sides before beginning a thyroidectomy. The danger of inadvertently removing the patient's entire thyroid tissue is increased by the fact that in the great majority of cases of hemiaplasia it is the left lobe which fails to develop. In both of the cases recorded here the left lobe was lacking. As it is almost universal practice in thyroid surgery to begin on the right side, the operator may detach this lobe from its vascular supply before becoming aware of the absence of the left lobe.

Solid Subdural Hematoma.—According to Money, solid subdural hematoma is rare. A man aged 23 presented symptoms suggestive of the presence of a cerebellar tumor on the left side. Preparations were begun for an exploratory suboccipital operation. As a preliminary step, burr holes were made in the skull over both occipital lobes. On the left side the dura mater was thick and discolored, and, when it was cut through, brown fluid and old liquid blood escaped, indicating the presence of an old subdural hematoma. About an ounce of liquid was evacuated by lavage and suction, with immediate relief of symptoms, and a small piece of corrugated rubber was inserted in a forward direction. It was hoped that the remainder of the hematoma would drain out this way. After the discovery of the hematoma, the patient recollected that about the end of March 1942, while playing soccer, he had received a blow or kick on the head, which knocked him down. He continued the game for at least half an hour in a dazed condition; yet this minor injury must have been sufficient to tear one of the cerebral veins entering the sagittal sinus and start bleeding into the subdural space. Later the patient had a generalized epileptic seizure; the headaches persisted and papilledema increased. These and other observations made it obvious that a large, probably clotted and organized subdural hematoma was still present. After a large osteoplastic flap had been raised and the thickened dura reflected, a substance having the appearance of liver was encountered in all directions. This liver-like mass represented a solid subdural hematoma. The patient made a good recovery.

Proceedings of Royal Society of Medicine, London

38:97-140 (Jan.) 1945. Partial Index

Physical Preparation of Commandos. G. M. Levick.—p. 97.
Discussion on Influence of Nutritional Factors in Liver Disease. H. P. Himsworth, L. E. Glynn, J. Beattie and C. Wilson.—p. 101.
Spinal Analgesia in the Very Young and Further Observations. W. Etherington-Wilson.—p. 109.
Serial Spinal Analgesia. J. A. Lee.—p. 115.

Semana Médica, Buenos Aires

52:223-270 (Feb. 1) 1945. Partial Index

*Sulfonamide in Therapy of Trichomoniasis Vaginalis. A. Alexander. —p. 248.

Sulfonamide Therapy of Trichomoniasis Vaginalis.—Alexander describes the local sulfonamide treatment of 26 patients with trichomoniasis vaginalis. The vagina was washed with 1 liter of boiled water and was cleansed with sterilized gauze, a sulfonamide tablet was placed in each cul-de-sac and the vagina was tamponed with gauze. The treatment was repeated on five or six consecutive days. The discharge, the vulvar pruritus and the burning local sensation disappeared after the first day in the course of the treatment. The permanent disappearance of the flagellum was verified by microscopic examination of the discharge.

Chirurg, Berlin

16:1-50 (Jan.) 1944. Partial Index

*Electrocoagulation of Gasserian Ganglion. K. H. Bauer.—p. 1.
Adhesive Pericarditis. E. K. Frey.—p. 5.
Arteriography in Frostbite. B. Breitner.—p. 8.
Management of Craniocerebral War Injuries. W. Kufferath.—p. 10.
Pathology and Clinical Aspect of Cerebral Abscess After Cranial Gunshot Injury. J. E. Lemke.—p. 16.
Exploratory Excision of Capsule in Suspected Tuberculosis of Knee Joint. H. D. Schumann.—p. 27.

Electrocoagulation of Gasserian Ganglion.—Bauer reports experiences with electrocoagulation of the gasserian ganglion in more than 500 cases of neuralgia. There was not a single fatality. Injection of procaine hydrochloride solution is made to infiltrate the track for the puncture cannula to the base of the skull. A 12 cm. long, thin cannula insulated with celluloid is introduced and is passed slowly forward along the foramen ovale without touching the base. The passage through the foramen ovale is made manifest by sudden radiating pain in the area of the third branch and by resistance offered by the nerve. X-ray examination of the position of the needle prior to coagulation is imperative. Examination of the eyes is important because changes in vision, in the size of the pupils and in the ocular movements suggest that a change in the position of the needle is required. This may also be necessitated by aspiration of blood or cerebrospinal fluid or by nausea. After these precautionary measures, high frequency electrocoagulation with the alternating current may be performed under evipal sodium anesthesia. Coagulation should be made in four stages of fifteen, twenty, twenty-five and thirty seconds' duration. The intensity of the current is increased during the last stage. Coagulation itself should not be performed under local anesthesia. Residual pains may persist for two or three days. Electrocoagulation may be repeated when pain persists on the fifth or sixth day, as well as in recurrences. The advantage of the method is that the effect of the current is limited to the area immediately next the cannula, thus preventing severe destruction at the base of the skull or extensive bone sequestration in the area of the base and of the upper jaw.

Deutsche medizinische Wochenschrift, Leipzig

70:23-52 (Jan. 21) 1944

Disturbances of Auditory Apparatus and of Apparatus Concerned with Maintaining Equilibrium and Inflammatory Disorders of Ear in Typhus. L. B. Seiferth.—p. 23.
So-Called New Infectious Diseases. J. Mrugowsky.—p. 24.
*Sulfonamide Therapy of Malignant Diphtheria, with Special Reference to Typhus Associated with Diphtheria. Harmsen and Siegler.—p. 27.
Treatment for Sciatic Neuralgia with Injections. E. Vaubel.—p. 28.
Problem of Active Immunization Against Scarlet Fever. E. Hässler. —p. 30.
Serum Therapy of Multiple Sclerosis. W. H. A. Schöttler and H. Selbach.—p. 32.
Experimental Study on Pathogenesis and Therapy of Intestinal Autointoxication. H. Nicolai.—p. 34.
Clinical Diagnosis of Myeloma (Plasmocytoma). F. Leypold.—p. 36.
Clinical Course of Otitis Media. R. Mittermaier.—p. 38.
Pathology of Round Ulcer During First Year of Life. H. Mellerowicz. —p. 41.

Sulfonamide Therapy of Typhus and Diphtheria.—Harmsen and Siegler report experiences with sulfonamide therapy in 30 severe toxic cases of diphtheria and in 23 cases of typhus complicated by diphtheria. Intravenous injections of large doses of sulfaethylthiazole (7 to 8 Gm.) were given for two to three days. Rinsing of the mouth and of the throat with a 3 to 5 per cent solution of sulfaethylthiazole was practiced at the same time. Rapid shrinking of false membranes took place and the membranes were cast off within three to four days. Edema of the throat subsided rapidly. Smears became negative within a short time. Sulfaethylthiazole was particularly effective in cases of mixed typhus and diphtheria infection complicated by pneumonia. The mortality rate was reduced from 80 per cent to 30 per cent.

Münchener medizinische Wochenschrift, Munich

91:271-296 (June 2) 1944. Partial Index

Treatment of Diabetes Mellitus in War. K. Gutzeit.—p. 271.
Front Line Surgery. E. Melzner.—p. 274.
*Full Diet in Diabetes Mellitus. H. J. Banse.—p. 276.
Commotio Cerebri and Mechanonarcosis as Effects of Increased Intracranial Pressure. U. Ebbecke.—p. 280.
Chemotherapy with Sulfonamides in Surgery: Critical Considerations and Personal Experiences. E. Grau.—p. 282.
Resumption of Work under Medical Supervision by Patients with Tuberculosis of Lungs as Necessary Preparation for Definite Return to Work. R. Griesbach.—p. 284.
*"Vegetative Insulin Shock" in Treatment of Urticaria. H. Bartelheimer. —p. 286.

Full Diet in Diabetes Mellitus.—Food conditions in Germany prompted Nonnenbruch to suggest that patients with diabetes mellitus should be granted the same rations as normal persons. According to Banse, change in metabolism for the worse resulted from a full diet consisting of unlimited carbohydrates and of normal small rations of fats and proteins with the addition of sugar and sweet marmalade. Results with limited diet consisting of unlimited carbohydrates without the addition of sugar were on the average satisfactory. Of 1,200 patients with diabetes 228 were given a full or limited full diet. Experiments were carried out on 170 men and on 58 women of various age groups as well as on children. The limited full diet was well tolerated by 136 (114 men and 22 women), i. e. 11.3 per cent of the total of 1,200 patients. Insulin was administered simultaneously to 96 patients (82 men and 14 women), whereas 40 (32 men and 8 women) did not require insulin. These 96 patients had "island diabetes"; they did not present symptoms of severe endocrine disturbances of metabolism. Insulin treatment was effective, the blood pressure was normal and there was no tendency either to obesity or to emaciation. The fasting blood sugar values of the 40 patients not on insulin treatment were up to 130 and 140 mg.; there was a mild glycosuria independent of the food, so that the terms diabetes lenissimus and diabetes innocens could be applied to them. The dose of insulin required in cases in which a prolonged limited full diet proved satisfactory was not higher than that of patients on a diabetic diet. Normal carbohydrate tolerance could not be produced in patients with diabetes mellitus by the administration of insulin. On limited full diet the normal work capacity could be maintained and a change of metabolism for the worse could be prevented in only a small portion of men. In all other patients, particularly in women, a sufficient metabolic balance could be maintained only on a diet which took into account the reduced carbohydrate tolerance.

"Vegetative Insulin Shock" in Treatment of Urticaria.—Bartelheimer treated with insulin several hundred cases of acute urticaria. Hypoglycemia characterized by vegetative symptoms can be produced by subcutaneous administration of 30 to 40 units of insulin. The rash subsides promptly with the outbreak of sweat and the occurrence of tremor, fatigue and palpitation. The more pronounced the vegetative symptoms of the insulin shock, the better the effect of the treatment. Intravenous injections of 10 to 16 units of insulin are suggested. Attention to the normal function of the kidneys and the pituitary is important in order to prevent severe hypoglycemia. The risk of circulatory failure has been overestimated, but electrocardiographic examination should be carried out prior to insulin administration in cases of rash following administration of diphtheria or scarlet fever serum. Satisfactory results were obtained with insulin shock treatment in these specific cases. Intravenous administration of the drug is not advisable in these cases and in hypotension. The treatment is likewise effective in chronic urticaria with repeated administration of small doses of insulin once or twice a day.

Book Notices

Foundations of Neuropsychiatry. By Stanley Cobb, A.B., M.D., Bullard Professor of Neuropathology, Harvard Medical School, Boston. Third edition. Cloth. Price, $2.50. Pp. 252, with 13 illustrations. Baltimore: William Wood & Company, 1944.

The popularity and usefulness of Dr. Cobb's book is attested by the fact that it is now in its third edition. It is surprising to note how well the author has performed his task of simplifying and schematizing a complex subject. In doing so he has of course subjected himself to the criticism of eliminating much important material and of being guilty of dogmatic assertions when these are not possible. It is difficult to see how these can be avoided in attempting to present neurology to medical students, and it should be borne in mind that to simplify adequately presupposes a sound knowledge of the subject in question. In this regard the author qualified without question. To follow the opposite extreme would be to make the subject both unpalatable and unintelligible. Despite the pitfalls inherent in his chosen approach to the problem of neuropsychiatry, Dr. Cobb has succeeded admirably in writing a book which does indeed present the essential features of a complex branch of medicine.

It is gratifying to note that although the author has always been a sound advocate of the inseparability of structural and psychogenic processes he has not found it necessary to resort to psychosomatics as a new form of psychiatric thinking. His little volume is testimony to the fact that psychosomatics has always occupied those neuropsychiatrists with a broad vision of their field.

The chapter on special neuropathology would have been more useful if it had been confined to a general discussion of neuropathologic processes such as demyelination and infection. Its consideration of the special diseases is too brief to be really useful. The chapter on psychopathology is subject to the same criticism. It would seem better to have confined the discussion of this problem to general concepts than to have attempted thumbnail sketches of diseases.

There has been added in this edition a new chapter on psychology which discusses briefly such problems as the instincts, intelligence, memory and attention. It is much too brief to cover the subject adequately, but it is useful in that it provides a springboard for further reading and presents a point of view on which further knowledge can be based. This is probably the most important feature of Dr. Cobb's book, that it provides a background and point of view which can be expanded or contracted as the student desires. There can be no hesitation in recommending the book highly not only to medical students but to all those who contemplate choosing neuropsychiatry as their field of choice.

Modern Methods of Amputation. By Edmundo Vasconcelos, Professor, University of São Paulo. With an Introductory Survey of the Development of Amputation by Major Gen. Norman T. Kirk, M. C., Surgeon General, U. S. Army. Fabrikold. Price, $10. Pp. 253, with 238 illustrations. New York: Philosophical Library, Inc., 1945.

This volume contains information valuable to any practitioner who may be faced with a problem of amputation surgery. The general principles of amputation are well stated. The distribution of skin flaps, the handling of muscle and fascia, the treatment of bone, with emphasis on respect for periosteum and the treatment of the nerve trunks, are all clearly and soundly stated in the text. Some of the instruments for and methods of retraction, which are so well illustrated, will however in unskilled hands lead to great stripping of the periosteum. Their hazards are not stressed.

The levels of amputation are cleverly and strikingly illustrated. As stated for the upper extremity, no exception can be taken. As stated for the lower extremity the level of 5 centimeters below the middle of the calf for an ideal below the knee amputation stump is open to question. This is considerably longer than the American prosthesis maker likes to fit and is in an area of the calf which is likely to have poor circulation and ulcerate easily.

The technics for individual amputations are well described, particularly the technic of the Syme-Ollier amputation, in which the author stresses the vulnerability of the blood supply to the flap and its protection by subperiosteal stripping of the os calcis. No other modern treatises on amputations cover well the pitfalls in this valuable procedure.

The paragraphs on interscapulothoracic amputation and disarticulation of the hip are in great detail and effectively illustrated in a manner to make the anatomy clear. Other modern textbooks on amputation leave much to be desired concerning these very major operations, which this volume makes clear.

The extensive description of the various modifications of amputations of the osteoplastic type through the astragalus and os calcis, including an original operation by the author, is interesting and is of value to the expert in amputations. However, the simplicity with which they are presented is likely to lead the average surgeon into procedures which will result unsatisfactorily. The successful selection of patients for these types of procedure and the execution of the operation require considerable experience in bone surgery, and these procedures should not be carried out by even the greatly experienced soft tissue surgeon.

The chapter on prosthesis is an outline and should be more detailed. While the important elements in after-care of the stump, viz. massage, active exercise, elimination of contractures and muscular development, are all mentioned briefly, there is much detail of this important aspect of rehabilitation which could be included and stressed with benefit to both practitioner and patient. No mention is made of the importance of teaching from the beginning proper walking habits, the technic of which is extremely important to the ultimate result of the surgery.

A chapter on the immediate complications of the surgery, viz. shock, hematoma, infection, necrosis of skin flaps and their management, would be a valuable addition toward completeness.

The illustrations are well done and informative and they stress the anatomic aspects of the operative procedures. All however show clearly an unnecessarily extensive undermining of the skin in the subcutaneous plane, which in some instances will result in the complication of necrosis of the skin flaps.

This book is one from which the expert, the practitioner who occasionally does an amputation and the student can all get ideas. It is a valuable addition to the literature on this phase of surgery and should be in every surgical library.

Colloid Chemistry Theoretical and Applied. By Selected International Contributors. Collected and Edited by Jerome Alexander. Volume V: Theory and Methods, Biology and Medicine. Cloth. Price, $20. Pp. 1,256, with illustrations. New York: Reinhold Publishing Corporation, 1944.

This large volume covers the "more recently developed theories, methods and procedures, as well as new topics or newer aspects of old topics" in colloid chemistry. The book is divided into two major portions. It is unfortunate that the second part (Biology and Medicine) could not have been published separately; for the first section will not appeal to the medical profession as a whole.

The first part (Theory and Methods), consisting of twenty-five chapters, includes descriptions and discussions of methods for the analysis of complex molecular structures with the aid of x-rays, the electron microscope (which includes some fine photographs of micro-organisms), high vacuum distillation, polymerization, sonic and ultrasonic waves in colloid chemistry, the cyclotron and some of its uses (especially in biology and medicine), electrophoretic studies of proteins and related substances (with part devoted to the electrophoretic study of blood, hormones, serums and numerous references to its use in other biologic studies). This section, as a whole, is written in a highly technical vein appreciated by the physicist, chemist or engineer but outside the ken of most medical practitioners.

The second portion of the book is also technically presented but obviously within the grasp of the physician. Articles covering the following subjects are presented: proteins; catalysis as a biologic factor; photosynthesis; plant cell membranes; recent advances in starch chemistry; enzymes and the biologic action of vitamins; minerals and vitamins in applied nutrition; mechanism of hormone action; molecular organization of visual processes; chemical pacemakers and physiologic rhythms; colloid chemistry of purified viruses; the gene as a structure of colloidal dimensions; the gene as a chemical unit; colloid chemistry in embryonic development; physical states of protoplasm compatible with life; physical properties of protoplasm; surface-

chemical properties of protoplasmic proteins; physical change of muscle related to activity; capillary circulation; biochemical and physiologic mechanisms in inflammation; modern outlook on blood coagulation; immunology; allergy and anaphylaxis; homeostasis (the maintenance of steady states in the organism); causes and nature of cancer; gerontology; formation of concretions; aero-emphysema and caisson disease; action of war gases; infective aerosols; physical chemistry of lipids, physicochemical mechanisms in neuropsychiatric disorders; psychiatry; changes in the surrounding medium produced by free living cells; physicochemical basis of organic evolution. Each chapter carries an extensive reference list.

These chapters are written by workers who are generally recognized as authorities in their respective fields. Such names as C. A. Elvehjem, Oliver Kamm, W. M. Stanley, Robert Chambers, Otto Meyerhof, William C. Boyd, Carl A. Dragstedt, Walter B. Cannon, Leo Loeb and A. J. Carlson constitute only a partial but representative list of the authors.

In addition to his knowledge and organizational ability, one of the editor's chief assets lies in his capacity to point out the significance of experimental data and present it in the proper perspective relative to the general pattern of biologic science.

The second half of the book is certainly of great value and interest to the physician, for it correlates and integrates physiologic and biochemical actions with the phenomena of living processes. In the various articles the doctor is given an opportunity to reacquaint himself with, or to learn of, new facts and theories on numerous subjects, each presented in relatively few pages.

The Pathology of Internal Diseases. By William Boyd, M.D., LL.D., M.R.C.P., Professor of Pathology and Bacteriology in the University of Toronto, Toronto. Fourth edition. Cloth. Price, $10. Pp. 857, with 374 illustrations. Philadelphia: Lea & Febiger, 1944.

This edition has been brought up to date with particular reference to such subjects of current interest as primary atypical pneumonia, Q fever, blast injury, Meigs's syndrome, dietary cirrhosis of the liver, infective hepatitis, alloxan diabetes, crush nephritis, sulfonamide nephritis, the Rh factor, sarcoidosis and equine encephalomyelitis. The discussion of diseases of the cardiovascular system has been amplified, and various other sections have been rewritten "in part or in whole." Twenty-two new black and white illustrations and four new colored plates have been added. The value of this book rests mainly on its correlation of symptoms with pathologic lesions, thus making pathologic anatomy the keystone of clinical medicine. As the author said in the first edition, this book is meant to be essentially "an illustrated textbook of internal medicine written from the point of view not of diagnosis or of cure but of the mechanisms of disease, its why and its wherefore." Although the book is of particular value to medical students studying special pathology, it should be of equal value to clinicians who wish to keep abreast of advances in clinical medicine. The discussions are necessarily brief, but the author's ability to condense and the excellent illustrations make the reading easy. The book should continue to serve well its original purpose.

An Experiment in Applied Nutrition for Canadian Communities. Summary Report of the Swift Fellowship. By Edna M. Guest, O.B.E., M.D., and Miss Ethel Chapman. Paper. Pp. 192. Toronto: Trustees of the Swift Fellowship, 1944.

This is the report of the work carried on in the year 1942-1943 under a fellowship providing for visits by a home economics nutritionist to local communities of all sections of Canada. In each town conferences were held with all available persons interested in or acquainted with nutritional problems such as public health nurses and doctors, teachers, women's clubs and nutrition committees. Encouragement and advice for planning nutritional improvement was given to individuals and groups. Plans were made for overcoming local food problems. Follow-up reports from the communities are given which show the achievements made as a result of the worker's visit. It was felt that in each case definite benefits were traceable to the personal visits made possible by the fellowship. This served to bridge a gap between the scientific sources of knowledge and its practical application.

Lições de anestesiologia: Curso realizado sob os auspícios da cátedra da Universidade de S. Paulo e da 2.ª região militar. Raul Briquet, editor. Com a colaboração de P. Alves Neto, et al. Boards. Pp. 411, with illustrations. São Paulo: Editora Atlas S. A., 1944

The editor, with nineteen collaborators, has reviewed the literature in connection with the administration of anesthetics and has emphasized methods employed, particularly in the United States. Some of the subjects covered are the evolution of anesthesia and the effects of anesthetics on the central nervous, respiratory, circulatory, digestive and urinary systems. The chemistry and pharmacology of anesthetic agents are discussed, as are preliminary medication, surgical anesthesia for war, inhalation anesthetics and rectal, intravenous, spinal, peridural, local and regional anesthesia. Technical problems of anesthesia and the subject of respiratory obstruction and the postoperative complications are considered in detail. There are chapters on oxygen therapy and on gas anesthesia apparatus. This volume is evidence of great interest in anesthesiology in South America, especially in Brazil and in the University of São Paulo. Anesthesiologists will be impressed with the thorough comprehension of all the commonly used methods of anesthesia that are covered.

Functional Disorders of the Foot: Their Diagnosis and Treatment. By Frank D. Dickson, M.D., F.A.C.S., Associate Professor of Clinical Surgery, Medical School, University of Kansas, Kansas City, and Rex L. Diveley, A.B., M.D., F.A.C.S., Colonel, Medical Corps, Army of the United States. Second edition. Fabrikoid. Price, $5. Pp. 352, with 292 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1944.

In its second edition this work has undergone much improvement, with additions of chapters especially related to military and industrial phases of foot problems. As the title suggests, the routine foot problems confronting practitioners are resolved to their simplest terms by sound reasoning. Diagnoses are classified and treatment is outlined. Dignity is given to the entire foot problem. The book is recommended to all, especially the military, pediatrician and general practitioner. Numerous photographs and line drawings supplement the text. A well organized bibliography contains many references for supplemental reading.

Uncle Sam Convalescing: A Glimpse into His Hospital Record from 1933-1940. By H. Ameroy Hartwell, M.D. Cloth. Price, $2. Pp. 79, with 6 illustrations. Boston: Bruce Humphries, Inc., 1944

"Uncle Sam Convalescing" is an interesting, original, economic case history and day by day hospital record of the first seven critical years of 1933 to 1940. Free use of charts, physical examination forms and summary sheets enable the reader to trace the rise and fall of pulse rate, blood pressure and general all around condition from the closing of the banks until Hitler and Mussolini began to show uncontrollable maniacal tendencies. Throughout the author deals with national events in the language of medicine which is amusing, surprising and entertaining, particularly in the early pages.

Notable Names in Medicine and Surgery. By Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London, and W. J. Bishop, F.L.A., Sub-Librarian, Royal Society of Medicine, London. Cloth. Price, 15s. Pp. 202, with illustrations. London: H. K. Lewis & Co., Ltd., 1944

Here are almost a hundred brief biographies, with photographs of great names in the history of medicine, particularly eponyms. The descriptions are brief. The great number of illustrations make the book especially living and delightful. Several Americans are included, notably Sims for the speculum, Bigelow for a ligament, McBurney for his point, Welch for his bacillus, Ochsner for his treatment of appendicitis, John B. Murphy for his drip, his sign and his button, Kelly for the proctoscope, and the Mayos for some operations and the scissors.

Alcoholics Are Sick People. By Robert V. Seliger, M.D., in collaboration with Victoria Cranford. Edited by Harold S. Goodwin, B.A. Cloth. Price, $2. Pp. 80. Baltimore: Alcoholism Publications, 1945

This small treatise is one of the best on alcoholism. It is about time that the layman be made to recognize the fact that the abuse of alcohol is a psychiatric disease as well as any other disease and that the patients need treatment by a psychiatrist. The author's book actually does this. It is thoroughly honest and straightforward. It should be in the hands of all medical men and social workers.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TESTS FOR DRUNKENNESS

To the Editor:—As assistant city physician I am interested to know the best ways to find out when a person is inebriated (drivers) so I can prove it in court. I bought a LaMotte set and had it used twice during the last fifteen days on the urine of intoxicated drivers. I just got my copy of Approved Laboratory Technic by Kolmer and Boerner and to my dismay I read on page 905 that the estimation of the amount of alcohol found in the urine is valueless. Please tell me how can I prove that a person is inebriated without having to anesthetize or kill him? Also please tell me the percentage of alcohol that should be in the urine of the person examined to be called drunk and the percentage in the four stages of acute alcoholism. Jesus Chapa-Badillo, M.D., Laredo, Texas.

ANSWER.—This query is based on the following quotation from Kolmer and Boerner:

It has been fairly well established that the various methods to determine intoxication, such as an estimation of the amount found in the urine or expired air, are valueless, since they are excreted and no longer causing inebriation. (Inebriation depends upon the amount of unoxidized alcohol in the brain.) Hence the ideal method is to determine the amount of alcohol present in the brain tissue. This of course is easy in the cases coming to necropsy but correspondingly difficult in an intoxicated individual. In such cases examination of the spinal fluid is probably of greatest value. For further details the reader must consult the enormous literature which has accumulated.

The assertions in this quotation are so obviously contrary to generally accepted opinions that Kolmer was asked to clarify the situation. He explained that the material under discussion had been written by a collaborator, who had based his opinions largely on the work of Gettler and his associates, and that this material had escaped revision. That Kolmer himself is in complete accord with the investigators who admit the importance of testing all body fluids is evident from quotations from his book Clinical Diagnosis by Laboratory Examinations (D. Appleton-Century Company, 1944):

Ethyl alcohol intoxication may be detected also by tests conducted with the breath and urine. With the latter a concentration of less than 0.1 per cent produces no intoxication; mild intoxication may occur in about 50 per cent of individuals with a concentration of 0.1 to 0.2 per cent; moderate intoxication with 0.2 to 0.3 per cent, and marked intoxication with 0.4 per cent or higher.

These statements are documented with references to the literature, and a more complete discussion of concentrations of ethyl alcohol in the blood in relation to intoxication is given on pages 194 and 195. In 1931 Gettler and Freireich reported a closer relationship between brain alcohol and spinal fluid alcohol than between brain and blood alcohol, and they concluded that brain alcohol and spinal fluid alcohol furnish the only adequate chemical criteria for intoxication. Again in 1944 Gettler, Freireich and Schwartz reported additional information on blood and brain alcohol. They determined the blood-brain alcohol ratio in a series of 28 dogs that had been given alcohol by stomach tube. From their experiments they concluded that the alcohol in the blood and other body fluids varies so greatly from brain alcohol that these fluids are unsuitable for diagnosis of inebriation in man. This work is open to criticism from many standpoints. The method of analysis used accounts for from 83 to 89 per cent of the alcohol present, and yet the authors report their findings to the third decimal place—mathematical precision with insignificant figures. The extreme limits of brain-blood ratios in dogs were used to calculate possible variations in human brain alcohol based on blood alcohol determinations. The dog furnishing one of the extreme blood-brain ratios was killed just seven minutes after the alcohol was administered, the time interval being ridiculously short for medicolegal interpretation. Finally, their mathematical calculations are erroneous, since they inverted their dog brain-blood alcohol ratios when figuring possible brain alcohol variations in man. The importance of blood and spinal fluid alcohol has been adequately summed up by Bogen:

Although Gettler's results, showing a closer relationship of brain alcohol to spinal fluid alcohol than to blood, seem contradicted by Newman and others, the differences between them would rarely lead to a change in diagnosis. On the other hand, there is available abundant data showing a close relation between blood alcohol and behavior.

It is true that chemical examination of the brain tissue would help solve the drunken driving problem by preventing individual repetitions of drunken driving and that spinal fluid alcohol is related to brain alcohol. But it is also true that the alcohol in the blood is responsible for the distribution of alcohol to the brain and all body fluids. Alcohol tends to disperse itself uniformly in the water of the body, so that, after equilibrium has been established, examination of any tissue or body fluid gives information regarding the unoxidized alcohol in the body. The urine, being a filtrate from the blood, is suitable for examination, although the alcohol readings are lower than those of the blood shortly after drinking. This low alcohol reading is to the advantage of the accused. A second specimen of urine taken about half an hour later will give a truer picture of his condition. That the urine is of great value in the practical confirmation of alcoholic influence was shown by Halporn when he was able to predict with remarkable accuracy the percentage of urinary alcohol from the examination of drivers who had been arrested for driving while under the influence of alcohol. Bogen has demonstrated that the alcohol of the spinal fluid and that of the urine are practically identical. This work was confirmed but not published by Heise, who also found in unpublished observations that the occasional discrepancies between blood and urine alcohols as described by Haggard were associated with close approximation of urine and spinal fluid alcohol levels. However, the amounts of alcohol in the urines under these unusual conditions have not been found to be high enough to have medicolegal significance. The value of tests for alcohol in the breath has been established by Harger, Haggard and Jetter. Although there is some disagreement regarding methods of analysis and interpretation of results, it is agreed that the expired air closely reflects the alcohol in the blood. Friedemann has shown that the alcohol in the saliva can be used to predict blood alcohol. That the blood alcohol furnishes an adequate criterion for medicolegal interpretation is generally accepted. The only disagreement comes from Gettler and his disciples. The apparent disagreements regarding the medicolegal interpretations of various levels of alcohol in body fluids arises from the misunderstanding between the expressions "under the influence" and "intoxication." Gettler, for example, finds that all individuals having more than 0.25 per cent alcohol in the brain are intoxicated but that there is a loss of sense of care or aggressiveness in persons who have between 0.10 and 0.25 per cent. Jetter reports "acute intoxication" in 100 per cent of persons having a blood alcohol above 0.45 but is nevertheless in complete agreement with the recommendation of the National Safety Council that a level of the blood above 0.15 per cent should be considered as definite evidence that a person is "under the influence." The National Safety Council's Committee on Tests for Intoxication and the Committee for the Study of Problems of Motor Vehicle Accidents of the American Medical Association have agreed that when the level of alcohol in the blood or its equivalent in other body fluids is below 0.05 per cent the influence by alcohol is doubtful; that most persons are under the influence when the alcohol percentage is between 0.05 and 0.15, but that the physical signs and symptoms should be carefully considered in rendering an opinion of "under the influence." All persons harboring 0.15 per cent or more of alcohol in their bloods are to be considered "under the influence," since they have lost, at least to some extent, some of that clearness of intellect and self control that they would otherwise possess. Laws embodying this interpretation have been passed by Indiana, Maine and New York, and the tests have been admitted as evidence in almost every state of the Union.

It is difficult to define stages of intoxication on the basis of alcohol percentages because of the differences in behavior of individuals. There is, however, a definite pattern, based on the fact that alcohol first of all affects that part of the nervous system which in its evolution was developed last and that, as the alcohol percentage rises, the more primitive parts of the nervous system are involved. When the higher centers are involved, which may occur with as little as 0.02 per cent alcohol in the blood, there is a sense of careless well-being or of bodily and mental comfort. The apparent stimulation arises from loss of inhibitions, associated with some loss of judgment and self-control, and particularly a blunting of the ability for self criticism. There is no obvious intoxication, and the individual in this state has probably not increased his chances for having an accident. A second stage begins with levels of alcohol somewhere between 0.05 and 0.15 per cent. The part of the nervous system which is now being affected extends to the centers concerned with the sensory and skilled motor functions. Hand-eye coordination becomes impaired, speech may be slurred and the individual may feel that he is detached from himself, so that he can observe with amusement or consternation the bodily actions

of his other self. The third stage begins at levels somewhere between 0.10 and 0.40 per cent, when the most primitive functions are disturbed. The intellectual processes of judgment and self criticism are virtually suspended, perception and coordination are impaired, and the individual can respond only to strong appeals to his emotions. However, even in this state he frequently pulls himself together sufficiently to impress onlookers with his sobriety, only to fall into a heavy sleep when the need for self control has apparently passed. Death usually occurs when the blood alcohol exceeds 0.40 per cent.

PREMENSTRUAL PAIN

To the Editor:—A married woman aged 41, without children, complains of severe pain in the lower part of the abdomen and the pelvis radiating to the back. The pain, which is described as being like a severe toothache, comes on each month about five days before menstruation is due. It strikes four or five times a day—more often during night than day—and lasts from five to ten minutes. The attacks are accompanied by the formation of a great deal of gas, but belching or passing gas from the bowel by using an enema does not stop the pain. These attacks have occurred every month for several years and always stop as soon as the menstrual flow starts. The patient had peritonitis in 1925 followed by *the formation of an abscess in the abdomen, which was evacuated.* Otherwise the history is not significant. The patient appears healthy and feels well except when these bouts of pain occur. Examination was essentially without significant findings except that the cervical canal seemed very narrow, but dilation a few days before the pains were due to start had no effect. All sorts of pain relievers, sedatives and hormone preparations have been tried without benefit.

H. W. Byrn, M.D., New Albany, Ind.

ANSWER.—This is indeed a puzzling case. The limitation of the symptoms to the few days before each menstrual flow may perhaps permit the association of this case with the syndrome known as premenstrual tension or premenstrual distress. The name premenstrual tension was given by Frank to a condition which is not uncommon. The symptoms start about a week before menstruation and may consist of headache, emotional instability, irritability and psychic depression. Frequently there occur abdominal distention, nausea and vomiting, increased sex desire, vulvar pruritus and sometimes edema of the vulva. Minor degrees of premenstrual distress are quite common but are accepted by many women without question as a normal feature of menstruation. When the disturbances become extreme, the condition is then assumed to be premenstrual tension. Frank has suggested that this condition is due to an increased concentration of estrogenic substance in the blood stream. Progesterone and testosterone propionate have been recommended as effective remedies. One to 5 mg. of progesterone or 5 to 10 mg. of androgen injected two or three times during the week preceding the anticipated menses has proved beneficial in some of these cases.

The hypothesis has been advanced by Greenhill and Freed (*Endocrinology* **26**:529 [March] 1940) that premenstrual tension is due to the increase in extracellular fluid of the various tissues such as the brain, gastrointestinal tract or skin. This edema gives rise to the symptoms which are typical of this condition. For this reason these investigators have treated their patients with ammonium chloride 0.6 Gm. three or four times daily, together with a sodium chloride free diet, starting at the midperiod and continuing to the beginning of menstruation in an attempt to cause a decrease in extracellular fluid. This therapy has benefited almost all patients who have been treated.

Some of the patients relieved had peculiar, localized edema. Perhaps in this case there is an undue amount of edema and distention of the intestine which produces the patient's symptoms. The attack of peritonitis may or may not be linked up with the patient's symptoms but probably not in view of the lapse of twenty years. Premenstrual intestinal distention is definitely relieved by ammonium chloride, and perhaps therefore the same treatment would help this patient.

DIAGNOSIS OF KERATOTIC LESION OF SKIN

To the Editor:—A man aged 60 has a *cornified patch of skin about the size of a silver dollar on the back of his hand. This has been caused by too many x-ray treatments for an eczematous condition which he had on both hands for several years. What treatment is suggested?*

M.D., Missouri.

ANSWER.—This lesion suggests at once the probability of a low grade squamous cell epithelioma. A biopsy should determine this point. If the lesion is merely hyperkeratotic, the application of an ointment containing 2 parts of 3 to 5 per cent salicylic acid in petrolatum and 1 part of lanolin should be of value. If the lesion has become neoplastic, vigorous fulguration should be used or excision with a skin graft if necessary.

SKIN TESTS IN ALLERGY

To the Editor:—Have there been any extensive studies of the correlation between *skin tests with allergens and other allergic manifestations? Are* there many instances of normal persons whose skin reaction is positive, although clinical manifestations of allergy to the substance showing the *positive skin test are not experienced?*

Perry B. Preston, M.D., Newark, N. J.

ANSWER.—In his presidential address, Dr. Louis Tuft presented to the American Society for the Study of Asthma and Allied Conditions a "Critical Evaluation of Skin Tests in Diagnosis." Much of the early work in this field was reviewed in the presentation.

Positive skin tests without any clinical sensitiveness to correspond are common enough. In 1935 Rackemann and Simon made skin tests by the intracutaneous method on 60 patients chosen at random in the medical wards and found that exactly half of them had positive reactions of varying size to some allergen. Since then, almost each day in a busy clinic, one can demonstrate patients with positive skin reactions who do not have symptoms to go with them. A common example is the patient who has hay fever in August with no trouble at all in June, and yet his skin tests made by the scratch method with pollen extracts in serial dilutions will show reactions to the grasses which may be even greater than the reactions to ragweed. In several cases in which treatment with pollen extract has been highly successful, the skin test made again after an interval of three years has been found still positive even though the patient has had no treatment and no symptoms in the meantime.

Such positive tests can be explained: "false positives" may depend on technic. As Sulzberger puts it, the skin is an "organ of memory." The positive tuberculin test can still be demonstrated in later adult life; and in a patient who in times past was clinically sensitive to a food or dust substance, the sensitiveness of the skin may be demonstrated in later years even though the sensitiveness of other organs has cleared away.

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INTOLERANCE TO IRON MEDICATION

To the Editor:—A woman aged 29 breaks out with a skin rash whenever iron is given for a secondary anemia. The skin first has a *macular* eruption of the face, back and trunk, which later on becomes papular and painful. Usually about four or five lesions break out following the administration of iron. She states that, should she continue with the iron, these at times become pustular. I have used ferrous sulfate both with and without enteric coating, ferrous gluconate and calcium gluconate and lactate at the same time. Torantil has also been administered Nothing seems to mitigate the development of this skin reaction.

M.D., Minnesota

ANSWER.—An eruption of the skin is one of the common manifestations of intolerance to iron medication. In these patients it is necessary to depend on food iron after the cause of blood loss has been corrected. The diet should contain whole liver, well cooked meat, strawberries, peaches, apricots, molasses and other foods having easily available iron. If achlorhydria or hypochlorhydria is present, an adequate supplement of hydrochloric acid during the meal is advisable.

VITAL CAPACITY IN PREGNANCY

To the Editor:—*Why is lung air capacity measured in pregnancy?*

L. Edward Giovine, M.D., Woodside, N. Y.

ANSWER.—It is presumed that lung air capacity refers to vital capacity, which normally forms 72 per cent of the total lung volume. The vital capacity is decreased in patients with cardiac decompensation and other conditions in which the volume of the chest is decreased. It is not altered in patients with toxemia of pregnancy. The average vital capacity in normal women is 3,140 cc. ± 40 cc. Thomson and Cohen have followed the same patients throughout pregnancy and conclude that the vital capacity remains within normal limits in normal pregnancy, averaging 100 cc. increase at term and decreasing 138 cc. in the postpartum period. Plass and Oberst noted that the volume of tidal air and the minute volume of respired air increase progressively as term is approached and return to normal during the second week of the puerperium.

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Dieckmann, W. J.: The Toxemias of Pregnancy, St. Louis, C. V. Mosby Company, 1941, p. 107.

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VALUE OF HEALTH EXAMINATIONS IN INDUSTRY

A STUDY OF THE COMPARATIVE SICKNESS RECORDS OF A GROUP OF PERIODIC HEALTH EXAMINEES AND A NONEXAMINED CONTROL GROUP

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In the fields of preventive and industrial medicine and public health many procedures are difficult, if not impossible, to evaluate with scientific precision. It often is a complicated problem to demonstrate that if so-called preventive measures had not been taken the condition supposedly prevented would have happened. These facts would seem to apply particularly to the routine periodic health examination, frequently referred to as the keystone in sickness prevention and health promotion among individuals or industrial workers.

OBJECT OF STUDY

While there has been ample evidence of occasional abnormal conditions, minor physical impairments and incipient diseases brought to light among individuals, thus making possible their prompt control or remedy, there is as yet no unanimity of opinion or proof that such routine health inventories play a large part or are worth the time, effort and cost involved as a factor in the promotion of group health in general or in the reduction of sickness among industrial workers as a company sponsored activity. Periodic health examinations of workers as a part of an industrial health program fail in important respects as means of prevention if, in addition to helping the individual, they do not contribute to the reduction of employee sickness in general or serve to control absence from work and its resulting costs and inefficiency from the standpoint of management.

This study does not attempt to enumerate the incipient conditions, physical impairments and abnormal health habits found in these periodic health examinations. The chief objective is to show what the correlated history of sickness and absence from work may be over an extended period of time in an examined group as compared with a control group of workers who have not had such periodic health examinations.

GROUPS SELECTED

In order to determine whether or not such periodic health examinations are of value in reducing sickness and lost time from work, a study was made of a group of 100 male workers who had had ten or more voluntary annual physical examinations during fourteen consecutive years in a company medical department. This will be referred to as the examined group. For purposes of comparison, a control or nonexamined group, selected at random so far as their sickness records were concerned, was set up. This control group included 100 male employees of comparable age, years of service, economic status and occupational classification who never had taken advantage of such available examinations during this period of time. The average age of each group was 46 years. Thus the only important variable involved in the two groups was that one had had voluntary annual health examinations while the other had not.

EXAMINATION PROCEDURES

The periodic health examinations of the individuals in the examined group were carried on largely by the same physician, who was recognized as a specialist on such examinations. The form used for several years was that prepared and published by the American Medical Association. The only routine laboratory test included in these examinations was an analysis of the urine. Blood, x-ray and other diagnostic tests were made when required. Following these examinations, the usual advice was given as to the correction of poor health habits, abnormal conditions and impairments found. Such individuals were referred to private physicians for further examinations or for treatment, if indicated as necessary.

SICKNESS RECORDS

The sickness records of these periodic health examinees, as well as of the nonexamined control group, were obtained from data accumulated in connection with the employees' attendance records and the administration of the company's sickness benefit plan. All such records of sickness lasting eight days or over were based on physicians' diagnoses and represented more serious cases. In addition to an analysis of these major cases, this study also includes a comparison of minor, incidental sickness absence of less than eight days' duration in the two groups. The results of this study are shown in the tables.

As noted in table 1, there is practically no difference between the examined and the nonexamined control groups as far as the total incidence or number of cases of major sickness lasting eight days or over is concerned. During fourteen consecutive years of available records, considered as a whole, there were 166 such cases in the examined group as compared with 164 in the control group.

Table 2 shows the total number of cases of sickness in each group, classified according to specific causes. The examined group showed a greater number of cases under five of the specific causes, while the nonexamined

group under four classifications showed the greater number of cases. The nonexamined group had a somewhat larger number of scattering miscellaneous diseases. The number of cases under each cause are not sufficiently large or significantly different to warrant specific conclusions.

TABLE 1.—*Sickness Incidence*

Number of cases lasting eight days or over during fourteen consecutive years in examined and nonexamined groups

Group	Number of Cases
Examined group	166
Nonexamined group (control)	164

TABLE 2.—*Causes of Sickness*

Number of cases by causes lasting eight days or over during fourteen consecutive years in examined and nonexamined groups

Causes of Sickness	Number of Cases: Examined Group	Number of Cases: Nonexamined Group
	44	52
	28	14
	16	24
Diseases of respiratory system (nontuberculous)	16	19
Diseases of nervous system	12	6
Diseases of bones and mastoid	9	1
External causes	7	4
Diseases of kidneys	6	2
Minor epidemic diseases	1	6
All other causes (scattering)	27	36
Total	166	164

Table 3 shows the relative number of cases of major sickness by years in the two groups, divided into two seven year periods. During the first seven years the examined group showed a total of 75 cases of sickness lasting eight days or over, while during the last seven years the total number of cases was 91, or an increase of about 21 per cent. On the other hand, in the nonexamined control group there were 59 cases during the first seven years and 105 cases during the last seven years, or an increase of about 78 per cent. It would appear that the periodic health examinations apparently had had a positive effect during the last seven years in definitely controlling the amount of sickness lasting eight days or over in the examined group as compared with the nonexamined group.

It will be noted from table 4 that on the average there were approximately one and one-half more days of lost time on account of major sickness in the nonexamined as compared with the examined group. This seems to suggest that periodic health examinations at least had some favorable effect in reducing severity and complications.

From table 5 it is found that, comparing the last seven years with the first seven years, there was an increase in the total calendar days absent of about 18 per cent in the examined group and about 63 per cent in the nonexamined control group. Here again the periodic health examinations apparently served to influence favorably the actual duration of major sickness of eight days or over after such examinations had been in operation for several years.

As was the finding in reference to major sickness lasting eight days or over noted in table 1, so also according to table 6, there was no significant variation in the total number of cases, taken as a whole, of short term, incidental sickness between the two groups.

It is suggested from the data in table 7, with reference to the incidence of short term illness by years, that the sickness records of the examined group improved very definitely as the years passed, while the records of the nonexamined control group became less favorable. Comparing the last five years with the first five years, the examined group showed an actual decrease of about 11 per cent in the number of cases of short term sickness, while the nonexamined group showed an increase of about 26 per cent. From this it would seem that the periodic health examinations apparently had a favorable influence in promoting a better sickness record in the examined group after sufficient time had elapsed to permit the periodic health examinations to show their possible cumulative effects in reducing incidental sickness.

As indicated in table 8, there was no material difference between the two groups in the average number of days lost from work on account of incidental or minor illness. In the examined group the average days lost was 1.62 and in the nonexamined group 1.63.

Comparing the last five years of record with the first five, table 9 indicates, with reference to minor incidental illness, that there was an actual decrease of about 3 per cent in total working days absent in the examined group, while at the same time there was an increase of about 47 per cent in the nonexamined group. This is additional evidence that through the possible cumulative favorable effects of periodic health examinations not only the number of cases of short term sickness was controlled, but the duration of such illness in terms of days absent was checked.

COMMENT

On first consideration, it would seem that such a small number as 100 individuals in the examined group and a like number in the nonexamined control group have little comparative statistical significance. It should be emphasized, however, that the examined group represents 100 individuals who had ten or more annual physical examinations, or a total of more than one thousand examinations during fourteen consecutive years, and that their sickness records for this rather extended period of time also were available for detailed study.

TABLE 3.—*Major Sickness by Years*

Number of cases of sickness lasting eight days or over during fourteen consecutive years in examined and nonexamined groups, by years

Year	Examined Group	Nonexamined Group
First	10	4
Second	8	9
Third	8	7
Fourth	17	16
Fifth	8	6
Sixth	13	7
Seventh	11	13
Total	75	59
Eighth	4	9
Ninth	6	11
Tenth	11	10
Eleventh	12	19
Twelfth	23	23
Thirteenth	16	20
Fourteenth	17	13
Total	91	105
Grand total	166	164

TABLE 4.—*Duration of Major Sickness*

Average number of days lost per employee on account of sickness lasting eight days or over during fourteen consecutive years in examined and nonexamined groups

Group	Average Days Lost
Examined group	25.95
Nonexamined group	27.46

Such continuous follow-up lends some significance even to these comparatively small groups.

It may be argued by some that comparisons between the two groups are not entirely valid, as the examined group may have been made up of individuals who were particularly and persistently health conscious and careful of their health and who naturally from the outset might be expected to have a superior health record. But this so-called "health conscious" group apparently has no better record with reference to the total incidence and nature of sickness than the nonexamined control group, supposedly not so health conscious. Their sickness records improved only after the periodic health examinations had been taken long enough to show favorable results. It is, of course, impossible to determine what the sickness experience of the examined group might have been if they had not had such periodic health examinations.

TABLE 5.—*Duration of Major Sickness (Calendar Days Absent) by Years in Examined and Nonexamined Groups*

Year	Examined Group	Nonexamined Group
First	279	49
Second	125	184
Third	286	127
Fourth	290	716
Fifth	210	93
Sixth	430	98
Seventh	355	451
Total	1,975	1,718
Eighth	54	189
Ninth	270	329
Tenth	468	235
Eleventh	264	584
Twelfth	485	484
Thirteenth	421	519
Fourteenth	371	459
Total	2,333	2,799
Grand total	4,308	4,517

TABLE 6.—*Incidence of Short Term Illness*

Number of cases of short term illness of less than eight days' duration during ten consecutive years in examined and nonexamined groups

Group	Cases of Sickness (Incidental or Short Term)
Examined group	1,247
Nonexamined group	1,262

Some would hold that those who voluntarily seek periodic health examinations instead of being "health conscious" are chiefly the ones who have reason to believe that they have something the matter with them or who tend to be "neurotic" and are anxious to check up on themselves. Even this supposition is somewhat discounted by the finding that the two groups, as far as the total incidence of sickness is concerned, have had practically the same amount and kind during the years studied, with a definite improvement, however, during the last half of the period in the examined group. Strictly speaking, a periodic health examination is not properly so designated unless it is taken on a routine periodic basis of time, regardless of symptoms, signs or suspicions of disease and when the individual is apparently in good health. Incidentally, it should be noted that in the course of this study no instance was found in which the results of periodic health examinations were used as a means for terminating or adversely affecting employment.

SUMMARY AND CONCLUSIONS

A study covering fourteen consecutive years has been made of the concurrent history of sickness and absence from work in a group of 100 male industrial workers who during this time had ten or more voluntary periodic health examinations in a company medical department. For purposes of comparison, a control group of 100 employees who had had no such periodic health examinations was set up and their records of sickness and absence from work during the same fourteen years also were studied. In all respects with reference to sex, age, years of service, economic status and occupational classification the two groups were statistically comparable, with no important variable other than that one group had had periodic health examinations while the other had not.

TABLE 7.—*Short Term Illness by Years*

Number of cases of short term illness of less than eight days' duration during ten consecutive years in examined and nonexamined groups, arranged by years

Year	Examined Group	Nonexamined Group
First	170	110
Second	152	141
Third	164	121
Fourth	97	116
Fifth	77	69
Total	660	557
Sixth	113	141
Seventh	101	103
Eighth	109	167
Ninth	132	142
Tenth	132	152
Total	587	705
Grand total	1,247	1,262

TABLE 8.—*Duration of Short Term Illness*

Average number of working days lost per employee on account of short term illness of less than eight days during ten consecutive years in examined and nonexamined groups

Group	Average Days Lost (Incidental Sickness)
Examined group	1.62
Nonexamined group	1.63

TABLE 9.—*Duration of Short Term Illness by Years in Examined and Nonexamined Groups*

Year	Total Working Days Absent: Examined Group	Total Working Days Absent: Nonexamined Group
First	250.0	162.0
Second	245.5	212.0
Third	243.5	187.0
Fourth	160.0	188.0
Fifth	113.0	96.0
Total	1,020.0	845.0
Sixth	187.5	227.5
Seventh	172.5	171.5
Eighth	185.0	303.5
Ninth	227.0	270.5
Tenth	217.0	267.0
Total	989.0	1,240.0
Grand total	2,009.0	2,085.0

The findings and suggestions resulting from this study are as follows:

1. No significant differences between the periodically examined group and the nonexamined control group were found as far as (*a*) the total incidence and (*b*) specific causes of illness during a period of fourteen years are concerned. However, in studying the records of sickness (*c*) by years there is positive evidence that the sickness incidence of the examined group as compared with the nonexamined group improved materially

as the years advanced, resulting apparently from the cumulative favorable influence of the periodic examinations.

2. In considering the total number of days absent on account of sickness, it was found in analyzing the data by years that the periodic health examinations also had an apparent influence in checking the duration of both major and minor illness, particularly as the years advanced.

3. As a case finding agency (*a*) to bring to light and control occasional early cases of tuberculosis, diabetes, occupational disorders and other incipient diseases and (*b*) to discover certain major or minor physical impairments or defects of the heart, eyes, tonsils, teeth and other parts of the body, the periodic health examination always has been considered of inestimable value to the individual and to the general public health. To this also may be added, as a result of this study, the value of the voluntary periodic health examination even from the standpoint of industrial management in the possible control of operating and financial losses due to sickness absence among the workers.

4. For individuals, in having voluntary periodic health examinations, and for industrial management, in providing facilities for such examinations in company sponsored health maintenance programs, the most important requirement is that of persistence, since the ultimate values are somewhat hidden and slow in appearing.

46 Riggs Avenue.

THE ATTITUDE OF INDUSTRY TOWARD X-RAY EXAMINATIONS OF THE CHEST

C. D. SELBY, M.D.
DETROIT

Collectively, industry has no defined attitude on the use of x-rays as an aid in diagnosing diseases of the thoracic organs in employees and applicants for employment. Certain committees of the National Association of Manufacturers and the United States Chamber of Commerce favor the procedure and are promoting it, but they cannot be said to represent industry's attitude, although they do indicate the trend of industry's thinking.

Generally, the attitude of an individual plant in this matter is determined, or at least is influenced, by the position taken by the management's medical adviser, who might be the doctor in charge of the plant medical department, the neighboring physician who treats the injured employees, the manager's own personal physician or a close medical friend. Except for the differences in cost, the management's attitude on the purchase of x-ray equipment is about the same as it is on blood pressure outfits, electrocardiographs and other diagnostic equipment. Usually the manager looks to the medical department, if he has one, for results in the form of health protection for the employees which cannot readily be valued and, as long as the doctor in charge retains the manager's confidence, decisions of this character are in accordance with his judgment. The attitude of industry can be said to be largely that of physicians in industrial and general practice. Industry is prepared to protect the workers against occupational diseases of a pulmonary nature and those arising out of nonoccupational causes which might be aggravated by the conditions of employment, of which the pneumonoconioses and pulmonary tuberculosis are respectively well known examples. Through industrial hygiene engineering methods industry has endeavored with considerable success to control these. Nevertheless, in the absence of specific immunizing agents, industry recognizes the value of early diagnoses in these important diseases, and experience confirms the effectiveness and practicability of x-rays of the chest as a means toward that end.

In relation to jobs associated with certain forms of dust, there is usually no question as to management's attitude. On the other hand, there may be some question on the use of x-rays for purely diagnostic purposes in the nonoccupational diseases. However; management's interest has been aroused by some spectacular experiences occurring here and there, particularly in regard to pulmonary tuberculosis.

Equipment had been installed in the medical department of a plant employing 10,000 people, and the medical director invited the top management group to inspect it. From a mechanical standpoint they were interested and, observing this, the doctor volunteered a demonstration. An important official stepped forward, and when the quickly processed film was placed on the viewing box it showed an apical lesion. In this case a key man was involved and the disability, though fortunately temporary, came at a difficult time and it was somewhat staggering to the organization. Such experiences are not wholly uncommon, for management is just as susceptible to pulmonary tuberculosis as hourly rated workers and perhaps more so under present conditions. When experiences like this occur they are impressively capable of arousing management's interest.

There is another reason for management's interest, and it is much more common than skeptics admit. For lack of a better expression it can be called the humanitarian interest. It does exist, and instances have occurred in which it has seemed to have received priority. The local tuberculosis society of an Eastern industrial city was ineffectually endeavoring to promote chest surveys in local plants. The manager of the largest was approached with an appeal to lead off with a survey in the hope that others would follow his example. Despite the fact that equipment was on order for an x-ray laboratory in his own plant, this manager granted permission, incidentally at a cost of over $2,000, solely to forward what he considered to be a commendable effort. As a sequel several active cases were found, one of which was in the management group.

An equally good example was in a plant of 7,000, about half of the employees being women. On request of the medical director excellent x-ray equipment had been installed for chest work. Wishing to make its use voluntary, the doctor invited a young woman acquaintance to be the first, expecting that she would spread a favorable word through the plant. As she had considerable local athletic fame the result was unanticipated and startling, for she was found to have a minimal-apical lesion. She accepted the shock sensibly and asked the doctor to call in her sister, likewise employed in the plant. Her sister also had an early lesion. Subsequent investigation by the local health department traced the contact to the father of the girls. These cases attracted a great deal of attention, as both

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of the young women were widely known and popular. Needless to say, volunteers quickly established the x-ray procedure. But that is not the point. In talking about the experience later on, which the manager often did, he expressed great satisfaction in the fact that he had made it possible, by purchase of the equipment, for these employees to have the benefit of an early diagnosis and consequently early treatment, with good prospects for recovery.

Improvements in portable equipment and photofluorographic units have popularized mass case finding surveys. While management usually follows the recommendations of the medical profession with respect to these, instances have occurred in which the advice and cooperation of the plant physician have not been sought. Needless to say, surveys are not wholly effective unless the findings are followed up with good medical procedures. There must be complete accord among the patients, the medical profession, the sanatoriums and the public health authorities, with the plant physician performing the functions of a coordinator.

Surveys serve the purpose of case finding, and to that extent they are useful; but, if size permits, in-the-plant x-ray facilities, with suitable arrangements for roentgenographic consultations, are much more desirable for the permanent control of the respiratory diseases in industry. For this reason further interpretations of industry's attitude will be limited to considerations with regard to the operation of permanent plant x-ray installations.

TABLE 1.—*Conditions Disclosed by 6,505 Chest Films*

Active cases of pulmonary tuberculosis:	
Employees disengaged from employment and referred to their physicians for treatment	15
Cases of questionable activity:	
Employees remained at work under medical supervision	6
Arrested cases:	
Employees also remained at work under medical supervision	34

At this point examples of industry's experience are appropriate. With due consideration to the prevalence of tuberculosis in various geographic areas the following may be regarded as fairly representative:

A plant engaged chiefly in the fabrication of military vehicles and airplane parts, located in the Great Lakes region, has a plant population of about 6,000, one third of whom are women. An analysis of 6,505 chest films gave the results presented in table 1.

All original exposures were on 35 mm. films. Confirmatory 14 by 17 films were taken in 357 cases, of which 74 required follow-up films. In addition to the findings in tuberculosis the conditions listed in table 2 were observed.

A plant located in southern Michigan which manufactures small parts for a great variety of war material has been offering x-rays of the chest as a regular feature of preemployment and health examinations for the past six years. In that period 47,424 chest exposures were made. The average plant population is 16,000. The findings are given in table 3.

In establishing chest diagnostic service, industry desires good relationships with all of the parties who are concerned. These parties are the employees, the medical profession, radiologists, official public health agencies and voluntary health organizations.

THE EMPLOYEES

Diagnostic chest service can be mutually beneficial to management and the employees, but for obvious reasons the employees are primarily the most concerned and the success of the service depends on their willingness to go along with the program. Measures for obtaining their cooperation need not be discussed; it suffices to say that the employees must be convinced of the justice of all medical decisions affecting them and their employment. As a feature of preplacement examinations for selective placement, diagnostic chest service can be obligatory; for health maintenance it may be voluntary. If the chest work is regarded as a regular feature of all examinations, as are other diagnostic aids, it is accepted without question as long as the employees have faith in the integrity of the physician in charge of the plant medical department. With respect to the employees, industry's attitude is characterized by a desire to obtain acceptance of a service which can be and should be mutually beneficial to both management and the employees.

TABLE 2.—*Additional Conditions Disclosed*

Pneumonia	12
Pleurisy	53
Heart enlargement	42
Aortic enlargement	50
Chronic nontuberculous process	57
Congenital abnormality and scoliosis	25
Tumor	8
Arrested tuberculosis	161
Healed miliary tuberculosis	3

THE MEDICAL PROFESSION

Industry does not ordinarily furnish treatment for pulmonary tuberculosis or any other of the conditions that are brought to light by case finding programs unless, of course, they are the results of employment. It is, however, a distinct advantage to the patients if the relationships between their personal physicians and the industrial physicians are those of good mutual understanding. With special reference to pulmonary tuberculosis, these relationships can advantageously be extended to include studies of the places of employment by the attending physicians and on-the-job conferences with the plant doctors. This applies particularly when

TABLE 3.—*Conditions Found Over Six Years in a Plant Employing 16,000*

Pulmonary tuberculosis (active)	86
Pulmonary tuberculosis (healed)	158
Miliary tuberculosis (healed)	27
Calcified lesions—"Wheatena"—Dr. Gardner's classification	131
Pneumonitis	28
Pneumonoconiosis	39
Calcified Ghon tubercle	7
Atelectasis	5
Chronic fibrosis	14
Pleural effusion	8
Pleura (thickened)	18
Pleura (calcified)	3
Unresolved pneumonia	17
[illegible]	7
[illegible]	11
Pneumothorax (spontaneous)	7
Pneumothorax (treatment)	27
Empyema	6
Heart:	
Mitral lesions	19
Generally enlarged	28
Aorta enlarged	42
Aneurysm	9

the patients are thought to be ready for reemployment to safeguard them on their jobs and to plan health maintenance procedures for them, such as how often and how extensively they should be periodically examined. With respect to the medical profession, industry's attitude is characterized by a desire for good mutual relationships between the plant physicians and the attending physicians. The former are expected to take the initiative in effecting these good relationships.

THE RADIOLOGISTS

In industry the diagnoses of pulmonary tuberculosis and other lesions of the thoracic organs are usually based on interpretations of the films and are necessarily tentative. No such diagnoses are complete until substantiated by clinical observation, which is the function of the patients' own physicians and their consultants. Nevertheless, as considerable dependence is placed on the x-ray films, their interpretations should be supported by x-ray knowledge and experience. Hence the radiologists have an important role in the operation of industrial x-ray laboratories. In this respect their relationships can be made to involve responsibilities as follows:

(1) Responsibility for the x-ray technic and the reading of all films, or

(2) Responsibility for the reading of films only, or

(3) Responsibility limited to the reading of films which are not obviously negative.

The first category is the most desirable, with the consultant giving part time service to the plant, but it is not always the most practical. Usually, as plant medical personnel gain experience the consulting radiologists are content to leave routines to them, reserving for themselves the reading of questionable films, and experience has proved that this arrangement is effectual and workable.

With respect to the radiologists, industry's attitude is influenced by that of the medical directors of the plants, who are permitted to make their own arrangements with the radiologists.

THE PUBLIC HEALTH AUTHORITIES

When industrial diagnostic studies of the chest disclose pulmonary tuberculosis, it is essential that the public health authorities be notified. Usually they follow up contacts and perform the other public health functions essential in such cases. Varying in different localities, these need not be discussed here. It is enough to say that industry's attitude in relation to the public health authorities is characterized by a desire for complete cooperation. Just what form the cooperation should take is not always clearly defined, however, and there is often doubt as to whether the plant physician should notify the department or the family doctor. Usually the plant physician does so if the family doctor does not.

THE VOLUNTARY ORGANIZATIONS

Local tuberculosis and public health societies are frequently quite active and influential. One or more plant managers and other industrial officials may be on their boards of directors, in fact often are, and with such support these organizations are likely to influence the whole local situation, including the attitude of industry. Their principal functions are to promote case findings in tuberculosis, better care of patients and their occupational rehabilitation. In these activities industry generally wishes to cooperate as far as is practical.

In conclusion it can be said that industry has no well defined attitude toward x-ray examinations of the chest, that its position with respect to this matter is influenced by the opinions of physicians who are accustomed to advise with management on medical affairs, and that industry's attitude is therefore in reality the attitude of the medical profession.

In making x-ray chest service available to the employees, industry wishes the relationships which necessarily result from case finding to be professionally ethical, suitable to the best interests of the employees and in conformance with local public health regulations and practices.

3044 West Grand Boulevard.

ABSTRACT OF DISCUSSION

Colonel A. J. Lanza, M. C., A. U. S.: There is no definite attitude on the part of industry toward x-rays and x-ray work, but there is no doubt that x-rays are becoming widely accepted as a necessity in well organized industrial organizations. We see a rather wide demand for x-ray work in industrial plants, and we are receiving a constantly increasing demand for x-ray installations in the plants over which we have jurisdiction. In their industrial application they have two distinct types of use: the first and obvious one is in the preplacement examination; and while it is true that their use was initiated in those types of industries in which a pulmonary hazard is involved, they are now coming into use for preemployment examinations in all types of industry. The second important use is in their public health aspect, in the industrial approach to tuberculosis case finding. Governmental agencies, state agencies, health departments, county medical societies have all initiated x-ray surveys in industry for the purpose of tuberculosis case finding; also we have at least two commercial agencies which are pushing this type of work. I have had no contact with the commercial agency type of survey, but it involves certain features or phases that need to be safeguarded. It is for that reason that, as Dr. Selby mentioned, the Council on Industrial Health felt it was highly important, both in the interest of the individual and in the interest of the medical profession, to make certain that whatever agency does mass surveys of tuberculosis in industrial organizations, it should conform to a certain minimum standard of ethical practice, without which the whole business would degenerate into a purely commercial venture for profit. Our object has been to confine tuberculosis surveys and x-ray work in industry to medical lines, through a medical approach, and to guarantee (as far as that can be done) that the interpretation of x-ray films be limited to those who are capable of interpreting them. Any one who has been through the early days of x-ray work in its industrial aspects has seen all the headaches and confusion which have resulted from the interpretation of x-ray films by those who are not qualified. I hope that this day has now passed and that the cooperation of the Section on Radiology and of the American College of Radiology with our Council will insure that only the highest standard of performance will be found in our industrial work.

Robert Willan.—Skin diseases were the subject of treatises by Daniel Turner (1667-1740), Joseph Pleuck (1732-1807) and Antoine Charles Larry (1726-1783), but the first systematic and scientific classification was that of Robert Willan (1757-1812) of London, whose On Cutaneous Diseases appeared in 1808. "His greatest feat," according to Dr. William Allen Pusey in his History of Dermatology, "was his grouping of a great number of various forms of dermatitis under the generalization eczema."—Clendening, Logan: Source Book of Medical History, New York, Paul B. Hoeber, Inc., 1942.

ENLISTED MEN DISCHARGED FROM THE ARMY BECAUSE OF PSYCHONEUROSES

FOLLOW-UP STUDY

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This follow-up study of enlisted men who were discharged from the Army because of psychoneuroses was undertaken by the Office of the Surgeon General in July 1944 in order to obtain more reliable data than had previously been available concerning the adjustment of these dischargees to civilian life. Information concerning their health as it related to their employment and employability was especially desired.

METHOD

A random selection of men discharged from the Army during the eight month period between May 1, 1943 and Jan. 1, 1944 was made on the basis of serial numbers. All of the men had been out of the service at least six months. Approximately 7,000 names were selected. Basic data used in this study were obtained from the Medical Statistics Division of the Surgeon General's Office and from the Demobilized Records Branch of the Adjutant General's Office. In only 5,937 cases was sufficient information available to warrant inclusion in the study.

A questionnaire to be mailed was drawn up with the assistance of the Morale Services Division. In order to determine whether or not the presence of an individual's name on the questionnaire would in any way influence the validity of his replies, a preliminary sampling of 500 was undertaken. In half of these the individual's name appeared on the questionnaire and in the other half no identification was included. In the latter group, in order to determine whether anonymity was preferred, a note was added stating that it was not necessary to sign one's name.

Assurance was given that replies would remain confidential and that the information would not be transmitted to any other government agency or be used in the veteran's further relations with the Army. It was realized from the start that the replies would represent subjective impressions, perhaps colored by many motives, and that they would not be completely objective. However, it was believed to be important to determine at least what the veterans would say about themselves, recognizing limitations in the reliability of responses obtained in this manner.

From the Neuropsychiatry Consultants Division, Office of the Surgeon General, War Department, Washington, D. C.

Capt. E. A. Lew, Capt. John S. Benz, Mr. Karl Benson and Mrs. Marie D. Wann of the Medical Statistics Division, Office of the Surgeon General, assisted in the collection of basic data and in the tabulation of the results. Lieut. Col. Jonathan D. Hawkins and Miss Melva M. Doyle of the Demobilized Personnel Records Branch, Office of the Adjutant General, assisted in the collection of basic data. Major F. D. Williams, Capt. Daniel F. Connell and Miss Shirley Star of the Research Branch, Information and Education Division, Army Service Forces Headquarters, assisted in the preparation and pretesting of the questionnaire and in the analyses of the data. Major H. E. Johnston, Director of the Office Service Division, Office of the Surgeon General, assisted in the preparation of the report. Miss Tessie Berkman of the American Red Cross assisted in obtaining the personal follow-up reports. Mrs. Jean Fritzsching of the Neuropsychiatry Consultants Division, Office of the Surgeon General, assisted in the preparation of the report. Without the help and advice of these persons and of the American Red Cross, this study would not have been possible.

Replies to this pretesting showed that approximately one half of those who were given the opportunity to remain anonymous chose to identify themselves and that there was no qualitative or quantitative difference in the replies from the main group as compared with the anonymous group.

In all, 5,937 questionnaires with the individual's name on them were mailed to enlisted men discharged from the Army on certificates of disability with the diagnosis of psychoneurosis, and 4,178 (over 70 per cent) replies were received.

Since it was possible that the 30 per cent who did not reply might differ from the others with respect to their health and employment and therefore affect the reliability of the findings, a personal follow-up on a sampling of 200 of this group was undertaken with the assistance of the Home Service of the American Red Cross. Replies obtained in this fashion were essentially the same as those in the large group.

BASIC DATA FROM GROUP STUDIED

Age.—As compared with the age distribution for the entire army, men discharged from the service are an older than average group; 59.9 per cent were 25 years of age or older on entering the military service as compared with a corresponding figure of 46.6 per cent for the entire army.

TABLE 1.—*Age Distribution* of Men Discharged from Army for Psychoneuroses as Compared with Total Army*

Ages (in Years)	NP Discharges, per Cent	Total Army, per Cent
Under 20	7.9	11.5
20-24	32.6	41.9
25-29	25.7	25.5
30-34	20.6	13.5
35 and over	13.2	7.6
Total	100.0	100.0

* For this and subsequent tables the "unknown group" for which data were inadequate was assumed to be distributed in the same proportion as those for which data were obtained.

TABLE 2.—*Marital Status of Men Discharged from Army for Psychoneuroses as Compared with Total Army*

Marital Status	NP Discharges, per Cent	Total Army, per Cent
Single	63.4	59.9
Married	31.2	38.0
Separated	0.5	0.5
Divorced	2.5	1.4
Widowed	2.4	0.2
Total	100.0	100.0

Marital Status.—There was no pronounced difference in the marital status of the follow-up group as compared with the figures for the total army.

Education.—Figures representing educational achievement indicate a lower level for the group studied than the average for the total army. This difference could not be accounted for on the basis of age alone.

Army Grade.—Of those discharged from the service because of psychoneurosis, 70.2 per cent were in the grade of private, as compared with 40.2 per cent, the corresponding figure for the entire army.

Diagnosis.—Almost 75 per cent of the group had been diagnosed anxiety state, conversion hysteria, or mixed type of psychoneurosis. The other types were relatively infrequent.

Incidence of Disciplinary Problems.—Of men included in the psychoneurotic sample 92.4 per cent had no record of trial by court martial; 5.6 per cent had been tried once, and 1.3 per cent twice. Less than 1 per cent had been tried three or more times.

Comment.—As compared with the overall Army averages, the individual discharged because of a psychoneurotic disorder is apt to be older, to have less education and to have made less progress in the Army. There is little to suggest that he has been a disciplinary problem. Anxiety states and hysterical disorders were the most common types of psychoneurosis encountered.

TABLE 3.—*Education of Men Discharged from Army for Psychoneuroses as Compared with Total Army*

Education	NP Discharges, per Cent	Total Army, per Cent
Elementary school, grades 1 to 8	43.4	30.9
High school, 1 to 4 years	45.1	53.2
College, including postgraduate work, 1 year or more	11.5	15.9
Total	100.0	100.0

TABLE 4.—*Grade of Men Discharged from Army for Psychoneuroses, as Compared with Total Army*

Grade	NP Discharges, per Cent	Total Army, per Cent
Private (including aviation cadets)	70.2	40.2
Private, first class	13.9	21.0
Corporal (including T/5)	9.0	18.3
Sergeant (all grades)	6.9	20.5
Total	100.0	100.0

FINDINGS OF FOLLOW-UP

Health.—Health Before Induction: It was found that 48.4 per cent considered themselves to be in good health before induction, 42.8 per cent considered themselves to be in fair health before induction and 8.8 per cent considered themselves to be in poor health before induction.

Present Health: Of those who had considered themselves to be in good health before induction 93 per cent state that their health has deteriorated to fair or poor. Of those who had considered themselves to be in fair health before induction 42.5 per cent state that their health is now poor, while 1.6 per cent now consider themselves to be in good health. Of those who had considered themselves to be in poor health before induction 80.7 per cent still describe their health as poor, while 19.3 per cent report improvement in their health status.

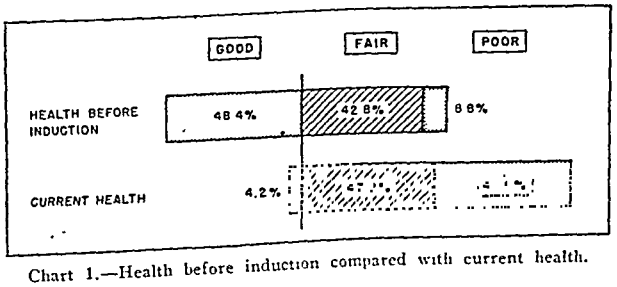


Chart 1.—Health before induction compared with current health.

In reply to the direct question "Is your health the same, better or worse than just before you entered the Army" 72.2 per cent of the entire group reported some deterioration in their health as a result of army service, 25.7 per cent described no change and 2.1 per cent reported that their health at present was better than it had been prior to entering the service.

Chart 2 illustrates that those who considered their health "good" or "fair" at induction reported deterioration in their health more often than those whose pre-army health was described as poor. It shows that men who considered themselves to be in poor health before Army service felt that they had to a much greater extent maintained their health status (52.2 per cent) or improved (6.6 per cent) than those in the "good" and "fair" groups.

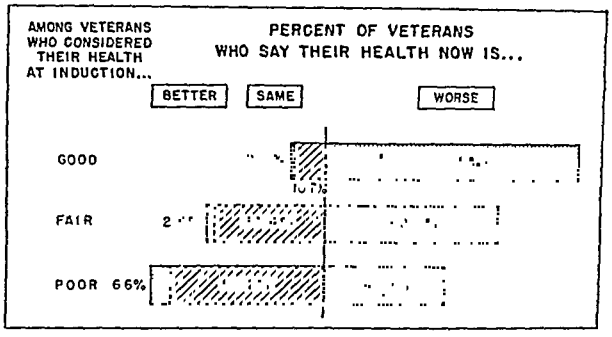


Chart 2.—Health before induction compared with current health.

HEALTH STATUS SINCE DISCHARGE FROM THE ARMY

It was found that 62.3 per cent considered their health to be the same now as their health was at discharge from the Army; 16.5 per cent believe their health has improved and 21.2 per cent believe their present health to be worse than it was at discharge. The greatest change in health status, therefore, seemed to have occurred during Army service rather than following discharge.

It was observed that there was a much greater tendency for the dischargees to look on their illnesses

TABLE 5.—*Diagnosis of Men Discharged from Army for Psychoneuroses* *

Diagnosis	Per Cent
Psychoneurosis, mixed	26.6
Psychoneurosis, anxiety states	21.6
Psychoneurosis, conversion hysteria	20.8
Psychoneurosis, hypochrondriasis	7.0
Neurasthenia	6.1
Psychoneurosis, anxiety hysteria	2.9
Psychoneurosis, reactive depression	1.2
Psychoneurosis, neurosis (somatic)	1.0
Psychoneurosis, obsessive-compulsive states	0.6
Neurocirculatory asthenia	0.5
Psychoneurosis, unclassified	8.7
Total	100.0

* Not uncommonly a mild organic defect was associated with the psychoneurotic disorder and was listed as an additional cause for discharge.

TABLE 6.—*Frequency of Courts Martial Among Men Discharged from Army for Psychoneurosis*

Recorded Courts Martial	Per Cent
None	92.4
One	5.6
Two	1.3
Three or more	0.7
Total	100.0

as physical disorders than as nervous or psychologic disorders.

There was a tendency in those who considered their current health better than it was before induction to believe that their health had improved since discharge. Those who considered their current health the same as it was before induction generally believed their health to have remained unchanged since discharge. It was only in the group who reported their current health as worse than it was at induction that this trend is not apparent. Almost one fourth of these men believe themselves to be worse than they were at discharge. The meaning of this beyond the suggestion of a kind of stability in thinking of one's health in retrospect is not clear.

LENGTH OF SERVICE IN RELATION TO SUBJECTIVE EVALUATION OF HEALTH

In general, the longer a man had been in the service prior to his discharge, the greater was the tendency to report deterioration in health.

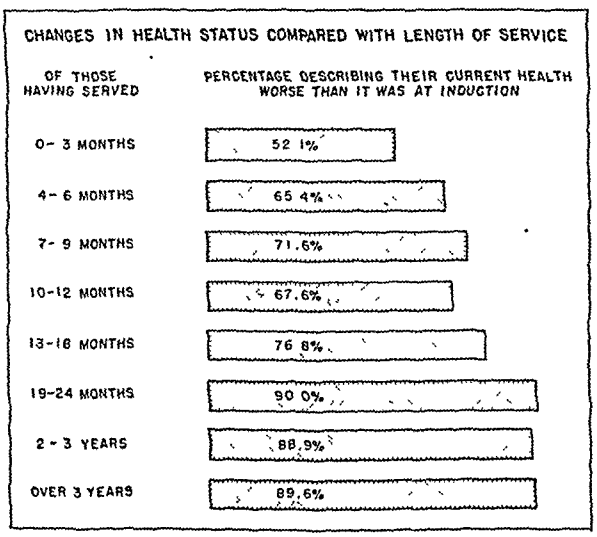


Chart 3.—Changes in status of health compared with length of service.

PLACE OF SERVICE IN RELATION TO SUBJECTIVE EVALUATION OF CURRENT HEALTH

Since length of service of the discharged psychoneurotic individual seems to have a direct relationship to his evaluation of his health status, the relationship between current health and place of service was examined. Proportionately more men who served overseas considered their health poor in comparison with those men who had only domestic service.

Of the total group, 13.7 per cent had overseas service. Of these, 91.9 per cent feel that their current health is worse than it was at induction, whereas only 69.1 per cent of the "domestic service only" men describe their current health as being worse than their health before induction. Only 7.6 per cent of the men who had seen overseas duty believe their health to have remained unchanged, as contrasted with 28.7 per cent of those whose service was domestic. This is illustrated graphically in chart 4.

However, in comparing the men's evaluation of their present health there is not as much difference between the overseas group and those whose service was confined to the continental limits of the United States. One possible explanation for this is that the men who were sent overseas were probably a healthier group.

MEDICAL CARE AND HOSPITALIZATION

Of the entire group 15.3 per cent had been seeing doctors "fairly often" prior to entering the service, 37.9 per cent "seldom" and 46.8 per cent "not at all."

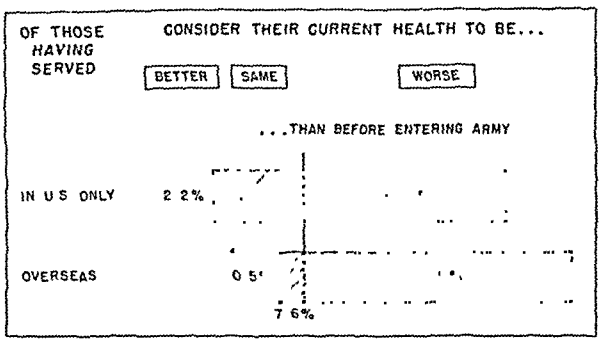


Chart 4.—Relationship of place of service to evaluation of current health and preinduction health.

Since discharge from the Army, 75 per cent of the entire group have consulted a physician one or more times, generally (83 per cent) for the same medical conditions for which they were discharged. In the other instances, physicians were consulted for routine physical examinations, accidents, surgery and complaints unrelated to their previous trouble.

TABLE 7.—*Time Between Discharge from Army and First Hospitalization*

Length of Time Between Discharge and Hospitalization	Frequency
Less than one month	70
One month	83
Two months	75
Three months	65
Four months	70
Five months	53
Six months	69
Seven months	41
Eight months	37
Nine months or more	58
Total	611

Median 3.2 months

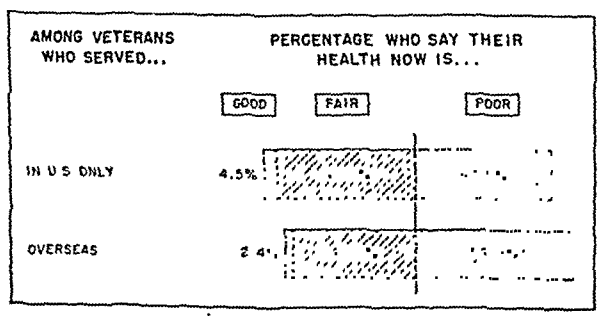


Chart 5.—Place of service in relation to evaluation of current health.

The figures for hospitalization since discharge in part confirm the apparently increased need for medical care. Six hundred and eleven, or 14.6 per cent of the entire group, were hospitalized at least once after leaving the Army. The vast majority (70 per cent) of these were hospitalized only once; 4.7 per cent had four to nine admissions. In some instances, however,

hospitalization merely involved remaining over night for tests.

The length of time elapsing between discharge from the Army and first hospitalization is indicated in table 7.

EMPLOYMENT

Employment at Present as Compared with Employment Before Induction.—While most of the men who have been discharged from the service because of psychoneuroses are working, the incidence of unemployment has increased appreciably. This is particularly significant in view of the current manpower shortage.

TABLE 8.—*Preinduction and Present Occupations*

	Pre-induction	Since Discharge	
Employed	93.7%	85.9%	{ 72%-full time. 28% part time
Unemployed	3.8%	13.1%	
Students	2.5%	1.0%*	
Total	100.0%	100.0%	

* Before the G. I. bill of rights was enacted.

ing the service. The majority of those who were unemployed prior to service are now working. The composition of the present employed and unemployed groups as compared with their preinduction status is presented in table 11.

REASONS FOR REPORTED CURRENT UNEMPLOYMENT

The veterans reporting current unemployment gave a variety of reasons for their failure to work. The majority (71 per cent) gave poor health as the reason and this was usually described as physical. The psychogenic nature of their disorders was apparently not recognized. In 29 per cent unemployment was attributed to factors other than health, such as "shop closed down temporarily" or "no work in my line."

HEALTH AS A FACTOR IN NOT WORKING FULL TIME

A majority of those who were not working attributed their unemployment to poor health, and a considerable percentage of those who were working part time attributed the limitation of their employment to health reasons. Even in the group which was employed full time, however, an appreciable number (18 per cent) reported the need to take some time off from work because of impaired health.

TABLE 9.—*Preinduction Occupation Compared with Present Occupation Expressed in Actual Numbers to Show Occupational Shifts*

Preinduction Occupation	Operatives	Laborers	Farmers and Farm Laborers	Craftsmen	Clerical	Salesmen	Service Workers	Business Owners and Managers	Professional and Semiprofessional	Students	Unemployed	No Data	Total
Operatives	704	92	56	131	80	24	13	28	17	3	137	7	1,292
Laborers	204	152	48	53	28	10	7	5	4	6	123	9	649
Farmers and farm laborers	120	33	208	42	12	7	2	1	3	..	81	3	512
Craftsmen	142	16	17	193	23	13	5	21	11	2	58	3	504
Clinical	55	9	2	13	165	17	2	14	5	3	30	2	317
Salesmen	33	8	3	8	22	59	3	10	4	2	11	1	164
Service workers	43	13	3	4	8	2	57	3	1	..	17	..	156
Business owners and managers	25	2	2	14	16	14	3	56	4	..	12	..	148
Professional and semiprof.	16	5	1	10	8	5	2	3	56	1	13	..	120
Students	22	8	4	2	15	7	1	5	9	19	12	..	104
Unemployed	44	13	5	12	21	5	2	3	6	2	43	..	156
No data	17	9	3	5	5	..	..	1	2	5	9	..	56
Total	1,430	360	352	487	403	163	97	150	122	43	546	25	4,178

Total remaining within same occupational category: 1,721 or 41%.

PREINDUCTION OCCUPATION COMPARED WITH PRESENT OCCUPATION

Arbitrary categories of employment were set up in order to study the occupational stability of the men discharged. The most pronounced trend was away from the laborer and farmer groups in the direction of operative [1] and clerical groups. Even if the unemployed returned to their preinduction occupations, the post-discharge occupational shift would still be apparent.

The significant reduction in the number of service workers was to be expected because higher paying jobs with better working conditions are available. The categories of business owners and managers, and professional and semiprofessional remain practically unchanged. Of the total group only 1,721, or 41 per cent, returned to the same kind of job after separation from the Army (tables 9 and 10).

THE UNEMPLOYED

The present group of unemployed is made up for the most part of those who were employed prior to enter-

1. This category as defined by Selective Service and the War Department includes workers, usually in industrial plants, who can be hired and taught their tasks in a relatively short time. Their tasks usually are the operation of various types of automatic machines.

TABLE 10.—*Preinduction Occupation Compared with Present Occupation Expressed in Percentages to Show Occupational Changes*

	Preinduction Occupation	Present Occupation
Operatives	31.4	31.6
Laborers	15.7	8.7
Farmers and farm laborers	12.4	8.5
Craftsmen	12.2	11.7
Clerical	7.7	9.7
Salesmen	4.0	3.9
Service workers	3.8	2.3
Business owners and managers	3.6	3.6
Professional and semiprofessional	2.9	2.9
Students	2.5	1.0
Unemployed	3.8	13.1
Total	100.0	100.0

SOURCE OF HELP IN FINDING EMPLOYMENT

Thirty-three per cent of the men returned to their old jobs, 41.6 per cent found new jobs without help and 6.1 per cent were helped by friends and relatives,

9.9 per cent reported assistance from federal agencies, and 1.8 per cent received assistance from sources such as voluntary community groups, unions and fraternal organizations.

ATTITUDE OF PROSPECTIVE EMPLOYERS AS REPORTED BY VETERANS

Of those veterans currently employed, 73.5 per cent experienced no difficulty in getting jobs despite the fact that they had received medical discharges. In this same employed group 22.7 per cent felt that prospective employers showed some hesitancy in considering them for jobs. The largest single reason given was failure

TABLE 11.—*Present Status*

Status before induction	Employed *	Unemployed
Employed *	84%	12%
Unemployed	3%	1%

* Includes those attending school.

TABLE 12.—*Source of Help in Finding Employment*

Source of Help		Per Cent
Returned to old job		33.0
Secured new job		60.0
No help	41.6	
USES	8.6	
Veterans Administration	0.6	
Selective Service	0.7	
American Red Cross	0.6	
Friends or relatives	6.1	
All other	1.8	
Unemployed		7.0*
Total		100.0

* This figure differs from the figure of 13.1 per cent reporting current unemployment. While 93 per cent of the entire group have worked at one time or another since discharge, only 85.5 per cent are now working.

TABLE 13.—*Attitudes of Prospective Employers*

Attitude of Prospective Employers	Employed per Cent		Unemployed per Cent	
Employers showed no reluctance to hire		73.5		59.7
Employers reluctant to hire		22.7		32.5
Failed to pass physical examination	12.4		16.2	
Poor physical risk for industrial insurance	2.7		4.6	
Too "nervous"	2.3		4.4	
Uninterested because of medical discharge	2.9		3.6	
Limitations of work a factor	0.5		0.7	
No details	1.9		3.0	
No data		3.8		7.8
Total		100.0		100.0

to pass the physical examination, which some veterans thought was made particularly rigid in order to exclude them. Other reasons for which they were refused employment included "poor physical risk for industrial insurance," "too nervous," "disinterest (on part of employer) because of medical discharge" and "limitations of working capacity."

Of those veterans currently unemployed, 59.7 per cent believed that prospective employers showed no reluctance to hire them because of their medical discharges, while 32.5 per cent did feel that prospective employers showed some hesitancy in considering them for jobs because of their medical discharges. This is a larger percentage than appears in the employed group. In 16.2 per cent failure to pass the physical examination was the reason given for not being hired.

COMMENT

The results of the follow-up study indicate that men discharged from the Army because of psychoneurosis differ significantly from the Army average with regard to age, education and Army grade.

In general, those discharged from the Army with a diagnosis of psychoneurosis consider their health to have been adversely affected by their Army service. They believe themselves to be in poorer health than at induction. They consider their health impairment chiefly in terms of physical disease and in general do not recognize the psychologic aspects.

The longer a man in this group served in the Army, the more likely he is to consider his health to be affected. Similarly, the men who served overseas consider themselves to be sicker than do those who did not see any overseas service. In addition to their reporting poor health, a need was expressed for medical and hospital care which is far beyond their prearmy requirements.

The vast majority of those studied are working but definite changes in their employability are apparent. More men are unemployed now than at the time of induction. The unemployed group is for the most part composed of those who were working before induction. In their subjective estimate of their reasons for not working now, the unemployed, to a great extent, attribute their failure to work to poor health. There was little indication that they were discriminated against by prospective employers because they received a medical discharge.

Overseas service was reported by 13.7 per cent of the group. This percentage may increase as time goes on. It is not possible, however, to predict at this time the effect such an increase would have on the findings of future similar studies. A special investigation of the overseas group will be undertaken in an attempt to determine whether or not they comprise a special group in terms of adjustment.

The limitations of the method used in obtaining the data are obvious. The replies received by mail from the men are purely suggestive. The results may not be a reflection of the true state of their health. Exaggerations may have been made consciously or unconsciously for a variety of reasons. However, the veterans' own evaluation of their conditions is important and cannot be ignored. The findings indicate that there was little tendency for them to report change in their conditions between discharge and the follow-up study. There is a distinct suggestion of permanence of their disorders in their own minds. Active measures will have to be taken if this attitude or state of affairs is to be influenced.

It is recognized that employment is easy to secure at this time and that adjustment in terms of employment is relatively simple now. It is not possible to predict what will happen in the future. Factors will be present which may influence adjustment in opposite directions. The end of the war may produce in some a change in intrapsychic tension and need for illness. Time alone may bring with it improvement. Increased competition for fewer jobs will exert its influence, and the socioeconomic condition of the postwar world will be an important factor affecting the adjustment of these men.

PSYCHIATRIC TECHNICS IN THE MANAGEMENT OF EMPLOYEE PROBLEMS

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Treatment of the many minor personality problems and maladjustments coming to the attention of the physician in industrial practice does not demand new or complicated technics so much as it does a more effective application of methods already at his disposal for influencing human beings and their relationships on the job. Psychotherapy is of course an integral part of all medical practice, but its special potentialities in the field of industrial relations have not received the emphasis they deserve. Not only the great number of dispensary calls which involve psychogenic disturbances either primarily or secondarily but also many of the other personality problems which harass industry could be more effectively handled if the role of the industrial physician included active and clearly defined psychotherapeutic functions. In dealing with pathologic aspects of industrial human relations the physician is constantly confronted with the need for brief psychotherapeutic technics which are both effective and practical.

Unfortunately much of the clinical psychiatry taught in medical schools is of little direct use in the industrial setting. Few of the technics learned from observing the end results of severe chronic mental disease, as found in hospitalized or committed patients, are applicable to everyday industrial practice. The interminably detailed case history records, and the involved terminology which has become traditional in mental institutions, have both contributed to the general belief that all psychiatric technics are too cumbersome and time consuming to be of practical use in industry. Along with this there is another common belief, often amounting to fear, that any attempt to streamline psychiatric methods would render them superficial and therefore useless or even dangerous when applied by general physicians to the minor nervous and emotional reactions encountered in ordinary practice. It is my purpose in this paper to present evidence which would tend to disprove such pessimistic assumptions concerning the place of psychiatric technics in industry and to uphold instead the usefulness and validity of certain types of brief psychotherapy which can be successfully practiced by the interested industrial physician without undue or excessive demands on his time.

The practice of psychotherapy does not require so much in the way of strictly medical knowledge and diagnostic acumen as it does patience and sympathetic interest in the employee as a person. Patients with personality maladjustments or neurotic tendencies usually always need more than mere assurance that they are free of organic disease. Psychotherapy begins when the physician takes interest in social and environmental factors and applies his technics for impersonal consideration of facts to the personal life of the individual. In such instances it becomes necessary to give the same attention to qualitative and quantitative aspects of emotion, stability, drives, capacity for persistent effort, initiative, maturity and motivations as the physician ordinarily gives to tissue lesions caused by trauma and bacteria. The clinical picture of the patient as a whole is distorted if the physician handicaps himself by singling out only those complaints and behavior changes which suggest physical malfunction and disregards those which in terms of neuronal circuits are functionally (electrochemically) related to attitudes and the satisfaction of emotional needs.

Because of the tremendous number of variables which enter into the emotional makeup of different individuals, it is next to impossible to set up detailed diagnostic criteria into which all the minor personality determined problems of industrial practice can be fitted. However, on the basis of the presenting complaints, personal attitudes and reactions it is usually possible to single out at least a few of the predominant emotional trends, and these often give excellent clues as to the type and extent of psychotherapy which will be required. As an example of the first step in such an approach, the following list presents in the order of frequency the varieties of psychosomatic disturbances found in the initial contacts with 40 unselected industrial workers and supervisors who appealed for psychiatric consultation or were referred for interviews:

1. Emotional instability and overexcitability under stress.
2. Rigidity, lack of adaptability.
3. Feelings of inferiority.
4. Egocentricity, overaggressiveness, lack of social consideration.
5. Inadequacy in attitude and responsiveness.
6. Love affairs, sex and marital problems.
7. Oversensitivity.
8. Pronounced feelings of insecurity.
9. Inappropriate self-protective defense reactions.
10. Habitual overuse of alcohol.
11. Visceral symptoms related to emotional tensions.
12. Poor attendance record.
13. Preoccupation over disturbing home and family situations.
14. Personality eccentricities and mannerisms.
15. Definite introvert or schizoid tendencies.
16. Poor organization, lack of regularization in habits.
17. Relative intellectual defect.
18. Special fears and anxiety reactions.

As might be expected, most of the persons in this small series had more than one symptom indicative of emotional subhealth and psychic unrest, the average being three for each employee. Regardless of the relationship between symptoms and coexisting or associated physical disorders, it is remarkable how willing and even eager the great majority of such persons are to discuss personality factors as such when the opportunity is presented. In many instances the relationship of such personal problems to lack of efficiency on the job is frankly acknowledged and adds further incentive to the acceptance of authoritative assistance and counsel.

With the stage thus set for psychotherapeutic contacts, it might be well at this point to review those methods open to the industrial physician or consultant which do not require extensive knowledge of psychiatry. In a recent book on this subject, Levine [1] listed some thirty general methods of psychotherapy which are used by the medical practitioner, and only five of these require added training and aptitude. When these are modified and adapted to fit into the industrial setting, they tend to fall into three overlapping categories: those which are an intimate part of routine procedures, those which

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Levine, Maurice: Psychotherapy in Medical Practice, New York, Macmillan Company, 1942, chapter 2.

might be termed "psychiatric first aid" and those which come into play when there is need and opportunity for extended private interviews and follow-up contacts. Some of the technics included in such an inventory are as follows:

1. Physical examinations as psychotherapy.
2. Physical therapy as psychotherapy.
3. Laboratory tests as psychotherapy.
4. Medicinal treatment (including placebos and sedation) as psychotherapy.
5. Guidance, interpretation and medical advice.
6. Giving diagnostic information with authoritative firmness.
7. Reassurance.
8. Minimizing or ignoring certain symptoms and attitudes.
9. Emphasizing a balanced daily routine (work, rest, food, recreation).
10. Drawing attention away from symptoms by praising healthful attributes.
11. Suggestive therapy.
12. Development of hobbies.
13. Encouraging socialized living and participation.
14. Pointing out opportunities for healthy identifications.
15. Sympathetic listening; confession and ventilation.
16. Provision of acceptable outlets for aggressiveness.
17. Provision of acceptable outlets for fears and inferiority feelings.
18. Provision of acceptable outlets for frustrated affective needs.
19. Lessening environmental strain, both industrial and non-industrial.
20. Using consultations with wife, relatives or home physician as psychotherapy.
21. Transferring to new occupation or environment.
22. Recommending additional training.
23. Changing attitude of supervisors.
24. Provision for rest or change through leave of absence.
25. Discussion analysis and desensitization.
26. Persuasion and reeducation.
27. Referral to consultant or specialist as psychotherapy.

Such a list could be extended indefinitely, but it must be emphasized that the effectiveness of all such measures depends as much on the individuality of the physician as the patient. The extent to which psychotherapeutic technics are used and the order in which they are woven into the physician-patient relationship will depend largely on specific needs and circumstances in each individual case. With neurotic patients as with children, emphasis should be placed on simple, workable procedures in which the patients participate, rather than on negative aspects or prohibitions. The key significance of the first interview should constantly be kept in mind by the psychotherapist. Some contacts are made much more effective if the physician stresses the necessity for a follow-up interview or even calls the patient in before he would ordinarily return with further complaints. Even in those instances in which the nature of the psychiatric problem goes beyond the scope and responsibility of the industrial physician, referral and cooperation with outside consultants can be greatly facilitated when inplant contacts are established in this way.

Preliminary observations from the application of these methods to the 40 cases mentioned indicate that good therapeutic response was obtained in 45 per cent, fair results in 38 per cent and no significant improvement in 17 per cent. Practically all in the third group were found to be in need of more intensive therapy than is possible on an inplant basis, and 3 have terminated their employment up to the time of this writing. Although observation and treatment of these individuals is still in process, it is of interest that the number of contacts per case was only 3.3 and that the average time spent over a six months period was a little under one and one-half hours per case. This does not seem excessive in comparison to the time often required for repeated visits to the physician for minor complaints, not to mention the inefficiencies on the job, when no effort is made to influence personality and emotional factors. It is especially gratifying to note that some degree of improvement in job relations was effected in 10 cases after only two interviews. As a rule when therapy is effective, follow-up contacts are progressively much shorter than the initial ground breaking interviews.

While industrial physicians and consulting psychiatrists are by no means the only individuals with personnel functions in industry who employ psychotherapeutic technics, it goes without saying that by virtue of their medical training and clinical experience they alone are best qualified to take authoritative leadership in the application of such methods to management and employee problems. Beyond enlarging the scope of their services to individual patients by more actively employing psychiatric insights, industrial physicians have another and still larger obligation—that of teaching both by example and in more formal ways the philosophy of this approach to management, foremen, employment interviewers and last but by no means least their own assistants, the industrial nurses.

LABOR-MANAGEMENT RELATIONSHIPS IN INDUSTRIAL HEALTH PROBLEMS

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Industrial hygiene as a science and as a public health service has been developed with the objective of protecting and promoting the health of the working population in an industrial system. Its development has been the result of a parallel growth of responsibility on the part of management and governmental agencies. Management has had an economic interest in preventing accidents, disease and premature death. Governmental agencies have taken action in solving industrial health problems because such action is a proper obligation of public agencies. Labor, as represented by both organized and unorganized workers, has had a lesser role in this development, largely because strong organization is necessary for effective action, and until recently unions have not been well enough established to allow them to give attention to the advancement of special welfare programs. Today, more than ever before, management is concerned about the workers' health because every available adult is needed on the job to produce. Labor unions have now gained the means and the leadership to make possible the initiation of progressive action in the health field.

There are many difficulties in the way of effective labor-management cooperation in applying industrial hygiene knowledge, which must be recognized at the outset in attempting to bring these partners together. Since management and labor both have so much to gain by cooperative and intelligent application of industrial hygiene methods, it is tragic that so much controversy, misunderstanding and resistance on both sides still exist in many industries.

From the Industrial Hygiene Division, Bureau of State Services, Bethesda, Md.

Management has developed health and safety rules and regulations in most instances without consulting the workers. The workers have at times used their union strength to oppose measures which would benefit them. There are still many companies and unions whose activities show no evidence of consideration of the health needs of the workers and the necessity for a healthful working environment. Despite new signs of increased interest in workers' health on the part of unions, some segments of labor are apparently still more concerned for compensation benefits than for prevention of the conditions which caused the compensable injuries —injuries which can never be compensated by cash benefits. On the other hand, attitudes of management toward industrial hygiene run the entire gamut from paternalism to neglect. In general, most large industries have an enlightened approach to industrial health, which insures to their workers high quality service and constant attention to the working environment.

What is really needed on the part of both labor and management is a new policy—a new attitude toward this question of industrial health. There is no reason why some formula could not be devised to harness the power of labor organizations with the splendid organization which management has created in many plants, so that the two will not oppose each other but pull together as a team toward the common goal.

Whatever gains management has made in the acceptance of progressive industrial health programs have been the result of many years of slow education—experience earned the hard way. Because of the requirements imposed by certain types of workmen's compensation acts, management first began to establish medical departments solely for the treatment of traumatic injuries, in accordance with the requirements of the laws. Gradually, management realized that there were other phases of the problem in need of attention, and it began to extend its surgical treatment work into such functions as preemployment and periodic physical examinations and, in recent years, medical and engineering control of occupational diseases and job placement. At the present time attention is being devoted, on the part of some of the larger concerns, to such problems as general illness among workers and such factors as fatigue, dental hygiene, nutrition, mental health and similar adult health problems.

It would seem that we are now passing from the strictly machine engineering age to the human engineering era. In other words, where in the past attention was given mainly to the improvement of machinery and processes, today management is beginning to be concerned with the economic waste resulting from the failure to provide protection for its workers against controllable or preventable occupational health hazards. Not all of these advances have been achieved without trials and tribulations. Perhaps it was necessary for a national emergency such as the present one, with its emphasis on production and the need for the conservation of manpower, to point up the importance of the human element in a highly industrialized nation.

Labor has just demonstrated how an effectively organized group can function successfully on the political front. This too has taken many hard years of work to achieve. There is no reason why labor cannot accomplish similar tasks in relation to other gains, and especially on the social front. Today labor is beginning to show an interest in health and safety services, and it portends to become widespread, vocal and specific. The unions are recognizing more and more that their contributions to the well being of the individual worker must parallel their activities for economic betterment and conditions of employment. However, labor should go slowly and recognize that it has a good deal to learn in the field of industrial health. It should work for a constructive program as an end unto itself and not use health problems merely as a means to obtain concessions, such as higher wages and shorter hours. It will probably not be necessary for labor to go through as long a period of education as it took management, since many of the patterns in this field have already been developed, but it would be well for labor, and especially its leaders, to study the various problems carefully before striving for demands either through collective bargaining or through some forms of legislation. Labor will find official and nonofficial health agencies ready to assist in this educational process.

Recent efforts to obtain labor-management cooperation in many fields vital to the nation's economic life give promise, so that ultimately these two powerful forces may come together in a mutual endeavor for the common good. Some industrialists may feel outraged at the mere thought of giving labor some voice in the management of any part of its affairs. On the other hand, many have recognized that the rank and file workers have resources of intelligence, ingenuity and enterprise which industry can utilize. By the intelligent use of these resources, management will not only do a better production job but at the same time will take a real step forward in establishing the worker as an individual, thereby doing away with one of the main difficulties in the field of labor relations.

Such action does not necessarily mean that labor will run management's business or that such a business will be run by a committee of labor and management. After all, management owns the plants and provides for safety and health in accordance with certain legal requirements. Such being the case, no one has the right to force management to do certain things when it is only management which is held responsible. In other words, nothing must be done to interfere with or reduce management's responsibility, so that it may direct the health and safety program properly. On the other hand, there is no reason why labor should not contribute in an advisory capacity many helpful suggestions which could be adopted and carried out by management. In fact, as has already been stated, there are many ways in which management and labor can work together, not only in the field of industrial health but in the field of production, training of personnel and in similar ways.

However, cooperation between labor and management appears still to be in its infancy, in spite of the impetus given to such cooperation in the present need for all-out production. More education in the technic of cooperation is needed for both industry and the unions, especially at the plant and local union level. The pattern is cut—it can fit and should be used much more widely and in more diverse fields than it is now, particularly in health and welfare activities, which should be of permanent concern to labor and management.

Labor-management committees sponsored by the War Production Board have served a useful function in stepping up production for the war effort. However, where they have functioned in the permanent health and welfare activities, the results have not been impressive. In those industries where good labor management relations already existed, some progress has been made in safety and health programs. In others, attention to workers' health has been perfunc-

tory. In most instances emphasis has been placed on accident prevention—the one field which has been an established, legally protected activity over a period of thirty years. New opportunities for the improvement of working conditions and workers' health have not been explored and exploited intensely by the labor-management committee. F[illegible]; which have been received from th[illegible] Board show activities for safety, better nutrition, better sanitation and general health promotion, in about that order of importance. For example, a large automotive vehicle company employing approximately 10,000 workers and the union, a U. A. W.-C. I. O. local, formed a War Production Drive Committee in 1942. The general committee and numerous subcommittees each had equal labor and management representation. The health and safety subcommittees reduced the accident frequency rate by 25 per cent in one year. Through the action of the labor-management committee, a safety engineer was employed full time. The reporting of unsafe practices and unsafe conditions to the health and safety subcommittee was encouraged. Despite an increase in man-hours worked by nearly a million and the addition of some 500 new workers, the accident frequency rate of 23.9 disabling injuries per million man-hours was reduced to 18.6. The committee also sponsored a vaccination program, with the aid of the medical department, and 3,000 workers were vaccinated. Chest x-ray examinations were made available to all employees on a voluntary basis.

Other evidence shows that health and working conditions are subjects of vital importance to the workers, although there may be no organized effort on the part of workers to improve them. This is attested by a recent statement from a labor-management committee which questioned some 1,300 new employees in a plant relative to the subjects they considered most important to their welfare. Some 36 per cent of these new workers stated that safe and healthful working conditions were most important, stating that employment was the next important subject, with about 16 per cent indicating their concern with this factor.

Mr. V. P. Ahearn, industry member of the National War Labor Board, recently stated:

> There is hardly a major case coming before the War Labor Board which does not involve, at one stage or another, a demand that something shall be done . . . to improve industrial health. Even though the demand may not meet the objective, even though it may be unworkable, nonetheless the reality of that demand is something that practical men in industry cannot ignore.

There are some leaders in both labor and management who, although not condemning labor-management committees in outright fashion, still feel that their scope has been restricted to such an extent that these joint programs have been vitiated. For example, Mr. Robert Watt, labor member of the National War Labor Board, feels that the work of these committees has been restricted to the old company union function of concentrating on ways to obtain more effective effort from the workers. According to him, labor does not object to such results but regrets that this important function was not knitted into the fabric of union representation in accordance with established public policy of a democratic nation. Mr. Watt feels that collective bargaining has served already to accomplish far more than these committees can do. He feels that the present National War Labor Board itself is the best demonstration of the value of economic democracy. Since this board has accredited representatives from management, labor and the public, such action places on the labor movement the necessity of maintaining effective and responsible leadership. It has made the interested parties in industrial relations shoulder the obligation of facing and solving issues. According to Mr. Watt, on any question of any importance there should be participation by representatives of labor and management, with authority to help analyze problems, seek solutions and formulate remedies.

This brings us to the role which collective bargaining has played in the field of health, safety and insurance. The union agreement negotiated through collective bargaining between management and labor offers one channel for the improvement of industrial health and working conditions. Health and safety provisions are specified in a number of existing contracts, a practice which was followed by many unions for many years. However, a study of the health and safety clauses shows that these provisions have been made in order to protect workers from unfair application of company regulations, to right some specific grievance or to correct some single outstanding hazard. As far as one can determine, no union agreement provides for a broad industrial health program in the industry with a view to long-term reduction of sickness and promotion of positive health. The health and safety clauses recently written by the U. A. W.-C. I. O. Health Institute for the guidance of local unions in the negotiation of future contracts are the nearest approach to such a contract. The chief provisions of these proposed health, safety, group insurance, and compensation clauses deal with such things as the formation of health and safety committees with equal representation from labor and management and discusses the duties of such committees with reference to the evaluation and control of the industrial environment. Such functions as reporting of injuries and illnesses to the committee, the provision of adequate emergency medical services, free periodic physical examinations and special provisions for women in industry are also highlighted in these suggested clauses. These clauses are perhaps the first attempt to negotiate for a broad industrial health program, but in their present form they will need considerable revision, since some of the demands are unnecessary or impracticable, while others, if not administered properly, would tend to impair the rights of management.

PHYSICAL EXAMINATIONS

In general, existing health and safety clauses in union agreements fall into three categories: (1) provisions with regard to physical examination of workers, (2) safety and health provisions and (3) insurance benefits. Let us consider the first and most controversial point—physical examinations. Until recently, neither management nor labor has fully understood how to utilize properly the physical examination as a technic for the improvement of the health of the industrial worker. In the past, routine preemployment and periodic examinations have been made a company requirement in order to protect management in compensation litigation and to reduce the costs of insurance premiums. Labor, on the other hand, has insisted on contract clauses or laws designed only to protect workers against unfair use of the examination rather than making it a health service to the worker.

We must recognize, first, that the physical examination is more than a medical problem. It is also a socioeconomic problem. The man who has spent his working life in one industry and has acquired seniority

and a higher wage scale cannot be expected willingly to accept placement in a less arduous but less remunerative job, even though it would save him from premature death due to a heart condition discovered in the examination. Enlightened employers recognize this problem, even though they have not yet provided the answer.

Perhaps this is one of the many problems in health and welfare which can be solved satisfactorily only by national and state legislation to provide adequate economic security for the workers handicapped by accident or disease. We have cases on record in which an attempt has already been made to deal with situations of a somewhat similar character. For example, when the state of Pennsylvania adopted its occupational disease compensation act it recognized that there were already many workers in the state's industries who had acquired certain diseases of occupation prior to the date when the law became effective. It also recognized that the last employer would be unduly penalized if he was made to carry the entire burden of the compensation to which some of the workers would be eligible, even though they might not have been employed in his plant long enough to acquire such diseases or conditions. For this reason the state of Pennsylvania created a special fund of $100,000 out of the general tax fund and gave it to the State Workers' Insurance Board for payment into a state workmen's insurance fund for the credit of the Second Injury Reserve Act. This fund was to be used for a perid of ten years and was an attempt to apportion equitably between the last employer and the state fund the amount of money due a worker. After the expiration of a ten year period, the employer was to pay the full compensation for disability or death.

It has also been suggested by leaders in the field of compensation administration that such funds be employed to take care of older workers whose earning capacity has been lowered. To take care of such contingencies it will be necessary to maintain a solvent second injury fund. This could be done by several methods, one of which would be through general taxation.

The war emergency has stimulated better use of the physical examination by management, since the shortage of manpower has made it necessary to accept for employment thousands of physically handicapped workers and others whose general health is substandard. It is unfortunate, therefore, that some segments of labor still resist actively the requirement for routine physical examinations. For example, there is one powerful union which has even written into its contract with management that no preemployment physical examinations should be given. As a result of this attitude, many of the plants operating under such a contract have experienced an enormously high labor turnover, since they have been forced to hire thousands of persons whose handicaps could not be studied and related to the job requirements.

It is difficult to understand such unenlightened attitudes of some labor leaders. If the purpose of a national health program is to attain national physical fitness for the people of this country, greater use must be made of a careful objective medical examination of more individuals. Its use in industry has contributed and can contribute greatly to public health if the problems associated with the physical examination of workers are solved. These problems can be solved if all interested groups get together and put their minds to it.

Management, labor and the medical profession have taken this step. The Council on Industrial Health of the American Medical Association in 1944 called together representatives of the American Federation of Labor, the C. I. O., the National Association of Manufacturers, the U. S. Chamber of Commerce and the casualty insurance companies. This group of competent authorities defined the purpose, scope, procedure and proper use of the physical examination. Their report has already been approved by the American Medical Association and by the other interested groups. Thus, management and labor have an authoritative guide to the constructive application of preventive medicine. Let us hope that it will be used.

The most significant feature of this guide is the definition of the purpose of the occupational physical examination. This report states that:

> The purpose of industrial health programs is to promote and maintain the physical and mental welfare of all industrial employees. Health examinations in industry are a means to this end.
>
> Unjust or questionable exclusion from work through improper application of the findings on health examinations in industry is against the public welfare and contrary to sound industrial health principles.
>
> From the public and industrial health standpoint, the only absolute bars to immediate employment in nonhazardous occupations should be:
>
> 1. Communicable disease.
> 2. Mental illness in which impaired judgment or actions prevent cooperative effort.
> 3. Incapacitating injury or disease.
>
> Other considerations related to employer liability, workmen's compensation, factory acts and health codes must be determined separately for each jurisdiction.

The liberal policies enumerated in this report on the use of medical records and appeals are worthy of special attention. These are too long to reproduce here, but, with regard to the preservation and use of records of industrial health examination, the confidential character of such records is to be rigidly observed and access granted only on written consent of the worker. However, I should like to reproduce the exact words of this report on the important and previously troublesome subject of review and appeal. On this point the report is very clear and specific, and states:

> When a worker has been physically examined, and the doctor making the examination reports that he is physically unfit for any work or for certain classes of work, which report may have an adverse effect on the employment of such worker, the following procedure shall apply:
>
> The worker may designate a physician of his choice and request a review of the findings made by the examining doctor. These two physicians may proceed to render a joint report. If they are not in agreement, then a third physician, agreed on by the two reviewing physicians, shall be selected and his findings shall be final. If the two physicians cannot agree on a third physician, then the chairman of the industrial commission in the state in which the plant is located shall make the selection.

HEALTH AND SAFETY

Undoubtedly industry and unions will continue to include health and safety provisions in their contracts, perhaps for some years to come. The purpose should be to broaden these provisions to encompass a comprehensive industrial health program in which both management and the workers will participate. As a guide, I should like to suggest that the basic health considerations in collective bargaining should include:

> 1. A labor-management committee, of equal representation, to advise the union and management on health needs of the workers and on ways and means to meet the needs.

2. In-plant medical services, adequate in scope and quality, and acceptable to both labor and management.

3. Preplacement and follow-up physical examinations conducted under the policies outlined by the report of the Council on Industrial Health of the American Medical Association and supplemented by careful job analysis for proper placement.

4. Routine industrial health surveys of working conditions by official industrial hygiene agencies or similar disinterested agencies acceptable to the committee.

5. Compliance with recommendations made by the surveying agency for the improvement of working conditions.

6. Promotion of special public health services in the plant for the improvement of individual health, such as nutrition programs, mental health services, dental care, communicable disease control and health education.

The major health problems of the working population, however, cannot be solved by union agreements or by management or by labor alone. A comprehensive national health program administered by state and local governments would meet the needs of all groups for health and medical service, hospital care and prevention of disease. Present federal and state laws on the subject of health maintenance are undoubtedly inadequate and are certainly not uniform. Labor, on the whole, is dissatisfied with present legal provisions of health and safety and for their enforcement. That is why, of course, labor is attempting to gain such benefits through collective bargaining procedures. Recently the Congress of Industrial Organizations passed a resolution on national and state legislation dealing with health and safety. This resolution calls for action on an educational program to inform the general public, as well as its own members, as to the desirability and necessity of providing and enforcing adequate standards of protection against the hazards of employment.

There is no doubt that our present laws on this subject need to be strengthened. Take, for example, our present provisions for industrial hygiene in the various states. Although considerable progress has been made on the part of the states during the past eight years in this field, still, even today, there are nine states which have no industrial hygiene services as such, and the thirty-nine states which do provide such services spend only approximately $1,250,000 for such activities. This sum, half of which is allotted to the states through federal grants-in-aid, permits but a small coverage in the way of services to the fifty odd million workers of this nation. Obviously there is a need for more funds, more state and local financial participation and more trained professional personnel to do an adequate service job in our industries.

For these reasons it would be far more preferable to revise and strengthen our present laws on health and safety requirements and especially their enforcement provisions so that benefits of such laws could be applied to all workers rather than to those who happen to be strong enough to obtain concessions through contracts. To this end we need the support of labor as well as management, with both getting behind proper legislation which would provide state health authorities with the necessary funds and trained personnel and the authority to do their job effectively. Such action is a far more democratic method of accomplishing the desired objective than through collective bargaining procedures alone and in addition would serve the millions of workers who are unorganized. Through such collective action on the legislative front the rights of neither management nor labor, nor their free functioning, will be impaired.

Any action taken, however, must be preceded by careful study of present industrial health laws, regulations and services by labor union leaders, with widespread discussion of proposed action among all union organizations, in order that there may be a unified attack on the problem. A first step in developing the required understanding at all levels of union organization would seem to be the appointment of individuals to the executive staffs of national and state union organizations, and to each international union staff, with responsibility for full time attention to health. Such persons should be given proper orientation in the health field through contact with health agencies and, if possible, through organized study of industrial and public health. Their function would be to maintain close working relationships with all health agencies and represent their organizations in all cooperative planning of activities among agencies concerned with health programs. These health advisers could assume leadership in organizing educational programs on health for union members through all the channels of union organization and activity.

In conclusion, I would urge that those of us who have an interest and an obligation to work with unions should help them in every way possible to attain their objectives, first being sure that sound objectives are established through full understanding. At the same time we should lend our aid in helping other groups to appreciate the fact that unions have a contribution to make and that statesmanlike cooperation can be expected where confidence is established on all sides.

LOCAL ORGANIZATION FOR EMERGENCY SERVICES

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In this country perhaps more than in any other a fashion, a song, a word, an expression, a mechanical gadget or an idea, when it happens to strike the popular fancy, sweeps over the country like a prairie fire. Many of these pass and disappear as rapidly as they came, but others, when they are bolstered by an outstanding personality or by systematic and persistent advertising, may continue indefinitely and may become, so to speak, a part of our folklore. Some of these things, especially gadgets and ideas which are associated with the use of gadgets, are immediately taken up by commercial exploiters who proceed to "cash in"; and as the cash rolls in, or even before, a corporation is organized, partly to hide the identity of the exploiters and partly to increase the take by all the means known to high pressure exploiters. One of the principal methods is advertising, which, to a considerable extent, has become the art of misleading people into acquiring things good or bad, whether or not they are needed. In fact, one of the main objects of advertising is to induce people to regard as desirable or necessary objects which are not at all essential or which may even be harmful.

During the past quarter of a century, or since the first world war, a peculiar situation has developed. Whenever a person drowned, or when breathing ceased for any other reason, the relatives immediately called, not a physician, but the fire department or the police department, because one or the other of these departments maintained a rescue squad which was subject to call at a moment's notice. Sometimes a physician also was called, but often enough the physician was busy elsewhere or, when he arrived on the scene, the rescue

From the Section on Therapeutic Radiology, Mayo Clinic.

squad of the fire or police department had already taken over the situation as well as the responsibility. Or perhaps the demands of a busy practice did not permit him to disregard them in order to take charge of an emergency situation which might detain him for an hour or longer. Gradually this practice has grown until now it is the accepted method of dealing with emergencies of this kind, not only in large cities, but even in small cities throughout the country.

How and why did this practice develop? The idea of organizing rescue squads among firemen and police officers was a perfectly natural one. During the course of many fires some persons, including some of the fire fighters themselves, are overcome by smoke or chemical fumes of one kind or another. The importance of immediate attention for these persons is so great that every minute counts. Any delay may mean the difference between life and death. Hence the organization of rescue squads was an eminently sound idea. Moreover, fires do not occur frequently, and members of fire brigades have much time on their hands, which they occupy in refurbishing their equipment or polishing the seats of their pants. By the very nature of their work police officers have less time to waste, but some of them have plenty of time to play cards, especially at night, when life in a police station often is a boring experience.

A second reason for the organization of rescue squads of firemen or police officers was the example provided by many large industrial plants, which, in order to diminish the loss of labor resulting from injuries incurred by their workmen, to diminish the claims for injuries sustained in the course of employment or to meet the requirements of the compensation laws of some of the states, organized and maintained, in connection with their welfare service, a department for the emergency treatment of injuries as well as rescue squads to deal on the spot with the effects of certain kinds of accidents. Thus telephone companies found it expedient to train squads to rescue some of their linemen through whom a strong charge of electricity had passed. As is well known, when contact with a live wire causes an excessive charge of electricity to pass through a person, the immediate effect is either fibrillation of the cardiac muscle or spastic contraction of the heart as a whole, according to the charge of electricity; and respiration ceases. Artificial respiration, when promptly instituted, can save many victims. But to wait until a physician can be called and until he can arrive would be to lose the chance of saving some of these men. Much the same is true of men working in mines who are affected by chemical fumes, by cave-ins or by electrical injuries. Large steel mills also have maintained departments for emergency treatment of all kinds.

Perhaps a third reason for the organization of these squads was the invention of an automatic breathing machine which was known as the pulmotor. This machine having been invented about 1911, what could have been more natural for its manufacturers to do than to persuade fire and police departments to organize rescue squads whose members were trained to use the pulmotor? Although the precise relationship between the invention of the pulmotor and the organization of special squads of firemen or police officers cannot now be absolutely established, certainly the rapid and widespread organization of these squads and the increasing use of the pulmotor or other artificial breathing devices of the same general description was not a coincidence.

As it was first designed and used, the pulmotor actually was dangerous because, being built on the principle of suck and blow and the degree of suck and blow not being absolutely controllable within safe limits, the possibility of injuring the lungs by excessive pressure was not eliminated. There is reason to think that, during the early stage of its development, the pulmotor may have done as much harm as good. Another dangerous possibility was that, as the result of publicity and the misleading claims which were made for this device, there was a strong tendency, when an accident occurred, to neglect ordinary and well known methods of artificial respiration, which do not require mechanical apparatus of any kind, and to wait for the pulmotor squad. The effect of this tendency was that, as a result of the delay, many persons died who might have been saved if more prompt measures had been taken. Later, the dangerous feature of the pulmotor, which resulted from the absence of an effective means of controlling the pressure of air, was eliminated when an automatic regulator of pressure was added.

Since then other similar devices built on the same general principle and incorporating automatic control of air pressure have been designed and placed on the market but, unless they are employed by some one who is thoroughly familiar with the process of respiration under normal as well as under pathologic conditions, mechanical apparatus of this kind may be, and no doubt often is, quite ineffective. However, unscrupulous advertising and high pressure salesmanship have led the general run of people to have an excessive and unwarranted faith in these devices. Indeed, the faith of Americans in mechanical gadgets of all kinds is astonishing and rather childish. But this is not the point which I should like to stress. It is about time to return to our rescue squads of firemen and policemen, who, in a preceding paragraph, were left peacefully enjoying their game of cards.

On the whole, men working in large industrial establishments or in mines or employed by public utility companies are cared for as well as they could be under any circumstances. What interests me at the moment is the provision of a similar grade of care for the public at large, and it is this phase of the problem which I should like to discuss.

To my simple mind, arrest of respiration and of heart action, whether caused by drowning, by an excessive charge of electricity, by smoke or gas fumes or by any other means, is as much a medical problem as nephritis or pneumonia. But accidents of this kind often occur under circumstances which constitute a special problem. Rescue squads of firemen or police officers are only a makeshift arrangement which is far from rational. The fact that these squads receive special training and that often their ministrations are more effective than would be those of physicians who have not had special training and experience in methods of resuscitation is beside the point. No matter how well firemen or police officers may be trained to perform artificial respiration or to run a mechanical breather, they cannot be expected to know the difference between drowning, an attack of heart disease, cerebral concussion and cerebral hemorrhage. Of course, special circumstances may give an intelligent layman some idea of the nature of such an accident, but it is not a rare occurrence for a police officer to mistake cerebral hemorrhage for an excessive dose of alcohol.

For many years, as a member of the Council on Physical Medicine, I have had the opportunity to hear many discussions of the problem of resuscitation and of many phases of this problem. More and more it has

seemed to me altogether incongruous that the present situation should have been allowed to develop. Lately my thoughts on this subject have crystallized in a certain direction and I am taking the liberty of submitting these thoughts for your consideration. It seems to me that this situation could and should be corrected and that all rescue activities, outside of coast guards and other similar guards at public beaches, should be reorganized on a different basis.

The medical profession should assume the responsibility for organizing emergency or rescue squads to take care of resuscitation and other first aid measures, as well as the removal of emergency cases to hospitals. This would necessarily mean one of two things: either that the physicians of each community should, on their own initiative or on the initiative of the county or state medical association, organize an emergency service for full time duty or that the state departments of health should be made responsible for the organization and operation of these emergency services. Physicians selected for this service might perhaps be on duty for a week at a time, one group during the day and one group at night, and have at their disposal an ambulance, fully equipped to deal with any emergency that might arise.

It is true that, at the present time, hospitals have ambulances and interns or residents who take care of emergency calls; but the young physicians who take care of these calls have had only limited training in medicine and have not had special instruction in resuscitation, whereas the emergency services or squads which I have in mind should be composed of experienced physicians, with special training in resuscitation and all other emergency situations. An alternative, or perhaps only a supplement to the foregoing suggestion, is that each city should have a centrally situated emergency medical station. This would be most important in cities with a population greater than 100,000 and especially in cities with a population greater than 1,000,000. In the largest cities it might be necessary to have substations strategically situated according to density of population.

The organization and supervision of such highly trained medical emergency and relief units should be undertaken by the medical profession itself. However, in the case of central emergency stations and substations the municipalities or the states should be persuaded to furnish buildings and necessary equipment, including ambulances and so forth, and should also pay the salaries of the physicians and all other expenses, subject to reimbursement by the patients or their relatives. To allow the present fashion of police and fire department squads to attend to medical emergencies seems entirely incongruous.

It is realized that such a step could not well be taken now or until the end of the war, but there is no valid reason why plans should not be made to adopt this principle and implement it as soon as the war has ended. If the American Medical Association were to adopt the principle of this plan and so inform the medical societies of the different states, this action would have great influence. Naturally, it would take time to apply the principle, especially in the larger cities, but, as soon as the circumstances allow, steps should be taken in this direction.

One way to accomplish the desired result, once the principle has been adopted by the medical profession, would be to undertake a strong educational campaign, which should be continued until the public demands action. It is possible that, in order to induce municipal or state politicians to provide funds for buildings and ambulances and to pay physicians instead of firemen or police officers, some kind of coercion would be necessary. But if an adequate educational campaign should be conducted, the acquiescence of political bodies would be imposed by the public demand. The most effective way to obtain political action is to build a fire under a legislature and to keep the fire going until the legislature is forced to move.

PSYCHIATRIC REACTION TO AMPUTATION

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Many surgeons have emphasized the importance of the psychiatric or psychologic components of the total problem of limb loss, stump construction and training in the productive use of prosthetic devices. As an example, MacDonald [1] has stated that "the surgeon has a definite responsibility in stimulating confidence and in teaching the man to use his appliance. Overoptimism on the part of the patient at the beginning is sometimes followed by an equal degree of depression when he feels the weight of the appliance and he has his first difficulty

TABLE 1.—*Frequency Distribution*

	Battle Casualty	Nonbattle Casualty
Upper	23	9
Lower	48	14
Double	5	1
Total	76	24
Total casualties	100	

TABLE 2.—*Mean Age Distribution*

	Battle Casualty		Nonbattle Casualty	
	Mean Age	No. of Cases	Mean Age	No. of Cases
Upper	23.9	23	24.5	9
Lower	27	48	28.7	14
Double	24 8	5	37	1
Total	25 2	76	30	24

Total amputees..... 100 cases
Mean age..... 26.7 years

TABLE 3.—*Types of Amputations*

Type	Battle Casualties	Nonbattle Casualties
Upper		
Above elbow	7	4
Below elbow	16	5
Lower		
Above knee	26	7
Below knee	22	7
Double	5	1
Total	76	24
Total casualties	100	

1. MacDonald, H. K.: Amputations and After Treatment, Canad. M. A. J. 47: 229 (Sept.) 1942

with his overenthusiastic attempts at walking." In spite of this attitude the reported studies on the psychiatric reaction to amputation consist, for the most part, of studies of phantom sensations. The complication of "phantom limb" has received much attention from many authors.[2] There is no general agreement as to the peripheral or central origin of these phenomena, but most writers agree that there is at least a psychologic component in all such cases. We have attempted to resist the temptation to write on this phase of the problem because we feel that the individual's total reaction to his injury and his adjustment to it are of greater importance to his future usefulness and comfort than any sensations that seem to come from his missing member.

METHOD

The 100 patients studied were selected at random from the card file index in the orthopedic section. Patients who had been referred for neuropsychiatric consultation were excluded, only those patients considered "normal" by the physicians and nurses remaining in the series. The purpose of the study was explained to each patient, and each was told that he could refuse to participate if he wished. No one refused and most patients seemed anxious to participate. A detailed social history was taken by a Red Cross social worker, and a Rorschach test was administered by a psychologist. The Rorschach records were scored and interpreted on a "blind" basis by one of us. Psychiatric evaluation of the data was made by another and the orthopedic care administered by the third.

TABLE 4.—*Immediate Acceptance; Type of Amputation*

Type of Casualty	Number of Patients	Shame		Self Pity		Lucky		Mother-Family		Depression		Severe Psychiatric		No Emotional Responses	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Battle															
Upper	23	0	0	0	0	11	48	4	17	6	26	1	4	1	4
Lower	48	0	0	1	2	20	42	7	15	15	31	1	2	4	8
Double	5	0	0	0	0	1	20	1	20	2	40	1	20	0	0
Total	76	0	0	1	1	32	42	12	16	23	30	3	4	5	7
Nonbattle															
Upper	9	0	0	0	0	0	0	0	0	8	89	1	11	0	0
Lower	14	0	0	0	0	0	0	3	21	6	43	2	15	3	21
Double	1	0	0	0	0	0	0	0	0	1	100	0	0	0	0
Total	24	0	0	0	0	0	0	3	13	15	61	3	13	3	13
Total	100	0	0	1	1	32	32	15	15	38	38	6	6	8	8

TABLE 5.—*Present Attitude (Intermediate Stage); Type of Amputation*

Type of Casualty	Number of Patients	Shame		Self Pity		Lucky		Mother-Family		Depression		Severe Psychiatric		No Emotional Responses	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Battle															
Upper	23	2	9	1	4	2	9	0	0	2	9	0	0	16	69
Lower	48	6	13	6	13	3	6	0	0	5	10	2	4	26	54
Double	5	0	0	0	0	0	0	0	0	3	60	0	0	2	40
Total	76	8	11	7	9	5	7	0	0	10	13	2	3	44	57
Nonbattle															
Upper	9	5	56	0	0	0	0	0	0	3	33	0	0	1	11
Lower	14	3	20	0	0	0	0	0	0	2	15	2	15	7	50
Double	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	24	8	33	0	0	0	0	0	0	5	21	2	8	9	38
Total	100	16	16	7	7	5	5	0	0	15	15	4	4	53	53

TABLE 6.—*Reaction of 100 Patients to Amputation*

	Immediate Stage		Intermediate Stage	
	Battle Casualties	Nonbattle Casualties	Battle Casualties	Nonbattle Casualties
Number of patients	76	24	76	24
	Per Cent		Per Cent	
Shame	0	0	11	33
Self pity	1	0	9	0
Lucky	2	0	7	0
Mother-family	16	13	0	0
Depression	30	61	13	21
Severe psychiatric	4	13	3	8
No emotional response	7	13	57	38

TABLE 7.—*Rorschach Tests*

	Signs of Anxiety	Sex Conflicts	Rejects
100 soldiers, a mixed group from 100 psychotic and 100 nonpsychotic	57	40	8
100 unselected neuropsychiatric consultations at university clinic	39	34	1
100 soldiers with amputations	67	81	2

The data were pooled and evaluated only after all had been collected. The series included 76 soldiers injured in battle and 24 injured in accidents incident to their training or noncombatant duties (table 1). The age average was 26.7 years (table 2 and the chart). All were well trained troops. It will be noted that lower extremity amputations were most frequent (table 3).

RESULTS

The reactions seem to fall into three fairly definite phases in terms of time: (1) the first or immediate reaction, (2) the intermediate period, beginning as the

2. Gallinek, Alfred: The Phantom Limb, Am. J. Psychiat. **96**: 413 (Sept.) 1939. Herman, Rudolph: Physical Therapy in After-Treatment of Amputations, M. Clin. North America **27**: 1109 (July) 1943. Pisetsky, J. E.: Phenomena of Phantom Limb, M. Bull. Vet. Admin. **20**: 320 (Jan.) 1944. de Rabinovich, Paulina H.: La ilusion de los amputados a la luz de los nuevos conceptos psicofisiologicos, Semana méd. **1**: 657 (April 2) 1942. Skillern, P. G.: The Relief of Painful Thigh Stump and Sciatica, J. A. M. A. **126**: 514 (Oct. 21) 1944. White, J. C.: Pain After Amputation and Its Treatment, ibid. **124**: 1039 (April 8) 1944. MacDonald.[3]

patient emerges from the shock and general reaction to the injury and ending when he masters his prosthesis and returns home, and (3) the late or final reaction, beginning when he goes home to reenter the civilian world.

The immediate reaction to the injury depends somewhat on the circumstances of the injury. Men who have survived an engagement or explosion with high casualties feel that they are so lucky to be alive that they have little concern about the details of the future. Whether this attitude will persist outside the hospital is a matter of great interest to us. Persons injured alone or as the only casualty at the time of their immediate group are more apt to be a little depressed and resentful at their "luck," but they still feel honorably wounded and have a good morale in spite of their doubts and misgivings about the future. Patients who have sustained injuries while absent without official leave or drunk or through carelessness generally have a poorer attitude, are more inclined to be depressed and resentful and are more apt to be disciplinary problems in the ward. The medical men and nurses in the

TABLE 8.—*One Hundred Patients with Amputations*

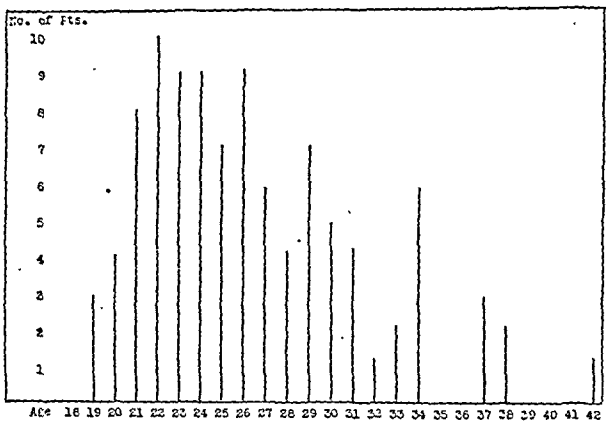
	Per Cent
Rorschach test:	
Serious psychopathologic conditions	50
Anxiety	67
Ross rating:	
Serious psychopathologic conditions	60
Clinical psychiatric study:	
Neuropsychiatric traits	64
Anxiety at this time	65

TABLE 9.—*Phantom Limb Sensations*

Casualty	Battle Casualties	Nonbattle Casualties	Total
Total patients	76	24	100
	71	24	95
	68	24	92
Pain	1	0	1

aid and evacuation centers do much to aid the battle casualties in their initial adjustment. They usually discuss the use of prostheses, the training program and so on with these men at the time they learn of their injury. When one considers how busy they are it is worthy of high commendation that they take the time for this effective on the spot psychotherapy. We have no doubt that the high morale in the interior hospital is in part due to the fact that the men come with high hopes of regaining their usefulness as effective producers in our society. Pain is not the immediate sensation. Those not rendered unconscious at the time of the injury state that the extremity is numb, and some try to use the extremity before they note its absence. Most of this group state that the pain starts when they notice that the extremity is gone. Many patients become aware of the loss after they have had morphine and are in the aid or evacuation station. The phantom sensations seem to start at about this time. Many soldiers are fatigued and hungry when injured and are quite ill for a few days after injury. Persons in this group give little attention to the injury and often note the loss of the extremity after they begin to improve. The patients we have studied in detail have been in the later part of the immediate reaction or in the intermediate phase. One of us has observed many patients at the aid and casualty stations, but more detailed observations at this level are indicated.

The next or intermediate phase comes with recovery from the general effects of the injury. Almost all patients need revision of the stump, repair of the flap, treatment of infections in the stump and so forth. Pain incident to these manipulations is often severe and frequently interpreted or felt as pain in some part of



Total age distribution.

the missing member. These factors focus the patient's attention on his injury, and at this time doubts, uncertainties and depressive symptoms appear. Many are much concerned over the anticipated reaction to the limb loss by their mother, wife or sweetheart. Of interest is the fact that no patient in this series mentioned any concern over the father's reaction to his injury. We believe that this intermediate period is the critical one. At this time we have the anxieties, the depressions, the battle dreams and the seeking of relief in alcoholism. Nurses and ward personnel will almost invariably tell you that these patients have the highest morale of any group in the hospital. Many patients assure you that they feel fine and have no worries,

TABLE 10.—*Social Adjustment in Amputees as to Type of Amputation*

Type of Amputation	Patients Showing Maladjustment Prior to Injury		Patients Showing Maladjustment After Injury		Total Number of Patients in Study	
	No.	%	No.	%	No.	%
Battle casualties						
Upper limb	5	6	6	8	23	30
Lower limb	17	22	19	25	48	63
Double	1	1	5	6	5	6
Total	23	29	30	39	76	99
Nonbattle casualties						
Upper limb	2	8	1	4	9	38
Lower limb	7	29	9	38	14	58
Double	2	8	0	0	1	4
Total	11	45	10	42	24	100
Total casualties						
Upper limb	7	7	7	7	32	32
Lower limb	24	24	28	28	62	62
Double	3	3	5	5	6	6
Total	34	34	40	40	100	100

present or future; in fact, one suspects that they feel too good. By this bravado they try to avoid questions and thus cover up the doubts and uncertainties which they do have. Once rapport is established they talk freely, and most of them are relieved at a chance to discuss their feelings, if only for a few moments. Tables 4, 5 and 6 show the incidence of feelings described as shame, self pity, lucky, depression and

worry over mother and family in the immediate and intermediate phases of their adjustment to injury. A more objective evidence of the state of tension, uncertainty over the future and doubts about their future status as men is reflected in the Rorschach study. The Rorschach revealed that the patients in this series show an unusually high incidence of anxiety of the so-called free floating type. This finding in the Rorschach test has been thought to represent anxiety and uncertainty about one's ability to adjust to the environmental and emotional demands of his future life in terms of the changes going on within himself. We have compared the occurrence of this finding in our cases with two other series in the files of one of us. One, (table 7) a random selection of 100 cases from a series of records on 200 selected soldiers in basic training, 100 of whom were neuropsychiatric casualties and 100 well adjusted to military life and a second unselected series of 100 cases taken from the active neuropsychiatric consultation files of one of us. (The records reviewed were all of those filed under A, B, C, D and some of E). The anxiety category just mentioned occurred approximately twice as often in the amputation cases as in the two groups used as "controls." The Rorschach tests in the amputation series show serious psychopathologic conditions in 50 per cent of the patients and anxiety in 67 per cent of the total series. The Ross Rating Scale (table 8), which is a compilation of various Rorschach signs, indicated serious psychopathologic conditions in 60 of the patients. The clinical evaluation indicated that about 64 per cent were having some difficulty in adjusting to their total life situation, the injury being an important part at the moment, and that 65 per cent were showing clinical signs of anxiety.

Ninety-five per cent of these patients had phantom sensations of some type (table 9). The symptoms vary from feeling that the limb is normally present to sensations of cramping, aching and itching. The fear that the phantom sensations were abnormal and represented insanity observed by Riddoch [3] was not observed in this series. These soldiers assumed that the sensations were normal and in most instances referred to them as "phantom limbs," having been educated by the hospital personnel and by other patients. The acceptance of one another's injury and their acceptance by the people in the ward and in the local community has much to do with their good morale. The uncertainties are of the future, where they anticipate and fear stares, curiosity and sympathy by the home folks and difficulty in occupational adjustment.

There is a tendency for patients who lose their legs to feel that the arm amputees are more fortunate, and the reverse is true. Many are doubtful of their ability to return to previous menial tasks because of the fatigue that accompanies prolonged activity with a prosthesis.

The individual's previous adjustment seems to be of great importance in determining the adaptation to the injury:

Patient X, a leg amputee, had been a successful cattleman prior to service. On return from his first furlough he told of having ridden horseback over his ranch, bought several hundred

3. Riddoch, George: Phantom Limbs and Body Shape, Brain 64: 197 (Dec.) 1941.

TABLE 13.—*Type of Amputation Affecting Occupational Adjustment*

	Total Number of Patients	With Change		With No Change		Uncertain	
Battle casualties		No.	%	No.	%	No.	%
Upper	23	7	30	9	39	7	16
Lower	48	31	65	8	17	9	18
Double	5	4	80	0	0	1	20
Total	76	42	55	15	20	19	25
Nonbattle casualties							
Upper	9	3	33	2	22	4	45
Lower	14	8	58	4	21	2	21
Double	1	1	100	0	0	0	0
Total	24	12	50	6	25	6	25
Total	100	54	54	21	21	25	25

TABLE 11.—*Age Factor in Social Adjustment*

	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-42	Total
Battle casualties									
Number of patients at age	10	21	21	10	6	5	4	0	76
Change									
Number	5	8	8	4	2	2	1	0	30
Per cent	50	38	38	40	40	40	25	0	39
No change									
Number	5	13	13	6	3	3	3	0	46
Per cent	50	62	62	60	60	60	75	0	61
Nonbattle casualties									
Number of patients at age	5	7	1	6	2	1	1	1	24
Change									
Number	4	4	0	0	2	0	0	0	10
Per cent	80	57	0	0	100	0	0	0	42
No change									
Number	1	3	1	6	0	1	1	1	14
Per cent	20	43	100	100	0	100	100	100	58
Total casualties									
Total patients at age	15	28	22	16	7	6	5	1	100
Change									
Number	9	12	8	4	4	2	1	0	40
Per cent	60	43	37	25	57	33	20	0	40
No change									
Number	6	16	14	12	3	4	4	1	60
Per cent	40	57	63	75	43	67	80	100	60

TABLE 12.—*Marital Status in Social Adjustment*

	Total Number of Patients	Number with Change	Per Cent with Change	Number with No Change	Per Cent with No Change
Battle casualties					
Married	28	8	28	20	72
Unmarried	48	22	44	26	56
Total	76	30	39	46	61
Nonbattle casualties					
Married	14	6	42	8	58
Unmarried	10	4	40	6	60
Total	24	10	41	14	59
Total	100	40	40	60	60

head of cattle and of straightening out his business affairs. He wasn't sure he could ride a horse with a prosthesis but he had demonstrated he could ride well without it and was not much concerned about the future.

Patient X had been a successful business man but owing to marital problems he gave up his work and became a heavy drinker. He enlisted to "cure" himself of his drinking. After his return home, as a casualty, he and his wife became reconciled and he had plans to work at a good job for another company. While he was still in the hospital the marital problem flared up and the patient is again drinking heavily.

show more reaction than the older men, and the single more trouble in social adjustment [4] than the married men. Forty per cent of the patients had some notable difficulty in social adjustment (tables 10, 11 and 12).

About one half of these soldiers plan a change in occupation because of the injury (tables 13 and 14). The double amputation and lower limb amputation patients have a greater tendency to plan changes in occupation than those who have lost an upper extremity. Most give rapid tiring and inability to be on their feet

TABLE 14.—*Age Factor in Occupational Adjustment*

	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-42	Total
Battle casualties									
Total	15	28	22	16	7	6	5	1	100
Number of patients at age	10	21	21	10	5	5	4	0	76
Change									
Number	7	10	11	6	3	3	2	0	42
Per cent	70	48	53	60	60	60	50	0	55
No change									
Number	1	4	6	3	0	1	0	0	15
Per cent	10	19	28	30	0	10	0	0	20
Uncertain									
Number	2	7	4	1	2	1	2	0	19
Per cent	20	33	19	10	40	10	50	0	25
Nonbattle casualties									
Number of patients at age	5	7	1	6	2	1	1	1	24
Change									
Number	2	4	1	2	1	0	1	1	12
Per cent	40	57	100	33	50	0	50	50	50
No change									
Number	1	1	0	3	1	0	0	0	6
Per cent	20	14	0	50	50	0	0	0	25
Uncertain									
Number	2	2	0	1	0	1	0	0	6
Per cent	40	29	0	17	0	50	0	0	25

TABLE 15.—*Age Factor as Affecting Sex Adjustment in Amputees*

	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-42	Total
Battle casualties									
Number of patients at age	10	21	21	10	5	5	4	0	76
Well adjusted									
Number	3	15	12	9	3	4	3	0	49
Per cent	30	72	57	90	60	80	75	0	64
Conflict or poorly adjusted									
Number	5	6	8	1	2	1	1	0	24
Per cent	50	28	38	10	40	20	25	0	32
No contacts									
Number	2	0	1	0	0	0	0	0	3
Per cent	20	0	5	0	0	0	0	0	4
Nonbattle casualties									
Number of patients at age	5	7	1	6	2	1	1	1	24
Well adjusted									
Number	4	5	1	4	1	1	1	0	17
Per cent	80	72	100	67	50	100	100	0	70
Conflict or poorly adjusted									
Number	1	2	0	2	0	0	0	1	6
Per cent	20	28	0	33	0	0	0	100	25
No contacts									
Number	0	0	0	0	1	0	0	0	1
Per cent	0	0	0	0	50	0	0	0	5
Total casualties									
Total number of patients	15	28	22	16	7	6	5	1	100
Well adjusted									
Number	7	20	13	13	4	5	4	0	66
Per cent	47	72	59	81	57	83	80	0	66
Conflict or poorly adjusted									
Number	6	8	8	3	2	1	1	1	30
Per cent	40	28	36	19	28	17	20	100	30
No contacts									
Number	2	0	1	0	1	0	0	0	4
Per cent	13	0	5	0	15	0	0	0	4

We have attempted to group the reactions to injury in several categories in an effort to explain some of these observations. These categories are represented in tables 10 to 26.

The patients with amputations involving the lower extremities had more difficulty in readjusting to social life with their families, fellows and others than those with upper extremity loss. This is contrary to the report of McKeever and our own expectations, because leg prostheses are less disfiguring and produce less occupational difficulty. In general the younger group for long at a time as the reason for the planned change. Many have rather ambitious plans; for example, a butcher planned to go into personnel work on the basis that his prewar handling of female customers qualified him for this type of work. The younger group, not well established in a job prior to induction, planned a change in occupation in greatest proportion.

4. The term "social adjustment" in this paper is used to designate embarrassment in front of family and friends, reluctance to attend social functions and difficulty in adjusting to fellow soldiers or to physicians and nurses.

The factor of sexual adjustment in relation to the injury is a complex one (tables 15 and 16). We feel that this phase requires longer and more detailed investigation. Deutsch [5] has made observations on surgical patients that may have an important bearing on these patients. The Rorschach picture shows definite signs of sex conflict in 81 per cent of these patients (table 7). Clinically only 30 per cent admit any great concern over the sex function. The married group tend to have less concern than the single soldiers. About one fourth of the single battle casualty group have definite plans to marry, usually immediately after discharge.

Personality change [6] of some definite degree occurred in 62 per cent of the patients (tables 17, 18 and 19). The battle casualties with lower extremity loss show a greater incidence of personality change than those with arm amputation, yet in the accident cases the reverse relationship is found. Double injuries show the highest incidence of change in both groups. In general the older patients show a greater tendency to personality alteration than the younger group, but the trend is not pronounced. Marital status has an inconstant relationship to personality change in this group.

Anxiety is a common symptom, as shown in both Rorschach (67 per cent) and clinical studies (65 per cent) (table 20). The anxiety reaction is slightly more common in the intermediate than in the immediate stages of the patients reaction.

Neuropsychiatric traits [7] other than the aforementioned occur in about 64 per cent of the patients (tables 21 and 22).

Increased use of alcohol is admitted in 11 per cent of the patients (table 23). The increase is greatest in the single patients and tends to be greater in the older age group.

Thirty-eight per cent of the battle casualty patients and 20 per cent of the nonbattle casualty cases admit of increased religious feelings (table 24).

Absence without official leave offenses (table 25) are less common in all groups after injury than before. This is in part due to decreased mobility but mostly due to the high morale of the ward and the liberal furlough policy toward patients in condition to go on leave.

Accident habit was not encountered in these military patients (table 26). Five (6 per cent) of the battle casualties and 1 (4 per cent) of the nonbattle casualties had accidents of some type earlier in their life. This

TABLE 16.—*Sexual Adjustment in Amputees and Marital Status*

Marital Status on Date of Injury	Married Prior	Married After	Divorced Prior	Plans to Marry	Single	Total
Battle casualties						
Well adjusted	22	4	3	15	5	49
Conflict or poorly adjusted	3	1	2	15	3	24
No contacts	0	0	0	2	1	3
Nonbattle casualties						
Well adjusted	10	1	0	5	1	17
Conflict or poorly adjusted	3	0	0	1	1	5
No contacts	..	..	..	1	..	1
Total casualties						
Number of patients	37	7	5	39	12	100
Well adjusted	31	5	3	19	6	65
Conflict or poorly adjusted	6	1	2	17	4	30
No contacts	0	0	0	3	1	4

TABLE 17.—*Age Factor in Personality Changes*

	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-42	Total
Battle casualties									
Total	15	28	22	16	7	6	5	1	100
At age	10	21	21	10	5	5	4	0	76
Change									
Number	6	14	13	6	4	4	3	0	50
Per cent	60	67	62	60	80	80	75	0	61
No change									
Number	4	7	8	4	1	1	1	0	26
Per cent	40	33	38	40	20	20	25	0	39
Nonbattle casualties									
At age	5	7	1	6	2	1	1	1	24
Change									
Number	3	4	0	3	0	0	1	1	12
Per cent	60	57	0	50	0	0	100	100	50
No change									
Number	2	3	1	3	2	1	0	0	12
Per cent	40	43	100	50	100	100	0	0	50

TABLE 18.—*Type of Amputation as Affecting Personality Changes*

	Total Number of Patients	Number with Change	Per Cent with Change	Number with No Change	Per Cent with No Change
Battle casualties					
Upper	23	13	52	10	48
Lower	48	32	67	16	33
Double	5	5	100	0	0
Total	76	50	61	26	39
Nonbattle casualties					
Upper	9	6	67	3	33
Lower	14	5	36	9	64
Double	1	1	100	0	0
Total	24	12	50	12	50
Total	100	62	62	38	38

TABLE 19.—*Marital Status Factor in Personality Changes*

	Total Number of Patients	Number Changed	Per Cent Changed	Number with No Change	Per Cent with No Change
Battle casualties					
Married	28	19	67	9	33
Unmarried	48	31	65	17	35
Total	76	50	61	26	39
Nonbattle casualties					
Married	14	9	64	5	36
Unmarried	10	3	30	7	70
Total	24	12	50	12	50
Total	100	62	62	38	38

5. Deutsch, Helene: Some Psychoanalytic Observations in Surgery, Psychosom. Med. 4:105 (Jan.) 1942.

6. "Personality change" in this paper is used to describe changes in habits and general behavior or changes in fundamental attitudes toward the world in general, the family or the Army.

7. "Neuropsychiatric traits" in this paper is used to describe pronounced irritability, sleep walking, battle dreams and so forth (table 22) which persist more than thirty days.

is much below the incidence in the fracture series reported by Dunbar,[8] in which patients in the age group 25-34 years had an incidence of previous injuries of 68 per cent.

No correlation could be made between either educational status or length of military service and the reaction to the injury.

The late reaction comes when these patients return to their homes and attempt to resume their normal place in life. We have formulated plans for following these patients after they leave the hospital. This will depend on the patients' voluntary cooperation, but we hope to be successful in this project. We have had the opportunity to discuss the reaction to amputation with two men injured in World War I. These two men have double amputations, one of the lower extremities and the other of an upper extremity. The National Office of the American Legion has them visiting the various amputee centers as morale builders and to demonstrate what can be done with their prostheses. We frequently see these men and find that they are a big factor in the morale of our patients. During the entire period since their injuries they have both had phantom sensations with cramps, aching and so forth, but they regard them as annoying physiologic experiences and not as evidence of invalidism or disability.

The correlation between the present reaction and the type of adjustment in the future should be the most valuable portion of the study.

TABLE 22.—*Neuropsychiatric Symptoms*

	Before		After	
	Battle Casualties	Nonbattle Casualties	Battle Casualties	Nonbattle Casualties
Floaters	1	..	..	..
Alcoholism, heavy	8	1	1	..
Sex	1	..	2	..
"Nervous"	2	3	2	1
Fights	1	..	..	..
Constitutional psychopathic state	1	2	..	..
Claustrophobia	1	..	..	..
Mother attachment	2	..	..	..
Run away	3	..	..	..
Sleep talking	1	..	..	..
Sleep walking	1	1	..	..
Nomads	..	1	..	..
Wall-flower	1	..	..	..
Battle dreams	..	..	13	..
Other frightful dreams	..	..	..	5
Paranoid	..	..	1	1
Fears civilian life	..	..	3	..
Insomnia	..	..	3	1
Anxiety	..	..	24	8
Nail biting	..	1	2	1
Bitter	..	..	4	3
Irritability	..	..	3	..
Depression	..	3	7	6
Noise conscious	..	..	1	..
Shame	..	..	1	2
..	1	1	10	2
	..	..	..	1

TABLE 20.—*Anxiety in Amputees*

	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-42	Total
Battle casualties									
Total number of patients	15	28	22	16	7	6	5	1	100
At age	10	21	21	10	5	5	4	0	76
Immediate anxiety									
Number	3	10	3	5	4	5	2	0	32
Per cent	30	47	14	50	80	100	50	0	42
Present anxiety									
Number	6	15	11	4	5	4	3	0	48
Per cent	60	71	52	40	100	80	75	0	63
Nonbattle casualties									
At age	5	7	1	6	2	1	1	1	24
Immediate anxiety									
Number	3	6	0	2	2	1	0	1	15
Per cent	60	85	0	33	100	100	0	100	62
Present anxiety									
Number	4	6	0	3	2	1	0	1	17
Per cent	80	85	0	50	100	100	0	100	70

TABLE 21.—*Psychiatric Conditions Before and After Injury as to Type of Injury*

Type of Amputation	Number of Patients in Study	Number of Patients Showing Conditions Before Injury	Number of Patients Showing Conditions After Injury
Battle casualties			
Upper	23	6	12
Lower	48	16	30
Double	5	1	1
Nonbattle casualties			
Upper	9	2	8
Lower	14	7	12
Double	1	1	1
Total casualties			
Upper	32	9	20
Lower	62	23	42
Double	6	2	2
Total	100	34	64

COMMENT

The most striking feature of the present study is the high incidence of psychopathologic conditions in a group of persons who seem well adjusted to their immediate environment. The environment to which they are adjusting has certain features that probably aid in this adjustment, and these features should be adequately substituted in the home after discharge. One element of the hospital environment is the acceptance of the patient as an ordinary person and not as an invalid, a hero or an object of pity. The nurses, physicians, fellow patients and even the people in the nearby city have become so accustomed to men lacking one or more extremities that the patients are looked on as other average citizens. This fact gives them great reassurance on their leave from the ward and should be a valuable tip to their families and the projected reception committees in their home town. Conn[9] has discussed this phase of the problem very well and mentions the "War 'Amps' of Canada" organization as an effective mental hygiene measure.

A second feature is the attitude of optimism prevalent among the ward personnel and the patients. The occupational training and physical therapy departments do much to foster this attitude. The patients have a ten-

8. Dunbar, Flanders: Psychosomatic Diagnosis, New York, Paul B. Hoeber, Inc.

9. Conn, H. R., in discussion on Symposium on Amputations, J. Bone & Joint Surg. 26: 670 (Oct.) 1944.

dency to set their occupational goals a little high, but the majority accept guidance in the choice of training and work hard at mastering the various technics.

The importance of a stable wife, sweetheart or mother is enormous. Those who visit them and show the normally expected excitement at the reunion and accept the injury as an unfortunate but unimportant incident give a tremendous boost to their morale. The dramatizers, the weepers and the rejecters add further burdens to the soldier who should be protected from such foolish behavior.

Another important feature in the hospital environment is the group morale or social pressure toward attainment of a useful productive role in life. This works subtly but powerfully. For example, only 1 patient in this series had phantom pain. Many entered the ward complaining bitterly of pain, demanding care from the nurses, asking for "hypos" and in general behaving in the same manner as our civilian compensation cases of phantom pain. Within a day or two these requests and complaints disappear. Neither physician nor nurse has said anything, but his fellows have. A day or so of group disapproval, often bluntly expressed, plus the varied constructive activities of the other patients seem to allay the pain and reorient the person toward his problem. It is realized that this particular brand of psychotherapy is not available outside the amputation section of the hospital, but it indicates that families and family physicians should ignore complaints and encourage constructive activity even though they are considered unsympathetic.

It is our opinion that most of these persons can and will adjust well in the communities after discharge if the community can meet their needs. These needs would seem to be a chance to work productively, marry and be accepted as an ordinary human being. We believe that an opportunity for a discussion of their problems with a competent psychiatrist would aid all patients with amputation to a better and more complete adjustment. This psychiatric aid should be available both in the hospital and after they return home.

TABLE 24.—*Change of Attitude Toward Religion in Amputees*

	Battle Casualties	Nonbattle Casualties	Total
Total number of patients	76	24	100
Number with increased religious feelings	29	5	34
Per cent of patients with increased religious feelings	38	20	34

SUMMARY

The reaction to the loss of one or more limbs has been studied in 100 soldiers who are considered normal. Seventy-six of these men were injured in battle and 24 in accidents.

Lower limb amputations predominate.

The average age of these patients is 26.7 years.

They are all well trained and experienced soldiers.

In general those with upper extremity injuries, married men and older men have less trouble in social adjustment to amputation.

More than 50 per cent plan some change in occupation as a result of the injury. The planned changes are more common in younger troops and in troops with lower extremity loss.

There is considerable difficulty in sexual adjustment. This phase of the problem is to be investigated further.

Signs of psychopathology in terms of personality change, anxiety, emotional instability, battle dreams and alcoholism occur in a surprising percentage of these men.

Phantom sensations of some type occur in 95 per cent of these patients.

An increased religious feeling is common in the two groups of patients but is more frequent in the battle casualties (38 per cent) than in the nonbattle casualties (20 per cent).

A history of previous accident is not common in these cases.

TABLE 25.—*Frequency Factor of Absence Without Official Leave in Amputees*

A. W. O. L. prior to injury	14%
A. W. O. L. after injury	3%
Total cases, 100	

TABLE 26.—*Previous Accidents*

	Number of Patients	Previous Accidents. Number	Per Cent
Battle casualties	76	5	6
Nonbattle casualties	24	1	4
Total previous accidents		6	

TABLE 23.—*Alcoholism in Amputees as to Type of Amputation*

Amount of Drinking Prior to injury	Heavy Drinker				Temperate Drinker				Abstinent			Total Number of Patients in Study
After injury	More	Less	No Change	Abstinent	More	Less	No Change	Abstinent	Heavy	Temperate	No Change	
Battle casualties												
Upper limb	..	..	..	..	..	5	15	1	..	1*	1	23
Lower limb	..	1	7	1	5	2	19	5	3	..	6	48
Double	..	1	..	..	1	..	3	..	..	..	..	5
Total	..	2	7	1	6	7	37	6	3	1*	7	76
Nonbattle casualties												
Upper limb	..	2	1	..	..	..	3	..	..	..	2	9
Lower limb	..	1	3	..	1	1	7	..	..	..	1	14
Double	..	1	..	..	..	..	..	..	..	..	..	1
Total	..	4	4	..	1	1	10	..	..	..	3	24
Total casualties												
Upper limb	..	2	1	..	..	5	18	1	..	1*	3	32
Lower limb	..	2	10	1	6	3	26	5	3	..	7	62
Double	..	2	..	..	1	..	3	..	..	..	..	6
Total	..	6	11	1	7	8	47	6	3	1*	10	100

* Reformed four years prior to injury.

PENICILLIN IN NEUROSYPHILIS

EFFECT ON BLOOD AND SPINAL FLUID

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PHILADELPHIA

In cases of neurosyphilis the response of the spinal fluid and blood are important objective criteria. Herein are suminarized the observations on blood and spinal fluid of 89 cases of neurosyphilis treated from November 1943 to October 1944. This study continues work previously reported [1] but is confined to cases treated at the University of Pennsylvania.

TABLE 1.—*Effect of Penicillin in Neurosyphilis*

Results in per Cent

		Became Normal	Total Improved	Unchanged	Worse
First course, 89 cases	Spinal fluid	12	72	18	10
	Blood	8	27	70	3
Second course, 29 cases	Spinal fluid	24	41	52	7
	Blood	0	7	83	10

Repeated examination, usually at two month intervals, were made of symptoms and signs and of the blood and spinal fluids. Cell counts were made immediately on fluid withdrawal; total protein was determined by the sulfosalicylic acid method of Kingsbury Clark. Kolmer quantitative Wassermann tests and colloidal mastic tests were run. The serologic tests on the blood were examined by a uniform series of technics, Kolmer, Eagle and Kline; for this report only the Kline quantitative titer results were used.

Sodium penicillin in aqueous solution was given intramuscularly for eight days, every four or three hours, for a total dose of 1.2 or 2.4 million Oxford units; a few received 3.0 or 4.0 million units. There was no intentional uniformity of lot or manufacturer. No other treatment which could influence the results was given.

The work described in this paper was done under contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and the University of Pennsylvania (OEMcmr-403).

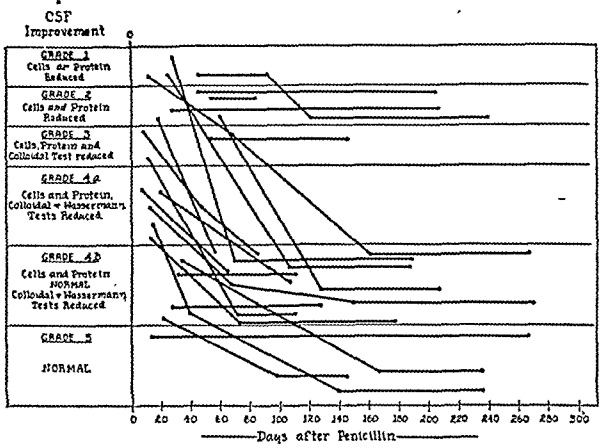
All material of this report is based on contributions from the Hospital of the University of Pennsylvania, Philadelphia General Hospital, Pennsylvania Hospital, Children's Hospital of Philadelphia and individual special departments constituting a penicillin panel.

From the Institute for the Control of Syphilis, University of Pennsylvania, United States Public Health Service cooperating. Neurologic work supported in part by the Kirby-McCarthy Fund.

1. Stokes, J. H.; Sternberg, T. H.; Schwartz, W. H.; Mahoney, J. F.; Moore, J. E., and Wood, W. B., Jr.: The Action of Penicillin in Late Syphilis, J. A. M. A. **126**: 73-79 (Sept. 9) 1944. Gammon, G. D.; Stokes, J. H.; Lentz, J. W.; Steele, W. H.; Rose, E. K.; Scott, J.; Scott, D. M., Jr., and Ornsteen, A. M.: The Immediate and Early Effects of Penicillin on Syphilis of the Central Nervous System, Tr. Am. Neurol. A. **70**: 65-69, 1944. Stokes, J. H.; Beerman, H.; Ingraham, N. R., Jr.; Lentz, J. W.; Morgan, H. G.; Gammon, G. D.; Steele, W.; Rose, E. K., and Gyorgy, P.: Penicillin in Late Syphilis: An Interim Report, Am. J. Syph., Gonor. & Ven. Dis. **29**: 313 (May) 1945.

RESULTS

Penicillin improves the spinal fluid in all its elements and to a lesser degree the blood serologic tests (table 1). The effect on spinal fluid cells and protein is greatest; only 6 of the whole group failed to become normal in respect to these items.



Improvement in cerebrospinal fluid (grades 2 and 3) under penicillin. Results of one course of penicillin. All fluids were, before treatment, grade 2 or 3 in the usual classification. Dots indicate the time of observation and are connected by lines to indicate the curve of the individual case. The improvement begins promptly and continues up to about one hundred and twenty days. The apparent exceptions occur in those cases in which infrequent observations were made. The degree of improvement is considerable in most cases. Retreatment accounts for the short time some of the cases were followed.

Tabetic cases show the least improvement in blood and spinal fluid of the various types of neurosyphilis (table 2). The reason probably lies in the fact that the more abnormal spinal fluids show the greatest improvement, as shown in table 3; the character of the fluid rather than the clinical type of the case appears to determine the response.

In judging the effect of treatment it is important to learn the time course of the change and particularly how long after a treatment session the improvement continues. As shown in the chart, the spinal fluid change begins a few days after penicillin is started and continues up to four months, after which very little further alteration can be seen. To observe the full effect, therefore, the case must be followed at least one hundred and twenty days.

TABLE 2.—*Response of Spinal Fluid of Various Types of Neurosyphilis to One Course of Penicillin*

Type of Neurosyphilis	Cases	Spinal Fluid Response in per Cent: To Normal	Improved	Total Improved	Total Unimproved	Unchanged	Worse	Normal Unchanged
Total.....	89	12	60	72	21	18	10	7
Dementia paralytica.	17	0	88	88	12	6	6	0
Tabes.....	32	16	43	59	32	25	16	9
Meningovascular...	23	19	57	76	19	19	5	5
Asymptomatic.....	11	15	62	77	23	8	15	0
Congenital	6	17	50	67	0	33	0	33

The table shows that the fluids of tabetic patients are least affected by penicillin.

The column Total Unimproved is the sum of columns Unchanged and Worse less column Normal, Unchanged. The sum of columns Total Improved, Total Unimproved and Normal Unchanged equals 100. Column Unchanged includes Normal Unchanged group; therefore the sum of Total Improved, Unchanged and Worse equals 100.

Two dosage levels were used: a low dose of 1.2 million units and a high dose of 2.4 million; a few patients were given 3.0 and 4.0 million units. Comparison of the results in these two groups appears to show no difference between them (table 4). But if the time element is taken into account, that is, if the cases

TABLE 3.—*Spinal Fluid Response in per Cent to One Course of Penicillin*

Control Spinal Fluid	Became Normal	Total Improved	Unchanged	Worse
Severely abnormal, 56 cases.....	13	93	2	5
Moderately abnormal, 23 cases....	17	51	40	9
Normal, 10 cases.....	..	..	60	40

Control spinal fluid signifies pretreatment fluid. The severely abnormal fluids are grade 3 in the usual classification. Moderately abnormal includes fluids with normal cells and protein but abnormal Wassermann and mastic curves.

The more abnormal fluids show a greater response than the less abnormal fluids. This is due in part to the fall in cells and protein, which almost always improve. Normal cases becoming worse usually show a very mild abnormality, which may be within the error of the methods used.

are followed long enough to obtain the maximum effect, there appears to be a slightly better response in the higher dosage group (table 5). In this table patients given one course only at low and at high dosage are compared with the final result in patients given a high dose administered in two courses, in other words, retreated. From the last three columns of the table it can be seen that better results are obtained from a high dose than a low one, and the best results from a high dose given in two courses as retreatment. In the latter, the effect of time is operative as well as dosage. It therefore appears that giving the high dose over a longer time is more effectual than administering it in a single short course. Although when tested by the chi square there is not a significant difference between these groups, the trend to the foregoing conclusion is clear.[2]

In view of these considerations and in order to judge the effect of time or length of treatment as well as the dosage levels, it is believed desirable to plan further treatment of neurosyphilis along these lines: Total

TABLE 4.—*Comparison of Effect of Various Amounts of Penicillin on Spinal Fluid and Blood (in Parentheses), One Course*

Results in per Cent

Million Units	Cases	To Normal	Total Improved	Unchanged	Worse	Control Normal No Change
1.2	54	13 (9)	68 (28)	19 (61)	9 (2)	4 (9)
2.4	22	8 (6)	72 (24)	6 (47)	11 (6)	11 (23)
3.0	7					
4.0	6					
	35					

No significant difference between the results of a low dose of 1.2 million units and a high dose can be seen. This table differs from table 5 in that the length of time after treatment is not considered.

dosage should be kept constant; it should be administered (1) as a single course and (2) split into two courses, the second given (*a*) at the end of the first course and (*b*) later, probably at the time when the results of the first have leveled off, at one hundred and twenty days.

Considering the data now available, we are increasing the total dose to 4.8 million units; this may be given in a single course of eight days and split into 2.4 million units administered in two courses at different times, as described.

The observation period over which these cases were followed is, in days, less than thirty, 1 per cent; thirty to sixty, 5 per cent; sixty to one hundred, 12 per cent; one hundred to two hundred, 31 per cent; two hundred to three hundred, 35 per cent; three hundred to four hundred, 14 per cent; to four hundred and eighty-three, 1 per cent.

SUMMARY

Penicillin shows a clear effect on the blood serologic reactions in neurosyphilis and an even greater effect on the elements of the spinal fluid. Fluids showing the greatest abnormality improve most. The improvement apparently continues for as long as four months after an eight day course.

Both dosage and length of treatment are important in the result. Within the amounts of sodium penicillin employed in this study, a larger dose is better than a smaller and the best results are obtained when the larger dose is given in two courses; that is, when the length of treatment is increased. In view of the history of other forms of treatment for syphilis, this might have been expected.

TABLE 5.—*Effect of Various Dosages of Penicillin on Spinal Fluid*

Dose in Million Units	Cases	Normal	Improved	Unimproved
One course, 1.2; 2.4; 3.0; 4.0....	41	22	80	20
One course, 1.2.....	24	21	75	25
One course, 2.4; 3.0; 4.0.....	17	24	88	12
Two courses, 2.4; 3.0; 4.0.....	20	31	92	8

The time of each course was the same, eight days. One course signifies no further treatment; all of these were followed one hundred and twenty days or more, which is long enough to observe the maximum change (as shown in the chart). Fluids normal before and unchanged during treatment are deleted.

A better result is obtained from a high dose than from a low dose, and the best result from a high dose given in two parts. Increasing the length of treatment as well as the dose improves the results.

2. Dr. Harold Austin gave advice on statistical matters in the study.

First Great Name in American Science.—Though his career as a printer, publisher, almanac keeper, diplomat, statesman, signer of the Declaration of Independence and member of the Constitutional Convention—not to mention his exploit with the kite, the key and the lightning bolt—are well known, too few, perhaps, appreciate that "Poor Richard," Benjamin Franklin, is the first great name in American science. Among his significant scientific contributions, most of which preceded his diplomatic days, can be named invention of the "Franklin stove" and bifocal spectacles; founding of hospitals, libraries and the first American scientific society, the American Philosophical Society (1743); improvement in public works, such as street lighting and postal systems; description of lead poisoning, an industrial disease of the print shop; and experiments in electricity. Franklin's famous kite experiment, performed in June 1752 in Philadelphia, was undertaken to prove that lightning, fashioned in the skies of the gods of the weather, was the same stuff that men were making on earth with their newly invented "static electricity machines" and storing in "Mr. Muschenbrock's wonderful bottle," the foil lined Leyden jar out of Holland. Franklin had completely investigated this "shocking instrument" a year or two after its invention (1745) and had concluded that there were two kinds of electricity, which he named positive and negative. Franklin was not the only founding father of the Republic who was interested in science. When Thomas Jefferson (1743-1826), author of the Declaration of Independence, rode horseback to his inauguration as third President of the United States in 1801, he carried in his saddlebags specimens of fossil bones on which to lecture before the American Philosophical Society.—The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co., Inc., 1945.

THE USE OF DRUGS IN RESUSCITATION FROM ELECTRIC SHOCK

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For many years I have encountered the apparently irresistible compulsion of doctors to give some sort of hypodermic injection to patients overcome by carbon monoxide, close to death from submersion, or in desperate straits from electric shock. At one time in a long experience I listed, as well as the records permitted, the different drugs given in carbon monoxide emergencies by ambulance physicians in New York. Nothing in the traditional teaching of medical students was left out.

This is not such a reflection on these young doctors and their training as may be thought. The drugs injected can be shown to stimulate breathing but not in the dosage or under the circumstances which are of consequence in the emergencies in which we are interested.

Let us consider an instance of electric shock in which the victim, who is obviously unable to breathe and whose heart and circulation may or may not be operating, is being given artificial respiration. The questions which arise at such a juncture are whether any drug can be administered which will at once improve the chances for reviving the breathing or aid the condition of the circulation.

STIMULANTS TO BREATHING

The following drugs can be shown by animal experimentation to stimulate breathing. I shall list what they do and where they fail. All the drugs can be given intravenously or under the skin by injection.

1. *Strychnine Sulfate.*—This alkaloid has a stimulating action on the spinal cord, on the medulla containing the respiratory center and on the brain. But in dosage of nonpoisonous size, strychnine has no appreciable effect on breathing and, when given in sufficient amount to stimulate breathing momentarily, the drug is eventually depressing to respiration and thus adds to, rather than remedies, the condition of the patient. The fact is that all medical men have so wholesome a respect for strychnine as a poison that such injections as are frequently given are so small as to be both ineffectual and harmless.

2. *Picrotoxin.*—This drug is a strong stimulant to the nervous system, particularly the lower brain and medulla, where respiration originates.

Again, however, it has been shown that when enough picrotoxin is injected to stimulate breathing convulsions result.

Picrotoxin, used carefully, under hospital conditions has proved useful in combating poisoning due to the barbiturates (veronal and other barbituric acid derivatives) but has no place in emergency failure of breathing from electric shock.

3. *Metrazol.*—This drug is related to camphor and has had extensive use in the treatment of certain sorts of insanity by the production of generalized convulsions. This means it is a strong stimulant of the nervous system, but it has no conspicuous effect on breathing and has no value in respiratory failure from electric shock.

4. *Nikethamide* (Coramine).—This is a relatively new drug and has some promise as a stimulant of a depressed breathing center. This value is, however, very uncertain, and nothing so far claimed for it makes the compound worth serious consideration in electric shock therapy.

5. *Caffeine and Sodium Benzoate.*—This caffeine compound is suitable for intravenous injection, and caffeine even in enormous dosage seems devoid of harmful effects of a serious sort. There is no doubt of the general stimulating effect of caffeine on the central nervous system, the breathing center included. I think it fair to describe the action as a sort of oiling of staggering nerve machinery. It thus makes normal processes in the breathing center go on more readily, and I know of no evidence that the drug can or has done harm. An intravenous injection of caffeine and sodium benzoate is not out of place in any sort of respiratory depression, but the injection must be made directly into the blood by vein and not be a simple hypodermic (under the skin), since prompt action is imperative.

6. *Alpha Lobeline.*—This drug had popularity as a respiratory stimulant about ten years ago and, fortunately, has dropped out of use, owing to its very capricious effect as a stimulant to breathing and its emphatically disadvantageous effects on the heart and circulation.

SUMMARY

At the present time there is no substance which can be given by injection which benefits the breathing significantly. Caffeine and sodium benzoate intravenously may be useful but has no specific potency.

In my opinion the Edison Institute might do well to consider financing research looking toward the discovery of some substance which will be of substantial aid to the respiratory center, much as does caffeine, but really efficient. I do not think any agency so completely dependent on the attendance of a physician, as is an intravenous injection, can be of primary consequence in resuscitation from electric shock, but year by year we have instances of artificial respiration carried out for minutes to even many hours with eventual recovery. It must be clear to every one that the most our crews trained in artificial respiration accomplish during their period of effort is to substitute artificial breathing for absent natural breathing. They merely give the patient a chance to recover by arresting asphyxia. I believe more than this could be done in the direction of finding some direct aid to the respiratory center and that in such a direction we shall see our greatest advances in the resuscitation of the most serious electric accidents.

STIMULANTS TO THE HEART AND CIRCULATION

The condition of the heart and the blood circulation as a result of electric shock is far better understood than was the case even a few years ago. Divested of all the medical description possible, it seems to me that the following circulatory derangements may be met:

1. The shock, by passing through the medulla, may have stopped the breathing and left the circulation of the blood somewhat impaired but not seriously so. This

From the Department of Physiology, Harvard School of Public Health. Read before the Committee on Safety of the American Institute of Electrical Engineers, New York, Jan. 23, 1945

is the ideal case for resuscitation. But if four or five minutes of absent breathing intervene before artificial respiration is started, the heart and blood vessels will begin to show the effects of oxygen lack. Oxygen will remedy this condition, and no injection or treatment other than artificial respiration is required or advisable.

2. The medulla, in addition to the breathing center, contains in very small space the centers for regulating the heart rate, particularly for slowing the heart and for regulating the blood pressure by controlling the caliber of the smallest blood vessels One may thus expect that a shock which stops breathing can readily affect nearby units concerned with the circulation. This occurs and, consequently, the situations resulting may be quite varied. Let me list a few of them:

(*a*) Breathing may be absent and the heart very slow and weak with low blood pressure.

(*b*) Breathing may be present, the heart slow and the blood pressure variable but becoming low

(*c*) Breathing may be irregular with a tendency to stop, the heart slow, irregular and weak, and the blood pressure low.

Obviously, these possible situations may vary between themselves so that in each case the condition of the circulation can be appraised only by a competent physician. By "competence" I mean a man capable in cardiology and with at least some knowledge of the consequences of electric shock Very few doctors meet this last mentioned requirement, and consequently the treatment given such patients is not, to say the least, discerning

Artificial respiration for absent or inadequate breathing is, of course, essential, since lack of oxygen will make the condition of the circulation grow worse rapidly. If breathing is feeble and unreliable, oxygen-carbon dioxide inhalation is helpful Absolute rest is imperative.

If the blood pressure continues to remain low and the heart feeble so that the patient begins to be in danger for circulatory inadequacy, the physician may consider giving an intravenous injection of a small dose of epinephrine or ephedrine. In either case the injection should be given very slowly and should be understood to be a last resort. Caffeine and sodium benzoate, discussed in the section on breathing, should have been given early in the management of the case and will benefit the circulation.

3. The shock by passing through the heart may cause ventricular fibrillation The patient is dead white, not bluish. No pulse can be felt and after three or four breaths respiration ceases. Such patients are often given injections of epinephrine through the chest wall directly into the heart

There is increasing evidence that ventricular fibrillation occurring spontaneously in man, though usually fatal, occasionally ceases with return of the heart to normal rhythmic beating. There is no reason to believe the same thing may not happen *after electric shock*, but such an event must be very rare.

There is no practical procedure which affects the fibrillating heart muscle, and an intracardiac injection of epinephrine can be relied on to do but one thing, namely make fibrillation worse, *so that any chance of* spontaneous shift to normal pulsation is lost.

Clinical Notes, Suggestions and New Instruments

SKIN GRAFTING IN HEMOPHILIA WITH A PREPARATION OF THROMBIN AND SULFANILAMIDE

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Operative procedures on patients with hemophilia are not often undertaken because of the high postoperative mortality Excessive bleeding following such a simple operation as tooth extraction has been a common cause of death[1] Recently the use of certain active thrombin preparations has made tooth extraction in hemophilia a relatively safe procedure[2] To our knowledge skin grafting has not been attempted in hemophilia, largely because of the likelihood of uncontrolled bleeding from the donor site



Fig 1.—Recipient area before skin grafting

The present report concerns a successful skin graft operation on a patient with hemophilia by means of a preparation of thrombin[3] and sulfanilamide[4] to control the bleeding from the donor site

REPORT OF CASE

W. M., a white man aged 26, hemophilic, of Irish descent, was admitted for the fourteenth time on March 6, 1944

His previous admissions had been for bleeding from a cut lip, from the buccal mucosa, for epistaxes, for hematomas for bleeding from loss of "milk" teeth and from cuts on the right

From the Thorndike Memorial Laboratory; the Second and Fourth (Harvard) Medical Services, Boston City Hospital, and the Department of Medicine, Harvard Medical School

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1 Birch, C L Hemophilia Clinical and Genetic Aspects, Urbana, Ill, University of Illinois Press, 1937

2 Lozner, E L, MacDonald, H, Finland, M, and Taylor, F H L The Use of Rabbit Thrombin as a Local Hemostatic, Am J M Sc **202**: 593 (Oct) 1941

3 Taylor, F H L, Lozner, F L, and Adams M A The Thrombic Activity of a Globulin Fraction Derived from Rabbit Plasma, Am J M Sc. **202**: 585 (Oct) 1941

4 This material was made available through the courtesy of the Lederle Laboratories, Pearl River, N Y

knee. He also suffered, from the age of 2, from other episodes of abnormal bleeding, especially hemarthroses and attacks of hematuria. The coagulation time of his blood has been from one to one and one-half hours as measured by a modification [5] of the method of Lee and White [6]



Fig 2.—Donor site at operation after application of thrombin with sulfanilamide. Note absence of bleeding.

The patient's family history included one maternal uncle, one brother and one maternal first cousin and one second cousin with hemophilia.



Fig 3.—Recipient area nine months after grafting. Complete healing.

The present bleeding episode began one month before admission following an abrasion and contusion of the right leg just distal to the anterior tibial tubercle. A transfusion of whole blood was given and a dry sterile dressing applied to the area. There was little subcutaneous hemorrhage. Healing was satisfactory, but the area was traumatized again three and one-half weeks later and became swollen, red and exquisitely tender. There was an area of cellulitis extending from the knee to the ankle, and swollen tender lymph nodes appeared in the right groin. His temperature was 102 F., the pulse rate 140. The following day the wound began discharging old blood and pus, and the patient was admitted to the hospital. Full doses of sulfadiazine orally were begun, and débridement of the gangrenous skin over the infected hematoma was carried out, care being taken not to incise normal skin. A considerable amount of pus and large blood clots were removed. A firm dressing of a sulfathiazole emulsion [7] was applied and subsequently changed infrequently. The patient became afrebrile on the fourth day and remained so thereafter. The cellulitis subsided and the wound began to granulate. Two weeks after admission, under pentothal anesthesia, a split thickness razor graft was taken from the lateral aspect of the left thigh and applied to the granulating area (fig. 1). The bleeding from the donor site was controlled instantly by applying a mixture of powdered sulfanilamide and thrombin to the area (fig. 2). Firm dry dressings were applied to both donor and recipient sites. There were no postoperative complications. The donor site healed uneventfully in nine days. The take of the graft was excellent (fig. 3).

5 Pohle, F. J., and Taylor, F. H. L. The Coagulation Defect in Hemophilia. The Effect in Hemophilia of Intramuscular Administration of a Globulin Substance Derived from Normal Human Plasma, J. Clin. Investigation 16: 741, 1937.

THROMBOCYTOPENIC PURPURA DUE TO MAPHARSEN (OXOPHENARSINE HYDROCHLORIDE U. S. P.)

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Blood dyscrasias such as thrombocytopenic purpura are uncommon complications of arsenotherapy for syphilis. It was nine years after the introduction of arsphenamine before Labbé and Langlois [1] called attention to the fact that purpuric manifestations might be a complication of this therapy for syphilis.

Loveman [2] was able to find reports of 14 instances of purpura hemorrhagica following arsphenamine therapy up to 1931 and added 1 case of his own. In 1942 Engelhardt,[3] in reporting a case of purpura hemorrhagica following neoarsphenamine, found 50 cases of thrombopenic purpura complicating arsphenamine therapy. Falconer and Epstein,[4] in discussing their observations on 8 cases of typical purpura following arsphenamine, have expressed the opinion that this toxic manifestation of arsphenamine therapy was relatively more frequent than reported and that the increased number of reported cases was probably due to a more widespread interest and alertness in recognition of complications due to arsphenamine therapy.

Neoarsphenamine, arsphenamine, sulfarsphenamine and bismarsen have been the arsenicals most frequently associated with this complication. Of this group neoarsphenamine has been by far the most often linked with this complication. However, one should not infer from this fact that neoarsphenamine is the most toxic of the arsenicals, since the latter drug up until recent times has been the most commonly employed of this group of arsenicals in antisyphilitic therapy. Mapharsen was introduced in 1936 for general use and has been used extensively since that time in the treatment of syphilis. Review

6 Lee, R. I., and White, P. D. Clinical Study of the Coagulation of Blood, Am. J. M. Sc. 145: 495, 1913.

7. Ackman, D., and Wilson, G. Surgical and Gynecological Experiences with an Emulsion of Sulfathiazole, Canad. M. A. J. 46: 209, 1942. This material was made available through the courtesy of Smith, Kline and French, Philadelphia.

From the Department of Medicine of Wayne University College of Medicine and City of Detroit Receiving Hospital.

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2 Loveman, A. B.: Toxic Granulocytopenic Purpura Hemorrhagica and Aplastic Anemia Following Arsphenamines, Ann. Int. Med. 5: 1238-1256 (April) 1932.

3 Engelhardt, H. T., and Bruno, F. E.: Observations on a Case of Thrombopenic Purpura Following Administration of Arsenicals, Urol. & Cutan. Rev. 46: 654-656 (Oct.) 1942.

4 Falconer, E. H., and Epstein, N. N.: Purpura Hemorrhagica Following Neoarsphenamine and Bismarsen Therapy, Arch. Int. Med. 65: 1158-1177 (June) 1940.

of published reports fails to reveal a single instance of thrombopenic purpura complicating mapharsen therapy. However, Wintrobe[5] has recently stated that he has seen 3 instances of this complication due to the drug. It is our purpose in this paper to report a case of thrombopenic purpura complicating mapharsen therapy for syphilis.

REPORT OF CASE

A white man aged 24, admitted to Detroit Receiving Hospital Nov. 16, 1941 because of copious bleeding from his mouth and nose, on admission gave a history of a penile lesion in March 1941 followed by a generalized eruption a month later. His family physician found a positive serologic reaction and instituted antisyphilitic therapy on April 24. This consisted of 0.06 Gm. of mapharsen intravenously and a bismuth compound intramuscularly for thirty weeks without a rest period. The first seventeen injections were well tolerated. Shortly after each of the last thirteen injections he experienced transient severe headaches. However, there were no other untoward symptoms.

On November 14, two days before admission to the hospital, he received his thirtieth injection of mapharsen. This was soon followed by severe headache, nausea and vomiting. Later that day he began to bleed from the mouth and subsequently from the nose. Local measures were of no value in controlling the bleeding. The next day a purpuric eruption was noted over the lower extremities and at the same time he noted that he bruised very easily and ecchymotic areas appeared over the upper arms.

There was no history of allergic, familial or hereditary disease. No drugs other than bismuth compounds and mapharsen were taken during his course of antisyphilitic therapy. Although isolated reports have appeared implicating bismuth,[6] it seems unlikely that this was the offending drug in this case, since bismuth was reinstituted after his recovery without untoward effects.

Physical examination on admission revealed that the patient was well nourished and developed and was acutely ill. The blood pressure was 124/70 and his temperature was elevated to 101 F. There was a purpuric area in the right conjunctiva, and a few small flame shaped hemorrhages were seen in both fundi. The mouth was foul smelling, and over the soft palate and posterior pharynx there was a large ecchymotic area. The uvula was edematous and ecchymotic, and there were several blood filled blebs on the buccal mucous membranes. Although he had profuse epistaxis, no bleeding points were discernible. There was no adenopathy, and but for a soft systolic murmur at the apex the heart and lungs were normal. The liver edge was palpable at the right costal margin and the spleen descended 2 fingerbreadths below the left costal margin. Over both tibial areas of the legs there was a generalized purpuric eruption. The capillary fragility test at this time was strongly positive.

Shortly after admission a blood count revealed 11.5 Gm. of hemoglobin, 4,160,000 red blood cells and 9,300 white blood cells, with 95 per cent neutrophils and 9,320 platelets. The bleeding time was over fifteen minutes and the clotting time eleven minutes. There was no clot retraction in twenty-four hours. Urinalysis was negative; the Kline reaction was doubtful but the Kahn reaction negative.

He received a 500 cc. blood transfusion the day after admission, but he continued to bleed from the mouth and nose for another two days. Daily platelet counts during this time varied between 4,000 and 6,000 platelets. In addition there appeared a fall in hemoglobin and erythrocytes as the result of continued bleeding. From the fifth day after admission until he was discharged from the hospital the platelet count rose, with the subsidence of bleeding manifestations and disappearance of the purpuric eruption. The spleen decreased in size during this period, being barely palpable three weeks after admission. A bone marrow aspiration on November 25 was entirely normal; the megakaryocytes present appeared of normal structure, staining quality and number. The bleeding time returned to within normal limits nine days after admission, at which time the clot retraction was complete in two hours and the capillary fragility test was negative.

Before he was discharged he received 5 mg. of mapharsen intravenously and its effect on the blood platelets was noted by taking platelet counts before and one-half hour after the injection. This amount of mapharsen had little effect on the blood platelets, the count being 194,000 before and 154,000 one-half hour after the injection. However, the patient complained of severe headache shortly after this procedure, there was an accompanying increase in pulse rate and the blood pressure, which had on former occasions averaged 120/80, fell to 96/60. The effects were of only short duration and resembled a nitritoid reaction.

On Dec. 9, 1941 he returned to the outpatient department and at this time received 40 mg. of neoarsphenamine intravenously so that its effect on the thrombocytes might be studied. It is well to remember that although this dose is a comparable fraction of the therapeutic dose it actually contains 8 mg. of arsenic, whereas the mapharsen test dose contained only 1.5 mg. of arsenic. A platelet count done before the injection of neoarsphenamine revealed 184,000 platelets. However, one-half hour after the injection the platelet count had fallen to 1,800. Somewhat later in the day he again began to bleed from the nose and mouth and hospitalization was again necessary. Physical examination on this admission revealed oozing from the gums and nose and hemorrhagic herpetic lesions on the mucous membranes of the lips. There was some oozing from the site of the intravenous injection, and over the ankles and tibias a purpuric eruption again appeared. The day after admission no platelets were found on examination of the peripheral blood, bleeding time was again prolonged, there was no clot retraction in twenty-four hours and the capillary fragility test was positive. From this time until his discharge from the hospital three days later the platelets rapidly rose to normal levels, the oozing from the mucous membranes of the mouth and nose subsided and the purpuric eruption disappeared. Blood studies done on this admission revealed a slight posthemorrhagic anemia but no abnormalities of the leukocytes.

He was treated with weekly injections of bismuth following his discharge with no untoward effects. After five months there was a reversal of his serologic reaction to negative and he was subsequently inducted into the armed forces.

COMMENT

In view of this thrombopenic reaction to mapharsen it is interesting to note the work done by Falconer and Epstein.[7] They studied several cases of thrombopenic purpura that were due to sensitivity to neoarsphenamine and bismarsen and administered as much as 40 mg. of mapharsen without effects on the platelets and capillaries and without observing constitutional manifestations. These investigators thought that the quantity of arsenic may be an important factor for this phenomenon, since mapharsen contains less arsenic. This seems to be borne out, at least in this case. Although sensitization to neoarsphenamine had resulted from the long administration of mapharsen, the reaction to a therapeutically equivalent dose of neoarsphenamine was much greater than that following a test dose of mapharsen. It was also suggested by Falconer and Epstein in view of the lack of reaction to mapharsen in their neoarsphenamine sensitive cases that sensitivity may be due to some oxidation product not present in mapharsen. The latter thought, however, does not seem plausible in view of this reported case of thrombopenic purpura due to mapharsen. Because of the differences of reaction in this case to comparable test doses of mapharsen and neoarsphenamine, it would seem that the factor of quantitative differences of arsenic present in neoarsphenamine and mapharsen might be the more important one. Further treatment with mapharsen of patients already

5. Wintrobe, M. M.: Clinical Hematology, Philadelphia, Lea & Febiger, 1942.

6. Bianchi, A. E.: Comments on a Case of Purpura, Rev. Asoc. méd. argent. 46: 1566 (Dec.) 1932.

7. Falconer, E. H.; Epstein, N. N., and Wever, G. K.: Purpura Hemorrhagica Following Administration of Neoarsphenamine, Arch. Int. Med. 58: 495-511 (Sept.) 1936. Falconer and Epstein.[4] Epstein and Falconer.[8]

sensitized to one of the other arsenicals may be extremely hazardous even though it was found that mapharsen produced no ill effects on the blood platelets of patients having had thrombopenic reactions to neoarsphenamine, bismarsen and other arsenicals.[8]

The exact mechanism for this purely thrombopenic reaction to the arsphenamines is not clearly understood. All these reactions are characterized by three findings: (1) free bleeding from mucous membranes, (2) a very rapid fall in circulating thrombocytes, as rapidly as fifteen to thirty minutes following the injection of an arsenical, and (3) evidence of increased capillary fragility as manifested by purpuric spots and a positive Rumple-Leede test. In this case, as well as in others so studied, the bone marrow showed no abnormalities. It is also noteworthy that a great number of platelets can be returned promptly into the general circulation by the injection of epinephrine,[4] although the latter observation was not found to be true in the case herein reported. In most cases of thrombopenic purpura following arsenotherapy the platelet count begins to rise in twenty-four to forty-eight hours and returns to normal in four to seven days after the reaction, as was true in this case. No fatalities have been recorded thus far as a result of this complication, differing in this respect from the other types of blood dyscrasia reactions to the arsphenamines.

It would seem, therefore, that the blood platelets that disappear from the circulation are not actually destroyed and that there has not been selective destruction of the megakaryocytes in the bone marrow. Falconer and Epstein[8] have postulated the theory that the blood platelets leave the larger vessels and enter greatly dilated capillaries, which are more permeable, probably because of some toxic action on the vasomotor center controlling capillary tonus. These investigators[9] have studied the effects of neoarsphenamine on the formed elements of the blood and have found no conclusive evidence that it affects the platelets to any extent. On the other hand, Mu[9] has observed a significant fall in platelets following the intravenous administration of neoarsphenamine. However, it should be noted that he was using doses which were much greater than those ordinarily employed therapeutically in the treatment for syphilis. It would seem, therefore, that thrombopenic reaction to the arsphenamines is due to the development of a sensitivity to repeated injections of the arsenicals employed and resembles to some extent a nitritoid reaction. It is interesting to note that peripheral thrombocytopenia has been observed in experimentally produced anaphylactic shock.[10]

SUMMARY

1. A case was observed of thrombopenic purpura following the prolonged administration of mapharsen. Although a few other cases of this complication following mapharsen have been seen, we believe this to be the first reported case.

2. Although mapharsen has been used with no untoward effects in some cases of thrombopenic purpura in which sensitization to neoarsphenamine has occurred, nevertheless it may be extremely hazardous to employ any arsenical once a patient has had such a reaction.

3. This thrombopenic reaction to mapharsen has many of the characteristics of a sensitivity reaction and resembles the nitritoid phenomenon.

4. From the available evidence it seems reasonable to assume that the platelets in the peripheral blood are not destroyed but are merely dislocated temporarily into the large capillary beds of the vascular tree, which have been rendered more permeable.

5. Isolated thrombopenic reaction following arsenical therapy is invariably associated with a good prognosis, provided the drug is stopped.

8. Epstein, N. N., and Falconer, E. H.: Effects of Neoarsphenamine on Formed Elements of Blood, Arch. Dermat. & Syph. **42**: 909-918 (Nov.) 1940. Falconer and Epstein.[4]

9. Mu, J. W.: Effect of Neoarsphenamine on Number of Blood Platelets, Proc. Soc. Exper. Biol. & Med. **26**: 407-409 (March) 1929.

10. von Behring, E.: Experimentelle Analyse und Theorie der anaphylaktischer und apotoxischer Vergiftung, Deutsche med. Wchnschr. **40**: 1857, 1914. Lee, R. I., and Vincent, B.: Study of Effect of Anaphylaxis and Leech Extract on Coagulation of Blood, J. M. Res. **27**: 445, 1915.

Council on Foods and Nutrition

SPECIAL ARTICLE

This is the ninth and last of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication.

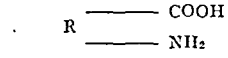
GEORGE K. ANDERSON, M.D., *Secretary.*

THE PRACTICAL USE OF AMINO ACIDS IN PROTEIN NUTRITION

ROBERT ELMAN, M.D.
ST. LOUIS

Amino acids are to protein what glucose is to starch. In other words, they are the unit components of food and tissue protein. Their discovery, purification and identification mark one of the milestones in the development of the science of nutrition. The isolation from foods of these specific chemical components which enter into the metabolic activities of the body represents the most important recent contribution of chemistry to the field of nutrition.

Amino acids differ from vitamins in that they are more than catalysts or enzymes; they actually enter into the structure of body tissue. While they are thus used up like glucose, unlike the latter they are not burned as fuel unless calorigenic elements are absent, when they may act for glucose when the latter is not available. They are also unlike other purified food essentials because there are so many of them. The glucose molecule represents the form in which carbohydrate is utilized; even the vitamin B complex has been divided into a number of different crystalline substances. On the other hand, amino acids are twenty-one or more in number, each different, though conforming to the same general chemical formula in that they contain an amino group and a carboxyl group.



Consideration, therefore, of the amino acids as the structural units of food protein leads immediately to an enumeration of these various amino acids (table 1). Most important is the fact that but ten of them may be considered as "essential." These essential amino acids are also termed indispensable in that the body is unable to manufacture them from other amino acids or from simpler material and that they must be supplied before normal protein metabolism can occur. For example, normal growth will take place if these essential amino acids are fed to growing rats as the sole source of protein in the diet. Yet if one of them is omitted, normal growth is not obtained. In this sense certain of the individual amino acids assume an importance comparable with the vitamins in maintaining normal nutrition and life processes. Much of the recent investigation regarding the nutritive significance of the amino acids has been carried out and described by W. C. Rose.[1]

Further consideration of amino acids reveals the fact that each protein in the body as well as each protein in food has its own individual amino acid composition (table 2). Thus transfers from one protein to another may be conceived as requiring a breakdown of the

Aided by a grant from the Commonwealth Fund.

1. Rose, W. C.: Physiol. Rev. **18**: 109, 1938.

protein molecule into its individual amino acids with the reassembling of them to form another protein. This general procedure is the normal method by which food protein is transformed into tissue protein—hydrolysis or digestion occurs in the gastrointestinal tract; the resulting amino acids are absorbed into the portal system and the synthesis of these building stones then takes place in the liver and other tissues. It is also probable that extra-

TABLE 1.—*The Various Amino Acids in Protein*

Indispensable	Dispensable
Lysine	Aminoacetic acid
Tryptophan	Alanine
Histidine	Serine
Phenylalanine	Norleucine
Leucine	Aspartic acid
Isoleucine	Glutamic acid
Threonine	Hydroxyglutamic acid
Methionine	Proline
Valine	Hydroxyproline
Arginine	Tyrosine
	Cystine

alimentary transfers also require a similar mechanism as, for example, the use of tissue protein in the synthesis of new serum protein after its loss in a hemorrhage. Other types of interchange between protein molecules also occur, as shown for example by the recent studies of Schoenheimer.[2] The important conception to emphasize from these new studies on protein metabolism is one of dynamic rather than static equilibrium. In other words, protein is constantly undergoing rapid and perhaps profound changes of many kinds; the concept of great masses of inactive protein stores must be abandoned—all protein tissue is in a constant state of chemical activity.

By using amino acids instead of food protein the physician can administer protein nourishment in its simplest form just as he uses glucose. With parenteral administration he does not have to depend on digestion and absorption by the gastrointestinal tract. In this way protein starvation can be avoided even though these two functions are completely impaired. Even if the patient requires parenteral fluids, these need no longer be confined to salts or glucose; protein building substances can now be just as easily supplied. Amino acids may also be administered orally for the maintenance of proper nutrition in certain special conditions, as will be described

SOURCES OF AMINO ACIDS

Like chemically pure glucose and vitamins, amino acids are available in crystalline form and may be purchased on the open market as such. They may then be combined in the desired proportions and given to the patient either by mouth or by injection just as in the case of crystalline vitamins or glucose. The greatest drawback to this is the cost. The large amount of protein nourishment needed makes the use of crystalline amino acids unpractical at the present time, although it may be that in the future chemical methods will be devised whereby crystalline amino acids may be cheap enough to permit their general use. Another objection to crystalline amino acids is the fact that, in preparing some of them, racemic mixtures are obtained containing both the natural and unnatural isomers, which are difficult to separate. All natural proteins contain only the natural isomers, although in the case of some amino acids the two forms are equally utilized. The suggestion of Albanese [3] that the unnatural form may in some cases be deleterious is an important consideration which needs further investigation.

By means of an adequate digestion in vitro of natural proteins a mixture of amino acids may be easily obtained. These procedures are essentially similar to those by which the body produces amino acids from protein food in the gastrointestinal tract and are both practical and cheap. Such methods of preparing amino acids involve the possibility of losing some of the essential ones during the procedure of digestion and purification. However, losses are dependent on the technical details and moreover can be measured by testing the resultant digest both chemically and biologically for the presence of all the essential amino acids. Another disadvantage of using protein hydrolysates as a source of amino acids is the possible generation or introduction of foreign or deleterious substances during manufacture This difficulty can, apparently, be avoided by carefully conducted procedures. A final possible criticism is the presence of peptides as well as amino acids in the final mixture; this objection appears to be of no practical significance. As long as digestion has been sufficient to remove all traces of true protein molecules, no danger seems to arise from the presence of peptides provided they are not too large. How large they may be is not really known. On the other hand, it may prove advantageous to provide some peptides rather than single amino acids in that one step in the process of building of body protein may be saved.

The several methods for producing amino acids by the digestion of protein may be classified in general into enzymatic and acid hydrolysis methods. Thus far the enzymatic procedure has been the more exten-

TABLE 2.—*Essential Amino Acid Composition of Various Proteins*

	Human Serum Globulin	Human Serum Albumin	Casein	Muscle	Egg White	Gelatin
Arginine	4 8*	6 1*	4 1	7.2	5 8	7 6
Cystine	2 0	3 8	0 3	1 1	2 3	0 1
Methionine	1 0*	1 2*	3 5	3 2	4 4	0 8
Isoleucine	?	2 0	6 5	5 4	?	1 7
Leucine	9 3*	11 9*	12 1	12 1	10 7	3 7
Lysine	0 7*	5 8*	6 9	7 6	6 5	4 3
Histidine	2 5*	3 5*	2 5	2 1	1 8	1 0
Phenylalanine	5 9	7 8	5 2	4 5	5 5	2 0
Threonine	8 3*	5 0*	3 9	5 3	3 6	1 5
Tryptophan	2 8*	0 19*	1 8	1 2	1 5	0 0
Valine	?	4 1	7 0	3 4	6 8	2 5
Total	43 4±	51 4	53 8	51 1	48 9+	25 2

These figures were obtained from Block and Bolling (The Amino Acid Composition of Proteins and Foods, Springfield, Ill., Charles C Thomas Publisher, 1945) with the exception of those marked with an asterisk (*), which represent data obtained by the analysis of gamma globulin and crystalline albumin by Brand, Kassell and Saidel, (J Clin Investigation 23: 437, 1944) They represent grams per hundred grams of the dry protein on the basis of 16 per cent nitrogen

Note how deficient gelatin is Note also that serum albumin is deficient in tryptophan and low in isoleucine A deficiency of isoleucine in human plasma protein has been shown by Hegsted, McKibbin and Stare in growth experiments (J Clin Investigation 23: 705, 1944)

sively used and has given very satisfactory results. In a review on nitrogen balance I [4] have reported the successful results obtained with use of a protein digest [5] prepared by pancreatic hydrolysis of casein. This product contains the amino acids of casein and pancreatic tissue, two animal proteins of high biologic value. Although its content of essential amino acids is not accurately known, biologic tests have shown that

2 Schoenheimer, R.: The Dynamic State of Body Constituents, Cambridge, Mass., Harvard University Press, 1942.

3 Albanese, A. A., and Irby, V. Science 98: 286, 1943.

4 Elman, R. Physiol. Rev. 24: 372, 1944

5 Trade name Amigen, manufactured by Meal Jelrs n and Company.

it contains all in sufficient concentration to support growth in rats when given as the sole source of nitrogen.[6] This is one of the most rigid tests of the efficiency of protein. Amino acid preparations produced by enzymatic hydrolysis contain approximately 70 per cent of the potential amino acid nitrogen in the form of amino nitrogen (representing amino acids), most of the remainder being present as peptide nitrogen. In the case of acid hydrolysis more nearly 100 per cent of the nitrogen can be obtained in the form of free amino acids, although it is known that the tryptophan is destroyed in the process of acid hydrolysis. This must be replaced in the products prepared by this method. It has now been demonstrated clinically that protein hydrolysates containing amino acids and peptides, when given in adequate amount, can maintain nitrogen balance effectively and cause regeneration of serum proteins.[6a]

GENERAL INDICATIONS FOR THE USE OF AMINO ACIDS

Whenever there is a failure in normal ingestion, digestion and absorption of food protein, inevitable deficiencies in protein begin to develop at once unless protein is supplied in some other way. The proper use of amino acids provides a practical method of preventing protein starvation. Any patient who does not eat will develop a protein deficiency; any patient who eats but does not digest or absorb his food will likewise suffer protein starvation. He may, of course, suffer deficiencies in other elements, water and salts, for example. Just as the universal use of solutions of glucose and saline obviates many of these deficiencies, the wider use of amino acids will prevent deficiencies in protein, which may be just as important as preventing deficiencies of water, electrolyte and vitamins. As far as parenteral administration is concerned, it may be stated as a general proposition that, when solutions of saline or glucose are injected for maintenance of daily needs, amino acids are indicated as well.

Protein deficiencies are actually of frequent occurrence in clinical medicine, yet they are seldom recognized because we as physicians are apt to view an inadequate protein intake with complacency. While we have recognized the importance of supplying glucose and vitamins, water and salts, we have looked on other food (e. g., protein) as being dispensable. We have been lulled into a false sense of security by the supposition that there are large stores of reserve body protein and that the absence of protein intake may result in little or no difficulty. The fallacy of this view is indicated in a recent review[6b] and in the other papers of this series in which the various clinical manifestations of protein deficiency have been described. Of these, a decrease in the level of plasma proteins (hypoproteinemia) is of great importance. However, it may be emphasized that hypoproteinemia, while not always found, is one of the objective evidences of protein deficiency, particularly when there is a fall in the albumin fraction. Though often masked by dehydration and an increase in the globulin fraction, a fall in plasma proteins has been observed frequently, especially after operation. Indeed, hypoproteinemia has now been demonstrated to be frequent in both medical and surgical wards of any hospital.

SPECIFIC INDICATIONS FOR THE CLINICAL USE OF AMINO ACIDS

A. Patients unable to ingest protein because of severe gastrointestinal disease or persistent vomiting from any other cause: In these cases amino acids must obviously be given parenterally. They include such conditions as intestinal obstruction, local or general peritonitis, acute cholecystitis and a severe peptic ulcer in which the ingestion of any food provokes severe pain or vomiting. Important in this group are cases of chronic disease such as gastrointestinal carcinoma, in which operation is contemplated in the presence of severe malnutrition which cannot be corrected by a high protein diet. The preoperative preparation in such cases with parenteral protein will lower mortality, facilitate surgery and reduce complications. To be included in this group also are postoperative cases in which abdominal operations have been performed and in which nothing by mouth is permitted in order to achieve gastrointestinal rest so that healing may occur. In such cases, too, protein starvation will obviously occur unless nourishment is given parenterally. Many manifestations of protein starvation can thus be avoided and the clinical condition be so improved thereby that a full diet by mouth can be started much earlier than when the parenteral injections are limited to water, salts and glucose.

Patients suffering from advanced inanition must also be included in this group. Amino acid therapy recently has been shown capable of saving many lives from the late, or what might be called the hitherto irreversible, stage of starvation. In the present war thousands, perhaps millions, have already died because of inanition. Many more will die even if food is made available for them. It has been known for a long time that after a certain point in progressive starvation a fatal outcome cannot be avoided because the gastrointestinal tract becomes incapable of function. Fluid or food cannot be swallowed or, if given by tube, is vomited or provokes diarrhea. In the recent (1943) famine in India Krishnan and his co-workers[6c] showed for the first time that the intravenous injection of a solution containing hydrolyzed protein and glucose reduced considerably the mortality in these late cases. Injections of glucose alone, of saline solution, plasma or blood proved relatively ineffective. Only a few injections, averaging three, of the hydrolyzed protein solution were necessary. After this treatment patients were revived and able to start taking food and fluid by mouth. These investigators reported 5,000 injections with few untoward reactions, none of them serious. Their hydrolysate was a papain digest of pork.

B. Patients able to ingest protein but in whom the amount is inadequate or difficulty is encountered in digestion or absorption: In this group of cases amino acids may sometimes be given orally, but in many they will have to be given parenterally. This group includes a wide variety of diseases, particularly those in which severe malnutrition has developed because of the patient's inability to take sufficient food. After a certain period of malnutrition, the gastrointestinal tract becomes incapable of digesting a sufficient amount of protein food, especially if edema of the gastrointestinal tract is present, and vomiting or diarrhea may result. Sparing digestion

6. Mueller, A. J., and others: J. Biol Chem **112**: 594, 1940.

6a *Brunschwig, A.; Clark, D. E., and Corbin, N.* Ann Surg. **115**: 1091, 1942 Gardner, C E., Jr., and Trent, J C Surg., Gynec. & Obst. **75**: 657, 1942. *Sholl, A. T.*; Butler, A. M.; Blackfan, K. C., and MacLachlan, E.: J. Pediat. **15**: 469, 1939 Hartmann, A. F. and others, ibid. **24**: 371, 1944. Elman, R.: Ann Surg **112**: 594, 1940; Bull. New York Acad. Med **20**: 220, 1944.

6b Elman, R.: Ann. Surg. **120**: 350, 1944.

6c. Krishnan, K. Y.; Narayanan, E. K., and Sankaran, G.: Indian M. Gaz. **79**: 160, 1944.

by giving amino acids orally will sometimes obviate the difficulty, as reported by Olmsted,[7] but in many cases the oral intake of food will have to be supplanted or supplemented for a time by intravenous administration in order to insure a sufficient intake. This is true of those with extreme malnutrition, as just described, but is not infrequently seen after severe injuries and extensive thermal burns. In other cases digestion or absorption is impaired because of severe gastroenteritis, ulcerative colitis or regional ileitis, so that food by mouth provokes severe diarrhea and thus digestion and absorption are prevented. In such a case also the substitution of amino acids for whole protein by mouth may, by sparing the necessity for digestion, result in adequate absorption, although in many cases it will be advisable to put the gastrointestinal tract completely at rest by giving nourishment parenterally. To be included in this group are certain types of intestinal fistulas in which profuse discharge of undigested contents escape.

C. Other indications including patients with allergy and intractable and especially bleeding peptic ulcer: In cases of extensive protein allergy the use of amino acids instead of whole protein will frequently avoid this difficulty and they have been used as such by a number of observers, especially in infancy, with very favorable results.[8] Olmsted [7] has used amino acids also during the diagnostic period in severe food allergy, thus avoiding the usual starvation which otherwise occurs. In peptic ulcer the use of amino acid mixtures orally has proved effective on purely clinical grounds with evidence of healing, as shown by x-ray examination in a series of peptic ulcers previously refractory to medical therapy as reported by Co Tui.[9] In a series of bleeding peptic ulcers a similar regimen of oral amino acids has been shown by Levy [10] to result in a much more rapid recovery than in cases in which the ordinary regimen of whole protein food has been employed. This may be due to the fact that the administration of amino acids not only permits protein nourishment without the need for digestion but has an additional advantage in that amino acids act as a buffer and thus tend to neutralize gastric acidity, as shown by Levy and Siler.[11]

THE ORAL USE OF AMINO ACIDS

The use of amino acids by mouth is therapeutically desirable in that it avoids the necessity of protein digestion. Thus it would seem that larger amounts of protein nourishment could be administered in this way and more rapid correction of protein deficiencies in extremely malnourished patients achieved. While clinical experience is not extensive, it has been my [12] observation that, in many of these patients in whom the ingestion of protein food provokes diarrhea or even vomiting, the substitution of amino acids permits absorption without difficulty. This would seem to be especially true of jejunal feeding; for example, Mulholland and his associates [13] have administered oral amino acids very soon after gastric resection through a jejunal tube passed across the stomach at the time of operation. They have succeeded in administering a 3,000 calory, 200 gram protein diet in this way with striking improvement in postoperative asthenia and rapidity of convalescence.

Amino acids dissolved in water, milk or juices may be taken by mouth. However, the taste of some of the commercial preparations available at present is unpleasant. Attempts have been made to flavor the solution but these have not been entirely successful, although the taste can be partially disguised in a number of ways. One method which has been employed by Co Tui is to stir 20 Gm. of the powdered protein hydrolysate in a small amount of water and ask the patient to follow it up with 20 Gm. of a sugar solution as a chaser. This is done ten to fifteen times a day and thus permits the ingestion of 200 to 300 Gm. of protein substance in the form of amino acids in twenty-four hours.

Tube Feeding.—The unpleasant taste of some amino acid preparations may be avoided by the use of tube feeding. Obviously a jejunostomy or a gastrostomy tube inserted at operation avoids the disadvantages of passing and retaining a nasal or an oral catheter. On the other hand, jejunal feeding by tube can also be achieved without an additional abdominal incision by inserting the tube across the lumen of the stomach into the lumen of the jejunum at the time of operation usually performed for gastric resection. This permits gastric rest and has been described in detail by Ravdin [14] and Mulholland.[13] Ordinarily, however, tube feeding requires the passage of a catheter into the stomach through the nose or mouth. Twenty Gm. each of a protein hydrolysate and simple carbohydrate in about 200 cc. of water may then be administered ten or fifteen times a day during day and night if desired, thus permitting the large intake of 200 to 300 Gm. of protein nourishment along with the same amount of carbohydrate.

While amino acids and glucose alone are the simplest formula for oral feeding, a more complete diet may easily be administered by adding fat according to the technic devised by Olmsted.[7] Olive oil is emulsified with the aid of gelatin, and the amino acids and carbohydrates are then added. Olmsted has been able to administer large amounts of food through a gastric tube in cases of severe malnutrition and start the patient on the road to nutritional recovery much more effectively and rapidly than is possible through persuasion or other methods using protein foods. Other suggestions for the addition of amino acids in tube feeding will be found in the paper of Lund and Levenson and others in this series.

It should be mentioned, of course, that vitamin mixtures must be added to the amino acids fed by mouth. Any of the preparations on the market may be used, particularly those that are available in liquid form. An adequate amount is simply added to the mixture given by tube.

PARENTERAL ADMINISTRATION OF AMINO ACIDS

The parenteral administration of protein food by means of amino acids represents as great an advance in therapy as the injection of glucose as a means of supplying calories or of water and electrolyte in maintaining water balance and in correcting dehydration, or as the injection of crystalline vitamins in combating vitamin deficiencies. Indeed, the addition of amino acids to the usual parenteral fluids makes possible the

7. Olmsted, W. H.; Harford, C. G., and Hampton, S. F.: Use of Synthetic Diet for Food Allergy and Typhoid, Arch. Int. Med. **73**: 341 (April) 1944.
8. Hill, L. W.: Amino Acids as a Source of Nitrogen for Allergic Infants, J. A. M. A. **116**: 2135 (May 10) 1941.
9. Co Tui: Unpublished observations.
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11. Levy, J. S.: Gastroenterology, Am. J. Digest. Dis. **9**: 354, 1942.
12. Levy, J. S., and Siler, K. A.: Am. J. Digest. Dis. **10**: 48, 1943.
13. Elman, R.: Am. J. Digest. Dis. **10**: 48, 1943.
13. Mulholland, J. H.; Co Tui; Wright, A. M., and Vinci, V. J.: Ann. Surg. **117**: 512, 1943.
14. Ravdin, I. S.; Stengel, A., Jr., and Prushankin, M.: Control of Hypoproteinemia in Surgical Patients, J. A. M. A. **114**: 107 (Jan. 13) 1940.

administration of an almost complete diet without recourse to the usual digestive processes. Thus starvation can be avoided almost completely even though the patient is unable to take anything by mouth. Complete rest of the gastrointestinal tract, which heretofore inevitably resulted in protein starvation, can now be achieved with an almost full dietary intake. Thus both food and rest can be utilized; both factors are obviously very important in the healing of many types of lesions both surgical and medical. To limit the parenteral diet to water, electrolyte, glucose and vitamins is no longer justified; the addition of amino acids makes the mixture more nearly complete.

Methods of Parenteral Administration.—Preparations of hydrolyzed protein are available as sterile solutions ready for intravenous injection or in the form of a powder which with appropriate care and facilities can be made into a solution for intravenous use. The mixture which I recommend is one containing 5 per cent protein hydrolysate, 5 per cent glucose and 0.2 per cent sodium chloride. A liter of such a solution provides four of the necessary nutritional elements: water, salt, carbohydrate and protein. It should be emphasized, of course, that the biologic value of any amino acid mixture or preparation of hydrolyzed protein depends on its content of essential amino acids, and this in turn depends on the proteins selected for hydrolysis as well as the details of the procedure itself. It is therefore important for the physician to be sure that any solution he uses has been sufficiently tested in order to demonstrate that it contains a sufficient concentration of all the essential amino acids to maintain normal protein metabolism.

The rate of injection of hydrolyzed protein cannot be too great lest symptoms of nausea and vomiting be produced. This rate is somewhat slower than that usually given for glucose solutions alone; e. g., for 1 liter containing 5 per cent protein digest and 5 per cent glucose a two hour period is usually required in an average sized adult. Great individual variations are observed and it is often permissible to let the patient adjust the rate of flow himself. In many cases a liter will run in during one and one-half hours with no unpleasant subjective symptoms, in others such a rate will provoke nausea, a feeling of warmth and occasional slight abdominal pain or perhaps other unpleasant symptoms. A two hour period is really required for full utilization of the injected glucose and amino acids; a more rapid rate may permit loss of either in the urine, though the amount is not very great even with a one hour injection.

Injections are best given a liter at a time, one in the morning and one in the afternoon. If the injection supplements food by mouth it should be given in the evening or after the last meal so as not to interfere with the eating of food.

Deleterious Effects.—No intravenous injection can be given with impunity; the possible dangers have been sufficiently emphasized by many and great care must always be exercised regardless of the solution given. The physician must remember, however, that a solution of amino acids is an excellent culture medium and particular care must be taken to prevent contamination. In this sense, it is similar to whole blood and plasma except that bacterial growth is much more apt to occur in amino acid solutions. Pyrogenic reactions may be produced by such contamination. Even with utmost care and elimination of bacterial growth solutions of amino acids are potentially as capable of provoking reactions when given intravenously as plasma or whole blood transfusions, although at the Barnes Hospital they have been less frequent than those experienced with plasma or whole blood when given with the same type of tubing and with the same care. Careful scrutiny was made of all injections during the past four months. Of 865 liters injected intravenously during this time, there were seven reactions. None were serious, and a few were extremely mild.

Subcutaneous Injections.—Amino acids may be injected subcutaneously as well as intravenously except that, like glucose, the solution should be isotonic with the blood and neutral in reaction. Thus a mixture containing 5 per cent glucose and 5 per cent amino acids should be diluted with an equal quantity of distilled water to provide isotonicity in order to achieve a maximum degree of absorption and a minimum degree of local reaction. An isotonic solution obviously requires the use of a larger volume of fluid than is necessary with intravenous injection.

TABLE 3.—*A Program for Daily Parenteral Feeding (Including Amino Acids)* *

Initially larger doses and plasma or whole blood transfusions may be required to meet acute deficits.

		Actual Amount of Nutriments				
	Solutions Required	H_2O, Cc.	Salt, Gm.	Glucose, Gm.	Protein as Amino Acids, Gm.	Calories
A. No protein depletion	Protein hydrolysate 5%-glucose 5%, 1 liter; glucose 5%, 1 liter; isotonic solution of sodium chloride,† 1 liter	3,000	11	100	50	600
B. Moderate protein depletion	Protein hydrolysate 5%-glucose 5%, 2 liters; isotonic solution of sodium chloride,† 1 liter	3,000	13	100	100	800
C. Severe protein depletion	Protein hydrolysate 5%-glucose 5%, 3 liters	3,000	6	150	150	1,200

* Vitamins are given separately. In certain surgical patients vitamin C is especially indicated in doses of 1 Gm. per day.

† After severe operations it may be inadvisable to inject saline solution in view of the evidence indicating the existence of a postoperative intolerance to salt (Coller, F. A., and others: Postoperative Salt Intolerance, Ann. Surg. 119:533, 1944). In such cases 5 per cent glucose in water is substituted for the isotonic solution of sodium chloride.

Plasma versus Amino Acids.—Plasma transfusions are also a means by which protein can be introduced parenterally and must be discussed in contrast to the method already described with amino acids. Actually, both ways of introducing protein substance have distinct indications and often should be used in the same patient. Plasma offers an immediate and often life saving method of replacing plasma protein depleted by hemorrhage, burns or other acute diseases. It should be emphasized that for such rapid replacement plasma represents but half of the blood and that, when red cells are lost, whole blood rather than plasma should be given. However, when plasma proteins have been depleted because of malnutrition, the use of transfusions as the sole source of protein has been disappointing largely because of the fact that the injected protein fails to remain in the circulating blood but leaves very rapidly, apparently in an attempt to replace protein deficiencies throughout the body. As a sole source of protein, moreover, plasma transfusions are expensive and inconvenient. Thus, 60 Gm. of protein administered in this way requires the bleeding of 4 donors, and processing.

Large and repeated plasma transfusions, unlike the use of amino acid solutions, may lead to reactions. Actually but little is known of the metabolic behavior of plasma protein when injected into the blood stream. Knowledge of the fate of the injected plasma protein is important in view of the fact that this method of introducing protein food has no counterpart in any normal physiologic process. The intravenous injection of amino acids, on the other hand, represents a physiologic method in that it is a normal way in which protein food enters the blood stream from the gastrointestinal tract. Nevertheless, in nutritional hypoproteinemia one or more ordinary plasma or whole blood transfusions are excellent supplementary procedures. Moreover, when plasma or whole blood are the only fluids available for the parenteral administration of protein they should be used in larger amounts and will exert considerable clinical benefit.

A PLAN FOR PARENTERAL FEEDING

Before undertaking the administration of amino acids by injection, the physician should determine as far as possible the amounts required and add to this the other nutritional requirements. This is an important consideration because each substance requires the presence of the others in order to be most completely effective. Water balance is often disturbed in protein deficiency; carbohydrate is needed for utilization of fat and protein; vitamins play an important part in carbohydrate and probably in protein utilization. The use of all these substances in appropriate amounts is therefore essential in planning such a parenteral diet. In planning the dose of parenteral fluids in each case it is of considerable value to distinguish between acute deficits and amounts required for maintenance. It should be emphasized, however, that any parenteral method is inconvenient, expensive and not without danger and should not be used with complacency. It should be employed for specific indications, only as much given as needed, and replaced as soon as possible by the normal oral route.

Acute Deficiencies in Dehydrated Patients.—Several liters of fluid up to 5 may be required to correct dehydration. Under certain circumstances special fluids for the treatment of acidosis and alkalosis also are indicated. Plasma or whole blood transfusion will similarly be required to correct acute hypoproteinemia and anemia. This type of parenteral therapy is fairly well known and really does not fall within the province of the present discussion. It is mentioned because such injections must always precede a plan for meeting the daily needs.

Daily Requirements.—It is probable that for short periods a complete caloric intake may be sacrificed in view of the fact that in many instances much of the caloric needs may safely be supplied by tissue fat.[14a] This is permissible except in the case of malnutrition in which tissue stores of fat have been exhausted. In such instances the administration of fat intravenously has great practical advantages and will probably be available in the near future but at present cannot be used.

For surgical or other patients unable to take food by mouth, a simple plan may be drawn up in which all of the nutritional elements can be introduced intravenously in a volume of 3,000 cc. This amount of water is probably necessary in most cases for maintaining water balance and providing a urinary output of about 1,000 cc. or more per day. Of the 3 liters, 1 liter at least should contain 5 per cent protein digest and 5 per cent dextrose. Of the other 2 liters 1 will contain 5 per cent dextrose in water and the other isotonic solution of sodium chloride, which can be injected subcutaneously, thus relieving the patient of the long period required for the administration of 3 liters of fluid into the vein. This should suffice in the average case in which no severe protein, salt or water deficiency is present at the time of operation.

In more severely depleted patients 2 liters instead of 1 liter of 5 per cent protein hydrolysate and 5 per cent glucose should be given; the remaining liter will consist of either isotonic solution of sodium chloride or 5 per cent glucose in water, the former having the advantage of being injectable under the skin.[15] In the cases of most severe protein depletion, all of the 3 liters should consist of 5 per cent amino acid preparation and 5 per cent glucose. In table 3 is listed the total intake in the three types of programs just outlined.

14a. Elman, R.; Davey, H. W., and Kiyasu, R.: J. Lab. & Clin. Med. 30: 273, 1945.

15. While many surgeons give 5 per cent glucose by hypodermoclysis with satisfactory result, I do not do so because I feel that it is slowly absorbed and apt to be irritating as compared with isotonic solution of sodium chloride. As regards amino acids, the same can be said as for glucose provided the reaction of the solution is neutral; hypodermoclysis can be used by merely diluting the 5 per cent amino acid, 5 per cent glucose solution with an equal amount of distilled water. In children this has been employed in a more concentrated mixture (Hartmann, A. F., and others: J. Pediat. 24: 371, 1944).

Council on Industrial Health

SELECTED PUBLICATIONS IN INDUSTRIAL HEALTH

The office of the Council on Industrial Health is frequently asked to recommend publications relating to industrial medicine, surgery and hygiene. The list of textbooks and periodicals which follows was compiled from information furnished by the chairmen of committees on industrial health in the state medical societies, directors of industrial hygiene bureaus in state and federal agencies, and by two hundred full time industrial physicians throughout the country.

C. M. PETERSON, M.D., *Secretary.*

Books

GENERAL TREATMENT

Division of Industrial Hygiene, National Institute of Health, United States Public Health Service: Manual of Industrial Hygiene. $3. Pp. 508. Philadelphia, W. B. Saunders Company, 1943.

International Labour Office: Occupation and Health, Volume I, pp. 999. Geneva, 1930. Volume II, pp. 1,310. Geneva, 1934. $24 set. Supplements, Geneva, 1938, 1939, 1940, 1944, 25 cents each.

Wampler, Fred J.: The Principles and Practice of Industrial Medicine. $6. Pp. 579. Baltimore, Williams & Wilkins Company, 1943.

Sappington, C. O.: Essentials of Industrial Health. $6.50. Pp. 626, with 63 illustrations. Philadelphia, J. B. Lippincott Company, 1943.

Lanza, A. J., and Goldberg, Jacob A.: Industrial Hygiene. $8.50. Pp. 743. New York, Oxford University Press, 1939.

Kober, George M., and Hayhurst, Emery R.: Industrial Health. $15. Pp. 1,184, with illustrations. Philadelphia, P. Blakiston's Son & Co., 1924.

Rosenau, Milton J.: Preventive Medicine and Hygiene. Ed. 6. $10. Pp. 1,481. New York, D. Appleton-Century Company, 1935.

Clark, W. Irving, and Drinker, Philip: Industrial Medicine. Ed. 2. $3. Pp. 262. New York, National Medical Book Company, Inc., 1935.

INDUSTRIAL MEDICINE AND SURGERY

Schwartz, Louis, and Tulipan, Louis: A Text-Book of Occupational Diseases of the Skin. $10. Pp. 799, illustrated with 116 photographs. Philadelphia, Lea & Febiger, 1939.

Johnstone, Rutherford T.: Occupational Diseases; Diagnosis, Medicolegal Aspects and Treatment. $7.50. Pp. 558, illustrated. Philadelphia, W. B. Saunders Company, 1941.

Sappington, C. O.: Medicolegal Phases of Occupational Diseases. An Outline of Theory and Practice. $2.75. Pp. 405. Chicago, Industrial Health Book Company, 1939.

Kessler, Henry H.: Accidental Injuries—The Medicolegal Aspects of Workmen's Compensation and Public Liability. Ed. 2, enlarged and thoroughly revised. $10. Pp. 803, illustrated with 202 engravings. Philadelphia, Lea & Febiger, 1941.

White, R. Prosser: The Dermatergoses or Occupational Affections of the Skin, Giving Descriptions of the Trade Processes, the Responsible

Agents and Their Actions. Ed 4 Pp 716, with 66 plates, including 72 figures London, H K Lewis & Co Ltd, 1934

Lanza, A J Silicosis and Asbestosis $4 25 Pp 439 New York, Oxford University Press, 1938

Resnick, Louis Eye Hazards in Industry—Extent, Cause and Means of Prevention $3 50 Pp 321 New York, Columbia University Press, 1941

McBride, Earl D Disability Evaluation—Principles of Treatment of Compensable Injuries Ed 2, revised $8 Pp 623, with 374 illustrations Philadelphia, J B Lippincott Company, 1938

Gardner, Leroy U, editor, National Tuberculosis Association Tuberculosis in Industry—Report of Symposium Held at the Saranac Laboratory for the Study of Tuberculosis, Saranac Lake, N Y June 9 14, 1941

Davis, George Gilbert, Salmonsen, E M, and Earlywine, J L Pneumoconioses (Silicosis)—Bibliography and Laws with a foreword by E R Le Count $7 50 Pp 482 Chicago Industrial Medicine, Inc, 1934

Christopher, Frederick Minor Surgery, with a foreword by Allen B Kanavel Ed 5. $10 Pp 1,006 Philadelphia, W B Saunders Company, 1944

Lasher, Willis W Industrial Surgery—Principles Problems and Practice $6 Pp 452, with 193 illustrations New York, Paul B Hoeber, Inc, 1938

Reed, Jewett V., and Harcourt, A K The Essentials of Occupational Diseases $4 50 Pp 225 Baltimore, Charles C Thomas, 1941

Kanavel, Allen B Infections of the Hand—A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers Hand and Forearm Ed 7 $6 Pp 503 Philadelphia, Lea & Febiger, 1939

Brahdy, Leopold, and Kahn, Samuel Trauma and Disease Ed 2 $7 50 Pp 655 Philadelphia Lea & Febiger 1941

Key, John Albert, and Conwell, H E Management of Fractures, Dislocations, and Sprains Ed 3 $12 50 Pp 1 303 St Louis C V Mosby Company, 1942

Painter, Charles F editor Year Book of Industrial and Orthopedic Surgery $3 Pp 432 Chicago, Year Book Publishers Inc, 1945

Kuhn Hedwig S Industrial Ophthalmology $6 50 Pp 294 with 114 text illustrations including 2 color plates St Louis, C V Mosby Company, 1944

Hueper, W C Occupational Tumors and Allied Diseases $8 Pp 896 Baltimore, Charles C Thomas, 1942

Todd, James C, and Sanford, A H Clinical Diagnosis by Laboratory Methods—A Working Manual of Clinical Pathology Ed 10 $6 Pp 911 Philadelphia, W B Saunders Company, 1943

Amor, Arthur J X Ray Atlas of Silicosis—With Translations of the Legends into French by Robert E Horne and with a foreword by Sir Wilson Jameson $8 Pp 206 Baltimore, Williams and Wilkins Company, 1941

Heinrich, Herbert W Industrial Accident Prevention—A Scientific Approach Ed 2 $3 Pp 448 New York McGraw Hill Book Company, Inc, 1941

INDUSTRIAL HYGIENE

Lehmann Karl B, and Flury, Ferdinand Toxicology and Hygiene of Industrial Solvents—With Translation by Eleanor King and Henry F. Smyth Jr $5 Pp 378 Baltimore, Williams & Wilkins Company, 1943

Henderson, Yandell, and Haggard, H W Noxious Gases and the Principles of Respiration Influencing Their Action Ed 2 $3 50 Pp 294 New York, Reinhold Publishing Corp 1943

Drinker, Philip, and Hatch, T I Industrial Dust—Hygienic Significance, Measurement and Control $4 Pp 316 New York, McGraw Hill Book Company, 1936

Hamilton, Alice Industrial Poisons in the United States $5 Pp 590 New York, Macmillan Company, 1925

Browning Ethel Toxicity of Industrial Organic Solvents $3 50 Pp 388 New York, Chemical Publishing Company, 1938

McNally, William D Toxicology $10 Pp 1,022 Chicago, Industrial Medicine Publishing Company, 1937.

Jacobs, Morris B Analytical Chemistry of Industrial Poisons Hazards and Solvents $7. Pp 661. New York, Interscience Publishers, Inc, 1941

Hamilton, Alice Industrial Toxicology (Harper's medical monographs) $3. Pp 352 New York, Harper & Bros, Publishers, 1934

American Society of Heating and Ventilating Engineers Heating, Ventilating, Air Conditioning Guide Annual $5

Ficklen, Joseph B Manual of Industrial Health Hazards—Comprising the occurrence and uses, the properties clinical symptomatology, permissible standards, physiological responses and methods for the evaluation of over 90 noxious vapors, gases and dusts including a chart showing potential health hazards occurring in 108 manufacturing classes $4 Pp 176 West Hartford, Conn, Service to Industry, 1940

Sollmann, Torald H Manual of Pharmacology and Its Applications to Therapeutics and Toxicology Ed 5 $7 50 Pp 1 190 Philadelphia, W B Saunders Company, 1936

Alden, J L Design of Industrial Exhaust Systems $3 Pp 220 New York, Industrial Press, 1939

Hodgman, Charles D, and Holmes Harry N Handbook of Chemistry and Physics A Ready Reference Book of Chemical and Physical Data Ed 26 $3 50 Pp 2,515 Cleveland, Chemical Rubber Company, 1942

Journals and Periodicals

Industrial Medicine $5 a year Industrial Medicine Publishing Company, Chicago, 605 North Michigan Avenue

Journal of Industrial Hygiene and Toxicology $6 a year Williams & Wilkins Company, Mount Royal & Guilford avenues, Baltimore 2

Journal of the American Medical Association $8 a year American Medical Association, 535 North Dearborn Street, Chicago 10

Industrial Hygiene Digest. Industrial Hygiene Foundation of America, 4400 Fifth Avenue Pittsburgh 13

American Journal of Public Health and the Nation's Health. $5 a year American Public Health Association, 1790 Broadway, New York 19

Public Health Reports $2 50 a year United States Public Health Service, Washington, D C

Industrial and Engineering Chemistry, Industrial Edition $3 a year to members $4 a year to nonmembers American Chemical Society, Easton, Pa

National Safety News $4 a year National Safety Council, 20 North Wacker Drive, Chicago 6

Public Health Bulletins United States Public Health Service, Washington, D C

Industrial Hygiene Bulletin Division of Industrial Hygiene, New York State Department of Labor Reprinted from the Industrial Bulletin issued each month at Albany by the Industrial Commissioner of the State of New York Albany, N Y

Industrial Standardization $4 a year American Standards Association, 70 East 45th Street New York 17

American Journal of Surgery $10 a year American Journal of Surgery, Inc, 49 West 45th Street, New York 19

Heating and Ventilating $2 a year Industrial Press, 148 Lafayette Street, New York

Chemical Abstracts of American Chemical Society $12 a year American Chemical Society, 1155 16th Street, Washington, D C

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application

AUSTIN SMITH, M D, *Secretary*

SCARLET FEVER STREPTOCOCCUS TOXIN FOR THE DICK TEST (See New and Nonofficial Remedies, 1944, p 577).

The following dosage form has been accepted

WYETH, INCORPORATED, PHILADELPHIA

Scarlet Fever Streptococcus Toxin for the Dick Test: 2 cc and 10 cc vials containing sufficient diluted toxin for withdrawal to perform five and fifty tests, respectively. Preserved with 0 4 per cent phenol

PYRIDOXINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p 618)

The following additional dosage form has been accepted.

LAKESIDE LABORATORIES, MILWAUKEE

Tablets Pyridoxine Hydrochloride: 20 mg

DIETHYLSTILBESTROL (See New and Nonofficial Remedies, 1944, p 417).

The following dosage form has been accepted

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Perles Diethylstilbestrol: 5 mg

SULFAMERAZINE (See Supplement to New and Nonofficial Remedies, 1944, p 10)

The following dosage form has been accepted

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Tablets Sulfamerazine: 0 5 Gm

NICOTINAMIDE (See New and Nonofficial Remedies, 1944, p 617)

The following dosage form has been accepted

PITMAN-MOORE CO., INDIANAPOLIS

Solution Nicotinamide 100 mg. per 2 cc.: 2 cc. ampuls.

SYNTHETIC OLEOVITAMIN D (See New and Nonofficial Remedies, 1944, p 623)

The following dosage form has been accepted

AMERICAN PHARMACEUTICAL CO., INC., NEW YORK

Viosterol in Oil: 10 cc and 50 cc bottles. Viosterol in vegetable oil

RIBOFLAVIN (See New and Nonofficial Remedies, 1944, p 613)

The following additional dosage form has been accepted

MEAD JOHNSON & CO., EVANSVILLE, IND.

Tablets Riboflavin: 5 mg

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SATURDAY, JUNE 30, 1945

REHABILITATION AND REEMPLOYMENT

As the rehabilitation program unfolds, medicine must assume responsibility for competent treatment and reconditioning, followed by placement in occupations based on a medical evaluation of residual ability rather than disability. From the latter concept selective placement has emerged. Selective placement demands the matching of the physical, mental and emotional capacity of an individual, his intelligence, talents, skills, experiences, desires and motivations with the technologic and physical demands of a given job.

Placement has long been practiced by private industry. Reported observations of success or failure have been relatively few. The Council on Industrial Health will shortly sponsor jointly with the Veterans Employment Service and the Occupational Analysis Division of the War Manpower Commission a controlled experiment in selective placement. The essential elements will be an adequate psychosomatic evaluation of a worker by a qualified examining physician, a job description by an occupational analyst, suitable attention to environmental hygiene and sanitation, and the application of the matching technic by medical and employment officers. Ultimately the experiment will extend to various kinds and sizes of industrial plants and to normal as well as subnormal workers. Any procedure which brings the right man and the right job together appeals to industry as a desirable objective from the varying points of view of human relations, health, safety and production.

Selective placement expresses capacity for work in terms of ability rather than of disability. The medical profession has struggled endlessly with efforts to define and determine disability. Methods have not yet been devised which do not yield wide variations in interpretation by different individuals. Percentage determination of disability has led to flagrant abuses in claim adjudication both in workmen's compensation affairs and in common law. The more positive approach which evaluates what a man has left rather than what he has lost should appeal to physicians as more amenable to logical and scientific appraisal.

Of the two major programs in rehabilitation, veteran reemployment still overshadows the activities of the state rehabilitation agencies now developing under the egis of the federal Office of Vocational Rehabilitation. Many industries, recognizing their obligations for veteran reemployment under the Selective Service and Training Act of 1940, have developed comprehensive procedures which include medical examination and placement. A feeling is growing, however, that reemployment of veterans is a community responsibility requiring participation of all social agencies as well as employers. Just what will be expected of the medical profession under such an arrangement is not altogether clear. Employers will however be interested in preplacement physical appraisal of disabled veterans. The Committee on Rehabilitation and Employment of the Council on Industrial Health is developing a series of recommendations about veteran reemployment for the guidance of physicians and medical organizations. The procedure which is being developed will avoid duplication of physical examinations either through central registration in a community reemployment center or by means of a card issued to the worker bearing essential data, which can be presented at the time of any interview.

INDUSTRIAL HEALTH—POSTWAR

Currently the demand for health services in industry is greater than the medical and allied professions are prepared to meet. Will this interest maintain itself after the stimulation of war production is over? Reconversion has already curtailed medical activity in a few war plants; on the whole, however, optimism is warranted as to the postwar course of industrial medicine. Certainly governmental agencies, committed to capacity peacetime employment and production, are not likely to moderate present activity in industrial hygiene or workmen's compensation. At the moment proposals are under consideration to expand industrial hygiene services in both federal and state health agencies to a considerable degree, through earmarked allotments in the budget of the U. S. Public Health Service. Furthermore, legislation now under consideration would make available to all federal employees occupational health services similar to those furnished by private industry. Extension into the states and municipalities will provide service to millions of government wage earners. Labor is more and more alive to its own responsibilities for health conservation and education. Safe and healthful working conditions are unquestionably here to stay as factors in collective bargaining. Management, through its national organizations and trade associations, has recognized the objectives of industrial health and is actively advocating their widespread

adoption. Medicine has accepted greater individual and collective responsibility for industrial health service than ever before.

Observers of industrial medical activity note its uneven distribution. Medicine and industry have not developed a formula which presents the benefits of industrial health service convincingly enough to attract full support from the great majority of small plant owners. Past demonstrations have shown that such services can be furnished within the means of almost any employer by using various combinations of part time service of physicians and nurses. One especially promising experiment is taking place in the Fort Greene District of Brooklyn, where the county medical society and the local health agency have joined forces with employers, labor and social agencies to promote a plan of health education sponsored by plant labor-management health committees. On this foundation the larger superstructure of a plant medical service can be built. In nearby Astoria, nursing and industrial hygiene services are supplied to small industry provided the plant employs a physician and complies with other requirements which include proper medical supervision and adequate record keeping. In time the employer will no doubt assume full support of the project.

Special medical services of various kinds will probably be introduced rapidly in the postwar period. There are few independent consultants in industrial hygiene, sanitation or ventilation. Clinical pathologists who have some acquaintance with toxicology could well expand their professional horizons to provide consultation service to industry. Psychiatrists working with clinical psychologists may contribute greatly to those aspects of human relations and behavior which have proved troublesome in our industrial civilization. Serious consideration, in fact, has already been given to the development of industrial medical clinics. They will provide conventional industrial procedure plus a diagnostic service which will supplement and make more effective the efforts of the worker's personal physician in the field of nonindustrial disorders.

Much interest is apparent by management and by labor regarding the extension of industrial medical services to include ordinary illness. Many variations in approach have been developed by such diverse industries as mining, shoe manufacturing, refining, ship construction and transportation. The Council on Industrial Health has taken the position that the principles on which medical care should be based have been defined by the House of Delegates of the American Medical Association. If medical care plans are in prospect, industry should be in agreement with the appropriate medical societies as to conformity of such plans with these established principles. Since these plans are essentially medical, the Council feels that policies should be directed and controlled by medical departments in industry.

INDUSTRIAL MEDICAL EDUCATION

The Committee on Postwar Medical Services has been inquiring into the postwar intentions of medical officers in the Army and Navy.[1] Out of over 20,000 questionnaires returned 4,215 officers indicated a desire for industrial medical practice, 863 of them full time. About one third of this group wanted special preparation. The questionnaire did not determine specifically the desire of these men for long or short courses; the impression is clear that university courses are preferred over training in industry itself.

According to a recent survey by the Council on Industrial Health, nine universities are prepared to supply advanced training in industrial health in schools either of medicine or of public health. Plans are maturing in a number of additional schools pending departmental organization, support or faculty assignments. These educational resources seem to be sufficient or susceptible of sufficient expansion to meet any immediate demand.

The Council on Industrial Health and the Council on Medical Education are jointly examining the whole industrial medical education structure in the expectation that suitable recommendations can be made for orderly development.[2] Full consideration will be given the details of undergraduate orientation, refresher and continuation courses, internships and residencies as well as fellowships or other long courses of a caliber similar to those demanded in other fields of graduate medical preparation for specialization.

SENATOR WAGNER'S COMMENTS

In the Organization Section in this issue of THE JOURNAL appears a second communication from Senator Wagner, commenting on the editorial and the condensation of his bill which appeared in THE JOURNAL, June 2. Because Senator Wagner occupies a position of importance in the legislative machinery of the United States government and because he has been persistent in his endeavor to force upon the American people a federal system of compulsory sickness insurance, THE JOURNAL prints in toto his comments on its editorial. Interpolated in his longer communication are a number of simple replies to the points that he raises. The Wagner-Murray-Dingell bill—1945 version—is 185 pages long. It is simply impossible, with the space available, to make the detailed line-by-line analysis of this proposal that will be necessary should it ever come to public hearings.

Almost coincidental with the introduction of this measure came another bill—Senate bill 380—developed by Senators Wagner, Murray, O'Mahoney and Thomas.

1. Lueth, H. C.: The Medical Officer and Future Industrial Medical Practice, J. A. M. A. **128**: 93 (May 12) 1945.
2. Bristol, L. D., and Peterson, C. M.: Industrial Health, J. A. M. A. **125**: 1106 (Aug. 19) 1944.

In his consideration of that measure Mr. Raymond Moley, editor of *Newsweek* Magazine, says "It is an old gag of Senator Wagner's to preface a bill with a bunch of rhetorical tripe called a declaration of policy. He knows, as a lawyer, that this preamble has no standing in court. But, as a politician, he knows that such stylistic flypaper snares votes and praise." The statement refers equally well to the long preamble developed by Senator Wagner for introduction to the Wagner-Murray-Dingell bill—1945 version—and certainly applies to the letter published in this issue of THE JOURNAL. Mr. Moley concludes that "'full employment,' literally enforced, would mean the end of freedom for all classes of Americans."

It is the simple contention of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION that the Wagner-Murray-Dingell bill—1945 version—would also mean the end of freedom for all classes of Americans.

Current Comment

STRUGGLE OVER DOGS

Recently newspapers in Chicago have described another clash between the antivivisectionists and a Chicago medical school. Despite repeated hearings in which they always fail to establish their charges, the antivivisectionists continue to oppose the Chicago ordinance which requires the pound to deliver unclaimed dogs to the medical schools. Mrs. Charles M. Petkus, vice president of the Illinois Citizens Animal Welfare League, has been insisting that Northwestern University keeps its dogs under insanitary and filthy conditions. The Chicago *Herald American* has given much publicity to Mrs. Petkus' activities; other newspapers have treated the whole situation either with brevity or with mild derision. Investigations of Mrs. Petkus' charges have not sustained her claims. On June 12 Mrs. Petkus took a dog out of a cage during an inspection tour through Northwestern's animal rooms and attempted to carry the animal away. According to their story, Mrs. Petkus and two other women with her were resisted. One of Mrs. Petkus' companions was Mrs. Irene Castle McLaughlin. A lieutenant colonel of the Army Medical Corps, just returned from overseas service, makes the following comment in a letter published in the Chicago *Daily News* of June 18:

> This morning I returned to Chicago after more than forty months overseas, where I commanded a portable surgical hospital and a field hospital.
>
> Upon my arrival I bought my first *Daily News* in nearly four years. My attention was drawn to the article about Mrs. Irene Castle McLaughlin and her antivivisectionist friends interfering with Northwestern University's Dr. Ivy, an internationally famous physiologist and undoubtedly the benefactor, through his work, of many millions of people.
>
> I studied at Loyola University and was introduced to surgery in the vivisection laboratory. The surgery I practiced in Chicago and later on the front lines and the surgery practiced by the vast majority of both civilian and military surgeons was begun in the vivisection laboratory.
>
> There can be no dispute that surgery in this war is saving lives and limbs of thousands of servicemen who would die had their surgeons been less well trained—and had they not at least begun their training by vivisection.
>
> I believe the people of Chicago are entitled to know what Mrs. McLaughlin has done for the war effort that she thinks entitles her to interfere with the training of our surgeons.

PHYSICIANS AS CULTURAL ATTACHÉS

The suggestion has been made recently that the post of cultural attaché in the United States embassies, if it is to be maintained, should be extended to all countries, and that those who fill these posts be men or women of distinction in fields of higher intellectual or artistic endeavor. In discussing this matter Vaillant [1] points out the undeniable fact that a man who is not a physician is not able to estimate the abilities of members of the medical profession. Few physicians would care to make a career of being a "cultural attaché" and, as Vaillant says, the name itself would be a contradiction as a permanent job. A physician serving in this capacity, however, could perform a national service and would receive an instructive interlude of his usual professional activity. A physician who was appointed for one or two years as a cultural attaché doubtless would be expected to evaluate medical problems of the country in which he was stationed and the qualifications of physicians there. As an eminent physician himself, he should lend distinction to the embassy staff in the eyes of a large and influential professional group. Indeed, a physician attached to a United States embassy would often be in a position to render valuable service not only to his government but also to the country to which he was accredited. For the physician himself and for medicine in the United States such a practice would have much to recommend it. It would be an enriching experience for a man already established in medicine to spend one or two years doing responsible work in some other country. The return of physicians with their experience of medicine in other lands would help to counteract what Osler called chauvinism in medicine. If the State Department continues and extends the policy of the "cultural attaché" the appointment of some qualified physicians would be desirable.

HEPATITIS TRANSMITTED BY SYRINGE

In a period of two years, January 1943 to January 1945, 63 patients with diabetes who attended a clinic at the Royal Hospital in Sheffield, England, were diagnosed as suffering from hepatitis. Four patients died and 6 patients were left with evidence of residual liver damage. According to Droller,[1] the epidemiologic picture was complex. The cases of hepatitis arose both from contact between patients and from syringe transmission. There was, however, conclusive evidence that some of the cases resulted from contaminated syringes and this outbreak therefore demonstrates the possibility of the development of hepatitis by such means.

1. Vaillant, G. C.: Shadow and Substance in Cultural Relations, Scient. Month. 60: 373 (May) 1945.

1. Droller, Hugo: An Outbreak of Hepatitis in a Diabetic Clinic, Brit. M. J. 1: 623 (May 5) 1945.

MEDICINE AND THE WAR

ARMY

MERITORIOUS SERVICE AWARD

The AAF Regional Hospital, Truax Field, Wisconsin, was recently awarded the Meritorious Service Unit Plaque for "superior performance of duty and outstanding devotion to its assigned mission for the period Jan. 1, 1944 to Dec. 31, 1944."

COLONEL FLORENCE A. BLANCHFIELD AWARDED MEDAL

Col. Florence A. Blanchfield, superintendent of the Army Nurse Corps, was recently awarded the Distinguished Service Medal "for exceptionally meritorious and distinguished service as superintendent of the Army Nurse Corps from June 1943 to June 1945." The medal was presented to Colonel Blanchfield by General Brehon Somervell, commanding general, Army Service Forces. "The War Department has cause to be proud of the work done by army nurses," General Somervell said, "but I can pay no greater tribute to yourself and the women of the Army Nurse Corps than to tell you that, to a man, the American soldier appreciates the work and spirit of devotion with which army nurses throughout the world have carried on their duties." Colonel Blanchfield, whose home is at Shepherdstown, W. Va., entered the Army Nurse Corps in July 1917, serving overseas in the first world war with Base Hospital No. 27. She has been assigned to the Surgeon General's Office since 1935. As superintendent, she is responsible for one of the most important jobs of the war, that of establishing and maintaining efficient nursing care for the thousands of American sick and wounded soldiers all over the world. Colonel Blanchfield is the first army nurse to receive the Distinguished Service Medal in this war, although twenty-three were so honored in the first world war. The first American woman to receive the Distinguished Service Medal was Army Nurse Julia C. Stimson, May 26, 1919.

Assignment of Medical Officers to Veterans Administration

June 20, 1945

Dr. Morris Fishbein,
Editor, The Journal,
Chicago.

Relative your telegram 14 June, in future Medical Corps officers will not be assigned to Veterans Administration unless they were previously employed by that agency or they specifically request such assignment.

KIRK
Office of the Surgeon General
Washington, D. C.

CONVALESCING VETERANS GET WAR DOGS

Veteran war dogs, those no longer suitable for combat because of over age and those not adaptable to scout duty, are being assigned to army convalescent hospitals as pet mascots for recuperating patients. If a hospitalized veteran soldier becomes attached to an individual dog, he may assume full ownership and take the dog home with him when he recovers and is released from service. Dogs given to the hospitals are those whose donors do not wish them returned, cannot be located or are willing to relinquish their claim to the dogs in favor of the convalescing soldier. The dogs have undergone retraining by the Quartermaster Corps at its War Dog Training Center, Fort Robinson, Neb., to remove all undesirable or aggressive traits acquired by reason of former training or combat duty. They have been given obedience training to reemphasize response to fundamental commands such as come, sit and stay.

ARMY AWARDS AND COMMENDATIONS

Captain Rex D. Hammond

Capt. Rex D. Hammond, formerly of Chicago, was recently awarded the Bronze Star for meritorious achievement. He had been with the 76th Medical Battalion, United States Third Army, since the invasion of Normandy and more recently became medical administrator of the Buchenwald Prison Camp. Dr. Hammond graduated from the University of Illinois College of Medicine, Chicago, in 1941 and entered the service Sept. 22, 1942.

Captain William E. Grove

Capt. William E. Grove, formerly of Newton, Kan., was recently awarded the Bronze Star "for meritorious service in connection with military operations against the enemy from Oct. 20, 1944 to Feb. 10, 1945 during the Leyte Island operations. During the entire campaign of the Leyte invasion Captain Grove performed his surgical duties in a very exemplary and outstanding manner. In spite of enemy bombings and lack of proper facilities on many occasions Captain Grove carried on his work. His devotion to the wounded was a great comfort to all who came under his care. In addition, from the period Dec. 23, 1944 to Feb. 10, 1945 Captain Grove was commanding officer of the organization and carried on his extra administrative duties with great ability. To compensate for the absence of one medical officer Captain Grove gave unstintingly of himself and often worked as long as five to six days with little or no rest. His professional and administrative capabilities, in spite of adverse conditions, served as an inspiration for and gained the admiration of the officers and enlisted men under his command." Dr. Grove graduated from Northwestern University Medical School, Chicago, in 1940 and entered the service Sept. 13, 1941.

Captain Rudolph Berke

Capt. Rudolph Berke, formerly of New York, was recently awarded the Bronze Star and shortly after was awarded the Oak Leaf Cluster. Dr. Berke graduated from the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, in 1930 and entered the service Sept. 16, 1942.

Captain Louie Goldberg

The Air Medal and one Oak Leaf Cluster was recently awarded to Capt. Louie Goldberg, formerly of Des Moines, Iowa, for service in air rescue of downed fliers. Dr. Goldberg graduated from the State University of Iowa College of Medicine, Iowa City, in 1936 and entered the service July 24, 1942.

Captain George L. Maison

The Legion of Merit was recently awarded to Capt. George L. Maison, formerly of Detroit. The citation accompanying the award read "for service from July 1942 to July 1944 as chief of the Acceleration Unit, Physiological Branch, Aero-Medical

Laboratory. He designed and developed the anti-G suit now used by A. A. F. fighter pilots to prevent blackout and to increase combat efficiency. This suit has had a beneficial effect in raising the score of enemy planes shot down by A. A. F. pilots. He demonstrated courage and forceful effort in developing this suit and demonstrating and instructing its use to the Eighth and Ninth Air Forces personnel." Dr. Maison graduated from Northwestern University Medical School, Chicago, in 1935 and entered the service April 16, 1942.

Major Ralph H. Riegelman

Major Ralph H. Riegelman, formerly of Des Moines, Iowa, was recently awarded the Bronze Star for "meritorious achievement as a group surgeon of a heavy bomb group and station surgeon of a station hospital in the North African and European theaters of operation from September 1942 to the present day. With no precedent to guide him and only limited personnel to work with, Major Riegelman established a most efficient station hospital to satisfy the many needs of an extensive combat operations program. By his diligence and devotion to duty he has successfully cared for the health of the group while operating from North Africa under adverse conditions. His skill, judgment, initiative, foresight and devotion to duty are most praiseworthy and reflect great credit on himself and on the armed forces of the United States." Dr. Riegelman graduated from the State University of Iowa College of Medicine, Iowa City, in 1936 and entered the service Dec. 12, 1940.

Captain Peter P. Baselice

The Bronze Star was recently awarded to Capt. Peter P. Baselice, formerly of New York, "for meritorious achievements in connection with military operations against the enemy at Sansapor, Dutch New Guinea and at ——, Philippine Islands, from Sept. 3, 1944 to March 20, 1945." Dr. Baselice graduated from the Royal University of Rome Faculty of Medicine and Surgery in 1935 and entered the service Aug. 18, 1942.

Major Ralph W. Wise

The French Croix-de-Guerre was recently awarded to Major Ralph W. Wise, formerly of Dallas Center, Iowa. The citation accompanying the award read, in part, "For exceptional services of war, rendered during the course of operations involving the liberation of France." Dr. Wise graduated from the State University of Iowa College of Medicine, Iowa City, in 1939 and entered the service Aug. 15, 1941.

Major Wayne C. Bartlett

Major Wayne C. Bartlett, formerly of Spearville, Kan., was recently awarded the Bronze Star for meritorious service. He has been overseas since August 1942, serving in an evacuation hospital as head of a surgical team. Dr. Bartlett graduated from Rush Medical College, Chicago, in 1931 and entered the service in May 1942.

Captain John H. Amesse

Capt. John H. Amesse, formerly of Denver, was recently awarded the Silver Star for gallantry in action during the Philippine Island campaign. In presenting this decoration, Brig. Gen. Hugh Hoffman of the 1st Cavalry Division stated that in each case this award is made by specific direction of the President. Dr. Amesse graduated from the University of Colorado School of Medicine, Denver, in 1941 and entered the service in July 1942.

MISCELLANEOUS

EIGHT AWARDED AMERICA TYPHUS COMMISSION MEDAL

Six army medical corps officers, one medical corps officer in the U. S. Naval Reserve and one officer in the sanitary corps were recently awarded the America Typhus Commission Medal. The recipients of the awards and the citations accompanying them include:

Col. Eugene W. Billick, formerly of Monongahela, Pa., who as chief surgeon, headquarters of the U. S. Army Forces in the Middle East, "rendered exceptionally meritorious service to the United States of America Typhus Commission by giving unstinted support to typhus research and control in the Middle East and the Balkans. His unfailing understanding of disease control and his ability to establish favorable liaison for the Typhus Commission with foreign governments and the armies of both the United States and Great Britain helped immeasurably in suppressing this fever throughout his sphere of influence. He also made available to the Typhus Commission in the winter of 1943-1944 personnel needed to combat an epidemic in Naples, Italy. His administrative actions and expert advice assisted materially in developing effective measures to prevent typhus in this theater of operations." Dr. Billick graduated from the University of Pittsburgh School of Medicine in 1925 and entered the service July 1, 1942.

Col. William L. Wilson, formerly of Washington, D. C., "performed exceptionally meritorious service in connection with the work of the United States of America Typhus Commission from September 1942 to May 1945 by giving valuable assistance and advice on numerous problems of policy, organization and operation. His wise counsel and excellent staff work greatly strengthened the commission. As deputy director of Public Health Section G-5, Supreme Headquarters, Allied Expeditionary Force, he influenced development of extensive plans for typhus control in northwestern Europe, particularly among refugees and displaced persons. He assisted materially in reducing the incidence of this disease." Dr. Wilson graduated from Baylor University College of Medicine, Dallas, Texas, in 1926 and entered the service Aug. 3, 1927.

Lieut. Col. Edward S. Murray, formerly of Cedar Rapids, Iowa, in Turkey in 1943-1944, in Egypt in 1944 and in Yugoslavia in 1945 "performed exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. He had a prominent part in organizing and applying typhus control programs beneficial to those countries, and by scientific investigations he contributed to medical knowledge of typhus fever. In difficult and dangerous situations he steadfastly adhered to the plans of the commission and carried out projects on a national scale with energy, intelligence, tact and high professional competence. His performance of duties was characterized by breadth of understanding and capacity to deal successfully with large problems." Dr. Murray graduated from the State University of Iowa College of Medicine, Iowa City, in 1938 and entered the service Aug. 20, 1941.

Major William A. Davis, formerly of New York, both as a civilian and as an officer "performed exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. In the winter of 1943-1944, while a staff member of the Rockefeller Foundation Health Commission, he gave valuable assistance in suppressing the typhus epidemic in Naples, Italy. After being commissioned he served as liaison officer representing the Typhus Commission with the 21st Army Group (British) from November 1944 to May 1945. In this position he assisted in formulating policy and organizing programs and participated in typhus control operations under campaign conditions in Belgium, the Netherlands, the Rhineland and at prison camps in Germany. His intelligent, energetic and professionally competent services were of great value to the Allied Expeditionary Forces in the enforcement of typhus control measures which reduced the incidence of this disease among refugees and displaced persons." Dr. Davis graduated from Harvard Medical School, Boston, in 1939.

Major Robert S. Ecke, formerly of Brooklyn, "performed exceptionally meritorious service in connection with the work of the United States of America Typhus Commission in several foreign countries. After successfully evaluating vaccination against typhus in Egypt in 1943 he helped control this disease among refugees in southern Italy during the 1943-1944 epidemic in Naples. Later in 1944 he carried out a valuable typhus survey and control program in the Aden Protectorate. In

June 1944 he made a survey of relapsing fever in the Anglo-Egyptian Sudan and in September 1944 a typhus survey in Ethiopia, each of which formed the basis for important decisions. During the spring of 1945 he pioneered typhus control in Yugoslavia. By his investigations he contributed new knowledge of typhus fever. Through constant and devoted service in situations requiring initiative and judgment he materially assisted in reducing the incidence of this disease." Dr. Ecke graduated from Johns Hopkins University School of Medicine, Baltimore, in 1935.

Major Chris J. D. Zarafonetis, formerly of Grand Rapids, Mich., "conducted investigations in the laboratory of the America Typhus Commission at Cairo, Egypt, during 1943-1944 which have increased the knowledge of immunity following vaccination against typhus. His researches contributed to development of improved methods of treating epidemic and scrub typhus. In July 1944 he made a survey of plague and typhus at Dakar and assisted in reducing the risk of infection of American troops. He has participated in pioneering work of control in Yugoslavia. From December 1944 to February 1945 he alone represented the commission in Greece, occupying a position of great responsibility in a military mission. Under the hardships of a civil war and at risks to his personal safety he carried out surveys and, in cooperation with local authority, formulated plans and procedures for typhus control. His service in Greece was an outstanding achievement." Dr. Zarafonetis graduated from the University of Michigan Medical School, Ann Arbor, in 1941 and entered the service July 1, 1942.

Lieut. Stafford M. Wheeler, M. C., U. S. Naval Reserve (posthumous), formerly of Boston, in Egypt during December 1944 and January 1945 and later in Yugoslavia "displayed special fitness for the work of the United States of America Typhus Commission. With other officers he was sent by the commission to Yugoslavia in February 1945 to assist in organizing and operating a typhus control program for that country. In difficult situations, under campaign conditions, he performed his duties with a high degree of intelligence, initiative and efficiency until killed at his work by the explosion of a land mine. He contributed materially to the advancement of the commission's typhus control program." Dr. Wheeler graduated from Harvard Medical School, Boston, in 1937.

Lieut. Col. Emory C. Cushing, Sanitary Corps, formerly of Arlington, Va., from 1942 "demonstrated unusual ability in developing and applying modern methods of typhus control. Drawing on his wide knowledge and experience, he gave expert advice on programs dealing with typhus control both for military personnel and among displaced persons and refugees. During 1944 and 1945 in the French and German campaigns he vigorously carried out disease control plans which he had helped formulate at an earlier date. His application of typhus control measures contributed greatly to a general reduction of the risks of infection in the western European combat zone."

CONTAGIOUS DISEASES AMONG DUTCH CHILDREN

A special release from the Netherlands Information Bureau states that infectious diseases due to malnutrition are continuing to take their toll among the children of the Netherlands. Thousands of youngsters are suffering from tuberculosis, dysentery and diphtheria, and the already overcrowded hospitals are unable to cope with the unprecedented demands on their services. Owing to the difficulty of obtaining nourishing foods in the western part of the Netherlands, tuberculosis is prevalent. Diphtheria and various skin diseases, including scabies, are particularly prevalent among babies and children under 4. Medical officials are doing all they can to fight disease, but they are hampered by a severe shortage of medicines, ointments, bandages and instruments. Even baby bottles, disinfectants and ingredients for such simple remedies as cough syrup are unavailable. Another handicap is the lack of sanatoriums for the hospitalization of tuberculosis victims. Doctors fear that home nursing of tuberculous patients may spread the disease to the rest of the population. In order to check any increase of various disease, repatriates from the concentration camps in Germany must undergo a strict physical examination, including a thorough delousing process, to prevent any possible typhoid epidemic. Furthermore, all of them are under obligation to take an x-ray examination for tuberculosis one week after their return to civilian life.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL June 9, page 447)

ILLINOIS

Belmont Community Hospital, Chicago. Capacity, 125; admissions, 4,180. Mrs. Gertrude F. Scofield, Superintendent (interns, July and October 1945, January 1946).

KANSAS

Wichita Hospital, Wichita. Capacity, 157; admissions, 3,888. Sister M. Agnes, Administrator (interns, July and October).

MICHIGAN

Kalamazoo State Hospital, Kalamazoo. Capacity, 3,380; admissions, 542. Dr. R. A. Morter, Medical Superintendent (2 residents—psychiatry).

NEBRASKA

Creighton Memorial St. Joseph's Hospital, Omaha. Capacity, 501; admissions, 11,812. Dr. C. M. Wilhelmj, Dean, Creighton University School of Medicine (resident—pathology).

NEW JERSEY

Orange Memorial Hospital, Orange. Capacity, 439; admissions, 8,103. Mr. F. Stanley Howe, Director (intern).

PENNSYLVANIA

Uniontown Hospital, Uniontown. Capacity, 230; admissions, 5,563. Mr. John Farrell, Superintendent (interns).

UTAH

Thomas D. Dee Memorial Hospital, Ogden. Capacity, 400; admissions, 8,405. Mr. Lawrence H. Evans, Superintendent (interns).

CHILEAN ORDER OF MERIT

Col. Harold B. Gotaas, director of the Division of Health and Sanitation, Institute of Inter-American Affairs, was recently decorated by the Chilean government with the Order of Merit. Before joining the army in 1942 Colonel Gotaas was professor of sanitary engineering of the School of Public Health, University of North Carolina.

VETERANS ADMINISTRATION HOSPITAL IN PITTSBURGH

The Veterans Administration announced recently that President Truman has authorized construction at Pittsburgh of a 1,200 bed general medical and surgical hospital on a 13 acre site adjacent to the University of Pittsburgh. When the hospital is completed, the Aspinwall Hospital outside Pittsburgh will be converted into a tuberculosis hospital.

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

Following an appeal from the Maritime Hospital at Toulon, France, the Medical and Surgical Relief Committee of America (420 Lexington Avenue, New York 17) recently sent a supply of radium. In addition, the hospital received more than $5,000 worth of material from the committee, including an ambulance, penicillin and assorted medical and surgical supplies.

OCCUPATIONAL THERAPY EXPANSION

Between May 16 and 31 twenty-nine emergency course apprentices from Mills College, Calif., were assigned to hospitals for clinical training in occupational therapy. Seventy students were assigned to the War Emergency Course starting June 1 at Milwaukee Downer College, Milwaukee, and seventy-five enlisted women were assigned to occupational therapy assistants courses at Halloran General Hospital.

ORGANIZATION SECTION

THE WAGNER-MURRAY-DINGELL BILL

Senator Wagner Comments on The Journal Editorial Concerning the Wagner-Murray-Dingell Bill—1945 Version

(Following is a letter sent by Senator Wagner of New York to the editor of The Journal together with interpolated comment:)

To the Editor:—THE JOURNAL on June 2 published an editorial on the Wagner-Murray-Dingell bill. I should like to comment on this editorial.

In the last paragraph of your editorial it is stated that I have "not consulted with the American Medical Association." The fact is that I *did* consult the American Medical Association. On Dec. 7, 1944, I addressed a letter to Dr. Olin West, Secretary and General Manager of the American Medical Association, listing a series of suggestions for the revision of the 1943 bill and inviting the Association to comment on these proposals. In Dr. West's reply to me of December 15 he said that he was not in a position to enter into a discussion of the proposals which I submitted; that any comment he might be disposed to make would be only in the nature of a personal opinion; that only the House of Delegates is in a position to commit the Association. He enclosed certain principles adopted by the House in June 1944.

In all discussions of the Wagner-Murray-Dingell bill by the House of Delegates, Dr. West said, it has been clearly evident that the members think "federalization of medical service" or "the subjection of medicine to political domination" would result in deterioration of quality and in lowering professional standards. Since the bill does not propose "federalization of medical service" or "the subjection of medicine to political domination," this was not pertinent or very helpful. Dr. West then said he was forwarding a copy of my letter to various elected officers and members of official bodies of the Association (whom he listed). In the five months which followed, prior to May 24, when the bill was introduced, neither Dr. West nor any other officer of the Association submitted any comments nor was there any indication on the part of the officers of the Association of a willingness to consult with me or my colleagues.

(This portion of letter was submitted to Dr. Olin West, Secretary of the American Medical Association, who replies:)

To the Editor:—On Dec. 11, 1944 I received a letter from Senator Wagner in which it was stated that he had received numerous suggestions for changes and broadening of the health insurance provisions of the Wagner-Murray-Dingell bill. There was submitted in the letter "a list of the most important suggestions I have received." The final paragraph of Mr. Wagner's letter read as follows: "I should appreciate having your comments on these suggestions as soon as possible, preferably within the next ten days."

In my reply I informed Mr. Wagner that I did not feel that I was in a position to enter into a discussion "of the proposals for changing and broadening the health provisions of the Wagner-Murray-Dingell bill," since any comment that I might be disposed to offer would be purely in the nature of personal opinion. I stated that the House of Delegates of the American Medical Association is its policy making body and that only the House of Delegates is in a position to commit the American Medical Association with respect to legislation of such great importance to the public and to the medical profession as the Wagner-Murray-Dingell bill. I further stated that in the discussions of the Wagner-Murray-Dingell bill at meetings of the House of Delegates previously held it had been clearly evident that the members of that body, representing fifty-four constituent state and territorial medical associations, were convinced that federalization of medical service in the United States or the subjection of medicine to political domination would result in bringing about deterioration of the quality of medical service and would lower professional standards which the American Medical Association for nearly one hundred years has attempted to establish and maintain on the highest possible plane.

I informed Mr. Wagner that a copy of his letter addressed to me had been sent to the elected officers of the Association, to the members of the Board of Trustees and to the members of the Council on Medical Service and Public Relations. I sent Mr. Wagner a copy of the principles adopted by the House of Delegates of the American Medical Association in June 1944. It did not occur to me that Mr. Wagner intended that his letter to me should be considered as a request for a statement representing the policy of the American Medical Association, and even had I believed his letter to be of that nature I should not have presumed to speak for the Association. The letter merely asked for comments on certain proposals, it did not suggest or invite a conference.

Olin West.

(Senator Wagner continues:)

On numerous occasions over the past ten years the American Medical Association has been urged to put forward constructive proposals to deal with admitted needs for health and medical services in the United States. In 1934, while members of the American Medical Association staff were working with the government's staff, even before a government report could be made, the Association called a special meeting of the House of Delegates and adopted policies condemning health insurance proposals *before* they were made. In 1938 at the National Health Conference the President of the American Medical Association promised the cooperation of the Association; but no constructive proposals were forthcoming. Since then—up to the introduction of the Hill-Burton hospital construction bill—the Association has condemned every proposal which had a chance to deal with our large national needs on an adequate basis.

I say this not in criticism or to rake over old ashes, but only to point out that there is a long record of attempts to cooperate with the Association and that those who have made such attempts have always been met with rebuffs. Nevertheless, let me repeat the assurance that I am willing—as I always have been—to consult with the Association at any time.

Comment.—Senator Wagner and the representatives of the Social Security Board have queer ideas of consultation and cooperation. From the first they have insisted on federal compulsory sickness insurance as the only answer to the problem of medical care. They refuse to listen to any other proposals or to modify in any way the proposals developed through the Social Security Board and introduced by the Senator.—*Ed.*

(Senator Wagner continues:)

Your editorial disparages the importance of two medical groups which consulted with me. One group, the Physicians' Forum, you dismiss with the charge that they are several hundred physicians "mostly inclined toward communism!" This brings to mind your editorial of Dec. 3, 1932 condemning the Majority Report of the Committee on the Costs of Medical Care as "socialism and communism—inciting to revolution." This charge was made about a report—mainly recommending *voluntary* health insurance—which was prepared under the chairmanship of Dr. Ray Lyman Wilbur, president of Leland Stanford University and a former President of the American Medical Association. At the time he signed the report, Dr. Wilbur was Secretary of the Interior in President Hoover's cabinet.

Comment.*—The American Medical Association through its House of Delegates has repeatedly shown its willingness to modify its point of view by accepting various technics for spreading the costs of medical service, such as hospitalization insurance, insurance against catastrophic illness and even insurance against illness in toto. Apparently the House of Delegates has only required the submission of actual evidence based on trial that such technics represented sound insurance practice and were conducted along lines which would insure a high quality of medical service without destroying those factors essential for maintaining medical advancement. This is in contrast with the proposals of Senator Wagner, which have invariably demanded that the entire nation be placed at one time under a single system and that system always a federal compulsory sickness insurance system.—*Ed.

(Senator Wagner continues:)

Your editorial says that our bill "would take over the proposals of the Hill-Burton bill for hospital and health center construction and make of it a ten year program at ten times the cost. This is long term planning with a vengeance, in view of the experimental character of the proposal, at best." The facts, as any one can verify by reading the bill, are as follows: The Hill-Burton bill authorizes the appropriation of $100,000,000 for construction purposes during the first fiscal year; our bill proposes one half as much, or $50,000,000, for the first year. The Hill-Burton bill authorizes that there be appropriated for each fiscal year thereafter a sum sufficient to carry out the purpose. This means an authorization of an unlimited amount for an unlimited number of years. Our bill, on the other hand, authorizes a *maximum* of $100,000,000 a year only for each of the nine years after the first year. Thus, your statement about our bill was totally incorrect.

Comment.*—The most significant factor in the Hill-Burton bill is its proposal to grant funds only on demonstration of existing need and on the ability of the community to maintain a high quality of medical service under local administration and control. Grants are made only to the limit of existing needs. The Wagner-Murray-Dingell bill, 1945 version, authorizes a maximum of $100,000 000 a year for nine years. How many instances are there in which federal agencies with an authorized maximum of $100,000,000 for spending have failed to utilize the maximum?—*Ed.

(Senator Wagner continues:)

In the same paragraph you say that the new Wagner-Murray-Dingell bill also proposes to extend the grants for the venereal disease and tuberculosis programs. No such extension is contained in our bill. On these two programs our bill merely repeats the existing provisions of section 314 of the Public Health Service Act with only such editorial changes as were necessary to make clear that our proposals for expanded public health work do not change the venereal disease and the tuberculosis programs.

Comment.*—Conceivably continuous improvement in the attack on venereal disease and on tuberculosis will lessen the total expenditures required for these purposes. Is it necessary then to extend existing grants indefinitely?—*Ed.

(Senator Wagner continues:)

Your editorial makes extensive use of questions raised by an editorial on our bill in the New York *Times* for May 26. How many times have I seen your columns inveigh against the views and comments on health programs advocated by the editorial columns of that newspaper! More important, however, it is unfortunate that you fall into the same errors as the *Times*. One would gather from your comment that an unemployed worker under our proposals would only have to appear at an office and demand an unemployment check. The fact is that existing unemployment insurance laws require—and our bill requires—that an unemployed worker eligible for unemployment benefits must register at an employment office each week and that he becomes entitled to benefits only if the employment service is unable to offer him suitable employment. The bill specifically provides that he is disqualified from receiving his benefits if he refuses to accept suitable employment. You also repeat the error that "the old age benefits in some instances would pay a man more for retiring than for continuing at his job." The fact is that our bill includes the 80 per cent maximum contained in the present law, and that a man cannot receive as much on retiring as he has ordinarily earned in covered employment (see page 132, line 19, of the bill).

Comment.*—Expert economists and accountants are having difficulty in interpreting the Senator's estimates and his tables. In the *Congressional Record*, May 28, 1945, page 530, he himself introduced some corrections of errors in his tables. Practically all authorities are convinced that the sums to be spent under this bill are far beyond the 8 per cent tax on the payroll that the bill proposes. This the Senator freely admits, stating that the total amount will be made up from general taxes. Referring specifically to Senator Wagner's comments in this paragraph, is it not the maximum government control over the individual to suggest that a worker will not be entitled to his benefits under unemployment insurance unless he takes a job that a federal government agency offers him? Will the workers of this country be willing to accept that type of dictation?—*Ed.

(Senator Wagner continues:)

Finally, I want to comment on the closing sentence of your editorial. You refer to "obstinacy" typical of the manner in which my colleagues and I have tried "to impose their notions regarding the care of the public health and the sick on the people of the United States." This statement appears at the close of the same paragraph which made mention of several organizations which have endorsed the bill. Many millions of people are members of those organizations, and many tens of millions of people are represented by them and their families. When they endorse legislation, is it still only the sponsors of the bill who are trying to "impose their notions?" The facts do not square with your assertion.

It is evident from the results of numerous polls and from the many thousands of letters written to me and to my colleagues that the American public is in favor of health insurance. I feel that the American Medical Association has the opportunity to render a great public service in this field. I hope that instead of pursuing a negative policy you will join with those of us who are trying to find constructive solutions to one of America's basic problems.

ROBERT F. WAGNER,
United States Senate, Washington, D. C.

Comment.—As has already been mentioned, various state and county medical associations are now participating in trials of various technics with the hope that suitable methods can be found. This is the very opposite of obstinacy. Senator Wagner and the Social Security Board, however, have never admitted any possible answer to the problem of medical care except a federal compulsory sickness insurance system. This is the apotheosis of stubbornness and obstinacy and with it a complete lack of willingness to confer, to consult or to reason.—*Ed.*

Washington Letter

(From a Special Correspondent)

June 25, 1945.

National Advisory Health Council Reviews Its Work

Present and postwar plans of various public health service divisions were reviewed at the first meeting of the National Advisory Health Council to be held since passage of the Public Health Service Act of 1944, which was called in Wilson Hall at the National Institute of Health, June 19 and 20. The council, which serves in an advisory capacity to Surgeon General Parran, also considered recommendations to meet existing conditions resulting from the war. The National Institute of Health took up extension of grants-in-aid for additional research and methods of assistance to young scientists through fellowships, and reported on the work of the institute and laboratories. The Office of the Surgeon General explained the work of the engineering division and discussed plans to have adequately trained public health personnel for the nation. Reviews were heard from the National Cancer Institute, Division of Infectious Diseases, Division of Physiology, Biologics Control Laboratory, Chemistry Laboratory, Pathology Laboratory, Zoology Laboratory and Industrial Hygiene Research Laboratory. The Bureau of Medical Services presented statements from the Division of Mental Hygiene, the Foreign Quarantine Division, the Interservice Committee for the Control of Exotic Diseases and the International Health Relations Section. Reports were also heard from the Bureau of State Services encompassing the State Relations Division, Venereal Disease Division, Tuberculosis Control Division and Public Health Nursing. Dr. Parran heads the council, which consists of Alphone R. Dochez, professor of medicine, Columbia University College of Physicians and Surgeons; Clarence C. Selby, medical consultant, General Motors, Detroit; Kenneth F. Maxcy, professor of epidemiology, School of Hygiene and Public Health, Johns Hopkins University, Baltimore; Alfred C. Reed, associate clinical professor of medicine, Stanford University School of Medicine, San Francisco; John H. Musser, professor of medicine, Tulane University of Louisiana School of Medicine, New Orleans; Henry F. Vaughan, dean, school of Public Health, University of Michigan, Ann Arbor; Harry S. Mustard, professor of public health practice, Columbia University College of Physicians and Surgeons, New York; Gordon M. Fair, professor of engineering, Harvard University, Cambridge, Mass.; Carl S. Marvel, professor of organic chemistry, University of Illinois, Urbana; William C. Rose, professor of biochemistry, Department of Chemistry, University of Illinois; Capt. T. J. Carter (MC), U.S.N., chief, division of preventive medicine and surgery, Navy Department, Washington, D. C.; Brig. Gen. Stanhope Bayne-Jones, director of the United States of America Typhus Commission, Office of the Surgeon General, Washington, D. C.; Harry W. Schoening, assistant chief, Bureau of Animal Industry, Department of Agriculture, Washington, D. C., and Asst. Surg. Gen. R. E. Dyer, director, National Institute of Health, Bethesda, Md.

Eisenhower Lauds Work of Medical Officers in War

Tribute to medical officers in the war was paid by General Eisenhower at his news conference in the Pentagon Building on his arrival in Washington last Monday. He was asked the question "Would you like to make a statement regarding the work of the medical officers in this war?" He replied "Well, the medical officer as an individual I can't say much about. I can talk about the medical service. I think the best way to measure it is the percentage of fatalities that come out of your wounded, and it has been cut more than half, less than 50 per cent what it was in the other world war. I think for a long time we were running 33 per cent, but it has been brought about, I think, largely, first, by better organization of the medical service and, second, by the addition of the sulfonamide drugs and penicillin and the use of blood plasma and whole blood. If I could reach all America there is one thing I would like to do—thank them for blood plasma and whole blood. It has been a tremendous thing. These are the things, I believe; that and one other factor—air evacuation. We have evacuated almost every one from our forward hospitals by air, and it has unquestionably saved hundreds of lives—thousands of lives."

Criticism of Overoptimistic Publicity on Amputation Cases

The Army has been accused of giving too glowing a picture in its publicity on the ease with which soldiers who have undergone amputation are fitting back into civilian life with artificial limbs. Soldiers are reported to have found that the newly designed artificial legs and arms are better than the old ones, but not a great deal better. The claim is made that the new "miracle hand" is not being made in large enough quantities and that many men are on the waiting list. Veterans are finding that it is a long tedious process to learn to use their new limbs. It is also stated that the newest developments are not satisfactory if a soldier has lost an elbow or a knee. A considerable number of men are disclosed to have become impatient with their appliances after discharge and on return home have bought other types of artificial limbs from small shops that have sprung up.

One curious outcome of all the optimistic publicity on the dexterity of amputees is the bill introduced by Senator Langer, Republican of North Dakota, to require every major league baseball club to have at least 10 per cent of men who have lost one or more limbs. In view of this situation on soldier attitude toward artificial limbs, critics say that the matter is a psychologic problem.

Slight Increase in Infantile Paralysis

With no signs of an epidemic, infantile paralysis cases have increased slightly throughout the United States. The total number of cases for the week ended June 16 was 99, which is 4 more than for the previous week and 25 more than for the same week last year. Fear of an epidemic led Texas to ask U. S. Public Health Service aid, and Dr. A. G. Gilliam was sent to Houston, where during the week of June 9 10 cases with two deaths were reported. The state's total for the week of June 9 dropped to 37 the week of June 16, and Houston had only 8 cases the following week. Since January 1 999 infantile paralysis cases have been reported in the nation, as compared with 657 in the same time in 1944.

Patenting of Earth-Dwelling Molds Related to Penicillin

Extracts from earth-dwelling molds related to penicillin are covered in patents just issued. One compound, known as actinomycin, together with a method for extracting it, is the subject of two U. S. patents assigned to Merck and Company, which pharmaceutical firm has been active in the production of

penicillin. The patent on the mold chemical, number 2,378,876, was taken out by Prof. Selman A. Waksman of Rutgers University and Dr. Harold B. Woodruff, Merck scientist. Actinomycin, as they call it, is a red substance left after a mold known as Actinomyces antibioticus has been subjected to ether extraction and the extract then evaporated. It can be chemically separated into two fractions, designated respectively A and B. Actinomycin A is stated to be powerful in its action against certain micro-organisms. The patent covering an improved method for extracting actinomycin A was number 2,378,449, issued to another Merck employee, Dr. Max Tishler.

President Proclaims National Farm Safety Week July 22-28

President Truman has proclaimed National Farm Safety week, July 22-28, to give every farm family in the country a safety check-up. Maynard H. Coe, director of the Farm Division of the National Safety Council, suggested that individuals and organizations center their attack on falls. These, he said, occur in the farm home more frequently than any other type of accident; on burns, which usually rank about second, and on educating farm workers in the proper handling of machinery, animals and firearms. Farm leaders who have pledged their cooperation include Edward S. O'Neal, president of the American Farm Bureau Federation, James G. Patton, president of the National Farmers' Union, and A. S. Goss, master of the National Grange.

General Hines Honored for Twenty-Two Years' Service to Veterans

Veterans Administrator Hines was to be honored June 26 for his twenty-two years of service to war veterans at a testimonial dinner in the Hotel Statler arranged by the Disabled American Veterans. In 1923 General Hines was appointed director of the Veterans Bureau. Since then he has served either as director of the Veterans Bureau or administrator of Veterans Affairs, which office came into being in 1930. General Hines has supervised construction of hospitals and homes involving an expenditure of approximately $180,000,000 and during his time in office has directed the disbursement of more than $15,000,000 in veterans' benefits.

The Veterans Administration now has 46,071 employees and operates ninety-four hospitals, homes and facilities and ten regional offices throughout the United States and its possessions.

World Health Decisions Hinge on New World League Charter

Authorities state that vitally important decisions concerning medical and health problems the world over hinge on the successful completion of a charter for a new world league at San Francisco. A steering committee of all conference delegation chiefs accepted the charter as pieced together by conference experts. The decision was made on May 1 that in this final plenary session there would be no discussion or statement on the substance of approved texts.

Ample Penicillin Is Reported Available Since WLB Release

Some communities report that ample supplies of penicillin are now available for those needing it, since the War Production Board released approximately 885,000,000,000 units for civilian distribution after March 15.

Capital Notes

A bill to provide $1,300,000 for improvements at the Columbia Hospital for Women, 80 year old Washington institution, will be introduced in the Senate by Senator Radcliffe, Democrat of Maryland.

Surg. Gen. Thomas Parran of the U. S. Public Health Service continues an appeal for U. S. Cadet Nurse Corps recruits "to meet civilian health needs."

Medical Legislation

MEDICAL BILLS IN CONGRESS

Penicillin

The House has passed H. R. 3266, the bill providing for the certification of batches of drugs composed wholly or partly of any kind of penicillin or any derivative thereof. This bill is similar to the existing law safeguarding the purity of insulin.

G. I. Bill of Rights

Senator Pepper, Florida, has introduced S. 1176, proposing to amend the Servicemen's Readjustment Act of 1944 with respect to the education and training of veterans. Among other changes, this bill would (1) make benefits available regardless of whether or not education was impeded, delayed, interrupted or interfered with by reason of his entrance into service; (2) remove the requirement that the educational course shall be initiated not later than two years after discharge or termination of the war; (3) remove the distinction between veterans over 25 years at the time of induction and those under this age; (4) add special provisions for qualifying veterans who wish to complete preprofessional and professional courses of education, extending the maximum benefit to seven years regardless of length of service; and (5) increase the monetary dependency benefits to veterans obtaining education.

Another bill, H. R. 3536, introduced by Representative Rankin, Mississippi, proposes to revise generally the Servicemen's Readjustment Act of 1944.

National Neuropsychiatric Institute

Senator Pepper, Florida, for himself and Senator Thomas, Utah, Senator Tunnell, Delaware, Senator Hill, Alabama, Senator Murray, Montana, Senator LaFollette, Wisconsin, and Senator Aiken, Vermont, has introduced S. 1160 to provide for, foster and aid in coordinating research relating to neuropsychiatric disorders, to provide for more effective methods of prevention, diagnosis and treatment of such disorders and to establish a National Neuropsychiatric Institute in the United States Public Health Service. The co-authors of this bill are members of a standing committee of the Senate Committee on Education and Labor which has been created to consider proposed legislation on health.

Dental Care

The Senate has passed S. 715 to provide more efficient dental care for the personnel of the United States Navy. The purpose of this bill is to reorganize the Bureau of Medicine and Surgery so as to provide for greater integrity of the dental service of the Navy. It would direct that this reorganization be consummated within six months.

The bill removing the limitation on the right to command of officers of the dental corps of the Army which limits such officers to command in that corps, S. 916, has passed the Senate and House.

Scientific Research

The House has passed H. R. 3440, proposing an appropriation not to exceed $8,000,000 for each fiscal year to enable the National Academy of Sciences, through a research board for national security consisting of representatives of the Army and of the Navy and civilians of outstanding accomplishments to provide for scientific research and advancement determined by the board to be desirable in the interest of national security.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

State Medical Election.—Dr. Henry King Wade, Hot Springs National Park, was chosen president-elect of the Arkansas Medical Society at a meeting of the council in Little Rock, April 22, and Dr. Charles A. Archer, DeQueen, was installed as president. Other officers include Drs. Richard C. Dickinson, Horatio, DeVeaux L. Owens, Harrison, and Frederick W. Hames, Pine Bluff, vice presidents, and Paul L. Mahoney, Little Rock, treasurer. Dr. William R. Brooksher, Fort Smith, secretary of the society, was chosen delegate to the American Medical Association and Dr. Edward E. Barlow, Dermott, was also chosen delegate, succeeding the late Dr. Sidney J. Wolfermann, Fort Smith.

CALIFORNIA

Executive Director Named for Physicians Service.—Mr. William M. Bowman, who has been assistant executive director in charge of the Los Angeles office of the California Physicians Service, has been appointed executive director of the state group.

Institute in Public Health Statistics.—The University of California School of Public Health and the state department of public health cooperated in an institute in public health statistics, June 18-30. The institute, which was held on the Berkeley campus, was designed to "acquaint participants with the legal and medical aspects of vital statistics, registration procedures and the simpler technics of public health statistics." Eschscholtzia L. Lucia, Ph.D., associate professor of biometry at the university, was director of the sessions.

COLORADO

Industrial Hygiene Newsletter.—The division of industrial hygiene of the University of Colorado School of Medicine, Denver, has recently begun the publication of a newsletter to serve as a clearing house for information on industrial health matters for Rocky Mountain industrial groups.

CONNECTICUT

Personal.—Dr. Robert E. Peck has resigned as director of the department of physical therapy at Grace Hospital to make his home in Dunbarton, N. H. He was guest of honor at a dinner given at the New Haven Medical Association April 28. His resignation concludes twenty-six years' association with the hospital.

First Case of Leprosy Since 1927.—On May 21 the bureau of preventable diseases of the Connecticut State Department of Health announced the discovery of the first case of leprosy in Connecticut since 1927. The patient, who was being sent back to Jamaica and who was working on a farm in Granby under the War Food Administration program, is said to have had the disease before coming to the United States.

DELAWARE

Society News.—The New Castle County Medical Society of Delaware was addressed May 15 by Dr. Sylvester W. Rennie, Wilmington, on "Thermal Burns."

State Social Hygiene Group Formed.—The Delaware State Social Hygiene Association was recently organized with Arthur D. Maybee, chairman of the Wilmington Safety Council and director of the Blue Cross Hospital Cooperative Plan, as president. Other officers include Dr. Arthur Parker Hitchens, Wilmington city health officer, Dr. Edwin Cameron, Dover, executive secretary, state board of health, and Dr. James Beebe, Lewes, vice presidents; Taggart Evans, executive secretary, Delaware Tuberculosis Association, secretary, and Pierre S. Du Pont III, treasurer.

DISTRICT OF COLUMBIA

Scientific Assembly Canceled.—The seventeenth annual scientific assembly of the Medical Society of the District of Columbia, scheduled for October 1-3, has been canceled.

IOWA

Outbreak of Ringworm of the Scalp.—On May 28 there were 235 cases of scalp ringworm reported in Davenport, according to the Davenport *Times*.

Course on Tropical Medicine.—A short course on tropical medicine will be conducted at the State University of Iowa College of Medicine, Iowa City, July 23-28, under the auspices of the state department of health.

Personal.—Dr. Max L. Durfee, health director at Iowa State Teachers College, Cedar Falls, since 1939, has resigned to accept a position as director of health service at the University of Oklahoma, Norman, effective July 1.

Physician Honored.—The Kiwanis distinguished service medal for 1944 was recently awarded to Dr. Allen C. Starry, Sioux City, for his work as director of laboratory work of the four Sioux City hospitals and as acting health director at the time of the flood in Sioux City early in the summer of 1944. The presentation of the medal was inaugurated by the Kiwanis Club in 1922, and its rule provides that no Kiwanian may accept the medal or serve on the award committee.

KANSAS

The Root Lecture.—Dr. Lewis J. Moorman, Oklahoma City, gave the annual William W. Root Lecture of the Alpha Omega Alpha Society, May 3, at the University of Kansas School of Medicine, Kansas City. His subject was "Tuberculosis and Genius."

Public Health Election.—Dr. William Fred Mayes was chosen president-elect of the Kansas Public Health Association during its meeting in Topeka, May 21-22; Paul D. Haney, director, state division of sanitation, was installed as president. Evan Wright, director, food and drug division, state board of health, is the secretary. All are in Topeka.

Changes in Health Personnel.—Recent changes among the health officers in Kansas include the transfer of Dr. Marion Friedman, Columbus, from Cherokee County to St. Louis County, Mo., Dr. John C. Ulrey, St. John, to succeed Dr. Charles S. Adams in Stafford County and Dr. Adelbert L. Suwalsky to succeed Dr. Alonzo R. Adams as city health officer of Leavenworth.——Dr. Laurence S. Nelson, Salina, has been appointed to a three year term on the Kansas State Board of Health, succeeding Dr. Gilbert A. Leslie, McDonald, who recently moved to Colorado (THE JOURNAL, March 4, p. 723). ——Dr. Clara R. Johns, Topeka, was recently appointed health officer of Johnson County.

KENTUCKY

Changes in Health Officers.—Dr. Martin H. Skaggs has resigned as health officer of Shelby County, effective June 1, to enter private practice in Taylorsville.——Dr. Edwin Bruce Underwood, Morganfield, has been appointed director of the Henderson County health department, succeeding Dr. Edwin W. Sigler (THE JOURNAL, April 28, p. 1138).

Distinguished Service Award Created.—Dr. E. Murphy Howard, Harlan, president of the Kentucky State Department of Health and past president of the state medical association, has, with the approval of the council, provided for a distinguished service medal to be given each year to the physician who represents the ideals of Kentucky medicine. The *Kentucky Medical Journal* states that this award is distinctly separate from the distinguished service medal awarded by the state medical association but will be given each year during the annual meeting of the association. The committee on award consists of Drs. Karl D. Winter, Ben W. Smock, Lillian H. South, all of Louisville, and the president and secretary of the association as ex officio members.

MASSACHUSETTS

George Bolling Dies.—Mr. George E. Bolling, who served the city of Brockton as chemist and bacteriologist for nearly fifty years, died May 20, aged 69.

Lecture Named for George Holmes.—On May 18 the New England Roentgen Ray Society created a lecture in honor of Dr. George W. Holmes, who is clinical professor of roentgenology emeritus, Harvard Medical School, Boston. The first lecture was delivered by Dr. Holmes.

Medicolegal Conference and Seminar.—The department of legal medicine of the medical schools of Harvard, Tufts College and Boston University in cooperation with the Massachusetts Medico-Legal Society will present a six day program

of lectures, conferences and demonstrations having to do with the investigation of deaths in the interests of public safety, at Harvard, October 1-6. Attendance during five of the six days of the course will be limited to fifteen persons who have registered in advance. On October 3 the program will be open to any physician, lawyer, police official or senior medical student who may care to attend. Further information may be obtained from the secretary of the Massachusetts Medico-Legal Society, 25 Shattuck Street, Boston.

Laboratories Dedicated.—The Shrewsbury Laboratories of the Worcester Foundation for Experimental Biology, Worcester, were dedicated on June 9. The foundation was incorporated in February 1944 (THE JOURNAL, May 13, 1944, p. 160) and is set up to make investigations at the discretion of its directors in the field of biologic sciences and publish the results of these investigations in scientific and medical journals so that they may become freely available to the public. Projects studied include hormone physiology, fatigue and the activity of the cortex of the adrenal gland as measured by urinary hormone excretion products, problems of human aging and cancer. The scientific work of the foundation is under the direction of Hudson Hoagland, Ph.D., and the laboratories are under Gregory G. Pincus, Sc.D.

MICHIGAN

Personal.—Dr. Willis R. Geerlings has been elected mayor of Fremont for a fourth term.—Dr. Lowell S. Selling, Detroit, has resigned as director of the psychopathic clinic of the recorder's court, a position he held for ten years.—Dr. Wilber J. M. Menke, formerly of Paris, Ill., has been chosen deputy commissioner in the state health department for the upper peninsula.

Study of Dental Caries.—Dentists of the U. S. Public Health Service are now examining 5,000 school children in Muskegon in a dental caries demonstration in which Muskegon was chosen as the control city. Grand Rapids was also selected for the demonstration, fluorine having been added to the city's drinking water. The dental records of some 28,000 school children in Grand Rapids before the fluorine was added to the city water supply have been completed. Periodic examinations will be made of school children in both cities to note any change made in the dental caries rate.

Alumni Association Honors Old Graduates.—Life memberships in the Wayne University College of Medicine Alumni Association were presented to twenty medical men at the annual dinner of the association held May 11 at the Statler Hotel, Detroit. All were graduated from the school fifty or more years ago (THE JOURNAL, May 12, p. 144). The oldest graduate honored was Dr. John A. Wessinger, for the past thirty years health officer for the city of Ann Arbor. Dr. Wessinger, who is 85 years old and still in active practice, received his diploma in 1882. Life memberships were also presented to Dr. Walter J. Cree, for many years historian of the Wayne County Medical Society, who graduated in 1883; Dr. Alfred N. Shotwell, Mount Clemens, 1884; Dr. Mortimer E. Roberts, Grand Rapids, 1889; Dr. William J. O'Reilly, Saginaw, 1890; Dr. Christian Storz, Toledo, Ohio, and Dr. Adolphus J. W. Nixon, Highland Park, both of the class of 1891; Dr. Nenian T. Shaw, Pontiac, 1892; Dr. Duncan J. McColl, Port Huron, and Dr. William H. Hoppenrath, Elwood, Ind., both graduated in 1893. Honored members of the class of 1894 included Drs. George Alexander, Pontiac; Henri Belanger, River Rouge; Alexander Thomson, Detroit, and Orlando A. Tooker, Lansing. The class of 1895 was represented by Drs. Channing W. Barrett, Chicago; Adelbert Edwards, Detroit; Thomas E. DeGurse, Marine City; Colin D. Munro and George E. Winter, both of Jackson, and Burt R. Shurly, member of the Detroit Board of Education. Dr. Clarence A. Mills, professor of experimental medicine at the University of Cincinnati College of Medicine, Cincinnati, spoke at the dinner meeting on "Climatic Imprint on Man."

MINNESOTA

Ninety Years of Age.—Dr. Thomas F. Quinby, Minneapolis, the oldest member in point of years and the oldest living ex-president of the Hennepin County Medical Society, observed his ninetieth birthday May 10. Dr. Quinby was elected to membership in the county society March 7, 1904, served as president in 1911 and became an affiliate member in 1931.

Illegal Practitioner.—On June 5 Marjorie J. Blatzheim, aged 29, Minneapolis, pleaded guilty to a charge of practicing healing without a basic science certificate. Following a sentence to a term of one year in the Minneapolis workhouse, the sentence was suspended and the defendant was placed on probation for one year. The defendant had been arrested when it was learned that she had offered to perform a criminal abortion for a fee of $200. At the time of her arrest the woman stated that she had just purchased the speculum found in her purse at a hospital supply house in Minneapolis and that she had also attempted to purchase catheters to be used in performing abortions. She stated that she had obtained the knowledge of performing criminal abortions from a Minneapolis man who has two previous convictions for felonies and who has been in the Minneapolis workhouse on two occasions in the past year for violating the medical laws of Minnesota.

NEW HAMPSHIRE

New Dean of Dartmouth Medical School.—Dr. Rolf C. Syvertsen, assistant dean of the Dartmouth Medical School, Hanover, since June 1944 and a member of the faculty since 1923, has been appointed dean of the medical school, effective July 1. He succeeds Dr. John P. Bowler, who has resigned because of pressure of his surgical work but who will continue as professor of surgery at the medical school. Dr. Syvertsen has been professor of anatomy at Dartmouth since 1938 and for many years has been secretary of the school. Dr. Bowler has served as dean since *1927*. Dr. Bowler and Dr. Syvertsen graduated at Dartmouth Medical School in 1917 and 1923 respectively. Both also graduated at Harvard Medical School, Boston, and Rush Medical College, Chicago, in 1919 and 1936 respectively.

NEW YORK

New Secretary of State Medical Board.—Dr. Jacob L. Lochner Jr., Albany, has been serving as secretary of the New York State Board of Medical Examiners since the resignation of Dr. Robert R. Hannon, Albany, who became executive officer of the state medical society.

Typhoid Traced to Carrier.—One carrier and one suspected carrier were found in a recent investigation of an outbreak of typhoid in Rochester. All 5 patients had eaten at the same restaurant in Rochester, 4 on one day and 1 two days later, but a review of the foods consumed failed to reveal any single item common to all. Practically all personnel had been employed at the restaurant for a number of years, during which time no typhoid had been traced to this source. Examination of blood and stool specimens, however, from each of these persons led to the discovery of a definite typhoid carrier and, in addition, of a suspected carrier. The definite carrier was employed in the restaurant bakery, but only 4 of the patients gave a history of having eaten bread and, according to *Health News*, it has not yet been determined exactly how she gave rise to the 5 cases, since no common food was implicated. As control measures the carrier and the suspected carrier were both relieved of their occupations and will be kept under surveillance.

New York City

License Reinstated.—The license to practice medicine in New York of Dr. Samuel G. Sisskind, Brooklyn, has been reinstated.

Personal.—Governor Dewey on May 28 reappointed Dr. George Baehr as a member of the state public health council to serve for a six year term dating from Jan. 1, 1945.—Dr. Aaron A. Karan has been appointed executive director of the Bronx Hospital. Dr. Karan has been holding a similar position at the Beth Moses Hospital, Brooklyn.

Sulfonamide Drugs Banned Without Prescription.—The city department of health on June 12 amended section 118 of the city sanitary code to prohibit the sale of sulfonamide drugs or sulfonamide-containing products for internal or external use without a prescription, according to a release from the city department of health. The ban, which becomes effective October 1, is said to have followed a recommendation by the public health relations committee of the New York Academy of Medicine and other health groups, which pointed out that sulfonamide drugs in any form could be used safely only under expert supervision and at a physician's direction.

OHIO

Dr. Lower Honored.—The distinguished service award of the Cleveland Academy of Medicine for 1945 was presented to Dr. William E. Lower, one of the founders of the Cleveland Clinic, during the academy's annual meeting, May 18. The citation accompanying the honor cited Dr. Lower as "a distinguished surgeon and practitioner who has been a con-

stant contributor to the life of Cleveland's medical profession." The citation also said that he had been a member of the academy since 1895 and had held many offices, once president, in the organization. Dr. Loyal Davis, Chicago, addressed the meeting.

Personal.—Dr. Anna M. Young on May 19 was elected to the board of directors of the Cleveland Academy of Medicine, the first woman ever to hold the position.——Dr. Richard A. Bolt has resigned as director of the Cleveland Child Health Association to assist in the organization of the new school of public health at the University of California, Berkeley, the Cleveland *Press* reported May 21.——Dr. John N. McCann, Youngstown, has been appointed to a seven year term on the state medical board, succeeding Dr. John H. Skavlem, Cincinnati, who was appointed last November to fill the unexpired term of the late Dr. Claude V. Davis, Pennsville.——Dr. James A. Doull, professor of hygiene and public health, Western Reserve University School of Medicine, Cleveland, recently went to England on a special mission.

SOUTH CAROLINA

Fifty Thousand Dollars to Care for Indigent Cancer Patients.—The senate has approved a $50,000 appropriation for hospital care for indigent cancer patients in South Carolina. According to the state medical journal the money is expected to be made available to the state board of health July 1 and represents an increase of $34,000 over last year's appropriation of $16,000. Discussing the project, the state medical journal stated that Dr. George S. T. Peeples, Columbia, director of the division of cancer control, had announced plans to resume the program, which had been repeatedly interrupted and curtailed on account of a lack of funds. The new appropriation makes available, for the first time since the program started in 1939, sufficient money for hospital care of as much as one third of the state's indigent cancer patients. The disease, which recorded 1,205 deaths in 1944, is the second leading cause of death in the state.

TEXAS

Cancer Committees.—The M. D. Anderson Hospital for Cancer Research, Houston, University of Texas, plans to launch an educational program on cancer through the creation of statewide cancer committees, it is reported.

VERMONT

University News.—Dr. George W. Thorn, Boston, addressed the Osler Clinical Society, May 15, on "Use of Concentrated Human Albumin Solution in the Treatment of Nephrosis and Cirrhosis." This was the last of a series of lectures sponsored by the undergraduate organization at the University of Vermont College of Medicine, Burlington, during the current school year.

VIRGINIA

Changes in Health Officers.—Dr. John McIver Jackson has been appointed health officer of the Norfolk-Princess Anne Health District, succeeding Dr. William B. Baily.——Dr. Glenn H. Baird has resigned as health officer of the Smyth-Washington-Bristol Health District, effective May 10, to accept a commission with the U. S. Naval Reserve.

Student Fund Memorial to Physician.—Miss Dorothy M. Strickland, Roanoke, and Daytona Beach, Fla., has established a loan fund for worthy Southern medical students as a memorial to her father, Dr. James Thomas Strickland, according to the *North Carolina Medical Journal*. For many years Dr. Strickland practiced medicine in Roanoke.

Pathologists Organized.—The Virginia Society for Pathology and Laboratory Medicine was recently organized with Dr. William E. Bray, Charlottesville, as president. Other officers include Drs. Morris B. Beecroft, Newport News, vice president and Thomas M. Peery, Alexandria, secretary-treasurer. The society will be affiliated with the Medical Society of Virginia.

Personal.—Dr. Raymond D. Kimbrough, Norfolk, has been appointed associate professor of preventive medicine and public health and associate professor of dermatology and syphilology at the Medical College of Virginia, Richmond, effective May 1. He will continue his private practice.——Dr. Hudson Mason Wingfield has resigned as physician and surgeon of the Richmond Fire Department, effective April 30.

New Officers of Cancer Foundation.—Dr. Isaac A. Bigger, Richmond, was elected president of the Virginia Cancer Foundation at a recent meeting. Dr. George Cooper Jr., Charlottesville, was elected director. Mrs. Augusta F. Jarman, Charlottesville, was reelected secretary. The Richmond *Times-Dispatch* states that the foundation has been raising funds for the past five years to care for indigent cancer patients. At a recent meeting it was voted to extend its activities to advanced cancer patients with the idea in view that beds can be found in hospitals which do not now provide space for the care of incurable cancer cases.

Special Society Elections.—Dr. Meade C. Edmunds, Petersburg, was chosen president of the Virginia Society of Ophthalmology and Otolaryngology at its twenty-sixth annual meeting in Richmond recently. Other officers include Drs. Thomas E. Hughes, Richmond, vice president and Francis H. McGovern, Danville, secretary-treasurer. Among the speakers at the meeting were Drs. Oliver E. Van Alyea, Chicago, "Management of Chronic Sinus Disease: A Critical Analysis of Modern Therapeutic Measures"; Joseph Krimsky, Charlottesville, "Hearing Aids: The Otologist's Problem," and Grady E. Clay, Atlanta, Ga., "Ophthalmoscopic Classification of Hypertensive Diseases."——New officers of the Roanoke Academy of Medicine, who will take office in October, include Drs. Thomas J. Hughes, president; Charles M. Irvin and Blanton P. Seward, vice presidents, and George S. Bourne, secretary-treasurer.

WASHINGTON

State Medical Bureau.—Mr. Ralph W. Neill, executive secretary of the Washington State Medical Association, will combine his present activities with those of state bureau manager of the State Medical Bureau, according to *Northwest Medicine*. Offices for the bureau have been established at 218 Cobb Building, Seattle, and its purpose will be to coordinate the activities of the respective county bureaus as well as to study the provision of statewide medical and hospital service contracts. Other activities will be the investigation of assuming administration of the old age assistance medical aid program, in compliance with a suggestion by the state department of social security, and expanding medical and hospital services to cover workers' families.

WISCONSIN

Dr. Thompson Resigns as Health Officer of Racine.—Dr. Ira F. Thompson has announced his resignation as commissioner of health of Racine, effective sometime in October. Dr. Thompson has been serving in the position since 1932, when he succeeded Dr. William W. Bauer, who resigned to become director of the Bureau of Health Education of the American Medical Association, Chicago.

The Helmholz Lecture.—Dr. Thomas Duckett Jones, assistant professor of medicine, Harvard Medical School, Boston, delivered the annual A. C. Helmholz Lecture at the University of Wisconsin Medical School, Madison, June 1. His subject was "Rheumatic Fever." The Helmholz lectureship was established in the medical school in 1941 by the children of Mr. and Mrs. August C. Helmholz.

Memorial to Dr. Grill.—To perpetuate the memory of Dr. John C. Grill, students, friends and associates are establishing a fund to be known as "John Grill, M.D., Memorial Fund," the interest of which is to be used to buy books for the medical library of the Marquette University School of Medicine, Milwaukee, according to the *Milwaukee Medical Times*. Dr. Grill had been associate professor of bacteriology and pathology at Marquette until December 1944, when he was made head of the department. He died March 17.

PHILIPPINE ISLANDS

Status of Medical Facilities.—A communication June 12 received from the Philippines reports the destruction by recent action of the medical school and library, the cancer hospital and the outpatient buildings at the University of the Philippines. All of the clinical records of the Philippine General Hospital, Manila, were destroyed and only a few broken test tubes and specimen jars were left in the laboratory. Members of the staff who have survived the Japanese occupation are devoting their full time to the treatment of any and all who are sick and cannot be treated at home. There is a shortage of everything, and many diagnoses are made on physical findings alone. Serologic tests are made by one of the Army laboratories. Limited blood counts are done in the hospital but bacteriologic studies are not possible at present, it was

stated. There is a great need for books and periodicals for the medical school and hospital and the library. The communication credited the great skill of the Filipino physicians in the present emergency.

GENERAL

Sixteen Air Lines Operate Without Fatalities.—Sixteen American air lines completed their 1944 operations without a single fatal accident, the National Safety Council reported June 26 in announcing its 1944 Aviation Safety Awards.

Meetings Canceled.—The 1945 meeting of the Mississippi Valley Medical Society, scheduled to be held at St. Louis in September, has been canceled because of war restrictions. Plans are being made to hold the 1946 meeting in the Jefferson Hotel, St. Louis, September 25-27.——The National Safety Congress of the National Safety Council scheduled for October will not be held this year.

Booklet Urges National Program on Nutrition.—The National Planning Association has issued a booklet entitled "A Food and Nutrition Program for the Nation" which carries a proposal that the President appoint a special committee of public officials and experts to make recommendations on government organization for nutrition. The recommendation was also made that this same group serve as the U. S. representative in the International Food and Agriculture Organization.

Trudeau Medal Goes to Florence Sabin.—At a meeting of the executive committee in New York June 6 the National Tuberculosis Association has awarded its Trudeau Medal to Dr. Florence R. Sabin, Denver, for her "extensive studies of the physiologic activities of the chemical fractions of the tubercle bacillus." Dr. John Alexander, Ann Arbor, Mich., was chosen president-elect of the American Trudeau Society, medical section of the National Tuberculosis Association, and Dr. Ezra R. Bridge, Rochester, N. Y., was inducted into the presidency.

New Committee Urges Cabinet Post for Health and Welfare Services.—A new cabinet post for education, health and welfare services will be advocated by the Committee on Reorganization of Community Services, according to the chairman, Mrs. Eugene Meyer, as reported in the New York *Times*, June 12. The committee of twenty-five working under the auspices of the Woman's Foundation plans to submit a detailed report soon, it was stated. Mrs. Meyer is reported to have said that a secretary of health, education and welfare, such as her committee proposes, would help local and state agencies by "dynamic leadership and financial assistance and by setting standards 'below which no American should be permitted to live.'"

Esmond Snell Receives Lilly Award.—Esmond E. Snell, Ph.D., of the research staff of the Clayton Biochemical Institute of the University of Texas, Austin, was on May 26 presented with the Eli Lilly and Company award in bacteriology and immunology for 1945 in recognition of his work on the nutritional requirements of micro-organisms. Selection of the recipient of the award is made by committees of the Society of American Bacteriologists, American Association of Immunologists and the American Society for Experimental Pathology. Eli Lilly and Company has made an additional grant making possible three more awards, presumably for 1946, 1947 and 1948. The award consists of a check for $1,000 and an engraved medal.

Narcotic Violations.—The U. S. Bureau of Narcotics announces the following actions:

Dr. Charles J. Raney, Yazoo City, Miss., pleaded nolo contendere to a violation of the Harrison Narcotic Law in the U. S. District Court, Jackson, Miss., May 7, and was placed on probation for three years.

Dr. James Samuel Harmon, Prichard, Ala., pleaded nolo contendere in the U. S. District Court at Mobile, Ala., to a violation of sending poison through the mail and on May 5 was sentenced to one year and one day and fined $500. Execution of the penitentiary sentence was suspended.

Dr. William Allen Young, Louisville, Miss., pleaded guilty in the U. S. District Court at Aberdeen, Miss., April 2 to violation of the narcotic law and was sentenced to a prison term of one year and one day and placed on probation for a period of five years.

Dr. Pasquale E. Massa, Boston, pleaded guilty in the U. S District Court, Boston, May 1, to violation of the Harrison Narcotic Law and was fined $500 and placed on probation for five years.

Dr. Joseph A Hirsch, Edwardsville, Ill., pleaded guilty in the U. S. District Court at Springfield, Ill., to violation of the federal narcotic law on March 19 and was fined $2,000.

Dr. Charles W. Robertson, Chandler, Okla., was fined $1,000 on April 11 following his plea of guilty in the U. S District Court at Oklahoma City to violation of the Harrison Narcotic Law.

Dr. William Lee Cosby, Painter, Va., pleaded guilty in the U. S District Court at Norfolk May 18 to violation of the Harrison Narcotic Law. He was given a suspended sentence for one year and placed on probation for a similar period.

Metropolitan's Tuberculosis Sanatorium to be Closed.—On September 1 the Metropolitan Life Insurance Company will close its tuberculosis sanatorium, which has been maintained at Mount McGregor, N. Y., since 1913 for the treatment of its tuberculous employees. Although a total of 3,507 employees have received treatment for tuberculosis since 1913, it is now felt that the number of patients and the period of treatment have been reduced to a point which no longer justifies the maintenance of an institution of this size. Patients now at the sanatorium will be given treatment at the company's expense in comparable sanatoriums located nearer to their homes. The Metropolitan sanatorium is located in the foothills of the Adirondack Mountains near Saratoga, N. Y. It occupies about 1,600 acres and consists of thirty buildings, including besides the main fireproof structure ward buildings, an infirmary and residences for the physician in charge, the staff and the nurses' home, providing facilities for the treatment of about 300 patients. One of the buildings, the John R. Hegeman Memorial Laboratory, established by the will of a former president of the Metropolitan, has been the seat of much of the modern research in the disease. The first director of the sanatorium was the late Dr. Horace J. Howk. He was succeeded by Dr. William H. Ordway, the present director.

FOREIGN

Faculty of Ophthalmologists Organized.—With the creation of a Faculty of Ophthalmologists by the Council of British Ophthalmologists, the council has dissolved. Officers of the council of the faculty were elected by ballot at its first meeting, April 12, and consisted of Brigadier Sir Stewart Duke-Elder, R. A. M. C., president; Dr. Frank A. Juler, vice president; Dr. Frank W. Law, honorary secretary, and Dr. Frederick A. Williamson-Noble, honorary treasurer. The address of the faculty is 45 Lincoln's Inn Fields, London, W. C. 2.

Endowment for Department of Anatomy.—Sir William Henry Collins, chairman of the Cerebos Salt Company, has made a gift of £100,000 to the Royal College of Surgeons for the endowment of the department of anatomy and for the establishment of a chair of human and comparative anatomy, according to *Science*. Last year Sir William gave £100,000 to endow a chair of pathology. The museum and research departments have been damaged during the war. Their maintenance, however, is now assured by the gift, and the college can proceed with its rebuilding plans.

Laboratory to Conserve Pathogenic Microbes.—A laboratory has been established in Lausanne, Switzerland, under the sponsorship of the Swiss Academy for Medical Sciences, which specializes in the preparation and conservation of pathogenic microbes common to man, animals and plants and which will operate in connection with the Institute of Hygiene and Bacteriology. Dr. Paul Hauduroy, professor of medical sciences at Lausanne and director of the Institute of Hygiene and Bacteriology, has been appointed director. According to an announcement from the Official Information Bureau of Switzerland, New York, samples of various microbes will be sent to scientists in all parts of the world who need such specimens in their research work. A detailed catalogue of the samples available will be prepared.

Japs Maintain Quinine Production in the Netherlands Indies.—Dr. Pieter Honig, member of the board for the Netherlands Indies, who recently returned from a survey of the liberated section of the Indies, stated that his observations and last minute underground reports show that the Japanese have been maintaining all quinine producing equipment that were not destroyed by the Dutch early in 1942. Dr. Honig is quoted in the Netherlands *News* as saying that reports coming from the men on the occupied islands indicates that quinine in the form in which the Dutch processed it is steadily being produced by the enemy to fight malaria and further that no Dutch or Indonesians are getting the quinine even though some of the equipment was left intact for that purpose. Much new equipment for processing cinchona bark into quinine, including twenty-five huge drying ovens capable of producing 2,200 pounds of dried bark per oven daily, is being purchased in the United States as rapidly as possible. This new machinery, plus vast numbers of trees maturing whenever the Indies are freed, will result in greatly increased quinine production for fighting global malaria, Dr. Honig said. He pointed out that, because cinchona trees from which quinine is extracted mature in cycles, no acute shortage of either bark or drug can occur for about fifteen years. By that time, authorities believe, the gap caused by Japanese omission to plant new trees will be closed by other means.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 26, 1945.

The British Medical Journal During the War

In its annual report the council of the British Medical Association states that the *Journal* has continued to appear regularly notwithstanding the war difficulties of production and distribution, with severe rationing of paper and shortage of staff. Since last year's report the obligatory circulation has grown in consequence of a large increase in membership, and the weekly printing order now approaches 53,000. With that figure a journal with an overall size of 60 pages and sometimes 64, compared with an average of 144 in 1938, can be produced on the present paper ration. Every means of economizing space has been adopted. From the early part of 1942 circulation outside the membership has been drastically curtailed and new subscriptions will be declined as long as the paper shortage remains. The number of original articles and medical memoranda submitted are far in excess of the space available under wartime conditions. Last year 946 signed articles were received, compared with 801, 797, 737 and 667 in the preceding years of the war. The total is now as large as before the war. Of the large number of letters from members at home and abroad only a selection can be published. The new section "Any Questions?" begun in 1943 has established its popularity and is continued in response to a wide demand. A first selection of the questions and answers has been prepared for publication in book form but awaits an allowance of paper for the purpose. A projected *Journal of Social Medicine,* under the editorship of Prof. F. A. E. Crew, to be issued by the association, is held up for the same reason.

Schemes for Emigration to the Dominions

The Japanese attempt to dominate the countries on the Pacific has wakened Australia and New Zealand to the danger of a small white population in control of vast territory in proximity to hundreds of millions of Asiatics. Hence immigration from Europe, preferably from Britain, has become important. Mr. F. M. Forde, deputy prime minister of Australia, who went to the San Francisco conference by way of London, stated that Australia had plans for the absorption of a steady flow of immigrants. The aim is to treble the present population of 7,300,000 in the shortest possible time. The extent to which the government succeeds would help substantially in ensuring the future security of the Pacific. Tens of thousands of emigrants from the British fighting forces would be welcomed, and it was hoped that the thousands of the young men now serving with the British fleet in the Pacific would make their homes in Australia after the war. They had decided on a child emigration scheme of 17,000 a year for three years after the war. Children from Britain would be preferred, but it was felt that the scheme should be extended to European children.

Daily inquiries at the London offices of the dominions in the last few months show an even more widespread desire to emigrate than in the closing stages of the last war and after it. The stream of inquirers includes civilians in many callings and members of the forces—skilled and unskilled, men and women—professional men in search of wider scope and careers for their children, parents wishing to rejoin sons and daughters, and others anxious to find places where their assured incomes would offer most benefits. But the available shipping is an obstacle. Australia House is receiving 700 to 800 inquiries a week. The New Zealand Office receives about 500 applications a week. South Africa House receives some 600 inquiries a week. Canada House is unable at present to discuss any plans for emigration, as Canada is already dealing with a large transport problem. Many thousands of Canadian soldiers who have served in this country have married British women. Already a special department deals with applications for the passage of wives and children at the rate of 100 a day. It is expected that the final total will be between 25,000 and 30,000. The difficulty which confronts all schemes of emigration to the dominions is, as previously shown in THE JOURNAL, that we are deeply concerned as to the maintenance of our population in Britain in consequence of the fall of the birth rate. The Australian scheme for child emigration is based on the large number of war orphans. On the European continent children have lost parents not only in the fighting but under the atrocious Nazi rule, with its deportations. Their parents have simply disappeared.

A College of Speech Therapists

A new institution, a College of Speech Therapists, has been formed. At the inaugural session Sir Farquhar Buzzard, who presided, said that over many years he had become more and more aware of the value of speech therapists to the doctor. He believed that the comprehensive medical service, now proposed, cannot function completely owing to the shortage of doctors, and that difficulties must be met by making greater use of medical auxiliaries, including speech therapists.

A surgeon, Mr. Zachary Cope, who is president of the Board of Registration of Medical Auxiliaries, said that none of the universities have a professor or lecturer in speech therapy. He thought that local authorities should regard speech as at least as important as grammar. Nine out of ten doctors, if asked where they would send a patient with defective speech, would be unable to give an answer. As an examiner in surgery he had known many candidates who might have failed owing to a speech defect but for an effort at understanding by the examiner. He thought that there should be a speech therapist at all major hospitals, but outside London there were only twenty-five hospitals with a speech therapist attached to them. At present the new college had only 200 to 300 members, but twice or thrice that number were needed.

A Record in Blood Donation

The Ministry of Health has published what it calls "a new record for blood donations." In the course of a single day's session a mobile team operating from the ministry's blood transfusion center at Leeds collected blood from 820 donors, all of whom were service personnel at a military unit. This is the highest number of donors ever dealt with by one team during a working day. The team consisted of one medical officer assisted by twelve nurses, a blood grouping technician and a clerk. They worked from 8 a. m. to 4:30 p. m. The next day all the blood collected was flown to the British army in western Europe.

Physician's Bequest for Carrying Out the Treatment He Advocated

Dr. J. R. Whitwell, for twenty-seven years medical superintendent of St. Audry's Hospital, Melton, Suffolk, has left his fortune of $130,000 to form a fund for the after-treatment of the mental patients of his hospital and to help to set them up in occupations. He always contended that many discharged mental patients could again become useful citizens if financial help was provided for them. Thus his bequest provides for the carrying out of the treatment he advocated during his life.

A Register of Dietitians

The Board of Registration of Medical Auxiliaries has published the first register of dietitians, which contains the names of 140 members of the British Dietetic Association. Dietetics is defined as "the interpretation and application of the scientific principles of nutrition in health and disease." But registered

dietitians agree, in cases of disease, not to undertake the dietetic treatment of any condition except under the direct control of a registered medical practitioner. The register is designed for the use of those requiring the services of an expert on all matters pertaining to diet.

Exhibition of War Injuries

An exhibition of war injuries is being held at the Royal Society of Medicine. Open only to the medical profession, it consists of pathologic specimens, colored photographs and drawings of typical war injuries. Before its destruction by German bombs the Army Medical War Collection was housed at the Royal College of Surgeons. The Medical Research Council then arranged with other medical organizations for a new collection, some of which is now being shown.

PARIS

(From Our Regular Correspondent)

May 12, 1945.

Mortality in France Since the War

The reports of the Institut national d'hygiène, published by its director, Professor Chevallier, brought out a peculiar mortality trend since the war, which consists in a considerable increase in the mortality in some areas but is compensated in part by a less pronounced and unexpected reduction in mortality figures in other regions. The zones with increased mortality are the densely populated regions; the zones with a decrease are predominantly rural regions with a developed agriculture.

Mortality rates in a homogeneous, chiefly agricultural region formed by nine departments in the west with a population of 4,183,000 for 1937, 1938 and 1939 amounted to 59,316, or 170 for 10,000 inhabitants; in the course of the three war years 1941, 1942 and 1943 the death rate here averaged only 152 for 10,000 inhabitants, a decrease of 10.6 per cent. In an urban region located on the Mediterranean with a population of 5,872,000 there were during the period from 1936 to 1938 an average of 53,176 deaths, a mortality rate of 137 per 10,000 of population, and for 1941 to 1943 a rate of 188 per 10,000, an increase of 37.2 per cent.

This tendency to increase in deaths in urban populations and to decrease in rural regions was found over the entire territory. The causes of this difference are difficult to determine, but it seems that nutrition plays an important part. Lack of conveyances and difficulties in distribution were doubtless responsible for the cruel want in the cities.

Considering the mortality by age groups and comparing it in the two typical regions selected by Chevallier, it was found that in the rural regions the decrease is general except in infants under 1 year, in whom the death rate has increased on the average by 22 per cent. In the urban regions the deaths of infants under 1 year have increased by 14 per cent, but the general mortality showed a growing curve with an almost normal profile, attaining 185 in aged persons. The decrease in mortality in the agricultural region involves particularly the active part of the population, between 15 and 65 years. It seems that for this population the war conditions have brought an improvement in living conditions; their diet permits them to endure their hard work better. In the Mediterranean or urban region the picture is bleak because of the increase in mortality in the ages usually affected by tuberculosis. It is, in fact, 28 per cent between the ages of 30 and 35.

The dietetic conditions before the war were not satisfactory in the rural regions. Different observers have noted that as a result of the occupation (refusal to deliver their produce, difficulties of communications), the French farmers have themselves consumed considerable quantities of the rich foods which they formerly sold, such as meat, butter and eggs.

Mortality of Infants During the Winter of 1944-1945

In 1938 the mortality of infants under 12 months diminished slowly but constantly, but in 1940 the mortality increased by 40 per cent; 1941 brought a mild improvement in the rate, with a decrease of 12 per cent, and in 1942 by 7.4 per cent as compared with 1938. The great increase in 1940 was due in part to the exodus, which was hard on the very young. However, in 1943 the ratio between 1938 had risen again by 15 per cent, without there being important epidemics during this year. The maximum number of deaths in 1943 occurred in the months of July and August, when before the war the mortality curve would show a slight fall. At the same time there was a renewed increase in the disorders of the digestive tract. The poor quality of the milk was probably the chief cause of the increase in infant mortality. The infants of 1944, except for the lucky ones who received American shipments of condensed milk, drank the worst milk. In 1941 the Germans imposed a decree requiring a skimming of 30 per thousand. Objections of pediatricians and hygienists were in vain; and this measure, designed to increase the requisitions of butter by the occupants, led to regrettable manipulation such as mixing skimmed and whole milk, as well as other adulterations. Furthermore, as Lesné has pointed out in a report to the Académie de médecine, war conditions led to a weakening of milk control. It was poorly

TABLE 1.—*Mortality in Paris During the Past Two Winters*

Months	Deaths in Paris	Months	Deaths in Paris	Excess
December 1943	151	December 1944	354	203
January 1944	169	January 1945	576	407
February 1944	194	February 1945	552	358

TABLE 2.—*Average Weight of the Newborn in France*

Years	1938	1939	1940	1941	1942	1943
Weight in grams	3,277	3,262	3,255	3,166	3,135	3,232

pasteurized, and the milk cans were inadequately cleaned because of lack of fuel. The milk soured easily and contained several million germs per cubic centimeter, with thousands of bacilli of the coliform type.

The situation was aggravated in 1944 and the rigors of the winter have been fatal for nurslings. The comparative figures for the winter of 1944-1945 and the preceding one are given in table 1.

The weight is not the essential measure of the vitality of an infant. If it has not suffered an intrauterine infection, the weight of a child will remain normal or almost normal whatever the state of the health of the mother. Even a cachectic tuberculous mother will have a fully developed child. One can see this from the average weights of the infants born during the war years (table 2) of mothers debilitated and depressed by malnutrition, anguish, hard work and prolonged standing.

The severe and prolonged winter and lack of fuel was largely responsible for the deaths of the newborn, whom the war conditions made more susceptible. They succumbed chiefly to upper respiratory or pulmonary disorders.

There is fear that in the coming summer there will be a considerable increase in the deaths of the very young from gastrointestinal disturbances because of the poor quality of the milk. To save these children France needs large quantities of canned milk. It is hoped that the energetic measures considered by the health services will at least attenuate this grave danger. There arrive now daily in Paris 60,000 liters of bottled milk which is pure, wholesome and up to the old standards. These shipments will increase considerably in the coming months.

ICELAND

(From Our Regular Correspondent)

May 25, 1945.

Nutrition of the Population

A committee was appointed by the government in 1939 to obtain information on the nutrition of the Icelandic population, which, although unquestionably greatly improving, was suspected of being in some respects deficient. No fruits are grown in the country, and production of cabbage is relatively small. The staple diet has for a long time been fish, mutton, milk, potatoes and bread.

INVESTIGATION OF FAMILY DIETS

Although a shortage of vitamin C must be expected under these conditions, scurvy has been a rare disease in this century. Formerly one of the worst scourges of the country, it has dwindled to insignificance since consumption of potatoes came into common usage about one hundred and fifty years ago. The lack of sunshine during the dark winter months must lead to a deficiency of vitamin D, and rickets is a common ailment, although rarely encountered in its worst form. A systematic survey of children under 2 years of age showed an incidence of 74 per cent with clinical or roentgenologic signs of rickets.

The first task of the National Council of Nutrition was to have an investigation made of what people were eating in Iceland. For that purpose sixty-five families were selected to keep careful records of their diets for a whole year. Of these fifty-four made satisfactory records, but nine were omitted as unreliable. These fifty-four families from different parts of the country supplied the information from which Dr. J. Sigurjónsson compiled his data on the food consumption of the population, as published in his monograph Mataræði og heilsufar (Reykjavik, 1943).

MAIN CHARACTERISTICS OF NUTRITION

The average consumption of men was found to be 3,090 calories in towns and villages and 3,553 calories among the rural population. Seasonal variations were negligible. Protein consumption averaged 135 Gm. per day in towns and villages and 167 in the country, or from three to four times what Sherman considers should be the minimum. As 70 Gm. is considered sufficient for everybody, the people are consuming twice that amount. The source of this liberal protein consumption is chiefly to be sought in fish and milk, both of which are abundantly available all over the country. Fat consumption was 125 and 155 Gm. respectively in towns and the country, contributing about 40 per cent to the total calory consumption. Carbohydrates contributed a similar amount to the calory intake, or 330-350 Gm. per day. The intake of calcium varied from 0.68 to 2.95 Gm. per day, averaging 1.14 in towns and 2.08 in the country. The liberal calcium intake is probably at least partially deprived of its nutritional value through lack of vitamin D. The Ca/P ratio was 1/1.5-1.68 in towns and 1/1.3-1.4 in the country, or fairly well balanced. The intake of iron was sufficient, 18 to 28 mg. per day. The chief characteristic of the average food consumption is seen to be the high protein intake, which is higher than found elsewhere (Denmark 110, Cardiff 78.7, Sweden 99 Gm., all prewar figures).

VITAMINS

The intake of vitamin A varied from 1,386 international units in a town in spring to 6,151 in a rural community in autumn. All communities showed lowest intakes in spring and highest in autumn. Most communities ranged between 2,400 and 3,000 international units per day.

Vitamin D is a difficult factor to grasp in such a survey, as the skin irradiation cannot be estimated. The low content of this vitamin in the food (generally from 100 to 300 international units) indicates a deficient supply of this important food factor in a country where everybody lacks sunshine in winter and the greater part of the population does not take the required advantage of the long days in summer. This vitamin may therefore with certainty be considered as insufficiently supplied in most homes.

Vitamin B_1 was considered fairly sufficient, averaging 446 international units in rural areas and 569 in towns. Riboflavin and niacin were not estimated, nor the rest of the B complex.

The intake of vitamin C varied from 12.5 mg. per person daily in spring in towns to 50.2 mg. in rural areas in autumn, the usual intake being about 20 mg. per adult. One community was down to 7.2 mg. in spring.

The chief sources of vitamin C are milk and potatoes, neither of which is rich in ascorbic acid. The content of potatoes decreases on storage, so that potatoes are a poor source in spring, which is clearly reflected in the figures from all places.

In spite of the low intake in this vitamin, scurvy is a rare disease in Iceland, only a few cases being observed yearly. The question whether latent scurvy is frequent cannot be answered at present, but many doctors incline toward the opinion that in spite of the low intake there is no visible lack in this vitamin. It has long been known that some people need more of this vitamin than others, and the possibility cannot be rejected that a selection has taken place through ages of hardship, with extermination of those requiring the higher quantities. Yet the constant hunger for fruits among the population points to an unsatisfied demand, which may have a deeper cause than that of novelty and change. As clinical signs of scurvy do not appear until four to six months after deprivation of the vitamin, there might exist a latent scurvy in winter and spring, which is corrected by consumption of fresh vegetables in summer.

EFFECT ON HEALTH

Icelanders in general have bad teeth, probably owing to lack of vitamins C and D, both of which are necessary for normal odontoblastic function. The increased requirements of women in the childbearing period is reflected in the caries rate. Up to 16 years the women have better teeth than men, but after that their teeth deteriorate much more rapidly. In the age group 30-40 the men displayed a caries rate of 31 per cent, but 90 per cent of all teeth in the examined women were decayed in this age group.

Tuberculosis has for a long time been a devastating disease in Iceland, the mortality rate surpassing 200 per hundred thousand a decade ago. The great proportion of acute cases, caseous pneumonia, meningitis and miliary dissemination is supposed to be a result of faulty nutrition, chiefly with regard to vitamins C and D. The fact that hepatic cirrhosis (Laënnec's) is hardly ever seen in Iceland might be explained by the protein-rich nutrition, which gives a good protection against damage to the liver.

Marriages

WINDER LAIRD PORTER, Wilmington, Del., to Miss Gladys Virginia Streett of Harbeson, May 12.

JOHN R. TIMMONS, Columbia, S. C., to DR. FRANCES WOODS LOVEJOY in Scarsdale, N. Y., June 2.

RICHARD S. O'CONNELL, Poston, Ariz., to Miss Virginia Bayliss of Rohwer, Ark., recently.

CARLTON L. OULD, San Francisco, to Miss Ruth McKevitt of Ironwood, Mich, January 6.

WILLIAM HENRY FOEGE to Miss Leslie Warnick Phelps, both of New York, June 3.

THOMAS J. RITTER to Miss Mary Susan Kern, both of Allentown, Pa., April 23.

MAJOR BERNARD WINKLER to DR. MIRIAM F. HELLER, both of Brooklyn, May 10.

JOHN T. SULLIVAN JR. to DR. TULLIA D. TESAURO, both of Chicago, May 30.

Deaths

Beverley Randolph Tucker ⊕ Richmond, Va.; Medical College of Virginia, Richmond, 1905; since 1938 emeritus professor of neuropsychiatry at his alma mater; specialist certified by the American Board of Psychiatry and Neurology, Inc.; past president of the Tri-State Medical Association and the Mental Hygiene Society of Virginia; president of the Richmond Academy of Medicine, 1942-1943; member of the American Neurological Association and the American Psychiatric Association; fellow of the American College of Physicians; member of the Society of Cincinnati, serving as president in the state of Virginia from 1933 to 1935; member of the state board of health and chairman of the first governor's Mental Advisory Board at the state penitentiary; during World War I member of the medical advisory board in Virginia, and contract surgeon in the U. S. Army in 1918; member of the American board of the American Hospital in Paris; member of the board of Nemours Foundation; served as vice chairman of the city library board; member of the board of the Industrial Home for Girls and consulting physician to State Colony for Feebleminded and Epileptic; neuropsychiatrist to the hospital division of the Medical College of Virginia; first Juvenile Court physician and one of the founders of the children's clinic; consulting neuropsychiatrist to the Johnston-Willis and St. Elizabeth's hospitals; editor, *Old Dominion Journal of Medicine and Surgery* from 1908 to 1914; author of "S. Weir Mitchell" 1914, "Nervous Children" 1916, "Verses of Virginia" 1923, "The Lost Lenore" (one act play) 1929, "The Gift of Genius, Adolescence" 1930, "Narna Darrell" 1936, "Various Verse" 1938, "Tales of the Tuckers" 1942; author of the section on cranial nerves in Tice's Practice of Medicine; contributed articles to medical publications and poems to newspapers and magazines; founder of the Tucker Hospital, where he died June 19, aged 71, of cerebral thrombosis.

John Edward Jennings, Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1899; member of the American Medical Association, serving in the House of Delegates in 1931; past president of the Medical Society of the County of Kings; member of the American Surgical Society; member of the New York Academy of Medicine; a fellow of the Brooklyn and New York Surgical societies, the New York Gastroenterological Society and the Brooklyn Thoracic Society; a fellow and founder member of the American College of Surgeons, serving as a member of the board of governors from 1926 to 1941 and regent since 1931 and first president of the Brooklyn chapter; specialist certified by the American Board of Surgery; at one time clinical professor of surgery at the Long Island College Hospital; during World War I entered the medical corps of the U. S. Army as a major and was promoted to lieutenant colonel in charge of an evacuation hospital in France; during World War II acted in an advisory capacity on the Selective Service staff; member of the New York City Board of Health; attending surgeon, St. Peter's Hospital; surgeon in chief, St. John's Hospital; consulting surgeon, Huntington (N. Y.) Hospital and the Mary Immaculate Hospital, Jamaica, N. Y., Bethany Deaconess, Beth-El and Cumberland hospitals, Norwegian Lutheran Deaconesses' Home and Hospital and the Brooklyn Hebrew Home and Hospital for Aged; consulting surgeon and formerly director of the surgical service, Brooklyn Cancer Institute; senior surgeon at the Brooklyn Hospital, where he died May 25, aged 69.

Frederick Bingham Miner ⊕ Flint, Mich.; Detroit College of Medicine, 1906; specialist certified by the American Board of Pediatrics, Inc.; fellow of the American Academy of Pediatrics and the American College of Physicians; member of the American Public Health Association and at one time chairman of its committee on endemic goiter; member of the Detroit Pediatric Society and the Michigan Trudeau Society; past president of the Genesee County Medical Society, which he served for many years as treasurer and business manager, becoming in 1914 the first editor of its *Bulletin*; a captain in the medical corps of the U. S. Army during World War I; one of the organizers of the pediatric section of the Michigan State Medical Society; served as examiner for the Kiwanis Health Camp, examiner of Civil War veterans, executive board member and past president of the Genesee County Tuberculosis Association, secretary of the medical advisory board of the Clara Elizabeth Fund for Maternal Health and president of the Donald McFarlan Whaley Memorial Home for Children; formerly physician for the King's Daughters Home; on the Mayor's Health Committee and the boards of the International Institute and Family Service Agency; formerly director of pediatrics at Hurley Hospital; at the time of his death in charge of pediatrics at the Women's Hospital and St. Joseph Hospital; for three years a member of the Oak Grove Hospital; a trustee and at one time vice president of the Michigan State Horticultural Society; died April 26, aged 68, of myocardial infarction.

Hilliard Eve Miller ⊕ New Orleans, Tulane University of Louisiana School of Medicine, New Orleans, 1916; joined the faculty of his alma mater on Nov. 12, 1917 as assistant instructor in obstetrics and gynecology and shortly thereafter was made instructor in clinical obstetrics; on July 13, 1925 appointed instructor in clinical gynecology and in July two years later made assistant professor of gynecology, professor of gynecology and head of the department from July 1, 1936 until he resigned July 16, 1944; served on the faculty of the Graduate School of Medicine of Tulane University; fellow of the American Gynecological Society, of which he had been secretary and member of the council; fellow of the American College of Surgeons and the Southern Surgical Association; member of the Southeastern Surgical Congress, Southern Medical Association and Louisiana State Gynecological and Obstetrical Society; member and in 1926 president of the New Orleans Gynecological and Obstetrical Society; a first lieutenant in the medical corps of the U. S. Army during World War I; served as chief of the department of gynecology at the Touro Infirmary, senior gynecologist in the Tulane Division of the Charity Hospital and consulting gynecologist at the Flint Goodridge Hospital of Dillard University; trustee of the Isaac Delgado Memorial Fund; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; wrote chapters for Curtis's Obstetrics and Gynecology and Davis's Obstetrics and Gynecology; died April 20, aged 51, of heart disease.

James Howell Corwin, Washington, Pa.; Jefferson Medical College of Philadelphia, 1903; member of the American Medical Association and member of its House of Delegates in 1934, 1942 and 1943; past president of the Washington County Medical Society; past vice president of the Jefferson Medical College Alumni Association; member of the committee on medical economics of the Medical Society of the State of Pennsylvania; city medical director of Washington; on the staff of the Washington Hospital; died in the Veterans Administration Facility, Aspinwall, May 20, aged 66, of arteriosclerosis and diabetes mellitus.

John Pracher ⊕ Monroe, La.; Georgetown University School of Medicine, Washington, D. C., 1915; member of the American Society of Clinical Pathologists; served as assistant professor of anatomy (histology and embryology) at his alma mater and instructor in biology in the dental school; formerly on the staff of the Tuberculosis Hospital in Washington, D. C., and clinical pathologist at the Holy Family Hospital in La Porte, Ind.; since July 1927 clinical pathologist and bacteriologist at St. Francis' Sanitarium; died March 30, aged 62, of coronary occlusion.

Braden Miller Alleman ⊕ Cincinnati; Eclectic Medical College, Cincinnati, 1929; served during World War I; secretary-treasurer of the staff and member of the consulting and active staff of the Bethesda Hospital; died May 10, aged 47, of coronary disease.

George Shafter Allen, Baltimore; Howard University College of Medicine, Washington, D. C., 1924; died March 27, aged 46, of cerebral hemorrhage.

Edwin Judge Barnett ⊕ Spokane, Wash.; University of Illinois College of Medicine, Chicago, 1916; member of the American Academy of Pediatrics; specialist certified by the American Board of Pediatrics, Inc.; served overseas during World War I; interned at the Cook County Hospital in Chicago; on the staffs of the Deaconess, Sacred Heart and St. Luke's hospitals; died March 29, aged 50, of coronary thrombosis.

Martin L. Barshinger ⊕ York, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; formerly health officer of York; served as physician to the County Home and city jail; died April 9, aged 78, of carcinoma of the prostate.

Harry Ferris Beebe, Grayslake, Ill.; Chicago Homeopathic Medical College, 1894; formerly health officer of Antioch and president of the school board; died May 17, aged 78, of heart disease.

Harry Franklin Bennett, Litchfield, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1895; member of the American Medical Association; for many years secretary of the Montgomery County Medical Society; served during World War I; died in St. Francis Hospital May 18, aged 73, of cerebral hemorrhage.

Raymond Joseph Blum ⊕ Rochester, N. Y.; University of Buffalo School of Medicine, 1910; on the staff of St. Mary's Hospital, where he died May 22, aged 57, of carcinoma of the lung.

Barbara Jean Boyd, San Francisco; University of Oregon Medical School, Portland, 1942; interned and served a residency at the Children's Hospital, where she died April 29, aged 28, of injuries received in an automobile accident.

William Griffiths Carter Brannon, Philadelphia; Howard University College of Medicine, Washington, D. C., 1918; member of the American Medical Association; on the courtesy staff and formerly chief of the outpatient department and associate in the department of surgery at the Frederick Douglass Memorial Hospital, where he died April 8, aged 51, of hemiplegia due to hypertensive cardiovascular disease.

Fidelio Fletcher Brown, Chicago; National Medical College, Chicago, 1896; Dunham Medical College, Chicago, 1900; also a dentist; life member of the Illinois Dental Association and member of the American Dental Association; died May 28, aged 75, of cardiac degeneration and Parkinson's disease.

Lee Van Leer Brown, De Land, Fla.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; member of the American Medical Association; past president of the Volusia County Medical Society; served overseas during World War I; served on the staff of the Deland Memorial Hospital; died March 20, aged 65, of arteriosclerosis.

Edward A. Bruns, Plymouth, Wis.; Homeopathic Medical College of Missouri, St. Louis, 1899; died March 12, aged 72, of coronary thrombosis and arteriosclerotic heart disease.

Walter Edward Bundy, Oak Hill, W. Va.; University College of Medicine, Richmond, 1908; member of the American Medical Association; president of the Fayette County Medical Society; died June 4, aged 61, of heart disease.

William Craig Byers ⊕ Webster, Pa.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1906; served during World War I; associate staff member of the Charleroi-Monessen Hospital, Charleroi, where he died April 28, aged 74, of cerebral hemorrhage.

Jesse Hope Campbell, Commerce, Ga.; Emory University School of Medicine, Atlanta, 1916; member of the American Medical Association; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; served during World War I; on the staff of the Commerce Hospital; died April 14, aged 54, of angina pectoris.

William Taylor Chamberlin ⊕ Hempstead, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1898; served as mayor of Hempstead and as president of the village; physician to the Nassau County Home; on the staff of the Nassau Hospital, Mineola; died May 22, aged 71, of pneumonia.

Thomas Grier Cook, Nicholasville, Ky.; Medical College of Virginia, Richmond, 1903; member of the American Medical Association; formerly coroner of Jessamine County; on the courtesy staffs of St. Joseph's Hospital and Good Samaritan Hospital, Lexington, where he died May 12, aged 72, of arteriosclerotic and congestive heart disease and cerebral hemorrhage.

William Alva Davis, Baltimore; Baltimore Medical College, 1898; member of the Society of American Bacteriologists; died March 28, aged 70, of carcinoma of the stomach.

William Henry Earnest, Seymour, Iowa; Cincinnati College of Medicine and Surgery, 1870; Civil War veteran; died March 4, aged 96, of coronary thrombosis.

Ottice Norval Eisaman, Pittsburgh; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1906; director of the division of biologic laboratory, city board of health; in 1918 appointed bacteriologist; died April 19, aged 71, of cerebral hemorrhage and myocarditis.



MAJOR EDGAR CRAWFORD FONDE, M. C., A. U. S., 1905-1945



LIEUT. COMDR. GEORGE W. FOX, (MC), U.S.N.R., 1906-1945

Charles Bennett Fisher, Washington, D. C.; Howard University College of Medicine, Washington, 1918; died June 3, aged 54, of carcinoma of the prostate.

Horace Lee Franks ⊕ Baltimore; College of Physicians and Surgeons, Baltimore, 1892; died April 2, aged 77.

Paul W. Friedemann, Stillwater, Okla. (licensed in Oklahoma by years of practice); a commissioned officer, served six years in the Imperial Russian Army; member of the American Medical Association; on the staff of the Stillwater Municipal Hospital; member of the chamber of commerce; died March 15, aged 84, of coronary thrombosis.

John Archibald Garrettson ⊕ Indianapolis; Medical College of Indiana, Indianapolis, 1904; a medical officer during World War I; for many years a member of the faculty of his

KILLED IN ACTION

Edgar Crawford Fonde ⊕ Mobile, Ala.; University of Pennsylvania School of Medicine, Philadelphia, 1930; interned at the Pennsylvania Hospital in Philadelphia and served a residency at the Presbyterian Hospital in San Juan, P. R.; began active duty as a captain in the medical corps, Army of the United States, on Aug. 22, 1942; assigned to the Lawson General Hospital in Atlanta, Ga.; later went to the Mayo Clinic, Rochester, Minn., then for a six weeks course at the Army Medical School, Walter Reed Hospital, Washington, D. C.; assigned to the Kennedy General Hospital in Memphis, Tenn., for a short while; went overseas in February 1945, at which time was reassigned to the surgical division of the 106th Evacuation Hospital; from D day on through the invasion in command of a field surgical unit and worked behind the advancing lines through France and across the Rhine; promoted to major; killed in action north of Frankfort, Germany April 1, aged 39.

George William Fox ⊕ Milwaukee; Rush Medical College, Chicago, 1931; interned at the Presbyterian Hospital in Chicago; member of the Milwaukee Academy of Medicine and the American Association of Railroad Surgeons; specialist certified by the American Board of Surgery; served as clinical instructor in surgery at the Marquette University School of Medicine and on the staffs of the Milwaukee Children's and Milwaukee hospitals; at one time chief surgeon for the International Harvester Company; held the position of assistant surgeon with two railroad firms; began active duty as a lieutenant in the medical corps of the U. S. Naval Reserve on Aug. 17, 1942; later promoted to lieutenant commander; died during attack on the *Franklin* in the Pacific area March 19, aged 38, of asphyxiation.

alma mater; served on the staffs of the City, St. Vincent's and Methodist Hospitals; died April 20, aged 66, of cardiovascular renal disease.

William Priest Greening ⊕ Pauls Valley, Okla.; Hospital College of Medicine, Louisville, Ky., 1901; served during World War I; on the staff of the Lindsey-Johnson-Shirley Hospital; died March 2, aged 69, of coronary thrombosis.

William Greig, Denver; Bellevue Hospital Medical College, New York, 1881; member of the American Medical Association; died in the Mount Airy Sanitarium March 22, aged 92, of lobar pneumonia.

Hovhanness Manook Hadidian ⊕ Troy, N. Y.; American University Medical School, Beirut, Syria, 1905; served during World War I; on the courtesy staff of the Samaritan Hospital; died May 19, aged 67, of coronary thrombosis.

Russell Lowe Hodge ⊕ North Kansas City, Mo.; Chicago College of Medicine and Surgery, 1912; served during World War I; on the staff of the Research Hospital, Kansas City, where he died March 27, aged 57, of carcinoma of the transverse colon.

Robert Elias Hogan, Dallas, Texas; Birmingham Medical College, 1901; member of the American Medical Association and the Medical Association of the State of Alabama; veteran of the Spanish-American War; died March 18, aged 69.

Francis Joseph Lennon, Buffalo; University and Bellevue Hospital Medical College, New York, 1908; served during World War I; on the staff of the Millard Fillmore Hospital, where he died April 24, aged 57, of ruptured esophageal varix.

Charles W. Littlefield, Seattle; Kansas City (Mo.) Homeopathic Medical College, 1896; died February 24, aged 85, of senility.

John Julius Loomis, Durango, Colo.; Loyola University School of Medicine, Chicago, 1922; member of the American Medical Association and the Nebraska State Medical Association; interned at St. Mary of Nazareth Hospital, Chicago; on the staff of St. Elizabeth's Hospital and for twelve years chairman of the department of obstetrics at the Bryan Memorial Hospital, both of Lincoln, Neb.; died March 21, aged 51, of coronary disease.



COLONEL JARRETT M. HUDDLESTON, M. C., U. S. A., 1893-1944



CAPT. PAUL LINTON KISTNER, M. C., A. U. S., 1916-1944

John Hortmon Mathews, Rebecca, Ga.; Birmingham Medical College, 1915; died March 27, aged 59, of coronary thrombosis.

John Adams Metzger, Long Beach, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1896; served in the U. S. Army from 1898 to 1905; placed on the reserve list as a major in 1908; formerly instructor and lecturer at the University of Southern California School of Medicine in Los Angeles; died May 9, aged 72, of cardiovascular heart disease.

Harry Maurice Montgomery, Burlington, N. C.; North Carolina Medical College, Davidson, 1903; member of the American Medical Association and honorary member of the Medical Society of the State of North Carolina; died March 31, aged 73, of angina pectoris.

James Lida Montgomery, Ellamore, W. Va.; Maryland Medical College, Baltimore, 1908; died in Baltimore, Md., April 7, aged 61, of coronary thrombosis and arteriosclerotic cardiovascular disease.

Harrison Galmoree Morris, Baton Rouge, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1900; member of the American Medical Association; past president of the Tangipahoa Parish Medical Society; on the associate staff of Our Lady of the Lake Sanitarium, where he died March 21, aged 79, of bronchopneumonia and coronary occlusion.

Harold Louis Walden ⊕ Corbin, Ky.; University of Louisville Medical Department, 1921; died March 2, aged 48.

Raymond Delbert Watson ⊕ Britton, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1929; physician for draft board number 7; on the staffs of the Polyclinic Hospital, University Hospital and the Wesley Hospital, Oklahoma City, where he died March 14, aged 40, of uremia.

Charles H. Wheeler, Okolona, Miss.; Meharry Medical College, Nashville, Tenn., 1907; died February 26, aged 67, of cerebral hemorrhage.

Giovanni Zoilo, Brooklyn; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1905; on the staff of the Cumberland Hospital; died February 2, aged 66, of heart disease.

KILLED IN ACTION

Jarrett Matthew Huddleston ⊕ Colonel, M. C., U. S. Army, Washington, D. C.; George Washington University School of Medicine, Washington, 1916; Medical Field Service School, Carlisle Barracks, Pa., in 1921, the Army Medical School, Washington, D. C. in 1922 and the School of Aviation Medicine, Mitchel Field, N. Y., in 1923; commissioned a first lieutenant in the medical reserve corps of the U. S. Army in 1917; appointed to the regular army in October 1918; rose through the various ranks to that of lieutenant colonel in 1937; later promoted to colonel; during World War I served overseas as regimental surgeon with the First Engineers, First Division, was in six major engagements and received the Croix de Guerre for bravery; after the signing of the Armistice was assigned to the Army of Occupation; formerly professor of military science and tactics at George Washington University School of Medicine and the Georgetown University School of Medicine; served as secretary of the Army Medical School; in March 1942 assigned to duty at Headquarters, Second Army, then detailed to the 7th Corps, Allied Forces Headquarters, Algiers, and later joined the Fifth Army; awarded the Legion of Merit and an Oak Leaf Cluster to the Silver Star posthumously; a U. S. Army Hospital Ship named in his honor; before leaving for his last assignment overseas was stationed at Fort Beauregard, La.; in action since the landing of the troops in Salerno until he was killed Feb. 9, 1944, aged 51.

Paul Linton Kistner, St. Louis; St. Louis University School of Medicine, 1942; interned at St. John's Hospital; entered the medical corps, Army of the United States, on June 2, 1942; began active duty as a first lieutenant on July 3, 1943; promoted to captain; assistant regimental surgeon, 106th Infantry, 423d Regiment; killed Dec. 23, 1944, aged 28, while a prisoner of the Germans subsequent to the battle of the Bulge.

Correspondence

TREATMENT OF ERYTHROBLASTOSIS FETALIS

To the Editor:—The opinions expressed by Dr. Ruth Darrow on the treatment of erythroblastosis fetalis (THE JOURNAL, April 28, p. 1146) are so greatly at variance with present concepts of this disease and its pathogenesis that we of the Blood Grouping Laboratory in Boston wish to draw your attention to certain proved facts concerning Rh sensitization and its recognition, together with the observations of many investigators on the best therapeutic procedures for the treatment of erythroblastotic infants.

It is an accepted fact that the Rh positive erythrocyte has antigenic properties capable of stimulating Rh antibodies in an Rh negative person. The antigen may enter the body either directly by transfusion or via the placenta. Agglutinating antibodies (Rh agglutinins) resulting from such sensitization may be demonstrated by the proper laboratory methods as emphasized repeatedly by Levine and by Wiener. In some cases the severity of erythroblastosis in the infant appears to be directly proportional to the titer of such agglutinins in the maternal blood; in other instances, however, there is little or no agglutinin demonstrable by the usual technic (incubation of a 2 per cent suspension of Rh positive cells with the unknown serum for thirty to sixty minutes) and these cases in general have the most severe manifestations of the disease. The explanation of this paradox was furnished by Race, by Wiener and by Diamond and Abelson, who proved beyond doubt that inhibitor or blocking antibody is present in such instances and interferes with the usual laboratory technic for agglutination of Rh positive cells. The last mentioned writers also found that these inhibitor antibodies are most commonly present and tend to increase in concentration after repeated stimulation, thus being associated with progressively more severe erythroblastosis in successive infants. In the experience of the Blood Grouping Laboratory there is a close correlation between this evidence of repeated stimulation (i. e., blocking antibody) and the most serious forms of erythroblastosis such as icterus gravis, fetal hydrops and intrauterine death.

Dr. Darrow's statement that "sensitization does not parallel the number of antibodies either in the blood or in the body tissues" reveals an apparent unfamiliarity with this blocking phenomenon, which represents greater, rather than less, sensitization and certainly does not suggest immunity in the sense of desensitization. On the contrary, it has been demonstrated that with the proper tests for recognition of blocking antibodies in the blood (and these tests are very easily and simply applied) (Diamond and Abelson: *J. Lab. & Clin. Med.*, March 1945) the level of antibody does parallel the degree of sensitization and the severity of the disease in the infant. With respect to determination of antibody titers in body tissues, we know at present of no method of making either qualitative or quantitative estimations of such antibodies.

Attention is drawn next to that section of Dr. Darrow's letter dealing with the actual effects of anti-Rh agglutinins on the infant. The liver, lungs, spleen and other tissues are involved beyond question. However, the changes in these organs are, in the opinion of most pathologists, the result of the severe hemoclastic effect of the antibody-antigen reaction. Splenomegaly and hepatomegaly vary directly with the degree of red cell destruction and regeneration; pulmonary involvement, purpuric hemorrhages, edema and other findings are manifestations of very severe and frequently terminal hemolysis associated with blocking of end capillaries with cellular débris. In view of this the degree of anemia, rapidity of its onset and progress appear to provide the most reliable criterion for the institution of proper therapeutic measures rather than such indefinite signs as "toxicity." In the opinion of two well known investigators in this field (Mollison, Gimson) "the most important single clinical feature is the progressive fall in hemoglobin level below that normally expected." Furthermore, our experience with those cases manifesting cerebral damage (kernicterus) demonstrates that all such cases occur in those severely jaundiced infants who represent an extreme degree of sensitization of the mother, and not in those infants manifesting anemia without icterus.

The use of Rh positive blood transfusions in the treatment of erythroblastotic infants to prevent "flooding of the circulatory system with an excess of erythrocytes, since the Rh positive cells absorb the antibodies and are destroyed," seems to us an illogical procedure, especially since there is adequate proof that Rh negative cells not only replace the destroyed erythrocytes of the erythroblastotic infant but, in addition, survive. On the contrary, transfused Rh positive cells are totally destroyed within three days. Evidence of the superiority of Rh negative over Rh positive blood has come from workers in Great Britain, Canada and South America as well as from workers in this country. It seems, therefore, unsound to advocate the introduction of Rh positive cells, since the cellular débris resulting from their certain destruction may embarrass an already overburdened infant's system. Certainly such a rationale is not indicated by the experience of consultants in hematology who deal with hemolytic diseases in all ages.

The administration of oxygen is undoubtedly of value in the presence of anoxic anoxia; on the other hand, transfusion of viable erythrocytes seems the appropriate therapeutic approach to the problem of anemic anoxia. In our experience intravenous glucose and saline solutions are not usually indicated as they tend to aggravate the edema and further embarrass the circulation. The multiple syringe method of transfusion is often a more difficult method than gravity or a simple gravity plus pressure set for tiny infants with poor peripheral veins.

Finally, the statement is made that early delivery of infants with probable erythroblastosis is ineffectual. Though it is certainly not desirable to impose too great prematurity on such a child, there is no doubt that two to four weeks of prematurity is a much slighter risk than the same period of time spent by the fetus in an environment where an increasing antibody absorption from the mother's circulation may produce more severe damage to the erythrocytes and secondarily to other important systems of the body. Statistics gained in the study of more than thirty families in which a previous child has succumbed to erythroblastosis support the opinion that earlier delivery of the next infant, especially in the face of an increasing antibody production on the part of the mother, results in a larger number of living children recovering from the disease. This occurs in spite of the well known increasing chances for more severe involvement of the infant born to the mother who has been sensitized by earlier pregnancies.

LOUIS K. DIAMOND, M.D.
RONALD L. DENTON, M.D.
Boston.

To the Editor:—In the communication on the treatment of erythroblastosis fetalis in THE JOURNAL, April 28, Dr. Ruth Renter Darrow emphasized certain aspects of the condition which have been neglected. It is conceivable that, in cases in which an Rh negative donor cannot be found, Rh positive blood, given slowly and under constant observation to an erythroblas-

totic child, may be the lesser evil as compared to no transfusion. So far as these cases go, her statement that no infant should die while Rh negative blood donors are being sought may be a useful antidote to excessive and inflexible dogmatism on the need for Rh negative donors.

However, situations in which the use of Rh positive blood is justified would seem to be exceedingly rare. In view of the existence of much misapprehension about the mechanism of erythroblastosis due to Rh incompatibility, it is perhaps more necessary at present to emphasize the importance of making every effort to find Rh negative donors.

Furthermore, one may question the advisability of using Rh positive blood "by preference, because of its sparing action on the infant's red cells." The author also states that "with Rh positive blood there is no danger . . . of flooding the circulatory system with an excess of erythrocytes, since the Rh positive cells absorbing the isoantibodies are destroyed."

The harm done by transfusions in which the injected cells are destroyed is not, as would seem to be implied by the author's statements, entirely or principally due to deprivation of the destroyed cells. The most serious dangers from destruction of transfused red cells are (1) kidney damage due to hematin precipitated from the dissolved hemoglobin freed by hemolysis of the transfused cells and (2) thrombosis of capillaries by agglutinated red cells or their stromas. This damage may be fatal or, if the patient survives, may leave irreversible lesions. Hence the hypothetic "sparing action on the infant's red cells" is far more than counterbalanced by the amply demonstrated dangers of intravascular hemolysis.

It is also questionable that "a 'toxic' baby with a red cell count of 4,000,000 per cubic millimeter of blood is therefore in far greater need of an immediate transfusion than a nontoxic baby with a count of 2,000,000." If the baby with a count of 4,000,000 is in a state of oligemic shock, plasma would be the indicated treatment in preference to whole blood, while the child with a count of 2,000,000 red cells would in most cases be in urgent need of replacement of the lost red blood cells with Rh negative cells resistant to hemolysis by the anti-Rh agglutinins in the child's plasma. The mother's blood cells can be used, provided they are separated from the plasma and are of a compatible group.

A. F. LIBER, M.D., Amsterdam, N. Y.
Director, Montgomery County Laboratory.

PSYCHOPATHOLOGY AND TERMINOLOGY

To the Editor:—There is a lamentable tendency in current psychiatry to use the label constitutional psychopathic inferior almost with complete abandon. It seems that in many instances it even becomes a means of projecting on the victim of the diagnosis the prejudices and inferiorities of the psychiatrist.

The very term C. P. I. implies a condition or state from birth, and yet many are so labeled who have never manifested any form of inadequacy until past maturity.

Dr. W. C. Alvarez in his article Constitutional Inadequacy in THE JOURNAL, July 4, 1942, page 782, column 2, lines 25 to 27, states that "like the walls of a defective tire they are likely to hold well for some time before they blow out."

No histologic, biologic or psychodynamic basis is given for this comparison of the human being to a tire.

But what is more important than the lack of basis for the statement is the fact that here we have a prominent psychiatrist finally pinning the label "constitutional inadequacy" on the psychoneuroses. Here is an example of psychotherapeutic defeatism given the dignity of a respectable paternity.

Quoting further, he states that "in some cases poor materials seem to have gone into almost every organ of the body," which again places all the emphasis on the individual's constitutional equipment.

Yet psychiatry has demonstrated that such conditions as chronic delinquency and chronic criminality can be eliminated at their ontogenetic sources. Certainly the neurosis, a much less profound and less inrooted condition, can be approached prophylactically as well as therapeutically.

To advise these patients to "hoard their energies and find a job that can be done without too much fatigue" is, in fact, to increase their feelings of inadequacy, frustration and insecurity, and encourage a chronic invalid attitude which is the very thing that should be avoided psychotherapeutically. It also discourages any efforts on the part of society to seek the elimination of the causes of these disorders and ignores the numerous instruments of therapeusis, from psychoanalysis to personal readjustments.

Further, no one who has followed the psychically ill can fail to observe how often just the elimination of a chronic focus of infection will achieve the complete psychic restitution of the individual. Often, simply the modification of external factors will do it.

Heredity, of course, is important, very important, but we have seen numerous examples of individuals with excellent inherited factors finally break down into neurosis because of overwhelming ontogenetic traumas. On the other hand, there are numerous instances of bad hereditary factors submerged and completely inactivated by the combination of a favorable environment and the felicitous course of events.

It is therefore evident that the neurosis is too dynamic, has too many interrelated causative and influencing factors and is too complex in its very nature to justify its being swept into the dumping ground of constitutional inadequacy.

Such a term is too general and devoid of psychiatric structure, as well as an injustice to the psychically ill.

MYER E. SEGAL, M.D.
State of Connecticut Veterans Home,
Rockey Hill, Conn.

BENIGN PNEUMONOCONIOSIS

To the Editor:—In our paper on Benign Pneumonoconiosis (THE JOURNAL, March 24, p. 701) there appears the statement that "advanced silicosis with conglomerate nodulation is often a disabling disease, and when silicosis is complicated by tuberculosis it is fatal." In the summary we state that "advanced silicosis is usually disabling and, when complicated with tuberculosis, it is fatal."

The statement that advanced silicosis when complicated with tuberculosis is fatal has been questioned, and properly so, because there are many patients with advanced silicosis who have inactive pulmonary tuberculosis without pronounced disability. We mean, of course, that advanced silicosis is fatal when complicated by active, progressive pulmonary tuberculosis.

EUGENE P. PENDERGRASS, M.D.
SIMON S. LEOPOLD, M.D.,
Philadelphia.

WRITE TO A BOY IN SERVICE

To the Editor:—At the suggestion of several pharmaceutical representatives who have called at the office I wish to report a little venture that my associates and I have made in our waiting room. We have a little stand on which are stamped V-Mail and pen and ink with a small sign inviting our patients to write a letter to a boy in service while waiting for their turn to see the doctor.

WALTER C. COREY, M.D., Chardon, Ohio.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Right of Physician in Kentucky to Receive Fee from County for Executing and Filing Birth or Death Certificate.—The treasurer of Bell County, Ky., questioned his legal right to pay (1) physicians or midwives in attendance at the birth of a child a fee of 25 cents for each birth certificate that they executed and filed as required by statute or (2) physicians the same fee for each death certificate made and filed by them. The applicable Kentucky statute reads in part as follows:

"Each local registrar, physician or registered midwife shall be entitled to be paid the sum of twenty-five cents for each birth certificate and each death certificate properly and completely made out and registered with or reported by him, and correctly copied and duly returned to the Division of Vital Statistics. . . . All amounts payable to registrars, physicians or midwives under this section shall be paid by the treasurer of the county in which the registration districts are located, upon certification by the Division of Vital Statistics. The Division of Vital Statistics shall annually certify to the treasurers of the several counties the number of births and deaths registered, with the names of the local registrars and the amounts due each at the rates fixed herein." (K R S sec. 213.150.)

Thirty physicians of that county instituted an action against the county treasurer seeking an injunction to require him to pay them such fees. From a judgment for the physicians the county treasurer appealed to the Court of Appeals of Kentucky.

The sole question to be determined here, said the appellate court, is whether a comma in the statute quoted should be regarded as the word "and." As noted, the statute specifically provides *"Each local registrar, physician or registered midwife shall be entitled to be paid the sum of twenty-five cents for each birth certificate and each death certificate properly and completely made out and registered"* in accordance with the terms of the statute. Literally the statute provides for the payment to only one of the three classes, the comma in such disjunctive clauses ordinarily taking the place of "or." The original statute was an Act of 1910 (chapter 37, sec. 20) and was in the same form. The difficulty here is not one of punctuation, which is ordinarily a minor element in construing a statute. The question is whether the word "and" should connect "registrar" and "physician or registered midwife." Not the literal language but the true intention or will of the legislature is the law. That is what the courts endeavor to ascertain and declare and what the executive departments must obey. All rules of statutory construction have that in view. Since words are used to express an idea, if that idea is manifest, although ineptly or obscurely expressed, no usurpation is committed by declaring the legislative intent and no violence done by supplying, deleting or changing words or their arrangement in clarification. The general intent is the key to each part of an act. Often its purpose and its entire tenor disclose the inadvertent or careless misuse or omission of a word or phrase, and the courts are justified in correcting or supplying the proper language. As stated in Lewis' Sutherland on Statutory Construction, section 397:

The popular use of "or" and "and" is so loose and so frequently inaccurate that it has infected statutory enactments. While they are not treated as interchangeable, and should be followed when their accurate reading does not render the sense dubious, their strict meaning is more readily departed from than that of other words, and one read in place of the other in deference to the meaning of the context.

The statute before us, continued the court, imposes the duty on either the physician attending a birth or the midwife, as the case may be, of making out the certificate and filing it with the registrar. On the face of it, it cannot be supposed that he or she should receive no compensation for this public service, which is basic and more laborious than the duty imposed on the registrar, who simply records the certificate and advises the state registrar. It is to be noted that the fee is payable "for" each certificate "properly and completely made out and registered." The registrar does not execute certificates of this sort. If there were no intention that the physician or midwife, who is charged with the duty of making out the certificates, should be paid, the natural inquiry arises Why should they have been mentioned at all? On the other hand, why should the Division of Vital Statistics be required to certify to the county treasurer each year the names of the registrar only? The case in which the constitutionality of the original act was declared involved the decision that a local registrar is entitled to collect this fee from the county. *Furlong* v. *Darnaby*, 206 Ky. 63, 257 S. W. 707; second appeal, *Darnaby* v. *Furlong*, 216 Ky. 475, 287 S. W. 913. As between conflicting consequences, a statute will be construed so as to make it equitable and just rather than inequitable and unjust. It would have been unjust not to provide compensation for the physician or midwife for making out the certificate but to provide payment of the one who records it. The same section, K R S 213.150, expressly declares that none of those persons can charge "any member of a family in which a birth or death may occur" for such services.

We cannot escape the conclusion that the trouble arises in this case, said the court, from mere faulty formulation of the phrase, and that the comma was inadvertently or intended to be used instead of the word "and." Therefore the trial court rightly construed the statute to provide that both the local registrar and the physician are entitled to have the county treasurer pay them the stipulated fees. If a registered midwife has performed the service of the physician, she should receive the fee.

The judgment in favor of the physicians was accordingly affirmed.—*Asher, Treasurer, v. Stacy, 185 S. W. (2d) 958 (Kentucky, 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, June 23, page 614.

BOARDS OF MEDICAL EXAMINERS

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA:* Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Oral.* Los Angeles, Aug. 11. *Written.* San Francisco, July 9-12. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT:* *Homeopathic.* New Haven, July 10-11. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical. Examination.* New Haven, July 10-11. *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

IDAHO: Boise, July 10. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

MAINE: Augusta, July 10-11. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, July 10-13. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F. State House, Boston.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEVADA: *Reciprocity.* Carson City, Aug. 6. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW MEXICO:* Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July. Sec. Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON:* Portland, July 25-27. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland 4.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 10-13. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

RHODE ISLAND:* July 5-6. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA:* Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Houston, July 17-19. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

WASHINGTON:* Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

WEST VIRGINIA: Charleston, July 5-7. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

OREGON: Portland, July 7. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 15. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

209:421-560 (April) 1945

Complications Arising in Donors in Mass Blood Procurement Project. Mary H. Boynton and E. S. Taylor.—p. 421.
*Use of "Modified Globin" from Human Erythrocytes as Plasma Substitute: Preliminary Report. M. M. Strumia, F. W. Chornock, A. D. Blake and W. G. Karr.—p. 436.
Hemophilia-like Disease in Female, with Note on Clotting Time of Recalcified Plasma. F. W. Madison and A. J. Quick.—p. 443.
Cardiac Hypertrophy and Extramedullary Erythropoiesis in Newborn Infants of Prediabetic Mothers. H. C. Miller.—p. 447.
*Acute Myocarditis in Influenza A Infections: Two Cases of Nonbacterial Myocarditis, with Isolation of Virus from Lungs. M. Finland, F. Parker Jr., Mildred W. Barnes and L. S. Jolliffe.—p. 455.
Provocative Prolongation of PR Interval in Rheumatic Fever. R. Gubner, M. Szucs and H. E. Ungerleider.—p. 469.
Primary Influence of Basal Vascular Tone on Development of Postocclusive Collateral Circulation and in Selecting Patients for Sympathectomy. M. Naide and Ann Sayen.—p. 478.
Fatal Case of Cerebral Coccidioidomycosis with Cultural Studies. H. G. Schlumberger.—p. 483.
Pneumococcic Pneumonia Resembling Primary Atypical Pneumonia. E. Racker, S. P. Rose and A. O. Tumen.—p. 496.
Roentgen Therapy of Boeck's Sarcoid. E. A. Pohle, L. W. Paul and Elizabeth A. Clark.—p. 503.
*Treatment of Tularemia with Intravenous Bismuth Sodium Tartrate. W. W. Jackson.—p. 513.
Vitamin Content of Liver Extracts for Parenteral Use: Comparison of Crude and Concentrated Preparations. G. W. Clark.—p. 520.

"Modified Globin" from Erythrocytes as Plasma Substitute.—Strumia and his associates prepared a globin from human erythrocytes which can serve as a plasma substitute, because it possesses some of the properties of plasma, more specifically a high colloidal osmotic pressure. It is estimated that every year nearly 1.5 billion cubic centimeters of packed red cells may be made available from the preparation of plasma for the armed forces and for the civilian population. By a relatively simple process this hemoglobin can be transformed into a "modified globin." From the amount of red cells mentioned 375,000 Kg. of globin can be prepared with an osmotic power about twice as great as an equivalent amount of plasma proteins, that is, an osmotic equivalent of about 12.5 million liters of citrated plasma. From a blood donation it is possible to obtain about 250 cc. of plasma and about 24 Gm. of globin. This globin is equivalent in osmotic power to about 600 cc. of plasma. Thus from a single 500 cc. donation of blood it is possible to obtain the osmotic equivalent of about four donations. Modified globin is safe and capable of replacing lost blood volume in cases of severe secondary shock. A total of 210 intravenous injections of globin have been administered to 108 human beings. The largest single dose has been 57 Gm. The largest total amount administered to any one patient has been 192 Gm. Several patients have received repeated injections of globin without exhibiting reactions.

Acute Myocarditis with Influenza A Infections.—A woman aged 34 who in December 1942 had a mild illness that might be construed as clinical influenza became acutely ill early in April 1943 and died in six days. The fatal illness was accompanied by fever, chills, extreme prostration and progressive dyspnea. There was evidence of myocardial weakness, and diffuse signs appeared in the lung bases before death. Clinically the findings were interpreted as those of a rapidly progressing primary atypical pneumonia. Necropsy revealed a minimum of pathologic alterations in the lungs, but the heart showed an extreme degree of acute diffuse myocarditis. Isolation of a virus from the lungs of this patient and its identification as influenza A makes it a very unusual case. It led to further search for similar cardiac lesions in other cases of influenza. A second patient, a man aged 39, presented the aspects of an acutely fatal pneumonia complicating influenza A. The virus obtained from the lungs showed characteristic lesions of a virus infection. The lesions in the heart were slight and limited in extent and were discovered only after careful search. They were similar in character to those seen in the first case. Finland and his associates believe that the myocardial lesions in these cases are the result of infection with influenza A virus.

Intravenous Bismuth Sodium Tartrate in Tularemia.—In the past three years Jackson has observed 61 cases of tularemia from Arkansas, Oklahoma, Missouri, Kansas, Louisiana and Texas. In 57 cases the source of infection was a tick bite; 1 was a squirrel bite; 3 were hand infections acquired by skinning rabbits. Every patient with tularemic tick bite on the lower extremity developed a bubo on the corresponding side. Two presented lesions on the penis, 1 an ulcer on the dorsal corona, the other an ulcer on the anterior surface at the base of the shaft. One of these developed a right-sided bubo, the other a left-sided one. Twenty-one cases with lesions on the arms or upper torso all showed an axillary adenitis, but in only 2 did the nodes progress to suppuration. No reason is apparent as to why the inguinal lymph nodes break down and the axillary do not. Epitrochlear lymph nodes suppurated in 2 cases in which the forearm presented the initial lesion. The initial chill and malaise occurred between seventy-two and one hundred and twenty hours after discovery of the tick and its removal from the skin. Agglutination tests were done in all cases. All but 2 showed positive titers of 1:360 or over. Jackson's experience with the Foshay specific antiserum has been disappointing, and more recently a trial of several of the sulfonamide compounds resulted in no clinical improvement whatever. Penicillin was ineffective. All patients were given intravenous injections of the bismuth solution at the time of the first visit, which was usually on the third or fourth day after the patient was aware of being sick. Diagnosis must be made and treatment started without the aid of the laboratory. Usually the characteristic clinical onset and the history of exposure to probable infection will supply the necessary evidence. During the last two years Jackson has used a solution of bismuth sodium tartrate especially prepared for intravenous use. The dose is estimated on the basis of 1 cc. per hundred pounds of body weight, but in children a relatively large dose (1 cc. for 50 pounds) may be given. The average number of injections required for cure is seven. Contrary to prevalent views, the intravenously administered bismuth is quite free from serious untoward manifestations. No death has occurred in this series of 61 cases. There was prompt recovery in all cases treated by intravenous injections of a solution of bismuth sodium tartrate, suggesting that the use of this solution is a specific procedure in the treatment of tularemia.

American Journal of Ophthalmology, Cincinnati

28:355-449 (April) 1945

Recurrent Erosion of Cornea. P. A. Chandler.—p. 355.
Electrical Sensitivity of Eye in Some Optic Nerve Diseases Resulting from Craniocerebral Traumata. S. V. Kravkov and A. N. Mursin.—p. 363.
Improved Treatment for Chemical Burns of Eye. L. Weston.—p. 370.
*Visual Symptoms Caused by Digitalis. F. D. Carroll.—p. 373.
Complete Congenital Pigmentation of Optic Disk. W. Moehle.—p. 377.
Penicillin in Treatment of Perforating Ocular Injuries and in Uveitis. R. G. Scobee.—p. 380.
Congenital Glaucoma and Cataract, Bilateral; Goniotomy and Needling: Case Report. T. D. Allen.—p. 388.
Contribution to Theory of Binocular Vision Supported by 3 Cases of Latent Nystagmus. A. Posner.—p. 392.

Visual Symptoms Caused by Digitalis.—Carroll reports visual symptoms that occurred in 6 patients who were taking digitalis. In 3 patients general symptoms of digitalis intoxication caused the patients to return to the internist for advice, but the other 3 came directly to the ophthalmologist because of visual disturbances. None of these suspected digitalis as the cause and none gave a history of taking digitalis until they were specifically questioned regarding it. The visual symptoms consisted in colored vision—chiefly white, green, yellow or red—flashes of light, positive colored scotomas and other visual hallucinations. There was no change in the visual acuity or

fields of these patients. It is suggested in the literature that if the intoxication is sufficiently profound a temporary cortical type of blindness may result. This condition may occur in patients receiving what is considered a normal dosage of the drug and may be the only symptom present. Recovery takes place within two weeks after the digitalis is stopped.

American Journal of Psychiatry, New York

101:573-716 (March) 1945. Partial Index

General Paresis in Senility: Critical Review of Literature and Clinicopathologic Report of 6 Cases. S. Arieti.—p. 585.
Studies on Corpus Callosum: IV. Diagonistic Dyspraxia in Epileptics Following Partial and Complete Section of Corpus Callosum. A. J. Akelaitis.—p. 594.
Reconditioning and Rehabilitating Program in Army Hospitals. W. E. Barton.—p. 608.
War Neuroses in Flying Personnel Overseas and After Return to U. S. A. R. R. Grinker and J. P. Spiegel.—p. 619.
Psychiatric Casualties in Royal Canadian Navy. M. Wellman and J. F. Simpson.—p. 625.
Course in Psychologic First Aid and Prevention: Preliminary Report. D. Blain, P. Hoch and V. G. Ryan.—p. 629.
Integrated Medicopsychologic Program at United States Coast Guard Academy: Preliminary Report. R. H. Felix, D. C. Cameron, J. M Bobbitt and S. H. Newman.—p. 635.
Neuropsychiatry in U. S. Marine Corps, Women's Reserve: I. Methods and Procedures in Neuropsychiatric Selection of Recruits. P. Solomon, M. Brown and M. R. Jones.—p. 643.
Psychiatric Aspects of Officer Selection. W. A. Hawk.—p. 655.
Selective Service Violators. C. G. Southard and J. R. Hurley.—p. 661.
Hypnotic Technics for Therapy of Acute Psychiatric Disturbances in War. M. H. Erickson.—p. 668.
Color Blindness in Psychoses. H. M. Kaplan and R. J. Lynch, with technical assistance of M. S. Weinstein and E. Manning.—p. 675.

American Journal of Public Health, New York

35:299-432 (April) 1945. Partial Index

Review of Evidence as to Nutritional State of Children in France. H. C. Stuart.—p. 299.
Health Services for Migrant Farm Families. F. D. Mott.—p. 308.
War and Birth Rate: Brief Historical Summary. L. I. Dublin.—p. 315.
Recent Trend of Birth Rate. A. W. Hedrich.—p. 321.
Effect of Increased Birth Rate on Future Population. P. K. Whelpton.—p. 326.
Nutrition and Its Relationship to Complications of Pregnancy and Survival of Infant. B. S. Burke.—p. 334.
Army Water Supplies in Foreign Areas. J. B. Baty.—p. 347.
Lessons Learned from Internal Security Program of War Department. W. H. Weir.—p. 353.
Application of Phosphatase Test to Cheese: I. Preliminary Report on Cheddar Type Cheese. H. Scharer.—p. 358.
Factors in Army Water Quality Control. W. A. Hardenbergh.—p. 361.
*Laboratory Criteria of Cure of Typhoid Carriers. R. F. Feemster and Helen M. Smith.—p. 368.
Insect Problems in World War II, with Special References to Insecticide DDT. F. C. Bishopp.—p. 373.

Cure of Typhoid Carriers.—Feemster and Smith say that as various chemical and biologic agents have been tried and found to be failures it has been necessary to return repeatedly to cholecystectomy as the only method which regularly cures an appreciable number of carriers. The authors review observations on 68 typhoid carriers operated on in Massachusetts between 1924 and 1944. There have been 63 cures and 5 failures. Medical treatment, even with sulfonamide compounds, cannot be relied on to eliminate the gallbladder focus. The authors have had 4 failures with sulfaguanidine and succinylsulfathiazole. To establish that a person is a bile carrier and supposedly a gallbladder carrier, it is necessary to demonstrate typhoid bacilli in the bile by duodenal drainage prior to operation or by culture taken from the gallbladder at the time of operation. The criteria of cure should consist of a careful bacteriologic follow-up for not less than twelve months of negative stool cultures and at least one negative bile. Cholecystectomy is still the only effective method of curing typhoid carriers.

American Review of Tuberculosis, New York

51:295-392 (April) 1945

Tuberculosis According to Age, Sex, Family History and Contact. R. R. Puffer, H. C. Stewart and R. S. Gass.—p. 295.
Passive Transfer of Specific Tuberculoimmunity and Specific Tuberculin Allergy. H. J. Corper and M. L. Cohn.—p. 312.
"Beriberi Heart" in Tuberculous Patient. J. E. Farber and D. K. Miller.—p. 315.
Anatomic Studies on Human Tuberculosis: XVI. Progressive Reinfection. K. Terplan.—p. 321.

Annals of Otol., Rhin. and Laryngology, St. Louis

54:5-240 (March) 1945. Partial Index

Bronchogenic Carcinoma: Analysis of 175 Proved Cases. P. H. Holinger, H. J. Hara and E. F. Hirsch.—p. 5.
Malignant Exophthalmos. L. A. Schall and D. J. Reagan.—p. 37.
Nasal Allergy for Practicing Rhinologist: I. Pathologic and Theoretical Considerations Underlying Nasal Allergy. G. E. Shambaugh Jr.—p. 43.
Postwar Deafness, a Challenge to the Otologist. B. J. McMahon.—p. 61.
Aerosinusitis—Résumé. P. A. Campbell.—p. 69.
Local Infiltration of Penicillin Solutions in Peritonsillar and Pharyngomaxillary Spaces. A. J. Cone.—p. 84.
Cilia and Penicillin: Laboratory Note. A. W. Proetz.—p. 94.
Bronchography as Diagnostic Aid in Chest Disease. G. S. McReynolds Jr. and F. W. Shelton.—p. 114.
Individualization in Management of Carcinoma of Maxillary Sinus. M. F. Snitman.—p. 125.
Significance of Hoarseness. W. F. Zinn.—p. 136.
Penicillin and Infections of Ear, Nose and Throat. M. H. Mothersill.—p. 166.
Foreign Bodies of Maxillary Sinus. J. C. Howard Jr.—p. 186.

Archives of Pathology, Chicago

39:221-280 (April) 1945

Morphologic Alterations of Neuron Due to Tumor Invasion. K. Stern and G. L. Odom.—p. 221.
*Morbid Anatomy of Typhus as Seen in Recent Guatemalan Epidemic: Observations on Disease. A. Golden.—p. 226.
Genetic Analysis of Induction of Tumors by Methylcholanthrene: VIII. Two Mutations Arising in Mice Following Injection of Methylcholanthrene. L. C. Strong.—p. 232.
Changes in Uterus After Eradication of Endometrial Adenocarcinoma by Radiotherapy, with Particular Reference to Infarct-like Radionecrotic Plaque in Lining. J. F. Sheehan, H. E. Schmitz and Janet Towne.—p 237.
Healing of Wounds in Skin of Mice Painted with 20-Methylcholanthrene. M. Silberberg and Ruth Silberberg.—p. 257.
Presacral Cyst Apparently Arising from Neurenteric Canal in Newborn Infant. W. W. Brandes and J. B. Sutton.—p. 265.
*Coronary Arteriosclerosis and Myocardial Infarction as Studied by Technic. J. B. Holyoke.—p. 268.
Histologic Diagnosis of Rabies. E. Herzog.—p. 279.

Morbid Anatomy of Typhus.—In April 1944 epidemic typhus broke out in a hospital for patients with mental disease in Guatemala City. Numerous blocks of necropsy tissue were forwarded to the Army Medical Museum in Washington, D. C., and examined by Golden. The lesions of louse borne epidemic typhus as seen in 10 fatal cases in this outbreak may be classified in two groups. One group consists of the specific vascular lesions of rickettsial infection. The vascular lesions appeared to be most pronounced in the central nervous system and the testes, and they were responsible apparently for a certain degree of destruction or inflammation of the regional tissues. The other group of lesions included interstitial myocarditis, meningitis, focal cellular necrosis of the adrenal glands, interstitial nephritis, hemoglobinuric nephrosis and focal necroses of the liver and spleen. The spinal cord showed lesions identical with those of the cerebral hemispheres, the cerebellum and the brain stem. The lesions of the pons and the medulla were the most severe. The state of collapse may be correlated with focal necrosis and cytolysis of the adrenal glands, although one must also consider interstitial myocarditis and the lesions of the central nervous system in the pathogenesis of that state. Hemoglobinuric nephrosis is of significance because similar lesions are seen in severe burns, massive crushing of muscles and certain shocklike states. Apparently, epidemic typhus may be added to the list of diseases in which interstitial nephritis may be encountered.

Coronary Arteriosclerosis and Myocardial Infarction.—Holyoke shows that the injection and dissection technic of Schlesinger has made possible a more accurate concept of the significance of sclerosis of the coronary arteries in relation to myocardial disease. He studied an unselected series of 70 adult hearts at the necropsy service of the Mary Hitchcock Memorial Hospital, Hanover, N. H., by means of the Schlesinger technic. After injection of the vessels and x-ray examination of the heart the coronary arteries were dissected, and all occlusions and narrowings were recorded as to location and length of the portion of vessel involved. In narrowing without occlusion, the degree of constriction was estimated. Occlusions of the coronary arteries were demonstrated in 12 of the 70 hearts. In these 12 hearts thirty-one points of obstruction were demonstrated. Thirteen were in the main stems of the three principal coronary arteries. Eighteen were in the large branches. Inter-

arterial anastomoses were demonstrated in all hearts with pronounced arteriosclerotic narrowing. Only in the presence of hypertrophy were such anastomoses demonstrated in other hearts. In 3 of 11 hearts with old occlusions of the coronary arteries there were no old infarcts. In 2 of 5 hearts with recent occlusions of the coronary arteries there were no corresponding recent infarcts. In 1 of 4 hearts with recent infarcts there was no recent occlusion. Grossly recognizable scars were present in the myocardium of 26 of the 70 hearts. Data from this work and from the literature emphasize that coronary arteriosclerosis is only one of the many factors which may be responsible for the anatomic changes and the symptoms resulting from myocardial anoxia.

Archives of Physical Medicine, Chicago

26:197-250 (April) 1945

Experimental Studies on Electrical Reactions of Denervated Skeletal Muscles. O. L. Huddleston.—p. 197.
Physical Restoration in Vocational Rehabilitation. D. A. Clark.—p. 206.
Rehabilitation in the Navy. H. H. Montgomery.—p. 214.
Practical Application of Physical Therapy in Rehabilitation. W. B. Snow.—p. 220.
Physical Medicine in Rehabilitation of Veteran of World War II. H. C. Mitchell.—p. 227.
Spa Therapy of Arthritis and Rheumatic Disorders. F. J. Scully.—p. 233.

Arizona Medicine, Phoenix

2:71-136 (March) 1945

Ganglioneuroma of Mediastinum. H. Randolph.—p. 95.
Symposium on Treatment of Syphilis: "Modern Routine Treatment of Syphilis." L. G. Jekel.—p. 97.
Rapid Treatment Methods. P. S. Armour.—p. 100.
Treatment of Neurosyphilis. L. Saxe.—p. 101.
Spontaneous Subcutaneous Emphysema Occurring During Labor. M. Cohen.—p. 105.

California and Western Medicine, San Francisco

62:153-242 (April) 1945

Radiologic Aspects of Certain Tropical Diseases. L. H. Garland.—p. 158.
Study of Pneumonia in San Francisco, 1943-1944. G. F. Warner, J. G. Li and S. M. Farber.—p. 161.
Arterial Spasm and Fat Metabolism: Their Relation to Certain Diseases and to Certain Members of Vitamin B Complex. G. Selfridge.—p. 163.
Is the Organized Medical Profession Antisocial? L. Porter.—p. 163.
Penicillin Treatment for Gonorrhea. D. W. Atcheson.—p. 164.
Prenatal Blood Tests and Congenital Syphilis. G. M. Uhl and R. L. Kaufman.—p. 168.
Arteriosclerotic Gangrene, with Special Reference to Amputations Below the Knee. W. Scott.—p. 170.
Primary Cancer of Lung. S. M. Farber and D. J. Edwards.—p. 172.
Edema of Eyelids in Trichinosis. P. N. Pierose and E. M. Butt.—p. 174.
Psychiatric Casualties. Pearl S. Pouppirt.—p. 176.

Florida Medical Association Journal, Jacksonville

31:445-494 (April) 1945

Bilateral Dactylomegaly. R. R. Killinger.—p. 471.
Abdominal Pregnancy: Report of Case with Living Baby and Mother. M. J. Rose.—p. 475.

Journal Industrial Hygiene & Toxicology, Baltimore

27:95-122 (April) 1945

Physiologic Response of Animals to Certain Chlorinated Mononitroparaffins. W. Machle, E. W. Scott, J. F. Treon, F. F. Heyroth and K. V. Kitzmiller.—p. 95.
*Intervertebral Disk Injury: Analysis from an Industrial Standpoint. H. C. Marble and W. A. Bishop.—p. 103.
Composition of Industrial Dusts: I. Foundry Dusts. C. R. Williams. —p. 110.
Collection of Fluoride Fumes in Air. C. R. Williams and L. Silverman.—p. 115.
Benzol Poisoning—Delayed: Case Report. Adelaide R. Smith.—p. 118.

Intervertebral Disk Injury.—Marble and Bishop attempt to present impartially some of the facts relating to intervertebral disk injury from the standpoint of an industrial surgical clinic. The sources of the material are the records of one of the largest insurance companies in the United States interested in workmen's compensation. The facts as gathered represent a cross section of the work of both neurosurgeons and orthopedic surgeons throughout the country. Compensable cases represent probably the most important group, since back injury in industry is frequent and the results of therapy vital to the future of the patient. Of 496 industrial patients suspected of having sustained herniation of the intervertebral disk 92, or approximately one fifth, were operated on, while four fifths received other therapy. The 92 cases are analyzed from the standpoint of cost, disability, cause and diagnostic criteria Less than 50 per cent of cases show a favorable result.

Journal of Lab. and Clinical Medicine, St. Louis

30:293-394 (April) 1945

Quantitative Determination of Serum Bilirubin, with Special Reference to Prompt Acting and Chloroform Soluble Types. H. Ducci and C. J. Watson.—p. 293.
Pathology of Experimental Choline Deficiency in Dogs. F. R. Dutra and J. M. McKibbin.—p. 301.
Recovery from Fulminating Meningococcic Infection with Myocarditis Proved by Electrocardiography. J. N. Rappaport and M. Zuckerbrod. —p. 307.
Diasone: Its Toxicity and Therapeutic Effectiveness. G. W. Raiziss and J. C. Moetsch.—p. 317.
Polycythemia Produced by Cobalt in Duck: Hematologic and Pathologic Study. J. E. Davis, A. W. McCullough and R. H. Rigdon.—p. 327.

Journal-Lancet, Minneapolis

65:133-164 (April) 1945

Small Film Radiography in Industrial Groups. H. E. Hilleboe and A. W. Newitt.—p. 133.
Miliary Tuberculosis vs. Typhoid Fever: Case Reports. W. E. Peterson and A. Canfield.—p. 138.
Tuberculin Test and Health Education. T. L. Harrington.—p. 139.
Survey of Tuberculosis Observed at Freeman Clinic, 1934-1944, and Related Statistics. G. L. Hacker.—p. 140.
Continuation of Mantoux Program in Rural Minnesota. L. S. Jordan. —p. 142.
Unusual Case of Primary Carcinoma of Liver Associated with Diabetes Mellitus, Pulmonary Tuberculosis and Tuberculous Empyema. S. G. Clayman.—p. 144.
Control and Eradication of Animal Tuberculosis. A. E. Wight.—p. 146.
Tuberculosis Deaths Among Children. Ruth E. Boynton.—p. 148.
Tuberculosis of Cervical Lymph Nodes. S. S. Cohen.—p. 151.
Syphilis of Lung. P. A. O'Leary and O. E. Ockuly.—p. 154.

J. Neuropathology & Exper. Neurology, Baltimore

4:99-194 (April) 1945

Effects of Bilateral Simultaneous Subcortical Lesions in the Primate. F. A. Mettler.—p. 99.
Paramyoclonus Multiplex: Clinical-Pathologic Considerations. G. B. Hassin and R. D. Kepner.—p. 123.
Studies on Ameboid Motion and Secretion of Motor End Plates: V. Experimental Pathologic Effects of Traumatic Shock on Motor End Plates in Skeletal Muscle. E. J. Carey, L. C. Massopust, W. Zeit, E. Haushalter and J. Schmitz.—p. 134.
Anatomic Defects and Pathologic Changes in Congenital Cerebral Aneurysms. F. M. Forster and B. J. Alpers.—p. 146.
*Primary Degeneration of Corpus Callosum (Marchiafava-Bignami's Disease). H. H. Merritt and A. D. Weisman.—p. 155.
Leukoencephalitis Associated with Purulent Leptomeningitis (Meningoleukoencephalitis). I. M. Scheinker.—p. 164.
Syndrome of Posterior Inferior Cerebellar Artery Resulting from a Metastatic Neoplasm. C. Davison and L. A. Spiegel.—p. 172.
Studies on Developmental Pathology: III. Disintegration in Nervous System of Normal and Maldeveloped Embryos. P. Gruenwald.—p. 178.
Simple and Reliable Trichrome Stain. G. L. Rasmussen, Margaret M. Powers and G. Clark.—p. 189.
Simple and Reliable Myelin Sheath Stain for Paraffin Sections. J. P. Mullen.—p. 192.

Primary Degeneration of Corpus Callosum.—Marchiafava and Bignami were the first to observe central necrosis of the corpus callosum in elderly Italian alcoholic addicts. Since their report in 1903 about 50 cases of the disease have been reported. Until recently most cases have been reported in native Italians. The first native American reported to have the disease had become addicted to crude Italian wine. Merritt and Weisman report 2 additional cases of Marchiafava-Bignami's disease. Both occurred in middle aged Italians, in at least one of whom a history of excess alcoholism could be established. Both patients had subsisted on grossly inadequate diets. The pathologic findings were limited to necrosis of the middle lamina of the corpus callosum in the first patient, but the second patient had extensive symmetrical lesions in the subcortical white matter of the hemispheres and middle cerebellar peduncles as well. The authors think that the clinical picture cannot be explained by the callosal lesion but requires postulation of a more diffuse cerebral disorder. They consider Marchiafava-Bignami's disease to be a form of chronic alcoholic encephalopathy for which an inadequate diet and prolonged alcoholism are necessary antecedents.

New Jersey Medical Society Journal, Trenton

42:105-128 (April) 1945

Mental Hygiene in New Jersey: Some Notes on Its Development. E. Frankel.—p. 107.
Respiratory Diseases in Tropics. I. L. Applebaum.—p. 111.

New York State Journal of Medicine, New York

45:677-816 (April 1) 1945

Tendogenetic Disease and Its Treatment with X-Rays. J. Borak.—p. 725.
*Lesions of Cervical Intervertebral Disk: Clinicopathologic Study of 22 Cases. J. Browder and R. Watson.—p. 730.
Report on Progress of Glaucoma Campaign During Past Three Years. M. J. Schoenberg.—p. 738.
Use of Bismuth in Treatment of Vincent's Infection. H. M. Cox and J. H. Hodas.—p. 741.

Lesions of Cervical Intervertebral Disk.—From a review of the literature Browder and Watson collected only 69 verified cases with protrusion or herniation of a part of the cervical disk. In this paper they present their experiences with 22 cases in which this lesion had disturbed the function of the cervical spinal cord and/or nerve roots. Twenty-one were verified at operation and 1 at necropsy. Three different types of pathologic processes were encountered: (*a*) discrete, oval or rounded nodules projecting into the ventral vertebral canal, (*b*) true dorsal herniations of the nucleus pulposus and (*c*) ridges of annulus fibrosus surmounting hypertrophic bone at the margins of the adjacent vertebra. A negative Queckenstedt test does not exclude the presence of such a lesion. The operative mortality for the series was zero. One patient died before coming to operation.

Northwest Medicine, Seattle

44:71-102 (March) 1945

Nitrous Oxide Pentothal Anesthesia. C. P. Wangeman.—p. 73.
Clinical Management of Jaundice. K. E. Hynes.—p. 76.
Tropical Diseases of Increasing Importance. F. B. Queen.—p. 80.
Pinealoma, with Report of Case. W. B. Dublin.—p. 86.
Surgery in Infants and Children. M. S. Rosenblatt.—p. 88.
Diagnostic Standards for Rheumatic Fever. P. F. Guy.—p. 90.
Antimony Intoxication. T. E. P. Gocher.—p. 92.

44:103-138 (April) 1945

Ischemia as Cause of Cancer. R. W. Kullberg.—p. 107.
Rheumatic Pericardial Effusion Treated Successfully with Penicillin. J. R. Ridlon and A. B. Geyer.—p. 111.
Subtrochanteric Osteotomy for Treatment of Nonunion of Hip Fractures. J. D. Stewart.—p. 112.
Meckel's Diverticulitis with Regional Ileitis. L. Patricelli.—p. 117.
Serology of Babies. A. H. Van Dell.—p. 118.
Right-Sided Aortic Arch: Report of 6 Cases. W. Y. Burton, L. H. Smith Jr. and G. A. Heustis.—p. 118.
Tropical Diseases of Increasing Importance. F. B. Queen.—p. 122.

Ohio State Medical Journal, Columbus

41:297-392 (April) 1945

Circulatory Failure During Anesthesia. B. B. Sankey.—p. 321.
Still's Disease. S. H. Ashmun.—p. 324.
Medical Service, First Step to Rehabilitation. W. J. Zeiter.—p. 327.
Venography of Lower Extremities. E. C. Baker.—p. 330.
*Foreign Bodies in Gallbladder: Case Report. T. F. Heatley and G. W. Bascom.—p. 333.
Recent Front Line Experiences in China. W. L. Furste II.—p. 336.
Man, Then Gods. A. J. Elkins.—p. 340.
Cine Bronchoscopy: Kodachrome Visualization of Bronchial Pathology. P. H. Holinger.—p. 342.
Neurogenic Paralytic Ileus Due to Compression of Splanchnic Nerves by Aneurysm. E. Schafer.—p. 344.
Medical Curiosities—Oxygen Therapy, 1887. R. M. Watkins.—p. 346.

Foreign Bodies in Gallbladder.—A woman aged 61, whose chief complaint was pain in the left hypochondrium, loss of appetite and a loss of 25 to 30 pounds (about 12 Kg.) in the past year, had an acute episode of pain in the right subcostal area one year ago. A physician told her that she probably suffered from a chronic gallbladder disease and probably gallstones. She made an uneventful recovery from this acute episode. Since that time there has been some tenderness and soreness in the right upper quadrant of the abdomen. She has been intolerant to fatty foods and has had increasing episodes of epigastric distress and pain. The x-ray examination revealed two metallic bodies in the gallbladder. At operation the liver was found to be normal except that there were dense fibroid adhesions anchoring the gallbladder firmly in its bed, apparently where the metal pins had perforated the gallbladder into the liver bed. The patient recovered. She stated that approximately twenty years ago she swallowed a closed safety pin. She has been a dressmaker for the past thirty years and commonly held many pins in her mouth while fitting clothes. Heatley and Bascom discuss whether the pins found in the gallbladder were the shafts of a safety pin, the spring and clasp ends having become oxidized, or whether they were straight pins swallowed on different occasions.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

20:289-416 (March) 1945

Trichomonas Vaginalis Donné: Recent Experimental Advances. R. E. Trussell and G. Johnson.—p. 289.
*Treatment of Schistosomiasis. F. Hernández Morales.—p. 322.
Effect of Chlorine on Motility and Infectivity of Cercariae of Schistosoma Mansoni. J. O. Gonzalez, N. Biaggi and J. Rivera León.—p. 357.
Trichiniasis: Review of Clinical Picture and Laboratory Diagnosis of Disease, with an Analysis of Several Cases. O. H. P. Pepper and R. S. Diaz Rivera.—p. 367.

Treatment of Schistosomiasis.—Hernández Morales says that in recent years physicians in Puerto Rico have become conscious of the frequent occurrence of schistosomiasis. A large number of patients with schistosomiasis were observed at the University Clinic of San Juan, and for the present study 157 of these cases have been selected. Trivalent antimony compounds are the most effective of all drugs in combating schistosomiasis. Antimony and potassium tartrate, antimony and sodium tartrate and fuadin appear to be the drugs of choice; anthiomaline deserves a more extensive trial. It seems that in spite of the fact that fuadin is effective in only 50 to 60 per cent of the cases its low toxicity and the ease with which it can be administered should make it the drug of choice. It is marketed in the form of a clear isotonic solution with 6.3 per cent of the drug; hence 1 cc. represents 8.5 mg. of trivalent antimony. Fuadin is administered intramuscularly with very little discomfort. For an adult the first three injections, of 1.5, 3.5 and 5 cc. respectively, are usually given daily. Subsequent doses of 5 cc. are given every other day or every three days until a total of 45 cc. has been given. Treatment can be repeated after a rest period of one to two weeks. Although this amount of drug may not be adequate for cure in a certain percentage of cases, the author does not favor the excessive amounts recommended by Cawston, who gives total doses of 60 cc., or by Valencia Parparcen, who gives up to from 100 to 150 cc. The high doses are likely to cause severe toxic reactions. The author presents case histories representative of toxic reactions. The more common reactions are nausea, vomiting, epigastric pain, pain in the joints and loss of weight. Of the more severe reactions peripheral neuritis is the most frequently found. A case of herpes zoster and of purpura hemorrhagica were recently observed. In 1 case the administration of fuadin apparently reactivated an old tuberculous process.

Rhode Island Medical Journal, Providence

28:157-232 (March) 1945

Bronchiectasis. U. E. Zambarano.—p. 169.
Technic of Bronchography. B. H. Cotton.—p. 171.
Progress in Surgical Management of Bronchiectasis. R. H. Overholt.—p. 172.
Laborers' Backaches. H. McCusker.—p. 174.

28:233-320 (April) 1945

Discussion of Acute Knee Injuries. G. E. Crane.—p. 245.
Naturopathic Legislation and Education. J. E. Farrell.—p. 248.

Virginia Medical Monthly, Richmond

72:149-188 (April) 1945

Congenital Pyloric Stenosis. F. S. Johns and J. B. Stone.—p. 151.
Dermatitis in American Munitions Industry. J. Q. Gant Jr.—p. 158.
Gas Gangrene: Report of Severe Case with Recovery. H. G. Lougaker, C. E. Holderby and M. L. Horne.—p. 164.
Treatment of Congestive Heart Failure. B. R. Powers.—p. 170.

72:189-234 (May) 1945

Psychiatry in Air Forces Station Hospital. D. B. Davis.—p. 192.
Erythroblastosis Fetalis and Rh Factor. P. Hogg.—p. 198.
Vasa Previa. M. P. Rucker and G. R. Tureman.—p. 202.
Observations on Combat Psychiatric Casualties. G. N. Raines.—p. 203.
Medical Problems in Changing World. L. D. Keyser.—p. 211.
Parotid Duct Fistula: Report of Case, with Simple Method of Treatment. C. I. Sease.—p. 217.
Lobar Pneumonia: Another Etiologic Viewpoint. H. Robertson.—p. 218.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

39:1-48 (Jan.) 1945

Basal Tuberculosis. P. Steen.—p. 3.
Mass Radiography in Wales: Experience with Mobile Unit. T. W. Davies and M. Davies.—p. 23.
*Eosinophilic Pneumonitis (Loeffler's Syndrome) with Response to Emetine. T. Randall.—p. 37.

Loeffler's Syndrome with Response to Emetine.—A man aged 20, whose temperature varied between 99 and 100.4 F., presented clinically a condition resembling one of those transitory pulmonary infiltrations with eosinophilia first described in 1936 by Loeffler. Examination revealed increased vocal fremitus and vocal resonance in the upper third of the right lung and crepitations in the right apex and midzone. X-ray examination showed what was presumed to be characteristic tuberculous infiltration of both lung fields. A series of eight sputums were negative for tubercle bacilli, and no amebas nor fungi were found in the sputum or the stools. Daily intramuscular injections of emetine were given for ten days. The patient showed a rapid and dramatic response. His cough and sputum decreased rapidly, his appetite improved and he became symptom free. X-ray examination twenty-five days after the first one showed clear lung fields. Randall calls attention to the rapid resolution of the pulmonary lesions, the relationship this had to emetine treatment and the problem which remains of whether such cases really have an amebic origin when they occur in a district where amebiasis is endemic.

British Medical Journal, London

1:319-356 (March 10) 1945

Incidence of Peptic Ulcer at St. Thomas's Hospital, 1910-1937. H. Tidy.—p. 319.
Blackwater Fever in West Africa. E. W. Skipper and G. L. Haine.—p. 325.
Diagnosis of Malaria in West Africa. D. G. Ferriman.—p. 328.
Removal of Projectile Fragments and Immobilization of Wounds in Forward Areas. J. A. Ross.—p. 330.
Rise in Incidence of Scabies in Closed Community Using Ordinary Soap, and Its Subsequent Fall on Substitution of 5 Per Cent Tetmosol Soap. W. Bartley, K. Usworth and R. M. Gordon.—p. 332.

1:357-398 (March 17) 1945

Shall We Nationalize Medicine? L. Horder.—p. 357.
Pregnancy and Diabetes. Mary A. M. Bigby and F. A. Jones.—p. 360.
Mortality in Childhood During 1920-1938. W. J. Martin.—p. 363.
Hematometra Due to Cicatricial Stenosis of Cervix After Labor. F. S. Tait.—p. 365.
Failure of Immunity Responses in Localized Disease. W. H. Hughes.—p. 366.
New Salmonella Type: Salmonella Cardiff. Joan Taylor, D. G. Edwards and P. R. Edwards.—p. 368.

Journal of Pathology and Bacteriology, Edinburgh

56:485-616 (Oct.) 1944

Lipids of Rat Adrenal in Shock Caused by Experimental Crushing Injury. G. Popják.—p. 485.
Phosphatase Reaction as Aid in Classification of Corynebacteria. J. Bray.—p. 497.
Epithelial Tumors of Urinary Bladder in Mice Induced by 2-Acetylamino-Fluorene. Elizabeth C. Armstrong and Georgiana M. Bonser.—p. 507.
Carriage of Staphylococcus (Pyogenes) Aureus in Man and Its Relation to Wound Infection. A. A. Miles, R. E. O. Williams and B. Clayton-Cooper.—p. 513.
Further Studies on Toxin of Corynebacterium Pyogenes. R. Lovell.—p. 525.
Umbilical Sepsis and Acute Interstitial Hepatitis. J. E. Morison.—p. 531.
Histologic Changes in Liver and Kidneys of Rat After Administration of Thyroid Hormone and Vitamins. V. Korenchevsky and K. Hall.—p. 543.
*Production of Penicillin on Media Made from Vegetable Extracts, Particularly Extracts of Pea. R. P. Cook and W. J. Tulloch.—p. 555.

Production of Penicillin.—Cook and Tulloch report experiments which had the purpose of finding a simple, cheap and easily made medium that might be substituted for the synthetic substrates and Coghill medium and to determine the most favorable conditions for cultivation in such a medium. A strain of Penicillium notatum was grown on a variety of "natural" mediums prepared by extracting various vegetable products and the yield of bacteriostatic substance was assessed. Of the vegetables tested, peas and pea flour gave the highest yields. The authors describe a method of obtaining moderate yields of penicillin by growth at 22 C. in watery extracts of pea. Maximum yield occurs about the eighth to the tenth day, after which the medium becomes alkaline. The product obtained is not "notatin" and is easily extracted with ethyl acetate from the medium acidified with phosphoric acid. When neutralized it is neither pyrogenic nor toxic in the doses tested (50 units for a mouse of 17 Gm. and 3,000 units for a rabbit of 2 Kg.).

Revista de la Policlínica, Caracas

13:319-406 (Sept.-Oct.) 1944. Partial Index

Autotransfusion. V. Brito and R. Rojas Guardia.—p. 331.
*Clinical Results Obtained with Oxophenarsine Hydrochloride in Treatment of Malaria. L. Dao L.—p. 339.
Computation of End and Duration of Pregnancy. O. Agüero.—p. 350.
Clinical Aspects and Treatment of Ulcerating Granuloma. L. A. Bello V.—p. 362.

Oxophenarsine Hydrochloride in Malaria.—Dao L. encountered a patient with a genital chancre and a strongly positive Kahn reaction, with fever of the tertian type and schizonts of Plasmodium vivax in the blood. The fever disappeared after the second injection of oxophenarsine hydrochloride (mapharsen) and splenomegaly after the fifth injection. Dao L. administered oxophenarsine hydrochloride to 16 patients with acute malaria, to 12 with relapsing malaria and to 18 with malarial splenomegaly. He obtained favorable results in acute attacks of tertian malaria. Caution is necessary in cases of plasmodium falciparum. In the relapsing cases of malaria the fever usually subsides after the second injection of the drug; also it causes reduction of small recent splenomegalies. In splenomegalic patients with acute febrile attacks the author first employs oxophenarsine hydrochloride alone and after the fever subsides he uses the combination of oxophenarsine hydrochloride and typhoid paratyphoid vaccine. This combination was effective also in a third of the patients with chronic splenomegaly.

Deutsche medizinische Wochenschrift, Leipzig

70:53-82 (Feb. 4) 1944

*Pregnancy Nephrosis. W. Nonnenbruch.—p. 53.
Spontaneous Hypoglycemia. F. Meythaler.—p. 54.
Paracoli Bacteria: Problem of Facultative Pathogenic Properties. P. Weiland.—p. 57.
Typhus in Spain. I. Andreu Urra.—p. 60.
Testing and Evaluation of Rapid Agglutination in Typhus. H. B. Sauter.—p. 63.
Comment on Sauter's Preceding Paper. Bohnenkamp.—p. 64.
Occurrence of Atypical Rudimentary Cases of Malaria During Winter Months. H. Puhlmann.—p. 64.
Front Line Observations on Irritable Bladder. L. Meuwsen.—p. 66.
Wartime Dietetics. E. G. Schenck.—p. 68.
Study of Gastric Juice in Atmosphere Rich in Carbon Dioxide and in Close Air. Lepel.—p. 70.

Pregnancy Nephrosis.—Nonnenbruch reports 5 instances of pure lipoid nephrosis with nephrotic syndrome in women after childbirth. The clinical picture was that of hypoproteinemia, shifting to the left of the albuminous substances of the blood, lipemia, lipoiduria and tendency to edema. Rise of blood pressure and eclampsia preceded in 2 cases and recovery occurred in one of them. One case presented a pure nephrosis in the second month of pregnancy. The nephrosis persisted for two years after the interruption of the pregnancy and recovery took place after an intercurrent fever. The pregnancy kidney is to be considered as nephrosis associated with edema and rise of blood pressure and in many instances with hematuria, but pregnancy kidney is not to be considered as diffuse glomerulonephritis in which condition a transition into a pure nephrotic syndrome was never observed. The edema in the nephrotic syndrome may depend on psychic excitement and that applies to the increase in the edema as well as its disappearance. Renal changes on the one hand and rise of blood pressure and edema on the other may have the same origin in diffuse glomerulonephritis and may be considered as coordinated manifestations of this condition. A common cause for the renal and extrarenal processes may have to be considered likewise in pregnancy kidney. Rise of blood pressure and edema may be the extrarenal results of this condition, as well as those of

glomerulonephritis, but glomerulonephrosis with heavy loss of albumin and without any inflammatory reaction of the kidney may develop in the absence of "nephritis." There may be various transitional stages to pure lipoid nephrosis with the nephrotic syndrome. Pregnancy nephropathy requires cooperation of the gynecologist with the internist.

Wiener klinische Wochenschrift, Vienna

70:263-292 (May 12) 1944

Principle of Localization and Analysis of Function in Vegetative System. C. Oehme.—p. 263.
*Experimental Study on Origin of Pylorospasm. G. Bonell.—p. 267.
Galactagogues? Lili Walter.—p. 269.
Functional Disturbances of Micturition in Wartime. J. Deussen.—p. 272.
Do Relapses of Typhus Occur? H. Raettig.—p. 274.
Use of Radioactive Indicator Methods in Biology and Medicine. J. Gerlach.—p. 275.
Effect of Estrogen and of Testosterone Propionate on Lacteal and Genital Crisis in Newborn. H. Slobozianu.—p. 276.
Thoracic Displacement of Stomach Caused by Diaphragmatic Hernia. F. Umber.—p. 278.

Origin of Pylorospasm.—Bonell studied the excretion of protective ferments in the urine of 19 normal male and female infants with mild disorders of nutrition of ages between 20 days and 13 months. Placenta, ovary, corpus luteum and testis were used as substrates for Abderhalden's reaction. The elaboration of specific protective ferments was studied in a second series of 10 male infants with pylorospasm between the ages of 3 and 7 weeks. The secretion of specific protective proteinases which split placenta proteins but frequently cause the disintegration of substrates from the ovary, corpus luteum and testis was demonstrated in the urine of all the infants up to 3 months of age and in 2 infants 4 months old. The excretion of these ferments, which were specific for the hormone substrates of the mother, could not be demonstrated in the urine of infants with pylorospasm. Their organism does not seem capable of producing protective ferments causing the breakdown of proteins which had been taken over by the infant from the mother and which were foreign to the blood or at least to the plasma of the infant. This is regarded as experimental proof of Stolte's concept of the origin of pylorospasm. The clinical picture of vomiting may therefore be included among the pregnancy reactions of the newborn. No other theory furnishes better explanation for the limitation of pylorospasm to a definite age and its predilection for one sex. The endocrine origin of pylorospasm is likewise suggested by clinical and roentgenologic observations which prove that pylorospasm requires a certain length of time for its full development. Further proof is to be seen in the high incidence of spontaneous recoveries after the third month, a period which coincides in the infant with the time at which the effect of the hormone of the mother gradually disappears.

Wiener klinische Wochenschrift, Vienna

57:157-182 (April 7) 1944. Partial Index

Surgery of Thyroid. B. Breitner.—p. 157.
Experiences of Ophthalmologist During Air Assaults on Civil Population. J. Bohnen.—p. 159.
Endocrine and Vegetative Component in Allergic Diseases and in Diabetes Mellitus. F. Gerl.—p. 161.
*Therapy of Acute Leukemia and of Agranulocytosis. O. Scharff.—p. 169.

Therapy of Acute Leukemia.—Scharff reports good results with sulfathiazole therapy in 3 cases of severe necrosis of the oral mucosa and septic agranulocytosis in the presence of chronic lymphadenitis in 1, with acute myelosis in another and with agranulocytosis in the third. The first patient, a man aged 44, was given 6 Gm. of sulfathiazole the first day and 4 Gm. for the two following days. The acute septic leukemia with its immediate threat to the patient's life gave place to chronic lymphadenosis complicated by this septic condition. Death occurred from the primary chronic disease four months later. Recovery from acute myelosis developing in the second case from chronic myelosis and combined with a large tumor of the spleen was obtained with 8 Gm. of sulfathiazole on the first and second days and of 4 Gm. on the third day. The early stage of chronic myelosis was restored and the patient, a man aged 37, was dismissed free from complaints. The third patient, a man aged 33 with septic agranulocytosis, was cured by two courses of sulfathiazole treatment. The first consisted of 8 Gm. of sulfathiazole for three days and of 4 Gm. for one more day. The recurrence of the acute septic condition required a second course. The rapid disappearance of the severe necrosis of the oral mucosa in all 3 cases and of the prepuce and the tympanic membrane in the second case was striking. The cure of the septic condition is to be considered as the result of the sulfathiazole treatment, since acute leukemia or septic agranulocytosis does not subside spontaneously. The same good results obtained in these 3 different cases suggest a relationship between the three pathologic conditions.

Acta Dermato-Venereologica, Stockholm

25:1-110 (June) 1944. Partial Index

*Treatment of Syphilis with Specific Drugs and Simultaneous Fever Therapy, Appraised by the Effect on Treponema Pallidum in Fresh Eruptions. H. Haxthausen.—p. 1.
Cultivation of Gonococci as Diagnostic Method in Gonorrhea in Women. F. Reymann.—p. 9.
Dermatologic Investigations on Pairs of Identical Twins. R. Melsom.—p. 29.
Comparative Studies on the Effect of Various Antimycotics on Dermatophytosis Pedis, Ascertained by Systematic Examination for Fungi. Mildrid Andersen and Marie Plesner.—p. 48.
Indications for the Treatment of Gonorrhea with Sulfathiazole and Fever Shock, Elucidated by Chemoresistance and Gonococcus Complement Fixation Reaction. P. V. Marcussen.—p. 77.

Simultaneous Treatment of Syphilis with Specific Drugs and Fever.—Haxthausen administered to 21 patients with primary syphilitic lesions 0.3 Gm. of neoarsphenamine, and to 20 patients 0.3 Gm. of neoarsphenamine and fever produced by simultaneous intravenous injections of a Bacillus aerogenes faecalis vaccine in doses of 80 to 100 million bacilli. In the first group of patients the spirochetes disappeared in 4 of the 21 patients within twenty-four hours, whereas the same result was obtained in 17 of the 20 patients in the second group. Fever vaccine therapy alone did not have much effect on the number and the motility of the spirochetes three days after the fever. The effect of bismuth on the presence of spirochetes in syphilitic papules demonstrated a similar accentuation of the bismuth effect by fever therapy. This suggested that intensification of the effect of the specific drugs may result from combining fever with specific drugs. It is advisable to employ fever therapy simultaneously with the specific drugs in old refractory cases, and particularly in cases in which the usual treatment is ineffective from the onset or in which treatment is soon followed by a relapse. One should employ doses of 0.6 Gm. for women and 0.75 Gm. for men. No untoward reactions were observed from these doses and fever therapy, whereas in 1 refractory case in which neoarsphenamine was given in 0.9 Gm. doses the second combined injection was followed by the occurrence of hepatitis.

Acta Medica Scandinavica, Stockholm

116:409-606 (March 10) 1944. Partial Index

Experiments on Allergic Bronchial Asthma. P. Kallós and L. Kallós-Deffner.—p. 409.
*Epinephrine Preparation with Delayed Action in Treatment of Experimental Asthma. P. Kallós and L. Kallós-Deffner.—p. 441.
Comparative Results in Cases of Hepatitis Treated With or Without Insulin-Dextrose. O. Lenz.—p. 447.
Diseases of Heart and Blood Vessels Due to Congenital Syphilis: Case Report. I. Aggerback.—p. 454.
Hallberg's Peculiar Corpuscles in Tuberculous Material. K. H. Clausen.—p. 468.
Anaphylactic In Vitro Reaction to Tuberculin. A. Grönwall.—p. 470.
Cardiovascular Observations in Myasthenia Gravis and Dystrophia Myotonica. E. Ask-Upmark.—p. 502.
Atropine Treatment of Sequel of Epidemic Encephalitis. I. Vartiainen.—p. 536.
Determination of Erythrocyte Content of Circulating Blood by Labeling with Radium Phosphorus. G. Hevesy, K. H. Köster, G. Sørensen, E. Warburg and K. Zerahn.—p. 561.

Epinephrine Preparation with Retarded Action.—Kallós and Kallós-Deffner used a slow acting epinephrine preparation (adrenaline retard) in experimentally induced asthma in guinea pigs. The preparation is effective in the prophylaxis of asthma. Experimentally produced attacks of asthma which without treatment would probably have a fatal outcome can be arrested by the intramuscular injection of the slow acting epinephrine preparation. The effect seems to persist for several hours. The preparation is well tolerated and has no damaging effect on the tissues.

Book Notices

The Precentral Motor Cortex. Edited by Paul C. Bucy. Illinois Monographs in the Medical Sciences, Vol. IV, Nos. 1-4. Paper. Price, $4.50. Pp. 605, with 140 illustrations. Published Under the Auspices of the Graduate School. Urbana: University of Illinois Press, 1944.

This is a timely monograph designed to bring to date the rapidly accumulating knowledge of the motor cortex. The editor, Dr. Paul C. Bucy, has selected his contributors wisely and chosen the subject material critically. The result is a volume of splendid contributions concerning all aspects of the problem of the motor cortex. It is quite fitting that this volume should be contributed by American authors, for it is in this country that much of the recent investigation of the motor cortex has unfolded, though the impetus for such investigation may have come from Dr. Otfrid Foerster, to whom the volume is dedicated.

The scope of the work is seen in the contents: (1) architecture of the precentral motor cortex, G. von Bonin; (2) role of architectonics in deciphering the electrical activity of the cortex, James L. O'Leary; (3) afferent connections, A. Earl Walker; (4) efferent fibers, Paul M. Levin; (5) pyramidal tract, Sara S. Tower; (6) excitatory and inhibitory processes within the motor centers of the brain, N. Bubnoff and R. Heidenhain; (7) corticocortical connections, W. S. McCulloch; (8) somatic functions, Margaret A. Kennard; (9) relationship to the cerebellum, Percival Bailey; (10) autonomic functions, Margaret A. Kennard; (11) frontal eye fields, Wilbur K. Smith; (12) electrical excitability in man, Theodore C. Erickson; (13) effects of extirpation in man, Paul C. Bucy; (14) relationship to abnormal involuntary movements, Paul C. Bucy; (15) clinical symptomatology, Charles D. Aring; (16) pathology, Charles Davison; (17) significance of the precentral motor cortex, Marion Hines.

Some conception of the strides which have been made in the understanding of our knowledge of the precentral cortex in recent years may be recognized by the disclosure of the significance of the strip area, by the working out of cortical and subcortical connections, by the elucidation of the meaning of flaccidity and spasticity, in which much still remains to be done, by the determination of the origin of the pyramidal tract, by the mapping out of extrapyramidal or parapyramidal cortical areas and connections and by the results of extirpation in man. These are but a few of the problems to which new data have been contributed, and it is safe to assert that much new material remains to be disclosed.

The editor and the authors are to be congratulated not only on a fine volume but on the part which American neurology, neurosurgery and neurophysiology have played in the amplification of our knowledge of the motor cortex.

A complete bibliography adds to the value of the volume. It is recommended without reservation to all those interested in neurology, whether their field is clinical or laboratory.

Emotional Problems of Living: Avoiding the Neurotic Pattern. By O. Spurgeon English, M.D., Professor of Psychiatry, and Gerald H. J. Pearson, M.D., Associate Professor of Child Psychiatry, Temple University Medical School, Philadelphia. Cloth. Price, $5. Pp. 438. New York: W. W. Norton & Company, Inc., 1945.

The first half of this book is devoted to a thoroughgoing discussion of the emotional disturbances that arise in infancy and childhood. Growth is conceived as a series of periods classified as oral, anal, phallic and latent, proceeding then to puberty and adolescence, work and marriage. Psychologic disturbances later in life seem to result largely from the frustrations of pleasure that result in hostility, pain and hatred. Nail biting is considered a sign of poor emotional adjustment. The severe cases are part of the desire of the child to annoy and humiliate the parents. Most of the points made are illustrated by case reports. The volume is planned not only for the medical reader but also for medical students, teachers, nurses and social workers. The book is definitely orientated to psychoanalytic thinking. Many statements are made as conclusive which might still be considered in the realm of investigation. However, a careful reading of the work will aid greatly the understanding of the relation of mind to body and thus advance greatly the quality of medical practice.

The Chemistry and Technology of Food and Food Products. Prepared by a Group of Specialists under the Editorship of Morris B. Jacobs, Ph.D., Senior Chemist, Department of Health, City of New York. Volume II. Cloth. Price, $10.50; $19 per set of two volumes. Pp. 890, with 166 illustrations. New York: Interscience Publishers, Inc., 1944.

This volume contains the four concluding sections of this treatise on food and food processing and is concerned entirely with the technology of processing. Such matters as conveying of foods in various forms and their storage are considered. Discussion is given to the principles of methods used in preparing food for storage. In later sections the more detailed technical procedures and problems of preservation are taken up. Standards of quality which must be met to pass federal, state and municipal requirements are outlined and references given to detailed description of federal standards adopted up to February 1943. Much information is given on the measures used to maintain sanitary control. The important and informative last section describes the production of all substantial types of processed and natural foods, with inclusion of many pictures. Facts and figures on the methods of preparation of alcoholic beverages and their chemical composition are found here. The treatment of water for various industrial uses as well as for drinking purposes is covered. This volume serves the valuable purpose of giving a broad survey of the field of food processing. The reader is oriented in each subject but would need to look further for detailed information. As an overall perspectus of the food industry the book would be hard to equal.

Science in Progress. By Walter R. Miles, and others. Edited by George A. Baitsell. Foreword by Lorande Loss Woodruff. Fourth series. The Society of the Sigma Xi, National Lectureships 1943 and 1944. Cloth. Price, $3. Pp. 331, with 106 illustrations. New Haven, Conn.: Yale University Press; London: Oxford University Press, 1945.

This volume is the fourth of a series which makes available Sigma Xi lectures dealing with fields in which there has been great progress. The scientist will find these lectures uniformly of high quality. The authors are the men who themselves have been in the forefront of research. The book is excellently printed, with numerous black and white and colored illustrations. The subjects especially involved in the present volume which would be of interest to physicians include psychologic aspects of military aviation, by Walter R. Miles; the physical structure and biologic action of nerve cells, by Detlev W. Bronk; energy and vision, by Selig Hecht; chemical transmission of nerve impulses, by Otto Loewi; present status of the vitamin B complex, by C. A. Elvehjem, and blood and blood derivatives, by Edwin J. Cohn.

The Svedberg 1884 $\frac{30}{8}$ 1944. [Anniversary Volume.] Boards. Pp. 731, with illustrations. Uppsala, Sweden: Almqvist & Wiksells Boktryckeri A.B., 1944.

This volume is a tribute by grateful associates, assistants and pupils to The Svedberg, professor of physical chemistry at the University of Uppsala, on his sixtieth birthday. Because of the war the contributions are practically all of Swedish origin. The English, German, Swedish and French languages are used in the order of frequency as mentioned. There are fifty-five papers by some seventy-five authors, dealing mainly with investigations in chemistry and its borderlands, particularly technology, but including also biology and medicine. The papers constitute an impressive record of Swedish chemical research during recent years and especially in the Institute of Physical Chemistry in Uppsala, where Svedberg has carried on his work since 1931. The publication of this handsome, well edited memorial volume was made possible by grants from Swedish industrial concerns.

Yeoman's Hospital. By Helen Ashton. Cloth. Price, $2.50. Pp. 271. New York: Viking Press, 1945.

The author studied medicine between 1920 and 1926 after serving as a nurse in the first world war. Most of her novels have a medical background. This novel tells the story of a nonprofit voluntary hospital in England, of a few days in the life of the institution when a new class of nurses begins, when the board of the hospital is concerned with its future, when the members of the resident staff are competing for an appointment in surgery. A young woman doctor who is a surgeon and a somewhat morose pathologist with a duodenal ulcer are the heroine and the hero of the book. A somewhat careless young surgeon who misses a diagnosis of brain abscess helps to make

the medical aspects interesting. Miss Ashton writes professionally and is exceedingly skilful in organizing her story. It serves, as does many another British novel, to picture certain aspects of medical practice more accurately than they appear in the writings of the economists and the politicians. She reveals the real concern of the medical profession over the disappearance of the voluntary hospital. She reveals the true opinion of the medical profession of the quality of panel practice, and she reveals also the scale of living of the British worker as it is seldom revealed in the writings of those who speak so learnedly about the Beveridge plan. The novel is well worth the time of any physician who likes to read fiction with a medical aspect.

Nursing: A Profession for College Women. Paper. Price, 25 cents. Pp. 35. Published by the Nursing Information Bureau of the American Nurses' Association co-operating with the National League of Nursing Education and the National Organization for Public Health Nursing. New York, 1945.

This handbook, prepared by leading organizations in the field of nursing education and service, contains a wealth of information for young women who are interested in professional nursing and wish to contribute to the care and welfare of the sick. It describes educational requirements, types of nursing schools, cost of preparation, available financial aid, placement opportunities, positions in military and civilian service, working conditions, salary ranges, opportunities for professional and personal development and many other significant factors. Selected references are included as well as other sources from which specific information can be obtained. While this pamphlet may find its greatest use among counselors in colleges and high schools, it will be equally valuable as a direct aid to individual students interested in nursing education. Since there is still an urgent demand for additional nursing personnel in relation to military and civilian needs, it is hoped that the information contained in this handbook will be given wide distribution throughout the country.

Annual Review of Physiology. James Murray Luck, Editor. Victor E. Hall, Associate Editor. Volume VII. Cloth. Price, $5. Pp. 774. Published by the American Physiological Society and Annual Reviews, Inc. Stanford University P. O., California: Annual Reviews, Inc., 1945.

This book contains important and fundamental contributions to physiology. In spite of the war it is the largest volume of the series yet published. It contains a wealth of valuable information, including chapters on the peripheral circulation, respiration, digestive system, blood, heart, special senses, exercise and other important subjects by thoroughly qualified investigators. As in previous years, this is an invaluable book of source material for investigators working in physiology or in the borderland between clinical medicine and physiology.

An Introduction to Animal Biology. By John B. Parker, Ph.D., and John J. Clarke, Ph.D. Second edition. Cloth. Price, $3.75. Pp. 532, with 172 illustrations. St. Louis: C. V. Mosby Company, 1945.

The second edition follows the general plan of the first edition, but the material has been brought up to date and expanded. The book is intended for a one semester college course. The authors have developed the material in such a way that the student sees the subject as a whole, rather than losing himself in a maze of details. Animal forms which are of economic or medical importance are emphasized. The subjects of heredity, genetics and evolution, as well as hormones and vitamins, are treated in separate chapters. An appendix groups the material together in tabular form, and the glossary covers fourteen pages.

Social Work Year Book 1945: A Description of Organized Activities in Social Work and in Related Fields. Russell H. Kurtz, editor. Eighth issue. Cloth. Price, $3.25. Pp. 620. New York: Russell Sage Foundation, 1945.

This is the eighth of the series which has made a place for itself as one of the most reliable reference works for those in the field of public health, medicine and social work generally. The book is a dependable guide to the agencies in the field and the advances that have been made in specific areas of social work. Of special interest in the current number are sections devoted to the veterans, social insurance, foreign relief and rehabilitation, and interracial and intercultural activities. Excellent bibliographies accompany each of the discussions.

Science Today and Tomorrow. By Waldemar Kaempffert. Second Series. Cloth. Price, $2.75. Pp. 279. New York: Viking Press; Toronto: Macmillan Company of Canada, Ltd., 1945.

Mr. Waldemar Kaempffert has collected here the essays which he has contributed at various times to various publications. Of special interest to physicians in this volume is a chapter called "Sick Medicine Needs a Doctor." It is replete with the misrepresentations which are expected when Mr. Kaempffert writes about medicine, of which he knows little and concerning which he seems unwilling to learn more. He charges, for instance, that physicians must practice by the fiat of their national organization. Actually the national organization adopts principles of ethics which members follow because they believe in them. For one who presumes to be educated in the scientific method Mr. Kaempffert writes with innumerable and extraordinary prejudices. Indeed, his choice of words is designed particularly to create prejudice. Mr. Kaempffert does not believe that doctors charge according to the patient's ability to pay. He thinks they charge all the traffic will bear. He charges that voluntary insurance does nothing for preventive medicine but disregards the fact that there is little or no preventive medicine in any compulsory sickness insurance plan. If the rest of Mr. Kaempffert's book is as bad as this chapter, investment will represent a considerable waste of money. Fortunately, however, the reader has free choice—he can take it or leave it. It is our recommendation that he leave it.

Vitamins and Hormones: Advances in Research and Applications. Edited by Robert S. Harris, Associate Professor of Nutritional Biochemistry, Massachusetts Institute of Technology, Cambridge, and Kenneth V. Thimann, Associate Professor of Plant Physiology, Harvard University, Cambridge. Volume II. Cloth. Price, $6.80. Pp. 514, with illustrations. New York: Academic Press, Inc., 1944.

This volume contains material on aspects of vitamins and hormones not dwelt on in volume I. The subjects considered include the role of vitamins in the anabolism of fats; the chemistry of biotin; the nutritional requirements of primates other than man; physiologic action of vitamin E and its homologues; the chemistry and physiology of vitamin A; para-aminobenzoic acid—experimental and clinical studies; critique of etiology of dental caries; vitamin and cancer; effect of androgens and estrogens on birds; hormones and cancer; x-ray crystallography, and sterol structure. There appears to be little rhyme or reason to the selection of topics. These volumes cannot serve as a reference source on the title subjects of vitamins and hormones because of the scattered coverage given thus far. The editors may feel that information is assembled here which is not found in other textbooks. This is actually true and is probably the objective of the work. This publication can be recommended as a particularly good and complete source of factual information on the subjects presented. Each contributor is a recognized expert who surveys the field with facts from the literature and but little discussion. Extensive reference lists increase the value of the books to the reader.

Clinical Roentgenology of the Digestive Tract. By Maurice Feldman, M.D., Assistant Professor of Gastroenterology, University of Maryland, Baltimore. Second edition. Cloth. Price, $7. Pp. 769, with 551 illustrations. Baltimore: Williams & Wilkins Company, 1945.

The second edition of this complete study of the gastrointestinal tract from the roentgenologic point of view has been thoroughly revised and newly illustrated. Every condition of the entire gastrointestinal tract has been covered; the more commonly seen pathologic entities have been thoroughly studied and the rarer conditions described in brief. A complete bibliography at the close of each chapter allows the reader to follow up whatever subject he may be particularly interested in. No pathologic condition in any way associated with any part of the gastrointestinal tract has been omitted. The subject matter is handled clearly and concisely, and all of the more recently described developments in x-ray examination have been added. Numerous x-ray reproductions and artist's drawings illustrate each condition. In this way the volume can be considered as an atlas for study by the medical student. It is designed not only for the roentgenologist but also for the gastroenterologist —the general practitioner and the medical student. The need for such a volume is evidenced by the difficulty usually encountered in seeking information on the many aspects of this large subject.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

RINGWORM OF THE SCALP

To the Editor:—What is the latest and most successful treatment for tinea capitis?

M.D., Pennsylvania.

ANSWER.—In the present rather widespread epidemic of tinea capitis the offending organism in most cases is Microsporum audouini. Infections caused by this organism are extremely resistant to treatment. The average case may last for eight or nine months. The most rapid and successful method of treatment is epilation of the diseased hair by means of the x-rays. This, however, is a most delicate operation and should be done only by some person experienced in this type of treatment. The machine should be accurately standardized and the quantity of x-rays necessary to produce a temporary alopecia definitely known; for further details of this treatment one should consult George M. MacKee's X-Ray and Radium Treatment of Diseases of the Skin (ed. 3, Philadelphia, Lea & Febiger, 1938, chapter 28).

Treatment with topical applications is slow, but if the hair is clipped short an ointment containing 10 per cent iodine crystals in aquaphor can be used twice daily. This should be applied with a soft toothbrush morning and night, and as soon as a reaction occurs and the scalp becomes tender, treatment should be suspended for a few days and then resumed.

Another ointment of value is composed of precipitated sulfur 6 Gm., salicylic acid 3 Gm., castor oil 6 cc. and petrolatum to make 60 Gm. Still another is ammoniated mercury 3 Gm., salicylic acid 2 Gm., petrolatum 30 Gm. and hydrous wool fat to make 60 Gm.

COMPLICATIONS AFTER CISTERNAL INJECTION OF RADIOPAQUE OIL

To the Editor:—One year ago a patient aged 35 had lipiodol 2.5 cc. injected cisternally to prove a diagnosis of a ruptured cervical disk. Following the injection the patient had a severe headache and a temperature of 102 F. for twenty-four hours. This was followed by severe pains in both hips and in the lower part of the back which necessitated sleeping in Fowler's position for ten days. For the next week the pains in both hips were less severe but were accentuated by walking or standing and were accompanied by pain in the sacrum on coughing, sneezing or laughing heartily. At the end of three weeks these pains had disappeared except for slight pains in both hips. About a month later the pain came back in both hips more severely than ever, particularly in the right hip. The pain was alleviated by bed rest and was accentuated by walking or standing. These attacks of pain in the right hip and back continued off and on for the next six months. At this time an attempt was made to remove the lipiodol, and half of it was removed. Following the removal of part of the lipiodol the pain subsided but two months later returned in the right hip, not as severe as originally but more chronic and persistent. An x-ray film of the lumbosacral area taken one year after the injection of the lipiodol showed lipiodol to be scattered on most of the nerve roots from the first thoracic down to the end of the spinal cord, with the bulk of the lipiodol in the sacral sac and immovable. The x-ray film showed also considerable calcification of the pelvic arteries. Is lipiodol in the subarachnoid space productive of irritation of the nerve root? If so; how long does such irritation last, and what is the prognosis? What references in the literature are there on the effects of lipiodol used in the spinal canal?

Harry L. Strachan, Captain, M. C., A. U. S.

ANSWER.—Current opinion, based on extensive experience, is that radiopaque iodized oil is of little value in the diagnosis of most ruptured intervertebral disks with compression of one of the cervical roots; in the future lipiodol or similar substances will probably be used only in those cases in which a herniation of an intervertebral disk has been confused with a spinal cord tumor.

The acute symptoms of headache, fever and irritation of the lumbosacral nerve roots which occurred in this case, though considerably more severe and persistent than are usually seen, are not rare following the intraspinal injection of radiopaque oils. In the vast majority of such cases these symptoms subside within twenty-four hours and in the remaining few within the next three days. Only rarely does irritation of the spinal roots and of the meninges persist beyond that. The most persistent irritation resulting from iodized oil is usually seen in cases in which the original symptoms arose from inflammatory disease of the meninges and spinal nerve roots. In order to avoid such irritation it is now common practice to remove the oil immediately after fluoroscopy whenever that is possible. Either lipiodol or pantopaque can be removed by aspiration through a large (18 gage) lumbar puncture needle by having the patient on his abdomen on the tilting fluoroscopic table and puddling the oil about the end of the needle.

Cases in which irritation of the spinal roots, definitely established as due to iodized oil, has persisted for longer than a few weeks are so rare that few if any have been studied. It is thus impossible to state whether, in the case cited, the symptoms result from lipiodol, as seems possible, or are secondary to the disease process for which the myelographic examination was originally made. It is likewise impossible to guess, with anything like worthwhile accuracy, how long such symptoms might persist or what the ultimate outcome may be.

References:

Marcovich, A. W.; Walker, A. E., and Jessico, C. M.: The Immediate and Late Effects of the Intrathecal Injection of Iodized Oil, THE JOURNAL, May 17, 1941, p. 2247.

Garland, P. H., and Morrissey, E. J.: Intracranial Collections of Iodized Oil Following Lumbar Myelography, *Surg., Gynec. & Obst.* **70**: 196 (Feb.) 1940.

Brown, H. A., and Carr, J. L.: The Effect of Lipiodol in the Subarachnoid Space, *ibid.* **68**: 945 (May) 1939.

Bucy, P. C., and Spiegel, I. J.: An Unusual Complication of the Intraspinal Use of Iodized Oil, THE JOURNAL, June 5, 1943, p. 367.

PAIN CAUSED BY MORPHINE AND CODEINE

To the Editor:—Following removal of the gallbladder, morphine and codeine have caused severe pain in the region of the common duct. Is Demerol effective in such a condition?

H. B. Aitkens, M.D., Le Center, Minn.

ANSWER.—Both morphine and codeine have been found to increase the tonus and motility of the common bile duct and of the sphincter of Oddi. Opium and derivatives of opium also increase the tonus and motility of the small intestine and colon and may produce violent spasms of localized areas of the intestine. Severe abdominal pain produced by morphine and codeine after removal of the gallbladder could be due to specific contraction of segments of the colon, small intestine or possibly also of the sphincter of Oddi. Isonipecaine ("Demerol") has been found to be effective as a substitute for morphine in relieving many types of pain and, in addition, seems to exert a definite spasmolytic effect.

References:

Yonkman, F. F.; Noth, P. H., and Hecht, H. H.: Demerol, *Ann. Int. Med.* **21**: 7 (July) 1944.

Noth, P. H.; Hecht, H. H., and Yonkman, F. F.: Demerol, *ibid.* **21**: 17 (July) 1944.

ELECTRIC SHOCK TREATMENT FOR MENOPAUSAL SYMPTOMS

To the Editor:—A letter now being distributed stresses electric sleep therapy for nervous or mental disturbances occurring during the menopause. I am not aware that this treatment is a recognized one for this type of trouble. Please advise me as to its value and use.

Elvin L. Clark, M.D., Shelbyville, Ill.

ANSWER.—The letter in question was from the State of Illinois Division for Cooperative Extension Work in Agriculture and Home Economics in Shelbyville. It was a condensed reprint of an article by Dr. Foster Kennedy, published in the *Woman's Home Companion* for November 1944. In this article appears the following statement relative to treatment for the symptoms of the menopause: "The most remarkable of these new weapons is electric sleep therapy—a treatment as painless and simple as it is safe and successful. Between 80 and 150 volts of electric current are passed through the brain for one tenth of a second, and that is all there is to it." This treatment is electric shock treatment. Because of the possibility of harm, it should never be carried out except by responsible physicians. In the original article the statement is made that patients may receive such treatment in the morning and attend a matinée the same afternoon. Since lapses of memory sometimes occur following treatment, however, this advice is questionable. Moreover, there are other methods of treatment in the menopause besides shock therapy, and it would seem to be desirable, at least in the present stage of experimentation, to limit this form of treatment to patients under good control in hospitals. Bennett and Wilbur (*Am. J. M. Sc.* **208**:170 [Aug.] 1944) report a series of 75 cases of involutional melancholia or similar symptoms in the menopause, in 90 per cent of which good results were obtained with a combination of shock therapy and psychotherapy. All of these patients, it is said, were treated with estrogens without good results; 64 of the 75 had shock therapy. Many had to be given psychotherapy in addition. Ninety per cent were helped or apparently cured in the course of from four to six weeks.

NUMBNESS OF FINGERS IN METAL WORKERS

To the Editor:—A number of the employees of an aircraft plant complain of "numb" fingers. The only metal used is aluminum. The numbness has sudden onset and usually does not follow any anatomic distribution but involves half a finger, part of a finger or several fingers. There are no associated complaints.

Frank Meola, M.D., Akron, Ohio.

ANSWER.—Aluminum is a nontoxic metal and, as such, is not the cause of the condition described. However, "numb fingers" may arise from the handling of any sheet metal or other sizable object with comparatively thin edges. The numbness results from pressure on nerve endings or nerve filaments. An analogous state may appear if a pail of water is carried by a thin wire bale. Another condition among sheet metal workers and in other occupations is termed "dead fingers" or "white fingers." This occurs only during cold weather and after exposure to cold along with the use of vibrating tools either pneumatic or electric. This condition, which is partially or totally an angiospasm, may be limited to one hand and characteristically to certain fingers, depending on the type of tool and the method of its application to work. For greater detail as to pathology, treatment and prevention, reference is made to the International Labor Office "Encyclopedia of Occupations and Health," under "Pneumatic Tools." In addition to a lengthy original publication, further discussion may be found in the supplement to this encyclopedia.

PRESBYOPIA OR CHEMICAL INJURY OF EYES

To the Editor:—A compensation case involves a man who was working with a chemical called phenathiazene and who developed contact dermatitis of the hands and also around the eyes. This condition cleared up under treatment without any complications, but the man is now claiming that his glasses, which previously were used for reading only, are no longer satisfactory; he believes that exposure to this chemical has had some detrimental effect on his near vision. There was no involvement whatever of the cornea or conjunctiva, and I feel that the change in his vision is due to presbyopia, which has become more pronounced now at his age of 49, thereby necessitating that he wear glasses constantly. Could there be any connection between the exposure to this phenathiazene and his apparent sudden loss of accommodation?

M.D., Minnesota.

ANSWER.—The cornea and conjunctiva having escaped involvement in the contact dermatitis process, it is obviously necessary to search elsewhere for the causative factor in this patient's loss of accommodation. The most frequent and the most likely factor is the patient's age. From 45 to 50 years of age there is such a rapid development of presbyopia that the useful life of a pair of spectacles seldom extends beyond eighteen to twenty-four months.

POSTOPERATIVE IRRADIATION AND STERILIZATION FOR MAMMARY CANCER

To the Editor:—An unmarried woman aged 31 discovered a lump in her breast which on removal a few days later was pronounced malignant by two very reliable pathologists. A radical mastectomy was performed a week later. The glands were not found to be involved. A radiologist suggests that she receive x-rays to the chest and also that she be sterilized by x-rays or radium. Is this advisable?

Mark S. Shaine, M.D., New York.

ANSWER.—The question of postoperative irradiation for mammary cancer is not settled. Most radiologists advocate this procedure routinely, whereas some consider that it should be used only on special indications [see editorial "The Dilemma of Prophylactic Postoperative Irradiation in Mammary Cancer," *Radiology* **30**:769 (June) 1938]. The question of ovarian sterilization as a prophylactic measure against recurrence and metastasis is also controversial. Many students of the subject would consider the evidence inadequate to perform sterilization of the patient under consideration and would advise against the procedure in a patient 31 years of age without clinical evidence of recurrence or metastasis.

MANIFEST SILICOSIS AND DURATION OF EXPOSURE

To the Editor:—I have a patient who the radiologist says has pneumonoconiosis. There is a question of compensation insurance. How long does silicosis take to develop? The patient has been exposed to sand blast, steel dust and spray paint. What is the minimum time in which silicosis and siderosis can develop?

William Heard, M.D., Pentwater, Mich.

ANSWER.—Sandblasters working continuously in enclosed spaces without adequate ventilation sometimes develop silicosis in about two years. If the exposure has been unusually severe the x-ray examination may not reveal the characteristic nodular pattern, but there may be a diffuse obliterative shadow like that of pneumonia. Siderosis from the steel dust might be manifested as a simple exaggeration of the normal branching shadows of the blood vessels. As the picture of spray paint may also be diffuse, with or without fine nodulation, it would be hard to evaluate the effects of the combined exposures without more detailed information as to the lengths of exposure to the various irritants mentioned. As a general rule one expects heavy exposures to dust in excess of two years to produce demonstrable effects on the lungs.

CASTRATION FOR CARCINOMA OF MALE BREAST

To the Editor:—Two years ago a man aged 36 had a lump in the right breast. A frozen section showed a typical adenocarcinoma, and a radical breast amputation was performed at the time. He made an excellent recovery. The sections showed some metastases in the axillary glands. A course of 2,000 roentgens of radiation was given following the operation. The patient has remained clear of any evidence of local recurrence or distant metastasis until recently. He now has x-ray evidence of metastatic bone destruction in a rib, a vertebral body and in the ilium, with pain associated with the involved areas. Further radiation therapy can be given, but the possibility of hormone treatment comes to mind. There is a fair amount in the literature concerning the use of female sex hormone for carcinoma of the prostate, of ovariectomy for carcinoma of the female breast, and of male sex hormone for carcinoma of the female breast. I am not able to find any comparable information on treatment of carcinoma of the breast in the male. The following possibilities are suggested: the use of the female sex hormone (theelin, stilbestrol, and so forth); the use of the male sex hormone; castration. Which, if any, could be recommended in this particular case (this patient is a perfectly normal virile male)? If a hormone is considered most suitable, please recommend size of dose, method of administration and frequency. Would the advice given be on theoretical grounds or based on concrete experience with a comparable case? Any other suggestions available would be appreciated.

M.D., California.

ANSWER.—Castration has been performed for carcinoma of the male breast, and in some instances this procedure has caused regression and repair of metastatic lesions in bone and lungs. Cessation of pain is sometimes dramatic. The clinical results are somewhat similar to those noted following castration for carcinoma of the prostate.

Reference:

Treves, Norman, and others: The Effects of Orchiectomy on Primary and Metastatic Carcinoma of the Breast, *Surg., Gynec. & Obst.* **79**: 589 (Dec.) 1944.

CILIARY ACTIVITY IN NASAL SINUSES

To the Editor:—I am desirous of ascertaining the ciliary activity within the antrum. Where can I find a detailed description of an acceptable method, previously employed, for the determination of this information? What type of carbon particles have been employed?

W. W. Wilkerson Jr., M.D., Nashville, Tenn.

ANSWER.—Arthur W. Proetz has written a textbook which discusses the question raised in considerable detail (Essays on the Applied Physiology of the Nose, Annals Publishing Company, St. Louis, 1941). He furnishes in addition numerous references to other work done in this field.

INFANT FEEDING

To the Editor:—Can an infant between the ages of 2 and 6 months gain weight and develop normally on a formula of equal parts of condensed milk and water, omitting the carbohydrates but giving the usual supplements of cereals, vegetable and fruit?

Sidney Schwartz, M.D., Ripon, Calif.

ANSWER.—Yes, if cereals are started early enough, followed by the fourth month with vegetables or fruits other than orange juice or ascorbic acid, which in practice are usually started by the third or fourth week of life.

EXTERNAL POPLITEAL PALSY

To the Editor:—Following an operation for repair of cystocele, rectocele and relaxed urethral sphincter under general anesthesia, a paralysis of the left peroneal nerve (lateral popliteal) developed. The patient is a white woman aged 35. There is a complete left foot drop without evidence of returning function as yet—six days following operation. The patient was on the operating room table with the legs in the stirrups for one hour and ten minutes. The stirrups were each padded with a doubled face towel. Might this be a permanent injury? What is the recommended treatment and the prognosis?

Captain, M. C., A. U. S.

ANSWER.—The patient has an external popliteal palsy. Involvement of this nerve usually requires a long time for recovery, although it is not likely to be a permanent injury. The foot, the ankle and the leg should receive heat, massage and stimulation by the galvanic current three times weekly. The foot should be kept at right angles to the leg. In bed a sand bag is usually sufficient for this purpose; when not in bed the foot and leg should be in a cast or splint.

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CAUSALGIC STATES IN PEACE AND WAR

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There is an urgent need for the redefinition of causalgia. Burning pain associated with edema, glossy skin and a local rise in temperature is well known to follow certain partial injuries of the major nerve trunks. This group requires less attention because it is readily recognized and because its existence is not contested since the classic description of Weir Mitchell.[1] Far more important, however, is another large group in which the origin and level of sensory stimulation is not frankly obvious. Such patients are frequently misunderstood or discredited [2] but should be differentiated from patients suffering from purely psychogenic disorders, which occur after trauma following industrial accidents or war injuries.

It is well to look on the sensory pathways as being susceptible of stimulation at any level [3] (fig. 1). Our cases have been classified accordingly (table 1). Peripheral trauma activates the first, lowest neuron, producing vasomotor reflexes which under certain conditions are predominantly vasodilator.[4] The stimulation of posterior root fibers is known to produce painful vasodilator substances, which are diffusible and which readily produce glove or stocking type of cutaneous hyperalgesia, confusing an orthodox neurologic examination. Miller and I [5] showed that such a state is characterized by an increased blood flow as measured by a special plethysmograph. But for a clinical examination the rise in skin temperatures and the increased pulsations can differentiate such a limb from a hysterical one.

Such a first neuron lesion is encountered in any injury of the extremities in which peripheral nerves are contused, concussed or overstretched.[6] While the causalgias following injuries to the median and sciatic nerves are obvious, many other lesions have not been sufficiently emphasized. Attention should be called to lesions of the dorsal interosseous nerve in Colles' fracture, to a stretch of the peroneal or saphenous nerves in ankle sprains, to the irritation of the plantar nerve in painful lesions of the foot. Such lesions are not sufficient to produce anesthesia of the skin, and the hyperalgesia is purely subjective; however, a rise in cutaneous temperature and a cessation of sweating is often helpful in mapping out a sensory distribution before the hyperesthesia becomes diffuse.

If an injury causing continuous sensory stimulation is capable of producing such neurovascular phenomena, other conditions affecting the sensory pathways between the dorsal root ganglion and the peripheral receptors should also produce identical phenomena. In this material one of the glomus tumors, a glucose injection at the elbow producing irritation of the median nerve, a herpes zoster, an apical tumor of the lung infiltrating the intervertebral foramens or a paravertebral alcohol injection have demonstrated that they are capable of producing the causalgic state of burning vasodilatation, increased heat production, edema and osteoporosis (table 2).

Recognition of a lesion of the second neuron is not difficult when other localizing signs are present. That poliomyelitis is often very painful is sufficiently known; when the virus invades the internuncial neurons [7] the muscular hypertonus and the reflex hyperirritability of the poliomyelitic limb is readily understood. Such extremities, just like those in tabes, in combined degeneration of the cord or in an acute postscarlatinal myelitis, have shown burning pain, increased heat and edema (table 3).

While such lesions are of neurologic interest, their real significance lies elsewhere. The first neuron lesion, if unrecognized or mistreated, may ascend to this level and produce the same diffuse intractable dysesthesia, with mirror images to contralateral, symmetrical areas. Livingston [2] has postulated that the internuncial neurons become hyperirritable in the presence of persistent peripheral impulses. That the sensory barrage does produce chemical and electrical phenomena in the cord is documented by good evidence.[8] Such a cord is then comparable to that of the experimental animal whose cord has been touched with strychnine.[9]

Sensory phenomena after lesions of the highest third neuron are not unknown. Cortical trauma, the infarcted cortex with an intractably painful hemiplegia and certain cortical tumors do produce painful vasomotor

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Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Mitchell, S. W.: Injuries of Nerves and Their Consequences, Philadelphia, J. B. Lippincott & Co., 1872.
2. Livingston, W. K.: Pain Mechanisms: A Physiologic Interpretation of Causalgia and Its Related States, New York, Macmillan Company, 1943.
3. Wilson, K.: Dysesthesiae and Their Neural Correlates, Brain **50**: 428, 1927.
4. Bayliss, W. M.: Reciprocal Innervation in Vasomotor Reflexes and the Action of Strychnine and Chloroform Thereon, Proc. Roy. Soc., London, s. B. **80**: 329, 1908.
5. Miller, D. S., and de Takats, G.: Post Traumatic Dystrophy of the Extremities, Surg., Gynec. & Obst. **75**: 558, 1942.
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7. Kabat, H., and Knapp, M. E.: The Mechanism of Muscle Spasm in Poliomyelitis, J. Pediat. **24**: 123, 1944.
8. Nachmansohn, D.: La transmission de l'influx nerveux dans le système nerveux central, *Compt. rend. Soc. de biol.* **126**: 783, 1937.
9. Dusser de Barenne, J. G.: Die Strychninwirkung auf das Zentralnervensystem: II. Zur Wirkung des Strychnins bei lokaler Applikation auf das Rückenmark, Folia neuro-biol. **5**: 42, 1910.

phenomena not unlike causalgia.[10] Again the fact must be kept in mind that, originating from lower sensory levels, the barrage of continuous impulses may so stamp their impression on the sensory cortex that it becomes the seat of projected, self-propelled impulses to the periphery. The typical example of this is the phantom limb, but many other types of peripheral trauma can be cited which finally reach a cortical level. In our material 6 patients have reached such a state from trauma in the extremities. One committed suicide, 2 are in institutions, 3 are addicted to morphine (table 4).

TABLE 1.—*A Study of 54 Cases of Causalgic States*

Lesion	Number of Cases
First neuron	36
Second neuron	12
Third neuron	6
Total	54

TABLE 2.—*Lesions of the First Sensory Neuron*

Initial Trauma	Number of Cases
Blunt injury to toes or dorsum of foot	2
Sprained ankle	8
Dislocated ankle	1
Ankle sprain and fractured fibula	2
Crushed finger	2
Fractured navicular bone	1
Blunt injury to dorsum of hand	2
Wrist sprain (wringer injury)	3
Colles' fracture	6
Glomus tumor	1
Periphlebitis	4
Lymphangitis of arm	1
Tumor of apex of lung	2
Paravertebral injection of alcohol	1
Total	36

TABLE 3.—*Lesions of the Second Sensory Neuron*

Lesion	Number of Cases
Poliomyelitis	5
Tabes	3
Combined degeneration of the cord	1
	1
	1
	1
Total	12

TABLE 4.—*Lesions of the Third Sensory Neuron*

Lesion	Number of Cases
Phantom limb pain	4
Brachial plexus injury	1
Cerebral thrombosis	1
Total	6

TREATMENT

The value of such segmentation of sensory neurons lies in the ability of selecting the proper level of attack for treatment. The early causalgic state, characterized by burning, throbbing pain relieved by suprasystolic compression of the limb, by elevation, by cooling or by moisture, is still localized to the area of stimulation. When the site of trauma, a digit, the ankle the wrist, is thoroughly infiltrated with 1 per cent procaine, not only are the sensory stimuli blocked but the secretion of the vasodilator substances is inhibited. Even though the anesthesia wears off shortly, the nonmyelinated fibers, which seem to be involved, are still paralyzed, since they are much more sensitive to procaine than the large myelinated sensory fibers.[11] The release of the protective muscle spasm, splinting the painful area, also adds to the relief from pain and allows early motion. If local infiltration fails to relieve the pain projected to that area, the stimulus has progressed to a higher level. If infiltration of an amputation neuroma does not relieve the painful stump or the phantom limb, a local excision is certainly not going to be of any benefit.

In the stage of a spreading neuralgia with which osteoporosis is frequently associated a block of the paravertebral sympathetics is advisable (figs. 2 and 3). It is surprising how much relief can be obtained in causalgias in this second stage of spreading hyperalgesia by repeated sympathetic block. In previous articles we[12] discussed the mechanisms whereby a block of the sympathetics which in itself produces vasodilatation is capable of relieving the painful vasodilatation of causalgia. All that can be said with assurance is that the causalgic type of vasodilatation is different from the one produced by heat, vasodilators or sympathetic block. It combines an increased pulse volume with an increased peripheral resistance, and sympathetic block abolishes this incoordination of vasomotor impulses (fig. 4).

TABLE 5.—*Results of Treatment of First Neuron Lesions*

Type of Treatment	Number of Cases	Recovery * Complete	Partial	None
Cast, physical therapy	10	1	3	6
Repeated procaine block	4	3	1	..
Repeated sympathetic block	8	7	1	..
Periarterial sympathectomy	3	2	1	..
Perivenous stripping	2	2	..	..
Sympathetic ganglionectomy	9	6	3	..
Total	36	21	9	6

* In reanalyzing the results obtained in former years, when a definite grading of the level of sensory irritation was not made, it is obvious that failure of recovery was invariably due to irreversible contractures or to a higher sensory level.

As Homans[13] pointed out, such repeated paravertebral blocks are capable of relieving the syndrome, but should it recur shortly after the block a sympathectomy, providing loss of vasomotor tone, is indicated.

My experience with sympathectomy in causalgia has not been extensive; it seems especially useful in the painful amputation stump when local infiltration does not help. Sympathetic interruption has helped to relieve the burning pain even in the presence of a lesion of the second neuron, suggesting that the pain, just as in the peripheral traumatic lesions, is due to a secretion of painful substances which the improved circulation is capable of neutralizing. Gesell and his associates[14] have shown how tissue acidity modifies nervous impulses by inhibiting the destruction of acetylcholine.

If sympathetic block fails to relieve the pain, sympathectomy should certainly not be undertaken. Posterior root section is not only mutilating but a dangerous procedure, since it adds the syndrome of "anesthesia dolorosa" to the causalgic state (table 5).

10. Michelsen, J. J.: Subjective Disturbances of the Sense of Pain from Lesions of the Cerebral Cortex, A. Research Nerv. & Ment. Dis., Proc. (1942) **23**: 86, 1943.

11. Gasser, H. S.: The Control of Excitation in the Nervous System, in Harvey Lectures, Baltimore, Williams & Wilkins Company, 1937, vol. 32, p. 169.

12. de Takats, G., and Miller, D. S.: Post-Traumatic Dystrophy of the Extremities: A Chronic Vasodilator Mechanism, Arch. Surg. **46**: 469 (April) 1943. de Takats,[24]

13. Homans, J.: Minor Causalgia: A Hyperesthetic Neurovascular Syndrome, New England J. Med. **222**: 870, 1940.

14. Gesell, R.; Brassfield, C. R., and Hamilton, H. A.: An Acid Neurohumoral Mechanism of Nerve Cell Activation, Am. J. Physiol **136**: 604, 1942.

Cutting of the spinothalamic tract (chordotomy) seems the logical procedure for a lesion of the second neuron. There can be no question of the relief it provides in painful lesions of the lower extremity unless the pain has become a psychic projection of the cortex. This may be the reason why Bailey and Moersch [15] could not register any relief in their cases. There is insufficient experience as yet with chordotomies for the arm, although Stookey [16] has recently reported having done sixteen high cervical chordotomies for relief of pain in the arm and upper chest due to mammary carcinoma. No cases of causalgia are included.

The important question arises whether or not one can localize the level of sensory irritation by certain nerve blocks. In White's case of a right parietofrontal meningioma the opposite arm exhibited excruciating pain following operation. A brachial plexus block resulting in complete motor and sensory anesthesia did not reduce the pain. Such a procedure can readily differentate a painful syndrome of the first neuron from that of the third neuron. But the fact that a spinal anesthesia fails to abolish the pain from a phantom foot does not mean that sympathectomy will not help.

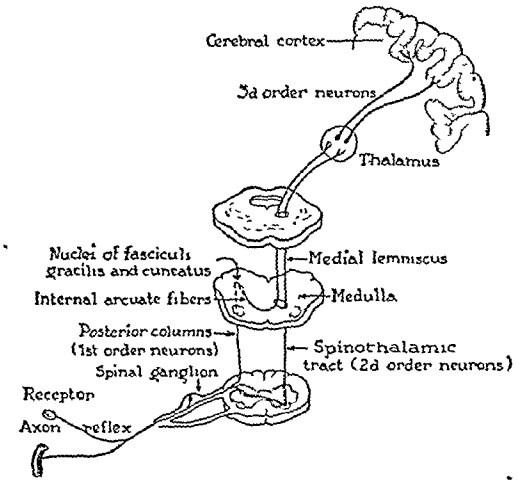


Fig. 1.—Diagram of three sensory neurons. The peripheral (first) neuron has its ganglion cell in the posterior root ganglion. The peripheral processes form the sensory fibers of the sensory nerves ending in special receptors in skin, muscle, tendon. The central processes pass through the dorsal roots into spinal columns, where they synapse with second order neurons. The spinothalamic tract constitutes the second order neuron connecting in the thalamus with the highest, third order neuron. Modified from McDonald, J. J., and Lange, J.: Correlative Neuroanatomy, ed. 2, Chicago, University Medical Publishers, 1939. Obviously, if pain persists after a procaine block of the first neuron, the irritative sensory lesion is at a higher sensory level.

This was the case in a man aged 53 with arteriosclerosis who lost his right leg in January 1943 and has had increasing pain in the phantom foot ever since. In January 1944 his left leg was amputated in my service at the Research and Educational Hospitals. Fifteen months after the first and three months after the second amputatioin he had bilateral phantom limb pain. The pain following the second amputation could be abolished by two infiltrations of procaine into a trigger zone. The pain following the first amputation, which kept him awake nights and culminated in attacks of stump epilepsy, could not be relieved by local infiltration or by spinal anesthesia to the level of the ninth dorsal. However, sympathetic block followed by lumbar sympathectomy completely freed him of pain on the right side.

15. Bailey, A. A., and Moersch, F. P.: Phantom Limb, Canad. M. A. J. 45: 37, 1941.
16. Stookey, B.: The Management of Intractable Pain by Chordotomy, A. Research Nerv. & Ment. Dis., Proc. (1942) 23: 416, 1943.

If local infiltration, peripheral nerve block, sympathetic block and spinal anesthesia fail to relieve the causalgic pain, there remains a selection of tractotomies at different levels of the central nervous system. In a recent communication on pain after amputation, Capt. James C. White has enumerated these central procedures.[17] Walker [18] has given an illuminating description of the levels at which pain may be integrated in the cortex. The highest level is in the cortex, the second in the thalamus and the lowest at the tectum mesencephali. Mention should be made of Mahoney's bril-

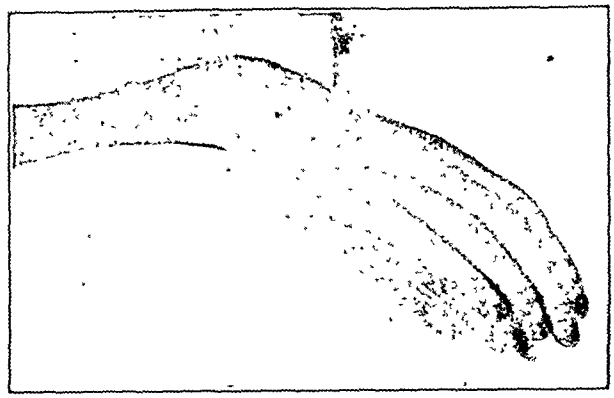


Fig. 2.—Case of H. L., a woman aged 24, a musician, who fell on the dorsum of her right hand while skating. No fracture or dislocation occurred. Burning, intractable pain was present from the start. She received much splinting, physical therapy and forced manipulation. Sympathetic blocks were started many months after the injury. This is the appearance of her right hand when first seen four years after the injury. The extensor muscles were so atrophic that active dorsiflexion was impossible, although the muscle reacted well to electrical stimulation. All the joints of the fingers were ankylosed in extension. The hand was cold and useless; it could be subjected to physical therapy only under the protection of a brachial plexus block. Functional recovery is not to be expected. Psychotherapy with rehabilitation is now under way.

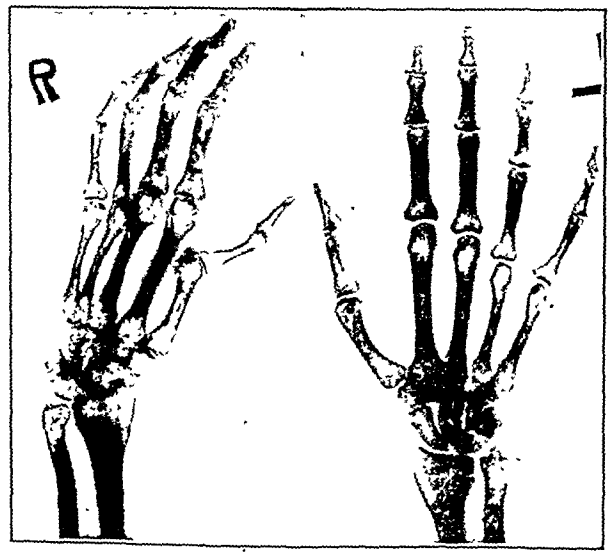


Fig. 3.—The affected right hand, with a control film of the left hand. Note the severe, spotty osteoporosis, showing some coarse trabeculation as an indication that the recalcification is under way. The joint spaces are narrow or obliterated. The atrophy of the ulnar extensors resulted in a deviation of the hand toward the radial side. The thumb shows a subluxation. It was not injured originally.

liant result with a phantom arm following the resection of the postcentral gyrus in December 1941. The relief persists to date.[19]

17. White, J. C.: Pain After Amputation and Its Treatment, J. A. M. A. 124: 1030 (April 8) 1944.
18. Walker, A. E.: Central Representation of Pain, A. Research Nerv. & Ment. Dis., Proc. (1942) 23: 63, 1943.
19. Mahoney, W. de G.: The Treatment of Painful Phantom Limb by Removal of Postcentral Cortex, J. Neurosurg. 1: 156, 1944.

COMMENT

The puzzling vasomotor and trophic phenomena following the irritation of sensory pathways have been described in the past under a great many names. It has been previously pointed out [20] that Sudeck's atrophy, traumatic osteoporosis, peripheral trophoneurosis, reflex dystrophy, chronic traumatic edema, are all based on the same mechanism. To this group one may add a nontraumatic group of irritative lesions in any of the three sensory neurons, which are capable of producing a chronic, spreading hyperalgesia. In such a lesion a group of fibers is activated which secrete pain-producing, vasodilator substances at the nerve endings. Phantom limb pain may be reasonably added to this group of cases, although the evidence of vasodilatation, edema and trophic changes cannot be elicited in the nonexisting limb; however, the stump itself is often red, hot and tender. Heat and dependency aggravate the symptoms. The patient keeps his stump elevated and uncovered.[21] Whether the activated fibers are ordinary sensory fibers conducting in the opposite, efferent direction [4] or whether it is necessary to postulate a special set of posterior root fibers that produce vasodilatation [22] is not within the scope of this discussion. Nor is it clear whether the substance produced at the nerve endings is acetylcholine or histamine; both of these substances have been recovered after stimulation of posterior root fibers.[23] What one can state with assurance is that in the causalgic state, unlike in other painful states which lead to continuous afferent impulses, there is an efferent stimulation of pain-producing, vasodilator substances which unless blocked or neutralized early will lead to the sensitization of higher and higher levels. It has also been previously [24] pointed out that neostigmine, a cholinergic vasodilator, is capable of producing a type of vasodilatation exhibited by causalgia (fig. 5).

In this group of 54 cases there was no evidence that any definite type of personality was responsible for this unusual reaction to a sensory stimulus. But the study of the fundamental work of Bayliss [4] reveals that under certain conditions, such as weak stimuli, cooling of the nerve or regeneration of a partially injured nerve, the stimulation of a peripheral nerve results in vasodilatation with a simultaneous inhibition of the vasoconstrictors. He also showed that stimuli which usually produce pressor effects may have a reversal of their effect to vasodilatation under the influence of drugs which affect a higher level. Thus cocaine, which usually produces a vasoconstriction and a rise in pressure, will produce vasodilatation when preceded by strychnine.

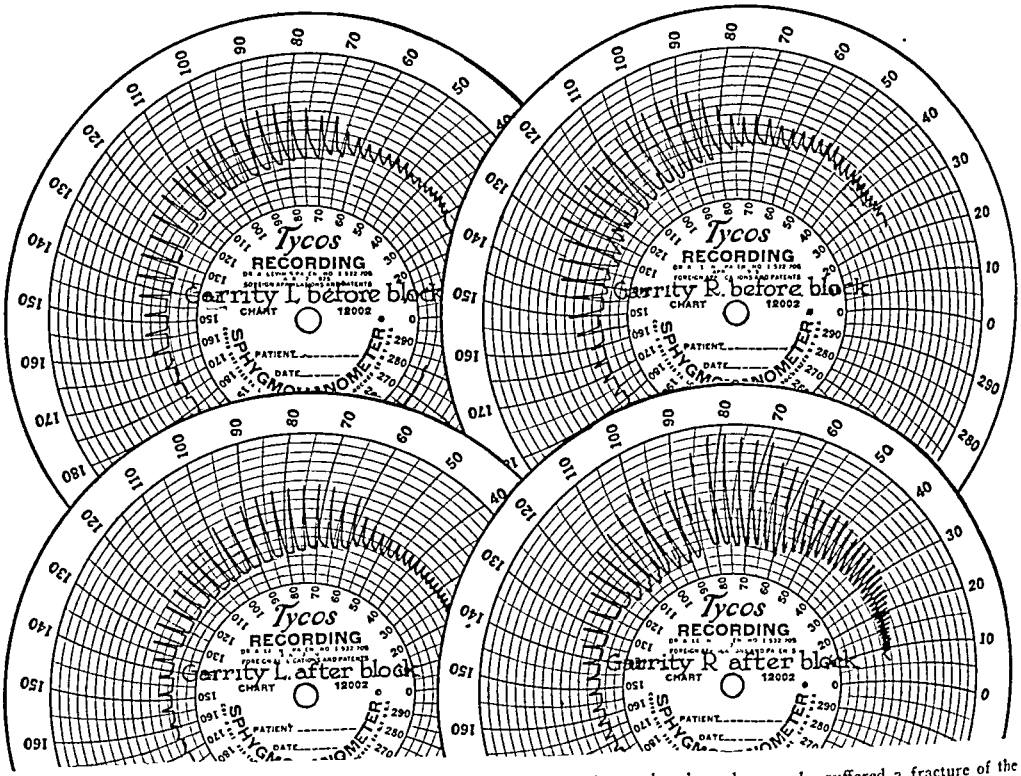


Fig. 4.—Oscillometric curves in the case of F. G., a man aged 55, a railroad employee, who suffered a fracture of the right fibula with an ankle sprain. The fracture was not recognized immediately and he walked on this foot for some time. Six months after the injury there was an area of anhidrosis with hyperesthesia corresponding to the distribution of the superficial peroneal nerve. . . . e showed much increased pulse waves between 150 and 80 mm. of mercury, as compared to . . . . . is a typical diminution of the waves at 75 mm. of mercury, which is quite sudden. The pain was th . . . . . ot was edematous and glossy. Cold, moist towels gave temporary relief. Twenty minutes after a . . . . . block there is an obvious increase in circulation. However, while the large spike at 125 mm. of mercury, seen before the block, is now absent, the maximal pulsations have shifted toward the right, toward lower pressures, reaching their maximum between 85 and 70 mm. of mercury. The decrease toward lower pressures is gradual. Pain completely disappeared for forty eight hours. After a few blocks pain was completely abolished and weight bearing resumed. This is the typical vascular reaction of a causalgic state (first stage) to a sympathetic block.

These findings have an immediate bearing on the problem at hand. They indicate that the causalgic state, as in the experimental animal, is a state of reversal from a normal vasomotor reaction and that this reversal is brought about by a changed state either of the peripheral nerve or of the higher centers. The character of the injury, namely pressure, traction or contusion, may be responsible for this peculiar phenomenon.

SUMMARY

The causalgic state is due to a chronic irritation of sensory pathways producing cutaneous hyperalgesia, burning pain and a local increase in blood flow. Three

20. de Takats, G.: Reflex Dystrophy of the Extremities, Arch. Surg. 34:939 (May) 1937.
21. Riddoch, G.: Phantom Limb and Body Shape, Brain 64:197, 1941.
22. Toennies, J. F.: Reflex Discharge from the Spinal Cord over Dorsal Roots, J. Neurophysiol. 1:378, 1938. Lewis, T.: Observations on the Vascular Axon Reflex in Human Skin as Exhibited by a Case of Urticaria with Remarks on the Nocifensor Nerve Hypothesis, Clin. Sc. 4:365, 1942.
23. Cannon, W. B., and Rosenblueth, A.: Autonomic Neuroeffector Systems, New York, Macmillan Company, 1937. Kwiatkowski, M.: Histamine in Nervous Tissue, J. Physiol. 102:32, 1943.
24. de Takats, G.: Nature of Painful Vasodilatation in Causalgic States, Arch. Neurol. & Psychiat. 50:318 (Sept.) 1943.

sensory level and a cortical, can be clinically becomes more and more intractable the higher it ascends. In the first stage local infiltration and block of the paravertebral sympathetic nerves are effective. At the second level anterolateral chordotomy has been most helpful. The treatment of the third stage with cerebral tractotomies or removal of the sensory cortex is still in its infancy. Early diagnosis and immediate treatment saves much suffering and eliminates permanent disability. The true hysterical lesion shows no vasomotor changes except those due to immobility.

ILLUSTRATIVE CASE HISTORIES

LESIONS OF THE FIRST NEURON

CASE 1.—F. G., a man aged 56, a conductor, injured his right leg on Dec. 21, 1942. At first an ankle sprain was diagnosed, but after a few days a fracture of the upper third of the fibula was identified by x-ray. A cast was applied but had to be removed in four days because of severe burning pain and edema. Neither moist nor dry heat relieved the pain. Ice packs gave some help. Deep phlebitis was suspected because of the edema. He was unable to bear weight on this leg because of severe pain and had been hospitalized for several months at a time. Examination July 3, 1943, seven months after the injury, revealed an erythematous, swollen right lower leg. He had good evidence of a deep venous thrombosis, but the oscillograms (fig. 4) and the pronounced osteoporosis suggested a causalgic state. The skin was warm and dry along the distribution of the superficial peroneal nerve, cold, moist and clammy around this area, a marginal hyperhidrosis. Following repeated lumbar sympathetic blocks he was able to get up and walk around bearing weight on the right leg, which he had been unable to do for seven months. He was discharged on July 31, 1943 with an elastic hose, with ability to walk around without crutches. The skin temperature remained increased for a year after the injury. He returned to limited duty but was found to suffer from an inoperable carcinoma of the stomach in the middle of May 1944.

Because of the fracture and the consecutive deep venous thrombosis the injury to the superficial peroneal nerve was missed by many observers. The patient was regarded as a malingerer, which made him defiant and ready to file suit. A simple clinical examination and repeated lumbar sympathetic blocks restored his earning power.

CASE 2.—M. P., a woman aged 25, admitted Jan. 26, 1943 and discharged Feb. 6, 1943, developed blisters on the fingers of the right hand while stripping cables, three months before admission. Her right hand became infected, and red streaks spread up from the wrist to the axilla. She was treated with hot fomentations and sulfadiazine at another hospital, and the acute infection subsided. However, a burning type of pain persisted which was aggravated by heat and dependency, alleviated by moist cold and elevation. Oscillometric curves showed increased peripheral resistance on the right side, right 5/100, left 5/80. Following block of the stellate ganglion the right arm and hand became dry and a complete Horner's syndrome developed. The oscillations increased but the pain and stiffness were relieved. There was no osteoporosis. She was given x-ray therapy to the right axilla: 125 kilovolt peak, 20 milliamperes, 50 cm. focal distance, ¼ copper 1 aluminum filter, 105 roentgens. She was readmitted a month later with a multiplicity of symptoms. She cried easily and had fainting spells. Dr. Francis Gerty found a suggestible, psychoneurotic background. She was quite anemic. Following some occupational therapy the pain and vasomotor symptoms in the arm were fully relieved. She has been said to have started suit against her employer.

Here is a psychoneurotic individual in whom an attack of acute lymphangitis acted like a trigger to bring out a variety of symptoms. There was, however, objective evidence of nerve irritation. A perineural lymphangitis may well produce a in the case of a radial nerve injury c in which the causalgia started after the wound became infected and erysipelas set in.[1]

CASE 3.—P. T., a man aged 42, admitted on Dec. 27, 1943, complained of anxiety regarding his health, "excessive warmth" of the left arm and pain under the inferior angle of the left scapula and the inner aspect of the left arm as far as the elbow. The pain was relieved by elevation. Night sweats and dizziness also were present. An electrocardiogram and chest films were said to be negative. The left arm and hand were noticeably warm and dry but not flushed. There was a Horner's syndrome on the left. Oscillations greatly increased but showed

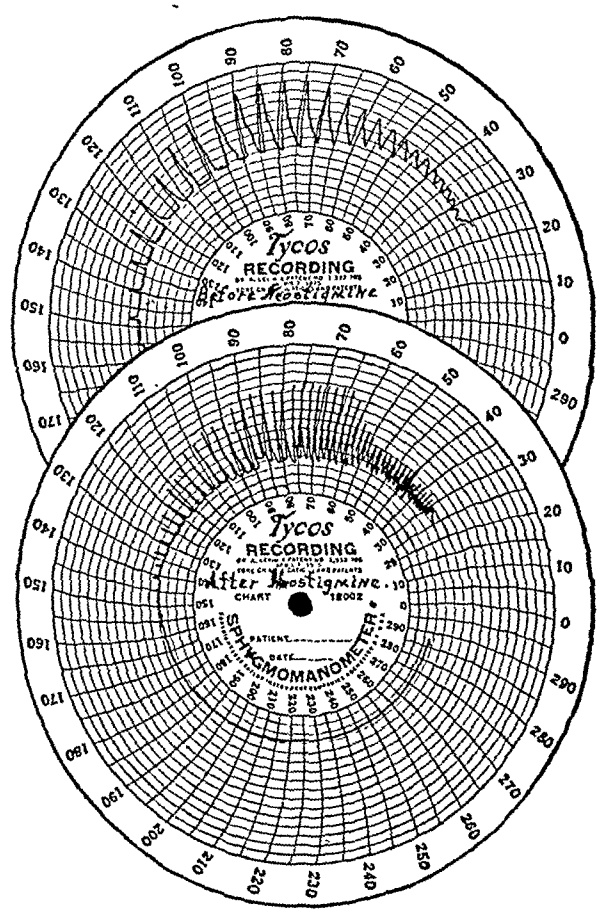


Fig. 5.—This patient, with a normal cardiovascular status, received 1 mg. of neostigmine subcutaneously together with 0.5 mg. of atropine sulfate to counteract the side effects. It is known that atropine will not affect the cholinergic vasodilatation produced by neostigmine. Note that one-half hour after the injection of neostigmine there is a striking rise of peripheral resistance at 60 mm. of mercury. The rise in pulse waves occurs between 90 and 60 mm. of mercury. This is the type of vasodilatation seen in causalgic states, which differs greatly from that following sympathetic paralysis or the administration of sodium nitrite.

increased peripheral resistance. Motor and sensory nerves were intact. X-ray examination revealed a tumor of the left apex.

On Jan. 19, 1944 left upper lobectomy was performed by Dr. W. Van Hazel. The tumor was seen to invade the first and second intervertebral foramens. A small portion of the tumor could not be removed. Intensive x-ray therapy was given shortly after the operation.

The severe causalgic pain continued after the operation. He rapidly went down-hill and died in April 1944. His first and

dominant symptom was the causalgic type of pain of the left arm due to irritation of the posterior roots and ganglions at the intervertebral foramens.

LESIONS OF THE SECOND NEURON

CASE 4.—J. K., a woman aged 39, admitted Nov. 23, 1941, had had severe poliomyelitis in South America in 1936 affecting the right arm, right jaw and left leg. Slight motor weakness remained but also a nagging, throbbing pain, relieved by elevation and cold, exaggerated by heat. There was also muscle twitching in the left leg, mostly at night.

The left leg was slightly atrophic, with partial foot drop. It was colder at room temperature, hotter and swollen in warm weather. The oscillometric readings were increased on the affected side. There was a diffuse hyperalgesia and a constricting type of pain around the thigh, which increased on fatigue. There was a weakness of the internal hamstrings. The faradic current gave a moderate feeling of warmth on the right and a sharp, lancinating pain on the left. Since the histamine flares were diminished, it was thought that perhaps the posterior root ganglions were involved. Treatment consisted of intravenous thiamine hydrochloride, x-rays to the paravertebral ganglions and sympathetic block. She was discharged Dec. 3, 1941 greatly improved.

This was a patient with a known infectious involvement of the cord producing causalgic pain, relieved by paravertebral block. Such cases of painful poliomyelitis are not infrequent.

CASE 5.—L. C., a man aged 22, a sailor, developed scarlet fever after a submucous resection. He received sulfonamide drugs. An erythema nodosum followed and, shortly after, pain and numbness developed in the right foot and left arm. Six months later there were attacks of coldness and cyanosis, alternating with rubor, edema and throbbing pain in the affected extremities. There was pronounced osteoporosis in the right foot and an oscillogram was obtained revealing increased pulsations with increased peripheral resistance. There was some loss of motor power and a partial foot drop. Because of a suspicion that periarteritis nodosa might be present, an exploration of the posterior tibial vessels and nerve was undertaken with a negative result. Following repeated sympathetic blocks, and aided by a cast with an incorporated walking iron, he was able to get up and bear weight on the painful extremity. A tentative diagnosis of an acute disseminated myelitis was made (Dr. R. P. Mackay). A follow-up inquiry revealed gradual improvement with some loss of motor power.

The cord lesion here was of questionable origin, although the infectious or allergic nature of disseminated vascular lesions of the cord is not unknown. As soon as weight bearing was started, made possible by the sympathetic block, a turn for the better ensued.

LESIONS OF THE THIRD NEURON

CASE 6.—A. F., a man aged 75, a retired executive, suffered an attack of cerebral thrombosis in May 1939. A left hemiplegia developed with a gradual return of motor power. However, the paralyzed left limb became agonizingly painful, with intermittent exacerbations of lancinating pain. During such attacks the oscillations increased and the skin temperature rose. Nothing was found to relieve the pain effectively. Between attacks a pronounced dysesthesia was present. He died three years after the initial vascular accident.

This pain was certainly central, whether thalamic due to cortical release or cortical due to an irritative lesion is uncertain. The attacks of vasodilatation accompanying these sensory jacksonian fits place this pain among the causalgic states.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. WARREN H. COLE, Chicago: Insufficient time has elapsed since our entry into the war for us to obtain accurate data from war casualties on the incidence of this condition. A German report of 2 cases of causalgia in 500 cases of nerve injury (Reichert: *Bull. War Med.* **3**:379, 1942) probably represents an average incidence. However, it must be emphasized that the etiologic factors are extremely numerous, many cases developing when the role of nerve injury would appear insignificant. The most impressive case which has come to my attention developed two or three weeks following a relatively mild ankle sprain in a person with no neurotic or hysterical tendencies. Although it may be difficult on many occasions to differentiate this condition from malingering states, the presence of a warm, shiny and pink skin along with increased blood flow should readily make the differentiation. The warm and pink surface may change to a cool and cyanotic skin. Unfortunately, treatment is by no means satisfactory. Early in the disease the patient learns that keeping the affected limb elevated, cool and moist adds to comfort. Even though this simple therapy may be quite effective, it cannot be adopted as the sole and permanent therapy because of the serious dangers of mental deterioration developing as the disease progresses. I know of no definite evidence that these mental changes predispose to the disease; it appears much more logical to me that the extreme pain and disability suffered week after week and month after month would be the primary factor in development of the mental deterioration. The possibility of development of serious mental changes more than justifies the philosophy that therapy must be carried out with minimal delay even though it may appear quite radical. Sympathetic block (including sympathectomy) appears to be accepted quite generally as offering the best chance of obtaining relief. At times, frequent blocks with procaine will result in permanent relief. Dr. de Takats correctly emphasized the fact that sympathectomy should not be performed if procaine block is ineffective in relieving pain. Neurolysis has been reported frequently as being effective and should be considered particularly when there appears a strong probability that the nerve was crushed or otherwise damaged.

EFFECTIVENESS OF PENICILLIN IN THE TREATMENT OF VINCENT'S ANGINA

CAPTAIN BERNARD M. SCHWARTZ
MEDICAL CORPS, ARMY OF THE UNITED STATES

The effectiveness of penicillin as an antispirochetal agent in the treatment of syphilis,[1] relapsing fever,[2] Weil's disease[3] and rat bite fever[4] has prompted a study of its use in Vincent's infections.

For this study, only patients with Vincent's angina have been selected because Vincent's infection of the tonsil, although subject to recurrence, is an acute illness and is almost always a primary infection. Where it is not, the underlying cause, such as a blood dyscrasia, is evident. On the other hand, Vincent's gingivitis is much more apt to be a chronic or frequently recurrent illness, often associated with dental abnormalities or faulty

From A. A. F. Regional Hospital, Truax Field, Madison 7, Wis.

1. Mahoney, J. F.; Arnold, R. C., and Harris, A.: Penicillin Treatment of Early Syphilis: A Preliminary Report, Ven. Dis. Inform. **24**: 355-356 (Dec.) 1943; Am. J. Pub. Health **33**:1387 (Dec.) 1943.

2. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Relapsing Fever, Proc. Staff Meet., Mayo Clin. **18**: 457-467 (Dec. 1) 1943. Augustine, D. L.; Weinman, D., and McAllister, Joan: Rapid and Sterilizing Effect of Penicillin Sodium in Experimental Relapsing Fever Infections and Its Ineffectiveness in the Treatment of Trypanosomiasis (Trypanosoma Lewisi) and Toxoplasmosis, Science **99**: 19-20 (Jan. 7) 1944. Lourie and Collier.[4]

3. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Leptospirosis Icterohemorrhagica (Weil's Disease), Proc. Staff Meet., Mayo Clin. **19**: 89-99 (Feb. 23) 1944.

4. Lourie, E. M., and Collier, H. O. J.: The Therapeutic Action of Penicillin on Spirocheta Recurrentis and Spirillum Minus in Mice, Ann. Trop. Med. **37**: 200-205 (Dec. 31) 1943. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Infections with Spirillum Minus and Streptobacillus Moniliformis (*Rat Bite Fever*), Proc. Staff Meet., Mayo Clin. **19**: 257-264 (May 17) 1944.

nutrition, and its treatment entails proper dental or vitamin therapy as well as antispirochetal measures. True evaluation of chemotherapy for Vincent's gingivitis, therefore, is difficult and a long follow-up period is necessary.

Fourteen cases of Vincent's angina have been treated with penicillin at this hospital, as summarized in the table. Diagnosis was established by positive clinical and laboratory findings. Clinically the local lesions on the tonsil or pharynx had the following features in varying severity and combination: hyperemia, ulceration, exudation (pseudomembrane), bleeding, characteristic odor, submaxillary lymphadenopathy, edema and associated mild gingivitis. One patient had a temperature of 101.2 F. (oral). The others either had slight fever (99-100 F.) or were afebrile. Symptoms in every case were pronounced. Pain in severe cases was so intense that solid food was refused. In some instances the symptoms were out of proportion to the physical findings.

In each case a dried smear of exudate from the lesion was positive for Borrelia vincenti. No smear was considered positive unless there was an unequivocal profusion of characteristic spirochetes and fusiform organisms present. In addition, in several cases, throat culture was negative for other pathogenic organisms. The differential leukocyte counts revealed no abnormal cells.

Penicillin was injected intramuscularly in each case. The intramuscular route was chosen in preference to local application for several reasons. Studies of the effect of penicillin on other micro-organisms have shown that it exerts its maximum effect after six to eight hours of contact.[5] Without knowing the length of time locally applied penicillin remains in contact with mucous membranes, one would find it hard to advise rational dosage schedules. The ease with which locally applied penicillin will penetrate to the depths of an exudate covered ulcer is unknown. Furthermore, it has been shown that parenterally injected penicillin is secreted in the saliva.[6] Thus, when the intramuscular route is employed the deep portions of the local lesion will be constantly attacked by penicillin conveyed in the blood stream while the superficial portions will be continually bathed by the penicillin present in the saliva.

The first 2 patients to be treated were given a total of 200,000 units of the sodium salt of penicillin administered in 20,000 unit doses every three hours intramuscularly. The response was so satisfactory that all subsequent cases, with 3 exceptions, had the dosage reduced to 100,000 units administered in 20,000 unit doses every three hours. The 3 exceptions were as follows: In 1 moderately severe case two doses of 50,000 units were given six hours apart, and in 2 mild cases a total of 50,000 and 25,000 units was given in one dose, respectively. Although the response in these 3 cases was satisfactory, it was deemed advisable to continue this study with doses of 100,000 units (20,000 units every three hours) because the smaller doses given were found to be only temporarily effective in cases of Vincent's gingivitis being observed at about the same time.

The result in each case treated was satisfactory. In every instance subjective discomfort was decidedly alleviated in twenty-four hours and completely eliminated in forty-eight hours. There was definite improvement within four to six hours. In every instance the smear which was positive before treatment became negative after treatment. Ten of 11 patients who had smears taken within twenty-four hours after the onset of treatment had negative smears at this time. The eleventh patient, who had received only 25,000 units, had a positive smear remaining after twenty-four hours but, without further penicillin or other therapy, had negative smears in forty-eight, seventy-two and ninety-six hours. The remaining 3 patients, whose clinical response was in every way similar to the foregoing 11, had negative smears two, three and nine days after treatment, respectively.

The appearance of the lesions also improved remarkably, although this improvement was not as dramatic as the relief of subjective symptoms and the disappearance of the organisms from the smears. The first effect, noted within twenty-four hours, was a change in the color and character of the exudate. The usual change was from a dirty gray or yellow membrane which bled easily to a clean whitish gray film which did not bleed. The offensive odor disappeared in twenty-four hours. The exudate and ulcer required from one to ten days for complete disappearance, depending on the initial severity of the lesion. Simultaneously, adenopathy gradually subsided. When present originally, gingivitis rapidly disappeared. The temperature was invariably normal after twenty-four hours. No recurrences have been observed.

Course in Fourteen Cases of Vincent's Angina Treated with Penicillin

Case	Severity	Tonsil Affected	Previous Treatment	Smear Before Penicillin, After Previous Therapy	Penicillin: Total Dosage, Units	Penicillin: Treatment Period, Hours	Smear from Beginning of Penicillin: 24 Hrs.	48 Hrs.	72 Hrs.	96 Hrs.	Days for Exudate to Disappear
1	Severe	Bilateral	Hydrogen peroxide	+	200,000	12, +12 †	—	—	..	..	4
2	Moderate *	Right	Sodium perborate, hydrogen peroxide	+	200,000	27	—	..	..	..	1
3	Severe	Bilateral	.....	+	100,000	12	—	—	—	..	*10*
4	Moderate	Bilateral	.. ...	+	100,000	12	..	—	—	—	2
5	Moderate *	Left	.....	+	100,000	12	—	..	..	..	2+
6	Moderate	Right	Sulfadiazine	+	100,000	6	—	—	..	..	2+
7	Mild	Right	.....	+(2)‡	25,000	—	+	—	—	—	5+
8	Severe	Right	... .	+	100,000	12	—	—	..	..	3+
9	Mild	Bilateral		+	50,000	—	—	..	..	..	1
10	Moderate	Right	Hydrogen peroxide	+(2)‡	100,000	12	—	..	..	..	2
11	Moderate *	Right	Hydrogen peroxide	+	100,000	12	—	..	..	..	2
12	Moderate	Left	Hydrogen peroxide, sulfadiazine	+(2)‡	100,000	12	..	..	—	..	3
13	Severe	Left	Sodium perborate	+	100,000	12	..	..	..	§	6
14	Moderate	Right	. . ..	+	100,000	12	—	—	—	..	3+

* Associated mild gingivitis † Two separate courses on two successive days. ‡ Positive smears on two successive days
§ Smear negative after nine days.

5. Keefer, C. S.; Blake, F. G.; Marshall, E. K.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections. A Report of 500 Cases, J. A. M. A. **122**: 1217-1224 (Aug. 28) 1943.

6. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Further Observations on Penicillin, Lancet **2**: 177-188 (Aug. 16) 1941.

The results demonstrate that penicillin is an effective agent in the treatment of Vincent's angina. From my own experience it is definitely superior to hydrogen peroxide or sodium perborate gargles. Several of the patients had received these medications before penicillin was started with slight or no improvement and continued positive smears after twenty-four to forty-eight hours. The rapidity with which penicillin acts should be of value in reducing the loss of man hours in military and civilian life, in decreasing contagiousness and in reducing the period of discomfort for the patient.

Schuessler, Fairchild and Stransky [7] and Strock [8] have found penicillin in the form of spray or mouth wash to be effective in the treatment of Vincent's stomatitis. Barr,[9] in a summary of results of penicillin therapy in the Navy, records 4 cases of Vincent's infection successfully treated, without further details. Denny, Shallenberger and Pyle [10] have also found penicillin effective for Vincent's infections. It should be pointed out that when Denny and his associates applied penicillin solutions in a concentration of 250 units per cubic centimeter to tonsillar lesions the smears became negative in three days, but in the 1 case in which they gave penicillin intramuscularly smears were negative within twenty-four hours. It would seem, from my experience, that the total dosage of 520,000 units given in this case was greater than is necessary. In a recent case of severe fusospirochetal balanitis treated by Capt. W. F. Schwartz,[11] at this station, 200,000 units of penicillin in a period of forty-eight hours resulted in a dramatic cure. The patient had subjective relief in four hours, and the inflammation had subsided about 80 per cent in twenty-four hours.[12]

SUMMARY AND CONCLUSIONS

1. Penicillin has been found to be of definite value in the treatment of Vincent's angina in 14 cases.

2. The recommended dose is 100,000 units administered intramuscularly in 20,000 unit doses every three hours. In mild cases smaller doses may be required and in unusually severe cases larger doses may be required.

7. Schuessler, C. F.; Fairchild, J. M., and Stransky, I.: Penicillin in the Treatment of Vincent's Infection, J. A. D. A. **32**: 551-554 (May) 1945.
8. Strock, A. E.: Relationship Between Gingivitis and Penicillin Administration, J. A. D. A. **31**: 1235-1236 (Sept.) 1944.
9. Barr, J. S.: The Use of Penicillin in the Navy, J. Bone & Joint Surg. **26**: 380-386 (April) 1944.
10. Denny, E. R.; Shallenberger, P. L., and Pyle, H. D.: Clinical Observations in Use of Penicillin, J. Oklahoma M. A. **37**: 193-205 (May) 1944.
11. Schwartz, W. F.: Personal communication to the author.
12. Since the submission of this article for approval for publication, the total number of cases treated has risen to 41, with similar results. Among these have been 3 cases of infectious mononucleosis with secondary Vincent's tonsillitis and gingivitis. Penicillin has had no effect on the course of the infectious mononucleosis but has eliminated the Vincent's infection.

Natural Control of the Black Widow Spider.—Enemies of the black widow spider should be encouraged to propagate and multiply. Those parasitic insects which pray on Latrodectus mactans should be permitted to roam unhampered in their outdoor habitats, and increasing efforts must be made to evaluate their spider-destroying propensities. The mud-dauber's nest, heretofore considered only as an evidence of untidiness, may now be accepted as indicative of human enlightenment, the abode of a known destroyer of the world's most poisonous arachnid. An appalling record of human suffering has been double-checked back to Latrodectus mactans and her prototypes. There is no appeal from the indictment, and mankind must now make a unified effort toward curtailment of the greatest arachnid menace the world has ever known.—Thorp, Raymond W., and Woodson, Weldon D.: Black Widow—America's Most Poisonous Spider, Chapel Hill, University of North Carolina Press, 1945.

THE USE OF PENICILLIN IN VINCENT'S ANGINA

MAJOR PAUL L. SHALLENBERGER
LIEUTENANT COLONEL EARL R. DENNY
AND
MAJOR HAROLD D. PYLE
MEDICAL CORPS, ARMY OF THE UNITED STATES

The chemotherapeutic effects of penicillin in certain spirochetal infections have been successfully demonstrated in human subjects and in experimental animals.

Mahoney [1] was the first to demonstrate the spirocheticidal effect of penicillin. In a careful and well planned study, he observed the disappearance of Treponema pallidum from scrapings of chancres after fourteen hours of treatment using 25,000 units intramuscularly at four hour intervals. Furthermore, the duration of the primary ulcerations was only eight days. We confirmed these observations by using penicillin in doses of 25,000 units every three hours on 2 patients with primary chancres. The dark field examinations were positive through the eighth hour following the institution of treatment, but specimens obtained at twelve hours did not contain Treponema pallidum. O'Leary and Herrell [2] observed a rapid disappearance of the late cutaneous manifestations of syphilis, following continuous intravenous drip of 20,000 units of penicillin twice daily.

Penicillin is highly effective against other types of spirochetes, as clearly shown in experimentally produced Leptospira icterohemorrhagiae infection in guinea pigs. In February 1944 Heilman and Herrell [3] reported their investigations with penicillin in experimental Weil's disease. In 64 guinea pigs infected with Leptospira icterohemorrhagiae 32 were treated intramuscularly daily for seven days with 800 units of calcium penicillin suspended in sesame oil. Of these 32 guinea pigs none died of the disease, although 3 died from toxic effects attributed to penicillin. Twenty-nine of the 32 untreated control animals died of Weil's disease.

Penicillin is not, however, equally effective against all strains of Leptospira icterohemorrhagiae. Augustine and his associates,[4] using a virulent strain, found that penicillin did not cure the disease in guinea pigs if treatment was started after the appearance of the symptoms. That pencillin may exert some suppressive effect is suggested by survival of some inoculated animals if treatment was started prior to the appearance of signs of the disease.

In view of the spirocheticidal potentiality of penicillin, one of us (P. L. S.) suggested that penicillin might be of value in the treatment of infections due to or associated with Vincent's organisms. In a previous report [5] our clinical and bacteriologic observations indicated that penicillin was indeed highly effective in the treatment of Vincent's infection.

Mr. J. W. Crunelle, head of the [illegible] University of Chicago, made the photomicrograp[illegible] Marzec and Miss Catherine J. Vanderboom, Gar[illegible] made the major portion of the bacteriologic examinations.

1. Mahoney, J. F.; Arnold, R. E., and Harris, A. D.: Penicillin Treatment of Early Syphilis: A Preliminary Report, Am. J. Pub. Health **33**: 1387 (Dec.) 1943.
2. O'Leary, P. A., and Herrell, W. E.: Penicillin in the Treatment of Late Cutaneous Syphilis: Report of a Case, Proc. Staff Meet., Mayo Clin. **19**: 20 (Jan. 12) 1944.
3. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Leptospirosis Icterohaemorrhagica (Weil's Disease), Proc. Staff Meet., Mayo Clin. **19**: 89 (Feb. 23) 1944.
4. Augustine, D. L.; Weinman, D., and McAllister, J.: Penicillin Sodium Therapy in Experimental Weil's Disease, New England J. Med. **231**: 358 (Sept. 7) 1944.
5. Denny, E. R.; Shallenberger, P. L., and Pyle, H. D.: Clinical Observations in the Use of Penicillin, J. Oklahoma M. A. **37**: 193 (May) 1944.

METHOD OF STUDY

The present study is based on adult patients suffering from Vincent's infections admitted to the communicable disease section of the Gardiner General Hospital.

The diagnosis of Vincent's angina was established in each patient by the findings of a patch or patches of pseudomembrane which is formed by the necrosis of the superficial layers of the mucous membrane and not by exudation. The patches were grayish white surrounded by an inflamed areola, usually separated from one another by normal healthy tissue. When the pseudomembrane, which was granular and cheesy in consistency, was removed an underlying ulcerative area was found with some variation in extent and depth. There was a tendency for the ulcerated area to bleed and the reformation of a new pseudomembrane. The areas involved were often confined to one or both of the tonsils, the tonsillar fossae if the tonsils had been removed, the pharynx or the soft palate. The clinical diagnosis was confirmed by making a microscopic examination of a fresh smear taken directly from the ulcer or the scrapings from the pseudomembrane, stained with warm carbolized crystal violet, demonstrating fusiform bacilli which were twice as long as they were wide, pointed at the ends, and a spirillum approximately 10 to 20 microns in length. From each patient of groups 3 and 4 cultures were obtained to exclude other pathogens, such as hemolytic streptococci.

The patients were divided into four groups. Group 1 consisted of 13 patients admitted during November and December 1943 who were treated variously with hydrogen peroxide, sodium perborate, chromic acid, silver nitrate and oxophenarsine hydrochloride (mapharsen). Most of this group were treated by swabbing the involved areas three times daily with a mixture of 3 per cent chromic acid and 10 per cent silver nitrate, preceded by gargling a mixture of equal parts of 50 per cent sodium perborate and 50 per cent hydrogen peroxide. A few of the patients received, in addition to this treatment, and others alone, 0.03 Gm. of oxophenarsine hydrochloride intravenously every second or third day.

Group 2 consisted of 11 patients admitted during January and February 1944 who were treated with 1 Gm. doses of sulfadiazine, used as lozenges, every four hours.

Group 3 consisted of 9 patients admitted subsequent to February 1944 and treated with penicillin by local application. The following method was used: 1. The involved tissues were swabbed with penicillin in a concentration of from 250 to 500 units per cubic centimeter four times daily. 2. Daily smears were obtained. 3. Treatment was continued until the smears were negative for Vincent's organisms.

No other supportive treatment was administered, although acetylsalicylic acid 5 grains (0.32 Gm.) was given as indicated for the relief of pain.

As the investigation progressed, concentrations of the penicillin solution used were maintained at 500 units per cubic centimeter.

Group 4 consisted of 2 patients treated with penicillin administered intramuscularly alone. One of those was treated with penicillin intramuscularly because his symptoms were unusually severe. In order to determine the clinical and bacteriologic effectiveness of penicillin following intramuscular administration, the second patient of this group was subjected to detailed study. The procedure in investigating this patient was as follows: (1) Culture and (2) warm carbolized crystal violet stained smears of the lesions were made on admission; (3) 15,000 units of penicillin in a concentration of 10,000 units per cubic centimeter was administered intramuscularly every three hours for eight doses; (4) following the institution of penicillin treatment estimates of the number of Vincent's organisms on stained smears were made hourly for twelve hours and subsequently at less frequent intervals, as indicated in figure 2; (5) the changes in objective and subjective symptoms were observed at the time specimens were obtained for bacteriologic examinations.

THERAPEUTIC RESULTS IN CONTROL GROUPS

Prior to January 1944 it was common practice to apply directly to the affected areas astringent agents and other medicinals which liberated nascent oxygen. As already noted we used mixtures of chromic acid and silver nitrate, sodium perborate and hydrogen peroxide, and in some cases oxophenarsine hydrochloride with this treatment, and in others alone. The summary of these cases is presented in figure 1. It is to be noted that in this group most of the smears did not become negative until the seventh to the twelfth day.

During January and February 1944 we began using 1 Gm. doses of sulfadiazine every four hours adminis-

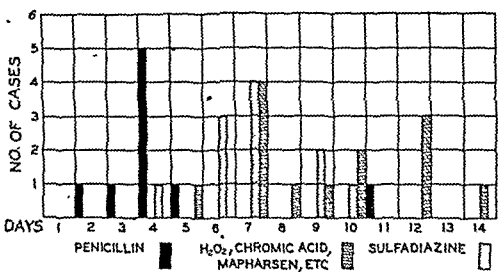


Fig. 1.—Comparative therapeutic effect in Vincent's infection of (1) hydrogen peroxide, chromic acid, oxophenarsine hydrochloride and so on and (3) penicillin. The ordinate indicates the number of cases. The abscissa indicates the days on which smears became negative for Vincent's organisms.

tered as lozenges. There were 11 cases treated by this method. In most of the cases the smears became negative for Vincent's organisms by the seventh or ninth day.

THERAPEUTIC RESULTS WITH LOCAL APPLICATIONS OF PENICILLIN

In group 3 the clinical and bacteriologic responses as obtained with local penicillin therapy were very striking. There was improvement in the appearance of the ulcerations in twenty-four to forty-eight hours and a relatively rapid subsidence of the symptoms. Pain was rapidly relieved in those patients who were suffering severely. The grayish membrane would often start receding in from three to five days from the beginning of treatment. The organisms disappeared frequently before the pseudomembrane faded. The rate at which the organisms disappeared from the infected site is indicated in figure 1. With the exception of 1 case, the infecting organisms disappeared from the site of infection by the fifth day. Excluding this 1 case, which persisted in giving a positive smear, although clinically much improved by the fourth day, the average time of disappearance of Vincent's organisms was 3.7 days following the institution of penicillin therapy.

A soldier was admitted with huge swollen red tonsils, pharyngeal injection, painful throat and fever. The cultures of the tonsils showed beta hemolytic strepto-

cocci, and smears revealed large numbers of fusiform bacilli and spirochetes. He was given sulfadiazine lozenges and on the second hospital day he developed a grayish white membrane over both tonsils. He continued to complain of painful throat. During the succeeding two days the cultures became negative for hemolytic streptococci but the smear remained positive for Vincent's organisms in large numbers. Sulfadiazine

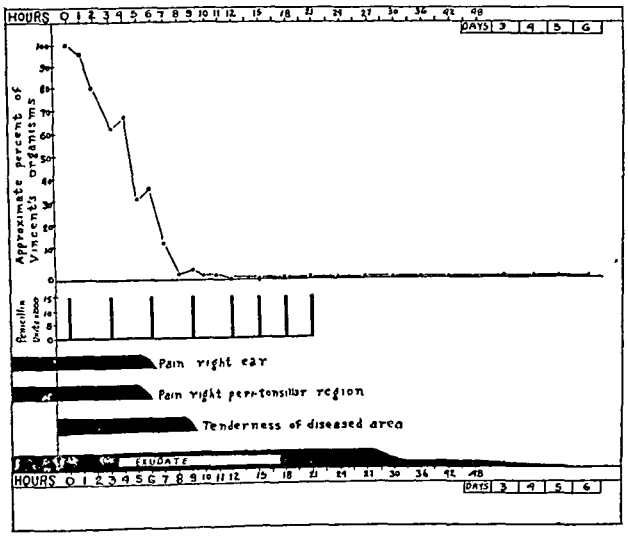


Fig. 2.—Approximate percentage in Vincent's angina of Vincent's organisms, penicillin dosage and the duration of referred pain to the right ear, the pain in the right peritonsillar region, the tenderness of the diseased area and exudate over the ulcer chronologically.

was discontinued. Local penicillin therapy was started. On the third day of this treatment the smears were negative and he was clinically well.

In group 4 intramuscular penicillin was administered to 1 patient who was acutely ill with Vincent's angina because of the severity of the disease. This patient had a temperature of 103.8 F. with hot, moist, flushed skin, a pulse rate of 110 and pronounced injection of all the gum margins, the tonsils and the pharyngeal wall. There was considerable edema with an occasional patch of loosely attached grayish membrane, over the tonsils and pharyngeal wall, which bled on separation. The submaxillary lymph nodes were enlarged and painful. The pain was severe. He was given 25,000 units intramuscularly followed with 15,000 units intramuscularly every three hours for thirty-three doses. An alpha hemolytic streptococcus was obtained on culture, but the predominating organisms were fusiform bacilli and spirilla of Vincent's organisms. Spirilla and fusiform bacilli persisted on the second day of treatment, but on the third day of treatment repeated smears showed no evidence of the organisms. There was definite clinical improvement within forty-eight hours.

The second patient in group 4 who was studied in considerable detail was a soldier aged 23 who five and two days prior to entry developed pain in the right peritonsillar area and pain in the right ear respectively. These symptoms became progressively more severe. Moderate fatigue developed two days prior to entry. On admission the significant findings were as follows: The tonsils had been removed. An ulcer, approximately 1 by 2 cm. covered by a grayish white membrane surrounded by edematous hyperemic mucosa, was present in the right tonsillar fossa. There was moderate hyperplasia and redness of lymphoid tissue on the posterior pharyngeal wall. The buccal and gingival mucosa appeared normal. The right submaxillary gland was slightly enlarged and tender. The findings on otoscopy were normal, indicating that the pain in the right ear was referred from the diseased right tonsillar area. The complete blood count was normal. Culture of the lesion showed only a few hemolytic streptococci, Lancefield type C, but direct smear revealed innumerable fusiform bacilli and spirilla. The therapy and subsequent bacteriologic studies described are recorded in figure 2. By the sixth hour after the first dose of penicillin, pain in the right peritonsillar area and the right ear ceased and tenderness in the right peritonsillar region stopped two hours later. There was less edema about the lesion twenty-four hours after the start of treatment. At forty-eight and seventy-two hours the size of the ulcer and pseudomembrane had diminished progressively. The latter gradually faded and disappeared on the ninth day.

In estimating the rapidity with which the Vincent's organisms disappeared following treatment, the smear taken prior to the institution of treatment was presumed to represent 100 per cent. The injection of 15,000 units of penicillin resulted in a reduction of approximately 40 per cent of the organisms in three hours; following a second 15,000 unit treatment an additional 25 per cent reduction of organisms resulted three hours later; two hours after the third treatment, or eight hours after the first treatment with penicillin, fusiform bacilli and spirilla could be found only by searching several fields on the slide. Twelve hours after starting treatment, or after the patient had received 60,000 units, fusiform bacilli and spirilla completely disappeared from

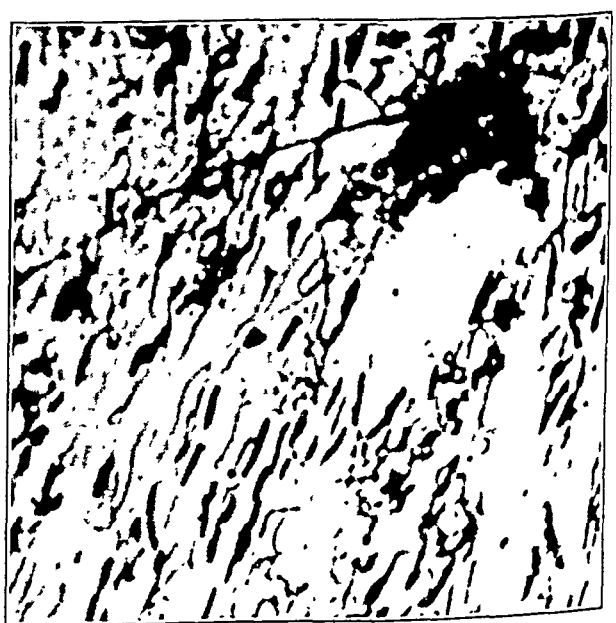


Fig. 3.—Organisms present immediately before the first injection of penicillin.

the site of infection, and subsequent examinations during the next five days resulted in negative findings as indicated in figure 2.

CYTOLOGIC FINDINGS

The photomicrographs taken immediately before the first injection of penicillin (fig. 3), the one taken three hours later (fig. 4) and seven hours later (fig. 5) clearly demonstrate the rapid disappearance of the

organisms. Only 7 fusiform bacilli and 1 spirillum are seen in the smear taken seven hours after the institution of treatment.

COMPARATIVE THERAPEUTIC RESULTS

The comparative therapeutic results as obtained with sodium perborate and hydrogen peroxide, chromic acid and silver nitrate, and oxophenarsine hydrochloride



Fig. 4.—Appearance three hours later.

(group 1), with sulfadiazine as lozenges (group 2) and with local penicillin (group 3) are shown in figure 1.

In group 1, consisting of 13 patients, there were none in whom the smear became negative before the fifth day, and in 3 patients the smear did not become negative until the twelfth day and 1 was not bacteriologically free until the fourteenth day of treatment. The average time before the smear became negative was 8.8 days.

Eleven patients (group 2) were treated with sulfadiazine lozenges. The smears of 1 patient became negative for Vincent's organisms on the fourth day, and 1 received treatment for ten days before the smear finally became negative. In this group treated with sulfadiazine lozenges the average time of disappearance of Vincent's organisms from the smears was 7.1 days.

The patients treated with penicillin locally (group 3) responded much more rapidly, as indicated in the chart. Smears were negative before the sixth day in all patients except 1, and this patient was clinically well on the fourth day of penicillin treatment with a large reduction in the number of Vincent's organisms found in the stained slide. However, occasional Vincent's spirilla and fusiform bacilli were seen on the smears on the eleventh day. Excluding this 1 case the average time of disappearance of the organisms from the smear was 3.7 days.

The patient in group 4 who received 15,000 units of penicillin intramuscularly every three hours for eight doses made the most rapid response to treatment of any of the patients in the first three groups. Following the initial treatment subjective symptoms disappeared in six hours and tenderness ceased in eight hours; the smears became essentially negative in eight hours, and fusiform bacilli and spirilla could not be found after eleven hours.[6]

COMMENT

The present clinical study demonstrates that penicillin is a remarkably effective agent in the treatment of Vincent's infection.

The efficacy of penicillin in Vincent's angina is of importance not only because of special sensitivity of Vincent's spirilla and fusiform bacilli but also because it is more rapidly effective than the methods heretofore advocated.

A favorable response was obtained in all cases treated locally. The only bacteriologic failure occurred in a patient who had organisms of Vincent's persist even after eleven days of local treatment, although the patient was clinically cured on the fourth treatment day.

In 1 case the effect was dramatic in that the subjective symptom of pain disappeared within six hours after the start of intramuscular treatment. The fact that symptoms disappeared within six hours after the onset of therapy and that the hourly quantitative bacterial study showed a rapid disappearance of the Vincent's organisms while receiving 15,000 units of



Fig. 5.—Appearance seven hours after the institution of treatment.

penicillin intramuscularly every three hours for eight doses suggest that this is a rapidly effective method of treatment of Vincent's angina. The duration of hospitalization was much reduced by this method of treatment when compared with sulfadiazine lozenges.

6. Subsequent to the time this paper was forwarded to the publisher, 2 additional cases, similar to the second case in group 4, have been observed. The treatment consisted in the intramuscular injection of 25,000 units and 20,000 units, respectively, administered every three hours for a total dosage of 100,000 units. The bacteriologic and clinical responses were so dramatic that the administration of 25,000 units of penicillin for four doses at three hour intervals is apparently the optimal treatment of Vincent's angina.

hydrogen peroxide and sodium perborate, chromic acid and silver nitrate, and oxophenarsine hydrochloride therapy.

The experience with this group of cases seems to justify the conclusion that topical application of penicillin in a concentration of 500 units per cubic centimeter applied four times daily is completely and rapidly effective therapeutic procedure in the treatment of Vincent's infection. As a result of our detailed study of 1 patient during the administration of 15,000 units every three hours for eight doses, it is suggested that this method of treatment warrants extended trial.

OXYGEN TOXICITY

THE EFFECT OF INHALATION OF HIGH CONCENTRATIONS OF OXYGEN FOR TWENTY FOUR HOURS ON NORMAL MEN AT SEA LEVEL AND AT A SIMULATED ALTITUDE OF 18,000 FEET

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The effects produced by breathing high concentrations of oxygen for prolonged periods of time have been studied intensively by many investigators in a variety of animals including frogs, turtles, pigeons, mice, rats, guinea pigs, cats, dogs and monkeys.[1] Practically all of these investigators have reported the occurrence of irritation, congestion and edema of the lungs and even death following long exposures. Because of the recent introduction and widespread use of apparatus designed to deliver 100 per cent oxygen it is highly important that similar well controlled experiments be done on man to determine the limits for safe oxygen usage in therapy and in aviation. Satisfactory experiments of this type have not yet been performed. Behnke[2] reported that healthy men between the ages of 20 and 40 are unable to breathe 99 per cent oxygen for periods in excess of seven hours because of nausea, dyspnea and substernal soreness; complete data were not given in his report in respect to the number of subjects, apparatus used, temperature, humidity, carbon dioxide content of inspired gas and other details. In a later report he[3] indicated that some individuals tolerated 99 per cent oxygen for as long as seventeen hours. A more complete investigation was carried out by Becker-Freyseng and Clamann[4] on 2 men breathing 90 per cent oxygen for sixty-five hours. The vital capacity was reduced in both, and 1 developed nausea, repeated vomiting, tachycardia, a febrile tracheobronchitis, dyspnea and pain in the elbows and knees. Neither Behnke nor Becker-Freyseng and Clamann employed controls breathing room air under identical circumstances.

These reports by Behnke and Becker-Freyseng and Clamann are at variance with the clinical opinion of Boothby,[5] who has "employed 100 per cent oxygen continuously for forty-eight hours in more than 800 patients without toxic actions," and of Evans,[6] who has never observed any untoward effects in more than 800 patients receiving 100 per cent oxygen therapy. However, we must point out that patients rarely if ever receive 100 per cent oxygen continuously for several reasons: 1. The mask is usually removed every two to three hours for feeding, drug administration or nursing care. The use of the word continuous by some authors is therefore not justified. 2. The B. L. B. nasal mask[7] may deliver 40 to 95 per cent oxygen, depending on whether the mouth is open (eating, talking, snoring) or closed. 3. The B. L. B. oronasal mask does not necessarily deliver 99 per cent oxygen because it employs partial rebreathing through a reservoir bag and because it permits outside air to be drawn through the sponge rubber disks when the respiratory volume of the subject is in excess of the volume delivered by the oxygen regulator. The same is true of the O. E. M. mask;[8] when demand exceeds the rate of flow the bag is collapsed and air is drawn in through the safety valve. 4. Neither the B. L. B. nor the O. E. M. mask fits the face tightly enough to exclude room air unless special precautions are taken in the fitting of the mask; this is particularly true in individuals with thin bony faces or with edentia. 5. The B. L. B. and O. E. M. oxygen masks may easily be displaced in sleep, and we have repeatedly seen persons (theoretically receiving 100 per cent oxygen) whose masks were on a cheek or the chin during sleep while the mouth or nose was completely uncovered. 6. Masks are often removed deliberately or unconsciously by anoxic patients.

For all these reasons, unless patients are observed by competent investigators continuously for twenty-four or forty-eight hours, with frequent analyses of mask air for percentage of oxygen, these observations[9] cannot be used as arguments against the possible occurrence of oxygen toxicity in man.

We therefore undertook to study with continuous observations a large series of normal men exposed to 98 to 99.5 per cent oxygen for twenty-four hours, with a sufficient number of controls to enable us to state with certainty that oxygen does or does not produce toxic symptoms when so given.

METHODS

Ninety healthy young men between the ages of 19 and 31 years were used; all of these subjects were under continuous observation for twenty-four hours by

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Col C. P. Rhoads and Major Louis Venet, Medical Division, Chemical Warfare Service, furnished much of the apparatus used. Messrs. Dunne and Levin of the Paschall Oxygen Company, Philadelphia, prepared most of the oxygen mixtures used in the experiments. Elizabeth Parcels performed the hematologic studies. Dr. David Drabkin performed the spectrophotometric determinations of total blood pigments. Mr. Herbert Hadley made available civilian public service volunteers. Miss P. Walker rendered valuable technical assistance.

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2. Behnke, A. R.: High Atmospheric Pressures: Physiological Effects of Increased and Decreased Pressures; Application of These Findings to Clinical Medicine, Ann. Int. Med. **13**: 2217-2228 (June) 1940.
3. Behnke, A. R., and Willmon, T. L.: Gaseous Nitrogen and Helium Elimination from the Body During Rest and Exercise, Am. J. Physiol. **131**: 619-626 (Jan.) 1941.
4. Becker-Freyseng, H., and Clamann, H. G.: Zur Frage der Sauerstoffvergiftung, Klin. Wchnschr. **18**: 1382-1385 (Oct. 28) 1939.
5. Boothby, W. M.; Mayo, C. W., and Lovelace, W. R.: One Hundred per Cent Oxygen: Indications for Its Use and Methods of Its Administration, J. A. M. A. **113**: 477-482 (Aug. 5) 1939.
6. Evans, J. H.: The War and Oxygen Therapy, New York State J. Med. **44**: 2443-2451 (Nov. 15) 1944.
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8. Barach, A. L., and Eckman, M.: A Mask Apparatus Which Provides High Oxygen Concentrations With Accurate Control of the Percentage of Oxygen in the Inspired Air and Without Accumulation of CO_2, J. Aviation Med. **12**: 39-52 (March) 1941.
9. Boothby, Mayo and Lovelace;[5] Evans.[6]

one or more of us. All our experiments were carried out at 1 atmosphere pressure (sea level) unless otherwise noted.

The first six experiments were performed singly. Each of the 6 subjects was placed at complete bed rest in a Heli-Ox hood closed circuit rebreathing apparatus.[10] Carbon dioxide was absorbed completely by baralyme. In addition to other measurements to be discussed later, oxygen and carbon dioxide concentrations, temperature and relative humidity within the hood, and pulse and respiratory rate were recorded at least once every thirty minutes.

In the other eighty-four experiments gas mixtures were administered through a demand system set at 1 inch of water positive pressure on inspiration, employing the Army gas mask with expiratory valve but without the customary canister. This is a full face mask and possesses the advantages of sealing tightly even during sleep, regardless of the shape or contours of the face, and of having a large enough dead space (300 to 400 cc.) to act as an excellent humidifier. Oxygen and carbon dioxide analyses were performed on the Scholander analyzer,[11] using samples withdrawn from the mask during inspiration. The carbon dioxide percentage occasionally exceeded 1 in 49 subjects, 1.5 in 28 and 2 in 5 subjects; 85 per cent of all carbon dioxide determinations in all subjects were less than 1.5 per cent of carbon dioxide, and only 3 per cent exceeded 2 per cent of carbon dioxide. An oxygen distributing line was used so that 20 men could receive the gas mixtures during the same twenty-four hour period. This permitted a large number of controls to be run simultaneously with the subjects receiving high oxygen concentrations. Oxygen was obtained from two different manufacturers; it was prepared by distillation of liquid air and supplied in medicinal cylinders of 240 or 300 cubic feet capacity.

All of these 84 individuals were studied with respect to symptomatology, vital capacity, pulse rate and physical examination of the chest. Complete venous blood studies (red blood cells, white blood cells, hemoglobin, differential, reticulocytes, hematocrit) were performed on 38 of these subjects.

Measurements of relative humidity of mask or hood air were made on representative subjects. No effort was made to provide unusually moist or dry air. The subjects in the hood breathed air with a relative humidity of 44 to 79 per cent (average 68 per cent); the hood temperature was usually 21 C. The relative humidity of the gas breathed by those wearing masks ranged from 38 to 47 per cent (average 40 per cent); this was determined by measuring the temperature of inspired air inside the mask (31 C.) and the dew point of small samples of air withdrawn from the mask during twenty consecutive inspirations. Actually the average amount of moisture contained in the gas breathed by the masked groups (13.1 Gm. of water per cubic meter) was greater than in the hood group (12.3 Gm. of water per cubic meter). Since the alveoli saturate the incoming air with water vapor at 37 C., it is the moisture content in grams of water per cubic meter of gas that determines the drying action. In this instance air with a relative humidity of 40 per cent contained more moisture than air with a relative humidity of 68 per cent; this is due to the fact that the temperature in the former was greater than in the latter. Consequently all the subjects in these experiments were breathing moist gases.

The 84 men wearing masks were permitted to be ambulatory to the extent of their 6 foot hose line. All 90 subjects slept six to twelve hours of the twenty-four. The masks or hood were not removed for feeding, which was accomplished by providing 1,500 to 4,000 cc. of liquid diet (soup, milk, eggnog, fruit juices, coffee, tea, water) via a tube or catheter sealed into the hood or inserted under the gas mask flap and held in place to prevent leakage. Descriptions of symptoms experienced were volunteered by the subjects and never elicited by leading questions. All of the subjects including the controls breathing air were told that they were breathing 100 per cent oxygen regardless of the concentration actually provided.

RESULTS

The data will be discussed from two points of view:

(A) Symptoms produced by inhalation of the gas mixtures and

(B) The effects of high concentrations of oxygen on the blood, circulation and respiration.

A. *Symptoms.*—1. Substernal Distress: Thirty-four subjects (6 in hood and 28 wearing masks) inhaled 100 per cent oxygen[12] continuously for twenty-four hours. The most prominent symptoms during the period was substernal distress. Four of the 6 men in the hood and 24 of 28 subjects wearing masks complained of this discomfort. It was considered slight in 4, of moderate intensity in 18 and severe in 6. It was characterized as a substernal ache which often became sharp and severe during inspiration. The sensations were described as follows: "felt as though I had been smoking excessively," "as though breathing raw, cold air," "as though I had just run a race to the point of exhaustion," "felt like bronchitis." The symptoms were quite similar to those of mild "chokes." The substernal distress was noted at an average time of fourteen hours after the start of the oxygen, the range being from four hours to twenty-two; 79 per cent of those developing substernal distress first noticed this symptom between the twelfth and the sixteenth hour. It was never severe enough to necessitate discontinuance of the experiment before the end of the twenty-four hour period. In some subjects the discomfort diminished as the experiment proceeded, but in the majority signs of greater irritation became evident. In some of the latter the pain increased in severity until it became continuous; in these a deep breath led to coughing or was so uncomfortable as to force the subject to limit his respiratory excursion.

Pain was localized to the right or left of the sternum in a small group, but in the majority of instances it was in the midsternal area. In a few cases the discomfort was centered above the sternal notch "in the throat" or "in the neck." Eight subjects noted aggravation of the discomfort when the mask was removed at the end of the experiment. A similar phenomenon was noted in one instance by Behnke.[3] It is possible that the inhalation of unfiltered, cooler, drier room air containing dust was responsible for this.

10. Barach, A. L.: Principles and Practices of Inhalation Therapy, Philadelphia, J. B. Lippincott Company, 1944
11. Scholander, P. F.: Analyzer for Quick Estimation of Respiratory Gases, J. Biol. Chem. 146: 159-162 (Nov.) 1942

12. The mask air contained 0.5 to 1.5 per cent nitrogen or argon and the small amounts of carbon dioxide mentioned. The concentration of oxygen inspired in the experiments conducted in the hood was 98.5 to 99.5 per cent of oxygen; in the experiments employing the masks, it was 97.5 to 99.0 per cent of oxygen. However, for purposes of brevity these individuals will be referred to throughout the paper as the "100 per cent oxygen" group.

An almost universal complaint in the postexperimental period was an accentuation of the substernal distress by deep inspiration, by breathing cold air or by smoking. The symptoms then gradually decreased in intensity over a period of four to five hours, with total disappearance at the end of twelve hours except in 3 men, who had symptoms which persisted for sixteen, twenty-four and thirty-one hours.

An attempt was made to discover whether these symptoms were due to the high tension of oxygen or to adventitious circumstances such as the apparatus used, humidity, resistance to respiration or substances carried over from the tubing or cylinders. To determine this, 10 men breathed compressed room air continuously for twenty-four hours at the same time as 10 of the 28 mentioned before. The oxygen and air cylinders were filled by the same manufacturer and were selected from standard stocks of medicinal oxygen cylinders; the regulators, the copper and rubber tubing, the demand valves and the oxygen masks were identical in the two groups; the relative humidity and carbon dioxide concentrations of the inspired air were the same in the two groups; the groups were observed under the same external environment and with similar fluid intakes, and both groups thought they were breathing 100 per cent oxygen. Nevertheless 9 of the 10 men breathing 100 per cent oxygen developed substernal distress, while none of the 10 breathing air had any corresponding symptoms during the twenty-four hour period. This shows conclusively that the substernal distress was due to inhalation of 100 per cent oxygen.

We then tried to determine the percentage of oxygen required to produce substernal distress. Nine men inhaled 75 per cent oxygen with a fifteen minute intermission every three hours for twenty-four hours and 10 men 50 per cent [13] oxygen continuously for a similar period. Five of the 9 subjects breathing 75 per cent oxygen developed this characteristic symptom, while none of the 10 exposed to 50 per cent oxygen had any complaints referable to the chest. It appears that the concentration of oxygen required to produce symptoms in normal men lies between 50 and 75 per cent and probably is close to the 60 per cent level estimated as safe by Bean [1] and by Stadie.[14]

Since exposure to gas mixtures low in nitrogen results in elimination of nitrogen from alveoli, blood and tissues, it was considered possible that the low tension of nitrogen rather than the increased amount of oxygen might be responsible for the chest pain. Accordingly 6 men were placed in a low pressure chamber at a simulated altitude of 18,000 feet (total pressure of 380 mm. of mercury) and given 100 per cent oxygen through masks. This resulted in a low nitrogen tension and an oxygen tension roughly equivalent to that obtained in the inspired air when breathing 50 per cent oxygen at sea level. None of the 6 subjects developed any substernal discomfort during the twenty-four hour period. It must therefore be concluded that it is the presence of high tensions of oxygen (in excess of 380 mm. or 50 per cent oxygen at sea level) which is required to produce the symptoms mentioned.

It is interesting to note that while none of those breathing 21 per cent or 50 per cent oxygen at sea level or 100 per cent oxygen at 380 mm. had substernal discomfort during the twenty-four hour period, 1, 5 and 2 subjects in these groups respectively had very slight temporary discomfort after the experiment either during the measurement of vital capacity or on going out into cold air. It is possible that prolonged breathing through the rubber tubing or apparatus produced a very mild subclinical irritation.

It has been suggested [15] that intermittent administration of oxygen is less harmful than continuous oxygen therapy. In order to obtain further information on this point we administered 100 per cent oxygen as follows: (*a*) 7 men were given intermissions of one minute every three hours, (*b*) 7 men were given intermissions of five minutes every three hours and (*c*) 7 men were given intermissions of fifteen minutes every three hours. All 21 subjects breathed oxygen for a total of twenty-four hours, i. e. the intermission periods were added to the total time. The masks were removed and room air was breathed during the intermissions. There was no significant difference between any of these groups and those who received oxygen continuously. Of the 7 with one minute intermissions 6 developed substernal distress, of the 7 with five minute intermissions all developed this symptom and of the 7 with fifteen minute intermissions 6 were similarly affected. It is of interest to note that 8 of 30 subjects who breathed 75 or 100 per cent oxygen intermittently noted aggravation of symptoms during the intermission while breathing room air and amelioration when the oxygen inhalation was resumed; 4 subjects with substernal pain were improved in the intermission period and the remainder noted no definite change in symptoms during intermissions.

As far as total incidence of symptoms (mild, moderate or severe) is concerned there appears to be no significant difference between those given 100 per cent oxygen continuously or with intermissions (chart 1). However, if the symptoms are graded according to their intensity (chart 2) those occuring in the group given 100 per cent oxygen with eight rest periods of fifteen minutes each appear to be less severe.

2. Cough, Sore Throat and Nasal Congestion: Forty-three per cent of those breathing 100 per cent oxygen continuously developed nasal congestion or coryza during or shortly after the twenty-four hour experiment; only 10 per cent of those breathing room air developed similar symptoms. Thirty-two per cent of those breathing 100 per cent oxygen developed sore throat and 54 per cent had occasional or repeated cough; 20 per cent of those breathing room air developed sore or dry thoat and none coughed. The development of these symptoms bore no relation to a person's tendency toward upper respiratory tract infection. It is interesting to note that there is not a striking difference between the control group and the 100 per cent oxygen group in respect to throat irritation. The incidence of upper respiratory tract symptoms in the control group breathing room air may be due to inhalation of volatile substances in rubber or to inability to expectorate or blow the nose or to the fact that the experiments were carried out in December and January, when a certain amount of respiratory infection is to be expected.

3. Eye Irritation: Conjunctival irritation occurred in 23 per cent of those breathing 100 per cent oxygen and in 10 per cent of those breathing room air. Part of this may be attributed to the fact that the gas masks

13. The percentage oxygen (mask analyses) varied from 75 to 79 of oxygen and from 49 to 53 of oxygen.

14. Stadie, W. C.; Riggs, B. C., and Haugaard, N.: Oxygen Poisoning, Am. J. M. Sc. **207**: 84-114 (Jan.) 1944.

15. Paine, J. R.; Keys, A., and Lynn, D.: Observations on the Effects of the Prolonged Administration of High Oxygen Concentration to Dogs, J. Thoracic Surg. **11**: 151-168 (Dec.) 1941. Barach, A. L.; Eckman, M.; Oppenheimer, E. T.; Rumsey, C., Jr., and Soroka, M.: Observations on Methods of Increasing Resistance to Oxygen Poisoning and Studies of Accompanying Physiological Effects, Am. J. Physiol. **142**: 462-475 (Oct.) 1944.

conducts the inspired air directly over the eye pieces; part may be ascribed to the irritancy of oxygen per se. The difference between the two groups is not significant.

4. Lower Respiratory Tract Damage: Since high concentrations of oxygen may irritate the conjunctiva, nose, throat, trachea and bronchi of man and since it is known that they may produce pulmonary congestion and edema in animals, it seemed important to determine whether alveolar damage resulted in man. The distribution of the substernal pain, its aggravation by inhalation of dry, cool ambient air, by cigarets and deep breathing strongly suggest the existence of a tracheobronchitis. In an attempt to determine coexistence of alveolar damage we measured vital capacity before and after the experiment on each subject; three or four determinations were made at each time, and the average of the two highest was recorded. The vital capacity of each of the 10 control subjects breathing room air increased, the average being 210 cc., at the end of the twenty-four hour experimental period (chart 3). This increase is probably attributable to the fact that the original vital capacity was determined on all subjects within thirty minutes after their evening

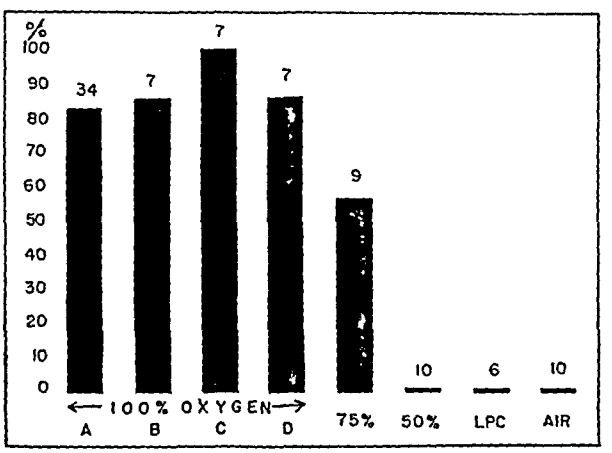


Chart 1.—Incidence of substernal discomfort. Solid bars show the percentage of subjects in each group who developed substernal discomfort during the twenty four hour inhalation. The first four groups inhaled 100 per cent oxygen; of these group A breathed oxygen continuously for twenty four hours, group B had a one minute intermission every three hours, group C five minute intermission every three hours and group D fifteen minute intermission every three hours. *75 %* indicates inhalation of 75 per cent oxygen, 50, 50 per cent oxygen. *LPC* indicates inhalation of 100 per cent oxygen in a low pressure chamber at 18,000 feet. *AIR* indicates inhalation of compressed air. The numbers above each bar indicate the number of subjects in each group.

meal, while the final measurement was made after twenty-four hours of a liquid diet with no intake at all during the last two to three hours. The relatively empty gastrointestinal tract presumably allowed the diaphragm to descend farther and enabled the subject to take a deeper breath or to expel more completely the inspired air.

In contrast to these findings, 63 of the 80 subjects breathing 50, 75 or 100 per cent oxygen showed a decreased vital capacity. In 38 subjects the diminution amounted to more than 200 cc., in 26 to more than 300 cc. and in 15 to more than 400 cc. (the maximal decrease was 1,480 cc. in 2 instances). In view of the data obtained in the group breathing room air it seems fair to assume that the base line for comparison should be plus 200 cc. This accentuates the diminution in vital capacity found in the subjects breathing increased concentrations of oxygen. Furthermore, in those subjects breathing 100 per cent oxygen abdominal distention should have been at a minimum, since Fine and his associates[16] have shown that this procedure leads to absorption of nitrogen from the gastrointestinal tract and a decrease in bowel lumen; this should permit easier descent of the diaphragm and increase the vital capacity. The decreased vital capacity observed

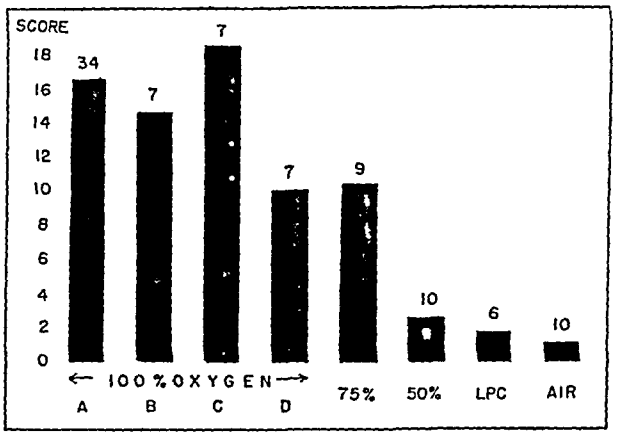


Chart 2.—Severity of substernal discomfort. The groups are the same as in chart 1. Severity of symptoms has been rated as follows: severe discomfort during the experiment 30 points, moderate discomfort 20 points, mild discomfort 10 points, slight temporary discomfort occurring only after the twenty four hour experiment 5 points. The total score in each group was divided by the number of subjects of each group to determine the average severity per subject.

in men breathing higher concentrations of oxygen is therefore significant.

The cause of this reduction in vital capacity is not certain. In some instances the subject was unwilling to make a maximal inspiratory effort because of pain. More often, however, the decrease in vital capacity bore no relationship to the severity of the substernal distress. Thus, of 26 instances in which the vital capacity was decreased more than 300 cc., in only 5

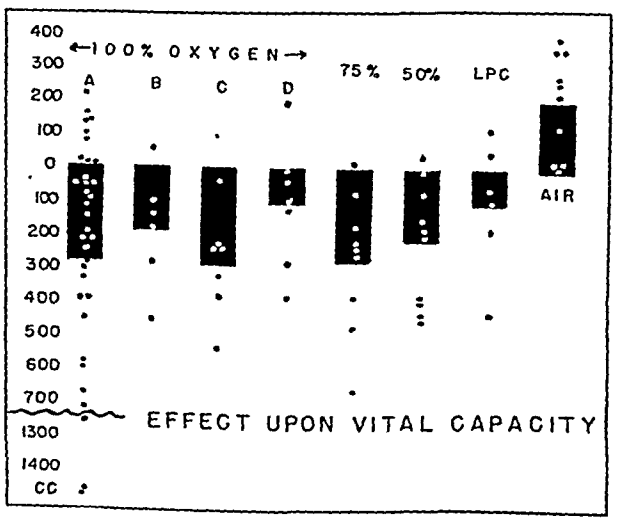


Chart 3.—The groups are the same as in charts 1 and 2. The individual variations in vital capacity from the beginning to the end of the experiment and the average for each group are shown. Above zero represents an increase in vital capacity, below represents a decrease.

was the substernal distress severe, in 9 it was moderate, in 4 slight and in 8 lacking entirely. Among 15 subjects in whom the vital capacity was decreased more

16 Fine, J.; Hermanson, L., and Frehling, S.: Further Clinical Experiences with 95 per Cent Oxygen for the Absorption of Air from the Body Tissues, Ann. Surg. **107**: 1-13 (Jan.) 1938.

than 400 cc., only 4 had severe distress, 5 had moderate discomfort, 2 slight and 4 none at all. Conversely, of the 26 subjects who had no substernal distress during inhalation of 50 to 100 per cent oxygen 7 had a decrease in vital capacity of more than 380 cc.

Since the decreased vital capacity could not be correlated positively with substernal distress, other explanations must be sought. Atelectasis (due to absorption of oxygen from poorly ventilated alveoli), pulmonary congestion (caused by the irritant effect of oxygen) or early pulmonary edema were considered. X-rays of the chest were taken in 6 subjects before and after the twenty-four hour exposure; these revealed no abnormalities, but it is likely that roentgenograms would not detect minor changes in the lungs. Physical examination of the chest was performed in all 90 subjects and likewise failed to reveal any pulmonary abnormalities after the twenty-four hour period. The arterial oxygen saturation (6 subjects) showed no significant changes during or immediately after the twenty-four hour period and direct measurements of arterial oxygen tension[17] in 2 subjects showed no deviation from normal at the end of twenty-four hours. This indicates that the ability of the alveolar membrane to transport oxygen was not interfered with. The minute volume of respiration was measured in 6 subjects breathing room air before and immediately after the twenty-four hour exposure to 100 per cent oxygen in the hood. It was increased after the experiment in only 2 of the 6; 1 of these had a 13 per cent increase in minute volume and a 33 per cent increase in rate, and the other had a 25 per cent increase in minute volume and a 20 per cent increase in rate. The former had very severe symptoms and a decreased vital capacity of 1,480 cc.; the latter had neither. Since pronounced changes in vital capacity must occur before minute volume is definitely increased,[18] respiratory changes are not sensitive indicators of pulmonary atelectasis, congestion or edema.

In summary, the only evidence of alveolar damage obtained in these experiments was a decrease in vital capacity occurring in subjects who had no substernal pain or cough. In view of alveolar damage that occurs in animals with longer exposure to 100 per cent oxygen, we believe that these subjects had signs of early pulmonary irritation.

5. Other Symptoms: Twenty-five per cent of those inhaling 100 per cent oxygen continuously developed ear discomfort during or (usually) after the experiment. Only 5 per cent of those breathing 100 per cent oxygen intermittently and 10 per cent of those breathing room air developed this symptom. It was due probably to absorption of gas from the middle ear (aural atelectasis); this occurs more rapidly when the gas breathed is 100 per cent oxygen. Since such gas is absorbed only when the pharyngeal end of the eustachian tube is closed, this indicates that a mild inflammatory reaction must have occurred in the nasopharynx.

Unusual degrees of fatigue were reported by 25 per cent of those breathing 100 per cent oxygen continuously and by 10 per cent of those breathing room air. Five subjects noted joint pains or crackling in the joints during or after the breathing of 100 per cent oxygen for twenty-four hours; these complaints were similar to early signs of bends. Three subjects noted paresthesias such as tingling in the extremities while breathing 100 per cent oxygen; these symptoms were similar to those commonly noted in decompression sickness. Muscle pains in the legs were noted by 4 subjects, hoarseness by 2, palpitation (on exercise) by 3, aching or sensitive teeth by 7, dizziness or lightheadedness in the postexperimental period by 7. None of these symptoms occurred in subjects breathing room air.

B. *Effects of High Concentrations of Oxygen on Other Body Systems.*—1. Red Blood Cells: Red blood cells were counted before and after inhalation of 100 per cent oxygen for twenty to twenty-four hours by 28 subjects and before and after inhalation of room air by 10 subjects. All of the blood studies were carried out on venous blood samples. Duplicate analyses were made. The preexperiment bloods were drawn between 6 and 7 p. m. (after the evening meal); the second sample was taken while the subject was still breathing gas between the twentieth and twenty-fourth hours of the experiment. In the group of 28 breathing 100 per cent oxygen, 19 showed increases in red blood cells ranging from 60,000 cells per cubic millimeter to 1,210,000, and 9 showed a decrease ranging from 40,000 to 640,000; the average for the whole group was an increase of 220,000 cells per cubic millimeter, which is within the limit of error of the method. Of the 10 control subjects breathing room air, 8 showed increases (180,000 to 1,350,000) and 2 showed decreases (80,000 and 540,000); the average for the 10 subjects was an increase of 560,000 cells per cubic millimeter. The increase in red blood cells occurring in the group breathing room air negates any significance which might be attached to the slight rise in red blood cells following 100 per cent oxygen inhalation. Reticulocyte counts were performed on 28 subjects breathing 100 per cent oxygen and in 10 controls breathing room air. In only 3 of the 28 did the count rise above 1.0 per cent (1.2, 1.8, 2.8 per cent); in 2 of the controls it rose above 1.0 per cent (1.5 and 4.0 per cent).

2. Hemoglobin: Hemoglobin was converted into cyanmethemoglobin and measured as total pigment by the Evelyn photoelectric colorimeter using constants obtained by comparison with the spectrophotometric method of Drabkin.[19] Of 28 subjects breathing 100 per cent oxygen, in 12 an increase occurred (0.15 Gm. to 0.89 Gm.) and in 15 a decrease occurred (0.13 Gm. to 1.67 Gm.); in 1 there was no change. The average of all 28 showed a decrease of 0.13 Gm. Of the 10 controls breathing room air, in 6 the hemoglobin increased (0.13 to 0.78) and in 4 it decreased (0.06 to 0.85); the average was an increase of 0.11 Gm. These average changes are not significant. It is interesting to note that hemoglobin determinations (done by a very accurate method) may vary by almost 1 Gm. on two successive days even though breathing room air. This confirms the observations of Dreyer and his associates[20] and of Rabinowitch.[21]

3. Hematocrit: Hematocrit determinations were done on 27 subjects breathing 100 per cent oxygen; 16 showed an increase (0.2 to 4.6 per cent), 10 showed a decrease (0.1 to 3.6 per cent) and 1 showed no change. The average change was an increase of 0.36

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20. Dreyer, G.; Bazett, H. C., and Pierce, H. F.: Diurnal Variations in the Hemoglobin Content of the Blood, Lancet **2**: 588-591 (Sept. 18) 1920.

21. Rabinowitch, I. M.: Variations of the Percentage of Hemoglobin in Man During the Day, J. Lab. & Clin. Med. **9**: 120-123 (Nov.) 1923

per cent. Similar determinations were performed on the subjects breathing room air; 5 increased (0.6 to 4.8 per cent) and 5 decreased (0.2 to 1.9 per cent). The average was an increase of 0.55 per cent.

4. White Blood Cells: Of the group of 28 breathing 100 per cent oxygen, the white blood cells count did not change in 3, increased in 7 (by 100 to 6,100 cells per cubic millimeter) and decreased in 18 (by 100 to 3,200 cells per cubic millimeter). The average change was a decrease of 190 cells per cubic millimeter. The apparent decrease in white blood cells postexperimentally was probably due to the fact that the control blood was obtained one hour after the evening meal and the white blood cells were slightly elevated at this time in response to food. This explanation is strengthened by the fact that in the group of 10 controls breathing room air the white blood cells decreased in 7 (by 50 to 2,900 cells per cubic millimeter) and increased in only 3 (100 to 3,500); the average decrease was 440 cells per cubic millimeter. The highest absolute level to which the white blood cells rose in the group breathing 100 per cent oxygen was 12,400 in 1 case (this subject had only slight substernal discomfort); in only 2 other instances did the white blood cells rise over 10,000 (10,350 to 10,100). The leukocytosis described by Behnke [2] and Becker-Freyseng and Clamann [4] was therefore not observed in this series. No abnormalities were noted in the differential white blood cells (granulocytes, filament and nonfilament, lymphocytes, monocytes, eosinophils or basophils).

In summary, it is apparent that inhalation of high concentrations of oxygen for twenty-four hours does not affect the formed elements of the blood.

5. Arterial p_H and Carbon Dioxide: In two subjects, arterial blood p_H was measured in a closed glass electrode at 38 C. before and at the conclusion of the twenty-four hour period of 100 per cent oxygen inhalation. In neither instance was there a change in p_H greater than 0.01 unit (limit of error of the measurement). Arterial carbon dioxide tension was calculated from measurements of arterial blood p_H and carbon dioxide content; in 1 there was a decrease of 0.7 mm. of mercury and in the other an increase of 1.0 mm. of mercury. Arterial whole blood carbon dioxide content was measured before and at the end of the twenty-four hour period of oxygen inhalation in 6 subjects; in 2 there was no change, in 1 an increase and in 3 a decrease; the average change was a decrease of 1.03 volumes per cent.

6. Pulse: A slowing of the pulse has been reported [22] during the inhalation of 100 per cent oxygen. This has been confirmed in this study, but since the control subjects breathing room air showed a bradycardia to the same degree it is obvious that this pulse slowing represents the effect of bed rest rather than of the gas breathed (table 1).

The figures in the last two columns were obtained as follows: At the end of the experiment the subjects were put at complete rest for fifteen to forty-five minutes while still breathing the gas and a pulse count was taken; then the mask was removed and the subject continued resting for another fifteen to forty-five minutes and the second count (room air) taken. In no case was there any significant increase in pulse on changing from oxygen to room air.

7. Blood Pressure: In 28 subjects breathing 100 per cent oxygen and in 10 breathing room air the blood pressure was determined before the experiment (twenty minutes' rest), at the end of the twenty-four hour period (twenty minutes' rest) and twenty minutes after removal of the mask. The average figures are shown in table 2. These figures show no significant trend in blood pressure as a result of inhalation of 100 per cent oxygen.

8. Respiration: In the 84 subjects wearing masks respiration was not measured quantitatively, but there was no instance in which dyspnea or hyperpnea was noted by subjects or observers. The total number of liters of oxygen used per subject in twenty-four hours could not be measured accurately because of wastage during tube feeding but corresponded roughly with the calculated amount for subjects at partial rest. In the 6 subjects in the hood, the respiratory rate was counted at least twice an hour for the twenty-four hours. In no instance did the respiratory rate increase above normal figures during the period of oxygen inhalation. These findings do not controvert previous findings [23] that oxygen increases respiratory minute volume by 10 to 15 per cent, for the experimental conditions in this work do not compare with the former; however, the break in respiratory compensation and dyspnea seen by others [2] did not occur in our experiments.

TABLE 1.—*Effect of 100 per Cent Oxygen on Pulse as Compared with Controls*

	Before Experiment	Lowest During Experiment	End of Experiment, 15' Rest	After Experiment, 30-40' Rest
100% oxygen				
Hood (average 6 men).....	69	49	61.6	60.6
Mask (average 28 men).....	80.5	55.5	65.6	67.3
Room air				
Mask (average 10 men).....	80.6	56 2	63 6	67.2

TABLE 2.—*Effect of 100 per Cent Oxygen on Blood Pressure as Compared with Controls*

	Before Experiment	End of Experiment	After Experiment
100% oxygen (28 men).....	128/76	127/75	122/76
Room air (10 men).....	126/78	120/76	119/80

COMMENT

There is no agreement whatever among clinical investigators concerning the harmful effects of oxygen on man. At one extreme Behnke has reported that healthy men between the ages of 20 and 40 are not able to breathe 99 per cent oxygen for periods in excess of seven hours, dyspnea, flushing of the face, nausea and substernal soreness terminating his experiments. At the other extreme are statements that 100 per cent oxygen is harmless in man when breathed continuously for forty-eight hours (Boothby) or even for much longer periods (Evans). Our results do not agree with either of these views. We have shown that signs of respiratory irritation do occur in man, characterized chiefly by substernal soreness. The average time of onset was not seven hours but fourteen hours, and all of the subjects were able to tolerate this discomfort for the full twenty-four hour period. As is the case with animals, there appears to be a factor of individual variation, some subjects having severe symptoms and a few

22. Benedict, F. G., and Higgins, H. L.: Effects of Men at Rest Breathing Oxygen Rich Mixtures, Am. J. Physiol. 28: 1 28 (April) 1911.

23. Shock, N. W., and Soley, M. H.: Effect of Breathing Pure Oxygen on Respiratory Volume in Humans, Proc. Soc. Exper. Biol & Med. 44: 418-420 (June) 1940. Watt, J. G.; Dumke, P. R., and Comroe, J. H., Jr.: Effects of Inhalation of 100 per cent and 14 per cent Oxygen on Respiration of Unanesthetized Dogs Before and After Chemoreceptor Denervation, Am. J. Physiol 138: 610 617 (March) 1943.

none at all. We have no explanation for the dyspnea, flushing and nausea noted by Behnke; these symptoms did not occur in our series. However, we can offer an explanation for the failure of other observers to note toxic effects from oxygen inhalation in man. As indicated previously, so-called "100 per cent" oxygen as administered clinically rarely approaches that concentration. The data of Reinhard and his associates [24] illustrate this very well. They report the administration of 70 to 100 per cent oxygen "continuously" for eight to twenty days to 4 patients with sickle cell anemia. However, while oxygen was administered for a total of seventy-two patient days, alveolar oxygen concentrations were determined only four times over this whole period (three times in 1 patient, once in another and not at all in 2 patients). Since these four analyses varied from 63.4 to 90.6 per cent oxygen, it is obvious that some might have been considerably lower, especially during sleep. It is impossible to tell whether these patients were breathing 60 to 70 per cent oxygen or 80 to 90 per cent oxygen and, since 60 per cent oxygen produces no toxic symptoms but 75 per cent may, no conclusions can be drawn from such uncontrolled observations. Their arterial blood analyses also suggest that less than 60 per cent oxygen was being inhaled, since inhalation of 100 per cent oxygen should result in at least 1.5 cc. of additional oxygen carried in the plasma over that dissolved when blood is equilibrated with room air; yet an increase in excess of 0.4 cc. was not recorded in their series. We began our investigation using several half-face masks (aviation type) and found that these often provided only 50 per cent oxygen. Clinicians must recognize the fact that just as oxygen tents leak and often provide only 30 per cent oxygen instead of 60 per cent, so masks will also leak when improperly applied. Figures relating to concentrations of inhaled oxygen are meaningless unless frequent determinations of oxygen concentrations in the mask are performed around the clock (during the patient's sleeping as well as his waking hours).

Another explanation for the failure of clinicians to observe the toxic effects of high oxygen concentrations is that patients with pneumonia or coronary occlusion may be so uncomfortable as a result of the pain of pleurisy or of cardiac ischemia that the substernal discomfort produced by oxygen may be overlooked.

Since we have shown that it is possible to provide patients with 100 per cent oxygen continuously by the use of full face mask and demand apparatus, and since such apparatus may soon be made available for clinical use, it becomes necessary to consider the advisability of this procedure. We feel that the clinician must bear in mind that oxygen is a drug and must be used in accordance with well recognized pharmacologic principles; i. e., since it has certain toxic effects and is not completely harmless (as widely believed in clinical circles) it should be given only in the lowest dosage or concentration required by the particular patient. Our results indicate that the instance of oxygen toxicity reported by Becker-Freyseng and Clamann [4] was not a chance observation and did not represent individual susceptibility but was an example of a now well defined clinical entity characterized by rhinitis, pharyngitis, substernal pain accentuated on deep breathing and pulmonary change manifested by a decreased vital capacity. Over a twenty-four hour period this pulmonary change probably is not extensive enough to result in any loss of lung function (such as proper oxygenation of the blood). While prolongation of the period of oxygen breathing to two, three or four days was not feasible in our experiments, we must assume on the basis of these twenty-four hour experiments, of Becker-Freyseng and Clamann's sixty-five hour experiments and of animal experiments, that severe pulmonary congestion and edema can result in man breathing oxygen for a sufficient period of time. In our experience the symptoms were never alarming and were rapidly reversible on cessation of the oxygen inhalation with no permanent harm resulting. This may not be true of longer exposures in normal men or even of short exposures in persons with pulmonary disease.

While we know that the tolerance of normal men to inhalation of 100 per cent oxygen continuously is in excess of twenty-four hours, we have little accurate information regarding the time required to produce pulmonary changes in lungs already damaged by inflammation or by irritant gases (industrial or war gases); we excluded from our tests all persons with rhinitis, pharyngitis or bronchitis. Until we are proved to be wrong, we think it is reasonable to assume that 100 per cent oxygen would be even more irritant when placed in contact with surfaces already damaged.

These are several dissenting points of view: (*a*) Evans [6] believes that inhalation of 100 per cent oxygen cannot be harmful to a patient with arterial anoxemia, for 100 per cent oxygen in such a case never raises the oxygen pressure to the toxic level which might be obtained in normal men. This is due to the presence of pulmonary transudate or exudate (as in pulmonary edema or bronchopneumonia), which prevents the high tension of oxygen from reaching the alveolar membrane. However, only the damaged alveoli would be thus protected from the harmful effects of high oxygen, which could still be exerted on the remaining normal alveoli or on the tracheobronchial tree. (*b*) Drinker [25] believes that the use of 100 per cent oxygen can actually aid in the resorption of pulmonary transudates. However, this is true only when the pulmonary edema is due primarily to severe anoxia with resultant increase in capillary permeability; in such instances 100 per cent oxygen would tend to reverse this process at least initially. The great majority of pulmonary transudates are not caused primarily by anoxia.

In general it may be said that there are three chief groups of indications for oxygen therapy: (1) to combat arterial anoxemia, (2) to hyperoxygenate the blood in conditions not associated with anoxemia (coronary occlusion, fever, migraine, polycythemia and so on) and (3) to eliminate nitrogen from the body (to prevent decompression sickness or to combat intestinal distention).

With respect to the first, we believe that the rational use of oxygen in anoxemic states should be governed by measurements of arterial blood oxygen saturation. The technics of arterial puncture and determination of arterial blood oxygen saturation by the Van Slyke method are simple enough to be employed more widely. It is amazing that, in an era when sulfonamide, penicillin, quinacrine (atabrine) and other types of therapy are being made more exact by studies of drug concentration in the blood, blood oxygen concentration studies are almost completely neglected in the clinic. The indication for this type of oxygen therapy is decreased saturation of the arterial blood; a high enough dose

24. Reinhard, E. H.; Moore, C. V.; Dubach, R., and Wade, L.: Depressant Effects of High Concentrations of Inspired Oxygen on Erythrocytogenesis, J. Clin. Investigation 23: 682-699 (Sept.) 1944.

25. Drinker, C. K.: Application of Pulmonary Physiology to Theoretical Procedures, New England J. Med. 231: 477-482 (Oct. 5) 1944.

or concentration has been given when the oxygen saturation has returned to normal, and it is not necessary to exceed this. We believe that 100 per cent oxygen may be given with safety to all anoxemic patients for short periods. When oxygen therapy must be continued beyond a twelve hour period, the concentration should be decreased to 50 or 60 per cent unless this is insufficient properly to oxygenate the arterial blood. When unsaturation of the arterial blood persists despite inhalation of 60 per cent oxygen, 80 to 100 per cent oxygen should be given, since arterial unsaturation represents more of a threat to the patient's life than does the possibility of a tracheobronchitis due to the oxygen. We take the conservative stand that 100 per cent oxygen should be used for long periods only when lower concentrations fail to saturate the blood. Many patients given oxygen therapy are seriously ill and ultimately die; it is difficult to assess the harmful effects of oxygen in these cases [26] and at present we must transfer to the therapy of these individuals knowledge gained in dealing with normal subjects. Physicians must not construe these statements to mean that oxygen therapy in general is harmful; oxygen therapy is of great value with practically no harmful effects when used in scientifically controlled concentrations.

With respect to the second indication for 100 per cent oxygen therapy (hyperoxygenation of the blood in conditions not associated with anoxemia or lung damage) it appears safe to use 100 per cent oxygen for twenty-four hours and possibly longer, for these individuals are wholly comparable to our normal subjects. In these cases the physician should question the patient every six hours in regard to substernal distress, especially following deep breathing or removal of the mask; if not contraindicated clinically, a careful vital capacity determination should be made twice daily to detect the appearance of pulmonary congestion.

With respect to the third group (denitrogenation) there is rarely a need for prolonged breathing of 100 per cent oxygen since nitrogen is eliminated from the body within several hours. Further inhalation of 100 per cent oxygen to remove nitrogen and relieve intestinal distention should not be necessary unless the patient swallows air on removal of the mask; in our opinion other procedures, such as intubation with the Miller-Abbott tube, should be tried first before resorting to prolonged breathing of 100 per cent oxygen.

With respect to the causation of the symptoms of oxygen toxicity, we have shown for the first time in man that these symptoms are caused by the high tension of oxygen rather than by denitrogenation. Our experiments with 100 per cent oxygen at an ambient pressure of 380 mm. of mercury show that denitrogenation per se does not produce symptoms as long as the oxygen tension is not abnormally high. This indicates that prolonged inhalation of 100 per cent oxygen at high altitudes in aircraft will not be harmful because the total atmospheric pressure is so low that even though all the gas inspired is pure oxygen its total pressure will never reach the irritant level. This confirms the opinion formed by Armstrong [27] on the basis of animal experimentation.

Our experiments have not confirmed the work of those investigators who have reported significant changes in hemoglobin, red blood cells, white blood cells, reticulocyte counts, pulse or blood pressure as a result of inhalation of oxygen for long periods. We believe that those who have previously reported these changes were misled because of lack of proper controls or by the use of blood obtained by finger puncture. We found no significant change in arterial blood p_H, carbon dioxide content or carbon dioxide tension at the end of twenty-four hours oxygen inhalation; we did not obtain mixed venous blood for p_H or carbon dioxide tension determinations.

One might wonder why the inhalation of 100 per cent oxygen affects chiefly the respiratory tract. We believe this is because these are the only surfaces in the body that are exposed to 100 per cent oxygen or a pO_2 of 670 to 690 mm.; despite the high arterial blood pO_2, the average tissue tension elsewhere is probably not over 70 mm. of mercury because of the steep pO_2 gradient in the capillaries. The pulmonary membranes, on the other hand, receive the high pO_2 by direct contact with the inspired gas.

We have found that most of the masks in common use do not deliver 95 to 100 per cent oxygen as applied routinely (without special precautions or specially trained attendants). We have found that the full face mask is more suitable for prolonged administration of 100 per cent oxygen. It is easy to apply and remove, is less annoying to the patient, is a good humidifier, fits practically all types of faces, does not build up excessive concentrations of carbon dioxide and may be used with positive pressure breathing if desired. Whenever the use of 100 per cent oxygen is essential for long periods, we recommend the use of this type mask. In view of the experiments of Hulpieu and Cole [28] it seems advisable to use a humidifying system in all types of oxygen administration.

SUMMARY AND CONCLUSIONS

1. One hundred per cent oxygen administered to a large group of normal men continuously for twenty-four hours produced substernal distress in 82 per cent. Vital capacity was usually decreased significantly. Signs of nose and throat irritation were common. Control subjects breathing room air through the same apparatus did not experience these symptoms.

2. Intermittence (up to fifteen minutes rest every three hours) did not decrease the incidence of the complaints.

3. Seventy-five per cent oxygen produced symptoms in only 55 per cent of the subjects; 50 per cent oxygen produced no symptoms during the twenty-four hour period. Since oxygen tents or catheters rarely produce alveolar oxygen concentrations higher than 50 per cent, these forms of administering oxygen are completely safe.

4. Breathing of 100 per cent oxygen at high altitudes (low total atmospheric pressures) does not produce symptoms, indicating that the symptoms are due to high oxygen tensions and not to elimination of nitrogen.

5. The use of 100 per cent oxygen for short periods is probably safe in all patients, but when oxygen must be given in excess of twelve hours the following rules should be followed: (*a*) the oxygen concentration should be reduced to 60 per cent unless this is insufficient to saturate the arterial blood, and (*b*) if 100 per cent oxygen must be administered a careful check should be made for the symptoms most likely to occur as a result of the high tension of oxygen.

26. Boothby, W. M.: Oxygen Therapy, J. A. M. A. **99**: 2106-2112 (Dec. 17) 1932.

27. Armstrong, H. G.: The Toxicity of Oxygen at Decreased Barometric Pressures, Mil. Surgeon **83**: 148-151 (Aug.) 1938.

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THE CLINICAL MANIFESTATIONS OF POLIOMYELITIS

TREATMENT WITH NEOSTIGMINE AND THE KENNY METHOD

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During recent years much controversy has centered around the introduction of the Kenny [1] concept of poliomyelitis, which forms the rationale for the treatment which she advocates for the manifestations of this disease. Kenny describes three cardinal symptoms of poliomyelitis: muscle spasm, mental alienation and incoordination. She considers muscle spasm an early and important manifestation of the disease, present in all cases and underlying most of the disability associated with the disease. Mental alienation she describes as the mode whereby the function of a muscle opposed to a muscle in spasm is disturbed although no organic lesion exists in the motor pathways to the muscle. Rather the muscle is dissociated from, or "forgotten" by, the central nervous system. This she considers a more important cause of disability than paralysis due to destruction of motor cells in the anterior horn. Finally, Kenny describes incoordination as the dysrhythmic or inefficient contraction of muscles.

Recent investigation casts doubt on the validity of Kenny's concept. Moldaver [2] found that neuromuscular degeneration was present in all muscles considered "alienated." He felt that muscle spasm was a complex phenomenon produced by three factors: meningeal irritation, enhanced stretch reflexes of muscles opposed to muscles exhibiting neuromuscular degeneration, and irritative lesions of posterior ganglions and posterior horn cells. Schwartz and Bouman [3] were able to demonstrate action currents suggesting spasm in all muscles except those completely paralyzed. Clinical spasm was often not apparent, especially in weak muscles. Likewise, Watkins, Brazier and Schwab [4] found increased action potentials in the resting state in all muscles involved, whether in spasm or weak, especially after three months' recovery period. These observers felt that this was evidence of recovery of innervation. In addition they noted simultaneous action currents to both of two opposing muscles in patients recovering from poliomyelitis, negating Sherrington's law of reciprocal innervation and possibly accounting for the incoordination described by Kenny.

Numerous investigators [5] have reported on the treatment of these manifestations by the Kenny method of hot foments and muscle reeducation, for the most part favorably. Kabat and Knapp [6] first described the use of neostigmine as a method of relaxing muscle spasm when used as an adjunct to hot foments and felt that return of motor power was enhanced and incoordination lessened.

It is our purpose in this paper to analyze the incidence and importance of the various manifestations of poliomyelitis on a purely clinical basis and to attempt to estimate the efficacy of neostigmine and hot foments combined with muscle reeducation in the relief of these phenomena.

CLINICAL MANIFESTATIONS

One hundred cases of poliomyelitis were observed in the Isolation Division of the San Francisco Hospital. These were all acute cases, the duration of illness on entry varying between one and thirty days. The treatment described was usually initiated within the first few days of hospitalization. Sixty-four males and thirty-six females, whose average age was 13.4 years, ranging in age from 3 months to 44 years, were studied.

Muscle Spasm.—All cases exhibited the phenomenon described by Kenny [1] as muscle spasm. This consisted primarily in a hyperirritable stretch reflex producing limitation of movement of parts. In addition, shortening of muscles at rest was often seen producing deformity. That this phenomenon of itself may produce disability is undoubted regardless of its role in production of muscle weakness, as evidenced by the shortened, fibrosed muscles seen in late or neglected cases. The muscles most commonly involved (table 1) were the posterior cervical, back and hamstring groups. These are the groups whose irritability to stretch stimulation is commonly attributed to meningeal irritation. That such is not the case in poliomyelitis is suggested by the persistence of these signs in some cases for many months after all possibility of meningeal irritation is passed, and also by the entire absence of spinal fluid abnormalities in a significant number of patients. In 93 early cases in which lumbar puncture was done, completely negative findings, usually on repeated taps, were obtained in 19, or 20.4 per cent. Seven of these cases showed muscle paralysis. In addition, 4 cases exhibited elevation of spinal fluid protein without pleocytosis. That the spasm was due primarily to enhanced stretch reflexes of muscles opposing muscles undergoing neuromuscular degeneration seemed doubtful, since the muscles opposing the muscles in spasm very frequently gave no clinical evidence of weakness, although no measurements of chronaxia were made.

Muscle Weakness.—This was observed in 48 (48.0 per cent) cases. It frequently existed in muscles whose opponents were not in spasm. However, more commonly the muscle opposing the weak muscle evidenced some degree of spasm. Quite commonly seen was the combination of spasm and weakness in a single muscle, whether or not opposed to a muscle in spasm. These weak muscles often developed atrophy while under treatment. The associated tendon reflexes were depressed or absent in 34.7 per cent of all cases. Hyperactive reflexes were seen in 17.9 per cent of cases, usually when the effector muscle exhibited spasm. Motor power generally returned gradually to weak

The neostigmine used in this study was furnished by Hoffmann LaRoche, Inc.
Mrs. Karen Blake, Miss Norah Lane, Mrs. Carolyn Herndon and the house staff of the San Francisco Hospital rendered invaluable aid in the treatment of these patients.
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muscles during reeducation, although rarely almost instantaneous return of function was noted when spasm was relieved and reeducation attempted, suggesting absence of organic interruption of motor pathways.

Incoordination.—We likewise frequently observed incoordination. The most striking example of this misuse of muscles was repeatedly demonstrated in patients having weak quadriceps, who, on being asked to extend the knee, would visibly and palpably contract the hamstrings. This was exhibited less strikingly in other muscles.

TREATMENT

We attempted to study the effects of neostigmine and packs on muscle spasm in two ways. Realizing the tremendous variation in spontaneous recovery rate in poliomyelitis regardless of treatment, we first determined the ability of neostigmine to relax muscle spasm and increase motor power one hour after a hypodermic injection of neostigmine methylsulfate, control measurements having been made immediately before injection. Children under 6 years received 0.5 mg., those between 6 and 12 years 1.0 mg. and adults 1.5 mg. accompanied by 0.4 mg. and 0.6 mg. of atropine in the latter two age groups, as described by Kabat and Knapp.[6] Measurements of range of motion were made with a goniometer. Motor power was estimated only by clinical examination. From repeated measurements of patients under treatment we found that a small variation of less than 10 degrees in either direction in motion occurred frequently, so accordingly we did not consider relaxation significant in the one hour test unless it equaled or exceeded 10 degrees in at least one of the measured movements. Of 28 early cases in which the one hour test was done, 24 (85.7 per cent) showed a significant degree of muscle relaxation within one hour. In individual cases there was often a startling difference in amount of relaxation of various muscle groups, some showing definite improvement and others changing little or not at all. A large number of cases showed a partial or, rarely, complete regression to previous range of motion in spite of continued treatment with packs and neostigmine, with subsequent more gradual improvement. That this was not entirely due to progressive involvement by the disease was suggested by the fact that regression was also observed in some cases first tested over two weeks after onset. Occasionally the relaxation of spasm was dramatic, and in 1 instance of a patient exhibiting moderate spasm of the posterior neck, back and hamstring groups almost complete motion was restored in one hour. In 2 instances of quadriceps muscles exhibiting motor weakness, definite return of motor power was noted during the test period.

Secondly, an attempt was made to compare the effectiveness of neostigmine or hot foments singly or in combination in a selected group of cases without paralysis and having spasm largely limited to the posterior cervical, back and hamstring groups. Thirty-one such cases were studied. Neostigmine was administered subcutaneously every other day in similar dosage to that used in the one hour test. In addition most patients also received neostigmine bromide by mouth thrice daily. Children under 6 years received 15 mg. three times daily, those from 6 to 12 years received 30 mg. thrice daily and adults received 45 mg. on a similar schedule. When parasympathomimetic side effects such as nausea, diarrhea or urgency occurred, increased atropinization almost always promptly relieved them. No serious toxic effects of neostigmine were noted. Measurements of range of motion were made at frequent intervals and comparison was made of the average duration of treatment before complete recovery. The results (table 2) we feel are misleading and illustrate the fact that no statement should be made on the long term results of any treatment of poliomyelitis without a very large controlled series. We suggest a cooperative clinical group for this purpose in the future.

With the exception of 2 patients who had prompt improvement in motor power during the one hour test, muscle power exhibited extreme variation in rate of return. In all, 45 patients were treated with neostigmine. Except in 4 instances these patients also received hot foments. The variation in duration of hospital stay and amount of residual impairment in those receiving packs alone or combined with neostigmine was maximal and would allow no accurate estimation of the relative efficacy of the two modes of treatment.

Certain statements may be made, however, concerning end results of the Kenny treatment with and without neostigmine. Thirty one (31 per cent) of our series have residual muscle weakness. (Two have facial weakness only.) Of this group only 1 has a contracture, not the fault of therapy but due to lack of cooperation. All patients are able to use what muscle power remains with remarkable efficiency. All are able to walk without braces. Fourteen of this group were treated with packs alone, 17 with packs and neostigmine.

TABLE 1.—*Distribution of Muscle Spasm in 100 Patients*

Muscle group	Patients with Spasm, %
Posterior cervical	99.0
Back	100.0
Hamstring	85.0
Quadriceps femoris	30.0
Adductor magnus	28.0
Calf	13.0
Pectoral	9.0
Other	21.0

TABLE 2.—*Treatment of Selected Patients, Exhibiting Only Spasm of Neck, Back and Hamstring Groups*

Treatment	Number of Patients	Average Days Before Recovery	Range of Days Before Recovery
Packs only	17	35.6	10 to 77
Neostigmine only	4	21.8	9 to 36
Packs and neostigmine	10	54.7	7 to 110

CONCLUSIONS

1. Muscle spasm is of uniform occurrence in early poliomyelitis and is of great diagnostic value.
2. Muscle spasm does not appear to be due primarily to meningeal irritation. Spinal fluid pleocytosis is frequently absent.
3. Muscle spasm is in itself disabling, but its role in the etiology of muscle weakness is unproved.
4. Neostigmine methylsulfate will relax the muscle spasm of poliomyelitis at least temporarily.
5. The value of continued medication with neostigmine, orally or subcutaneously, requires further proof, but its further trial under controlled circumstances is definitely warranted.
6. The Kenny treatment with or without neostigmine is an effective method of preventing contracture and deformity.
7. Our study gave no proof nor disproof that either neostigmine or Kenny packs reduce the incidence of paralysis.

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THE VALUE OF NEOSTIGMINE IN ACUTE ANTERIOR POLIOMYELITIS

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Recent developments in the therapy of poliomyelitis have emphasized the element of spasm of the involved muscles and the desirability of treating this spasticity. In the Kenny method, hot foments are used for this purpose. Kabat and Knapp [1] have reported favorably on the use of neostigmine to control the muscle spasm. They have attacked the problem from the point of view of the disturbed neurophysiology described by Watkins, Brazier and Schwab [2] and by Moldaver.[3]

Since many of the patients studied by Kabat and Knapp were in the chronic stage of poliomyelitis, we have been interested in studying the relaxing effect of neostigmine on the acute stage of the disease. Thus far we have used neostigmine in 24 cases in which the age ranged from 3 to 55 years. The patients had been ill with poliomyelitis for an average of only 5.5 days, with the duratioin of the disease before admission to the hospital ranging from one to twenty-one days. The average duration of neostigmine therapy for this group was 14.6 days, while the control cases were studied for an average of 10.8 days.

PROCEDURE

On admission to the hospital all patients were examined thoroughly, spinal taps were performed, and the diagnosis of acute anterior poliomyelitis was thus confirmed. The muscles most commonly found to be in spasm were the gluteals, hamstrings, extensors of the neck and the sacrospinalis groups, but only the hamstring and gluteal muscles have been studied in relation to relaxation in this series.

In order to evaluate the effectiveness of therapy, specific measurements were made of the amount of spasm in these muscles. The degree of spasm in the hamstring muscles was determined by measuring the angle formed at the popliteal fossa between the leg and the thigh, with the thigh flexed at a right angle to the plane of the body. The amount of gluteal spasm was determined by measuring, with the knee extended, the angle formed between the thigh and the support on which the body rested. The patient's subjective sensation of pain was used as the limit of the range of passive motion possible in the affected muscle.

After the admission work-up of the patient was completed, the following regimen was instituted:

At 8 a. m. the angles related to the gluteal or hamstring spasm were measured. Immediately thereafter the patients were given neostigmine methylsulfate. Atropine sulfate 1/100 to 1/200 grain (0.65 to 0.32 mg.) was administered hypodermically at the same time in an attempt to control parasympathetic reactions.

From the South View Isolation Hospital of the Milwaukee Health Department and the Department of Internal Medicine, Marquette University School of Medicine.

1. Kabat, H., and Knapp, M. E.: The Use of Prostigmine in the Treatment of Poliomyelitis, J. A. M. A. **122**: 989-995 (Aug. 7) 1943.
2. Watkins, A. L.; Brazier, M. A. B., and Schwab, R. S.: Concepts of Muscle Dysfunction in Poliomyelitis, Based on Electromyographic Studies, J. A. M. A. **123**: 188-192 (Sept. 25) 1943.
3. Moldaver, J.: Physiopathologic Aspect of the Disorders of Muscles in Infantile Paralysis: Preliminary Report, J. A. M. A. **123**: 74-77 (Sept. 11) 1943.

At 9 a. m. the angles were remeasured and the number of degrees of increase due to muscular relaxation were thus determined. Hot fomentations were then applied continuously to the involved muscles according to the Kenny technic until 3 p. m., when they were stopped and the angles again measured.

Two methods of administration of neostigmine were used in our study:

1. Thirteen of the patients received single daily subcutaneous injections of 1:2,000 neostigmine, the usual dose being 1.0 mg.

2. Six of these patients were changed to oral administration of the drug after four to thirteen days, and 11 additional patients received the oral neostigmine from the beginning of their therapy. The oral neostigmine was given twice daily, 30 mg. being given at 8 a. m., with 15 mg. at 6 p. m.

Six patients served as partial controls. Unfortunately some of these had received neostigmine for a portion of their therapeutic period. Three of these were treated with neostigmine for six, seven and eleven days respectively before it was discontinued and relaxation studied without its use. One patient was studied without neostigmine for the first nine days of hospitalization and was then treated with the drug for three days. A fifth patient recived 1.0 mg. of neostigmine on his second and third hospital days in an attempt to relieve bladder sphincter paresis. Only 1 patient received no neostigmine at all. The control patients received the continuous hot foments comparably to the other patients for six to seven hours each day, and the angles related to the muscles in spasm were measured at 8 a. m. and 3 p. m.

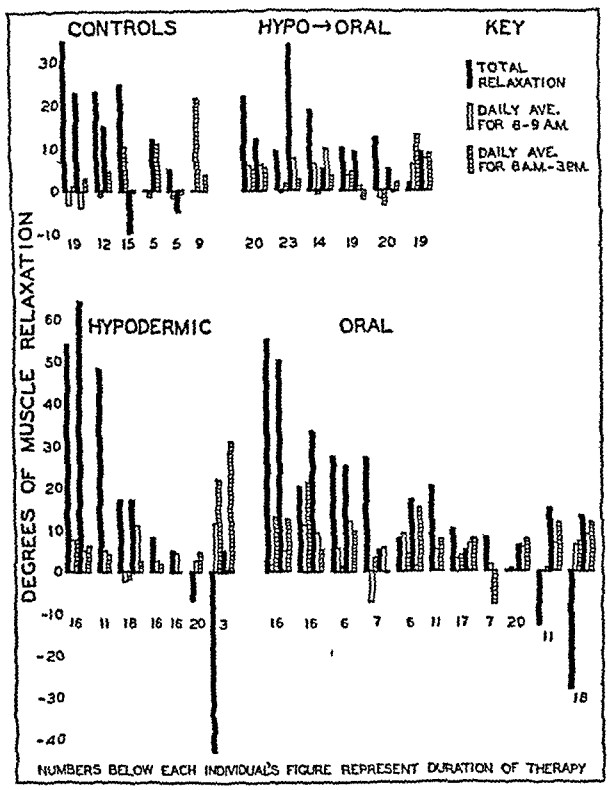
RESULTS

Within the first hour after neostigmine administration, several of the patients had drug reactions consisting of muscle spasm or twitching, abdominal sensory illusions, substernal pain, nausea, vertigo or emotional disturbances. These reactions, however, were not severe and the patients rarely complained unless questioned regarding the effects of the drug. In no case was it necessary to discontinue the neostigmine.

The details of the effects of the neostigmine therapy on the passive motion of spastic muscles are given in the accompanying table. Results are grouped according to the amount of neostigmine given and the method of its administration. Listed in the table are the average daily amounts of relaxation obtained at 9 a. m., one hour after the neostigmine administration and at 3 p. m., six hours later, after the continuous applications of the hot fomentations. These results are recorded separately for each muscle group measured, i. e. right or left hamstring or gluteal spasm, but each figure represents the average of several days of individual measurements. Also included in the table are the total changes in the degree of spasticity for each muscle group during the entire therapeutic period.

It is to be noted that there was not a constant relaxation of muscle spasm for any form of therapy or period of time. Some cases showed decided improvement, while other cases exhibited either slight or no improvement, and some even showed an increase in the amount of spasm. Often those who relaxed well during the day would have enough return of spasm at night so that the total change for the entire therapeutic period was less than might have been anticipated on the basis of one day's performance.

In view of this extreme variability, the use of averages is of questionable value; but we have presented this form of summary as a further aid for interpreting the results. The average relaxation of all patients one hour after giving the neostigmine was found to be 3.4 degrees, with a greatest relaxation for



Effect of neostigmine on muscle spasm: relaxation reported for right and left hamstrings or gluteal muscles for each patient.

any one muscle group for this hour of 39 degrees. The average relaxation for the day in the patients receiving neostigmine was 3.5 degrees, a figure which is comparable to the reduction of spasm which occurred during the first hour. One might conclude, therefore, that the neostigmine gave more relaxation than did the hot foments which were used later throughout the day or, on the other hand, that the effect of neostigmine was produced early rather than over a prolonged period of time. It must be remembered, however, that there is a natural impairment of mobility of joints following a night's sleep and that there would automatically be some improvement in passive motion during the 8 a. m. to 9 a. m. hour, regardless of whether or not any therapy had been given.

In the control series the average daily relaxation was 5.9 degrees, which is a better response than that for the neostigmine group. This must be interpreted as due to individual variability and an inadequate number of cases, since, if this relaxation had been due to hot fomentations alone, the results of the two series should have been comparable.

The average total amount of improvement in the patients receiving neostigmine from the beginning to the end of therapy was found to be 14.7 degrees. These overall results for neostigmine are somewhat higher than those of the control group, which had an average total increase of 10.3 degrees of relaxation. It must be pointed out, however, that the control patients were studied for a shorter period of time.

The variability of the effects of neostigmine is perhaps appreciated better from the graphic presentation of the data in the chart. The results have been plotted for the separate muscle groups, right and left, of each individual patient and show the total amount of relaxation in these muscles over the entire therapeutic period as well as the average changes for the first hour after administration of the neostigmine and for the whole day. It will be observed that the black columns for total relaxation vary considerably in height between individuals and have no relationship with the white or barred columns, which represent the average changes during the day.

Several factors must be considered in any attempt to explain the variability in our data. In addition to an inadequate number of cases and the resultant domination of individual differences, part of the apparent conflict in our data may have been due to the subjective element unavoidable with the angle measurements. In spite of our efforts to determine these angles accurately, the subjective element was important since the patients tended to show resistance to passive motion

Amount of Relaxation Produced in Spastic Muscles by Means of Neostigmine and Hot Fomentations

(Relaxation was determined daily by measuring the angle of passive motion obtainable with the spastic muscles)

Age	Days Since Onset	Period of Therapy	Neostigmine Dose	Neostigmine Adm.	Average Daily Change in Angle: Right 8-9	Right 8-3	Left 8-9	Left 8-3	Total Change During Therapy: Right	Left
6	3	19	0	.....	—3.3	1.0	—3.6	2.8	35	23
15†	7	12	0	.....		—1.2		4.6	23	15
15	3	15	0	.....		10.2		—0.3	25	—10
41†	10	5	0	.....		—1.5		11.0	0	12
21†	13	5	0	.....		—1.7		—1.0	5	—5
13†	8	9	0	.....		21.6		3.7	—1	—2
								Average	10.3	
12*	4	16	1	Hypo.	7.5	7.5	4.9	6.0	54	64
7*	6	11	1	Hypo.	...	...	4.0	4.0	..	48
12*	6	18	1	Hypo.	—2.2	—2.0	11.1	2.3	17	17
16*	9	16	1	Hypo.	—2.4	—1.7	...	...	8	..
39*	4	16	1	Hypo.	...	...	4.3	0.0	..	5
15*	4	20	1.5	Hypo.	...	...	2.4	4.5	..	—7
13†	19	3	1	Hypo.	11.4	21.6	0.2	30.7	—43	5
								Average	16.8	
32*	8	20	(1	(Hypo.	5.8	4.9	5.8	5.3	22	12
21*	5	23	or	or	—0.4	1.7	7.3	2.3	9	34
17	15	14	45)	Oral)	6.1	—1.2	9.7	3.2	19	5
15	5	19	.....		3.3	4.4	1.0	—2.2	10	9
13	3	20	.....		—2.0	—3.4	—0.2	2.0	12	5
10	4	19	.....		6.3	13.0	7.5	8.5	2	9
								Average	12.3	
3	5	16	30	Oral	1.3	12.7	4.7	12.4	55	50
7	8	16	45	Oral	10.8	20.8	9.0	4.7	29	33
7	4	6	45	Oral	5.5	1.0	12.0	9.6	27	25
41†	3	7	45	Oral	—7.2	3.0	5.5	—0.4	27	5
15†	1	6	45	Oral	9.0	4.0	1.0	15.0	8	17
16	7	11	45	Oral	5.0	7.5	.....	.....	20	..
55	8	17	45	Oral	3.0	3.8	6.6	7.7	10	5
29	21	7	45	Oral	1.5	—8.0	.....	.....	8	..
13	4	20	45	Oral	0.6	0.0	5.5	7.3	0	6
21†	2	11	45	Oral	0.0	0.8	6.7	11.2	—13	15
7	1	16	45	Oral	6.1	7.9	8.5	11.4	—28	13
								Average	15.2	

* Measurements on these patients are for gluteal spasm. All other measurements are for hamstring spasm.
† These patients were studied both for control and for neostigmine periods.

by either voluntary or involuntary contraction of muscles during the examination, and the point at which passive motion would produce pain was not constant. Immediate repetition of the measurement occasionally gave an entirely different angle, which sometimes differed by as much as 100 per cent from the first measurement.

Another factor which may have influenced the results must also be considered. The duration of effect of neostigmine, as well as the difference in response due to mode of administration, need more careful study. Goodman and Gilman [4] state that hypodermic injections are believed to have an influence of at least six hours' duration, while oral neostigmine exerts its effect over a longer period.

The following case is presented briefly to show that there are inconsistent and irregular periods of relaxation of affected muscles in acute poliomyelitis which can appear at any time and disappear within a few hours. This further illustrates the fallacy of attempting to interpret accurately the relaxation of the spastic muscles.

L. A., a white youth aged 15 years, entered the hospital on Oct. 17, 1943, four days after the onset of the disease. His cerebrospinal fluid findings substantiated a diagnosis of acute anterior poliomyelitis. His initial muscle involvement was spasm of the neck extensors, sacrospinalis group and hamstrings, paralysis of the right quadriceps and left iliopsoas, and paresis of muscles for micturition. He received 1.0 mg. of neostigmine on October 17 and 1.0 mg. on the 18th. Representative angle readings for his left and right hamstrings were, on the 18th, 1 and 22 relaxation, respectively, for the day, on the 28th, 5 and 15 relaxation and on Jan. 30, 1944 1 and 0 relaxation.

The effects of neostigmine were studied on 4 cases of bulbar poliomyelitis also. All 4 of these cases were primarily bulbar in type, i. e. not of the ascending form but with the paralysis confined chiefly to the pharynx, larynx and palate, with loss of cough reflexes. Neostigmine injections of 1.0 to 1.5 mg. daily were given to these 4 patients. In addition, hot packs were applied to their necks, fluids were administered to combat dehydration, and scarlet fever convalescent serum and sulfonamides were used to combat pneumonitis. Beds were elevated at the foot to promote drainage of nasal and pharyngeal secretions. In spite of these therapeutic efforts, 3 of the 4 patients died, and no benefit whatever was noted from the neostigmine.

It will thus be seen that in our series of cases of acute poliomyelitis no pronounced or even consistent relaxation was produced by the neostigmine therapy. This was disappointing to us, since we felt that its use was based on sound pathophysiologic principles and also since Kabat and Knapp's work had been encouraging. It is probable that our results differed from those of Kabat and Knapp because all of our cases were acute in contrast to a predominance of chronic cases in their series. In spite of the discrepancies in our data, we wish to advance the following tentative conclusions, since we believe them to be justified on the basis of our observations:

1. Neostigmine produces a partial relaxation of the spastic muscles in a majority of cases of acute anterior poliomyelitis. The relaxation obtained with neostigmine is neither dramatic nor constant, is characterized by irregularity in response and is followed by a gradual return of spasm, which frequently reaches its initial level within twenty-four hours.

2. The combined use of neostigmine and hot foments in the treatment of acute anterior poliomyelitis results, in most cases, in a perceptible and persistent relaxation of spastic muscles, which is evident after several days of therapy and its further use is warranted.

3. Neostigmine appears to be of little value in bulbar poliomyelitis.

4. Goodman, L., and Gilman, A.: The Pharmacologic Basis of Therapeutics, New York, Macmillan Company, 1941, chapter 21, pp 378-388

SUMMARY

1. The effect of neostigmine on spastic muscles has been studied by the use of subcutaneous and oral doses of the drug in 24 patients with acute anterior poliomyelitis.

2. The degree of daily relaxation of the involved muscles produced by neostigmine was determined by measuring increases in passive motion one hour and seven hours after administration of the drug. Results for each patient were compared from day to day.

3. The total amount of relaxation obtained in the spastic muscles during the patient's entire therapeutic period was also determined and results were compared with a control group of 6 patients who did not receive the neostigmine. Both groups of patients had been given hot fomentation treatments according to the Kenny technic.

4. In these cases of acute poliomyelitis the neostigmine caused a partial relaxation of spastic muscles which was neither pronounced nor constant and which was characterized by irregularity. Nevertheless it was concluded that the combined use of neostigmine with hot fomentations resulted in a persistent and perceptible relaxation of spastic muscles in most of the cases of acute anterior poliomyelitis.

5. These observations are limited to the acute phase of poliomyelitis and not to the effect of neostigmine on the subacute or chronic phases of the disease.

324 East Wisconsin Avenue.

ACUTE ANTERIOR POLIOMYELITIS

FINAL REPORT ON SEVENTY CASES TREATED IN 1943

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In May of 1944 a preliminary report was made on the status of 70 patients six months after they had had acute anterior poliomyelitis during the Chicago epidemic of 1943.[1] These patients had had only general supportive therapy during the acute phase of the disease. The survey revealed that 10 per cent had enough residual weakness to require braces or future surgery, 72.8 per cent had no residual weakness or such slight weakness that it was barely detectable, and 8.6 per cent had functionally significant weakness which did not require further therapy and which did not constitute a handicap to a normal life. There were 8.6 per cent deaths.

The 64 survivors of this group have been followed carefully at short intervals, and it is now possible to present a report of their condition eighteen months after the acute disease.

No one of the 13 nonparalytic patients has developed any sign of weakness, spasm, stiffness or deformity. Seven patients who had had paresis but who had recovered completely at the end of six months have remained normal. Since then 19 other patients have recovered sufficiently so that no weakness is now demonstrable. Of this total of 26, 20 had originally moderate weakness and 6 (all of whom had severe bulbar involvement) had profound paresis. There are 12 others who have improved decidedly but who have remaining detectable though functionally insignificant

From the Department of Surgery, Division of Orthopedic Surgery, University of Chicago

1. Sherman, Mary S.: The Natural Course of Poliomyelitis. A Report of 70 Cases, J. A. M. A. 125:99-102 (May 13) 1944.

weaknesses. Two of these patients have very mild, well compensated and nonprogressive scoliosis which does not require treatment. All 6 patients who were listed as having functionally significant weakness which did not require further treatment have made sufficient recovery to be classed at present with those whose weaknesses are insignificant even though 2 of them limp slightly.

The 7 patients who after six months were considered to be candidates for braces or surgery are essentially unchanged and are still in the same group. Two are wearing long leg braces and 2 have flail arms which show no recovery, but only 1 is extensively handicapped. One arm will be restored to good function by a shoulder arthrodesis and 1 patient with a weak foot will be returned almost to normal by a foot stabilizing operation.

The accompanying table shows the comparison of results at six months and at eighteen months. It will be seen that at eighteen months 81.4 per cent of the total initial group or 89.1 per cent of the survivors have either no residual or slight weakness, and 10.9 per cent of the survivors have a handicap which will require braces or surgery.

Status of Patients Six Months and Eighteen Months After Illness

	Total Group		Survivors Only	
	6 Mos.	18 Mos.	6 Mos.	18 Mos.
1 No detectable weakness at any time	13 (18.5%)	13 (18.5%)	13 (20.3%)	13 (20.3%)
2 Those who had paresis but are not now handicapped	38 (54.3%)	44 (62.9%)	38 (59.4%)	44 (68.8%)
a. No detectable weakness now....	7	26	7	26
b Functionally insignificant weakness	31	18	31	18
3 Functionally significant weakness which requires no further therapy	6 (8.6%)	0	6 (9.4%)	0
4 Severe weakness requiring braces or surgery	7 (10%)	7 (10%)	7 (10.9%)	7 (10.9%)
5 Deaths (4 bulbars, 2 spinal).....	6 (8.6%)	6 (8.6%)		

COMMENT

No patient has regressed. This is probably attributable not so much to the degree of recovery as to the detailed early evaluation of the patient's muscular state.

Major improvements, as was expected, have occurred, without exception, in those patients who had not been completely paralyzed. In all patients but 1 the subsequent course has agreed with the prognosis made when the acute phase had subsided. This 1 patient was expected to be grossly handicapped but has made a spectacular recovery.

The later course of these patients supports further the recently ignored fact that the amount of ultimate recovery depends primarily on the extent of initial involvement of the central nervous system and not on the type of treatment.

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Medical Institutions in Japan.—In 1937 there were nineteen government controlled medical schools and nine private medical schools. In the same year there were eight dental colleges. Diagnostic, research and biologic laboratories are almost exclusively government controlled or operated. There are several charitable organizations in Japan that are interested in public health, most notable of which is the Red Cross.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

OSTEITIS CONDENSANS ILII

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AND
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Osteitis condensans ilii is a term applied to the alteration of the bony architecture of the iliac bone adjacent to the sacroiliac joint. The condition is characterized by condensation of the involved bone without involvement of the joint space or adjacent sacrum. During the year 1943, 23 patients presenting these changes were seen in the clinic. Since the condition has been described infrequently, a study of the clinical manifestations was undertaken to determine whether a clinical syndrome accompanied or produced this roentgenographic change.

A review of the literature relative to osteitis condensans ilii revealed that the first article appeared in 1926, at which time Sicard, Gally and Haguenau [1] reported 5 cases, describing accurately the roentgenograms. They stated that they did not know the etiology. In 1928 Bársony and Polgár [2] in an article on the condition were not sure that it was a clinical syndrome but described the changes in the iliac bone quite satisfactorily as a sclerosing type of bone lesion. In 1932 Berent [3] in a report stated that it was his belief that the disease was the result of pregnancy and that he had seen it only in women following childbirth. He presented 3 cases, all with some injury prior to or during delivery as a result of (1) premature rupture, (2) the use of high forceps and (3) acute pain during delivery. This hypothesis has been partially disproved, as the condition has occasionally been diagnosed in the male patient.[4] Berent's experience has been similar to ours in that all patients have been women, but not all gave a history of pregnancy.

In 1936 Rendich and Shapiro [4] carefully reviewed the literature and reported their cases. In 1 case fusion of the sacroiliac joint was carried out, at which time a biopsy of the involved bone was taken and the report of Dr. William Hala [4] was as follows: "There is marked condensation of the osseous tissue with obliteration of the evident former lacunae. There appear to be no osteolytic or osteoclastic changes in the bone and neither is there any evidence of overactivity of the osteoclasts or osteoblasts. In fact, these cells are more or less conspicuous by their absence. The marrow spaces contain an unusual number of myocytic and plasma types of cells. The significance of the plasma cells is undetermined. In general, the lesion appears to be of an osteitis condensans type. It is apparently independent of any inflammatory or other etiology so far as can be ascertained from the histology of the specimen. Occasionally, in the condensed bone there appear to be depositions of lime salts which occur more or less in irregular linear areas, but more or less parallel to the lamellae of the bone." Rendich and Shapiro did not attempt to describe the condition as a clinical entity but simply stated that the symptoms were vague and the physical findings scant and not informative.

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Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Sicard, J. A.; Gally, L., and Haguenau, J.: Ostéites condensantes, à étiologie inconnue, J. de radiol. et d'électrol. **10**: 503-507 (Nov.) 1926.

2. Barsony, T., and Polgar, T.: Ostitis condensans ilii—ein bisher nicht beschriebenes Krankheitsbild, Fortschr. a. d. Geb. d. Röntgenstrahlen **37**: 663-669 (May) 1928.

3. Berent, Fritz: Beitrage zur Pathologie der Kreuzdarmbeinfugen, Arch. f. orthop. u. Unfall Chir. **32**: 642-646, 1933.

4. Rendich, R. A., and Shapiro, A. V.: Osteitis Condensans Ilii, J. Bone & Joint Surg. **18**: 899-908 (Oct.) 1936.

SYMPTOMATOLOGY AND PHYSICAL FINDINGS

Recurrent attacks of chronic low back and pelvic pain were the most common complaints. In most instances the pain was more severe in one sacroiliac than in the other. In 10 cases pain remained localized, whereas in 13 cases it extended down one thigh. Attacks of pain in most instances were brought on by bending forward or by lifting. These attacks lasted from two weeks to several months, during which time the patient was incapacitated, and with each subsequent attack the pain became more severe.

In 8 of the 23 cases, and probably in more although the history does not record it, the onset of symptoms was noted just prior to or following delivery. In no instance was there a history of severe trauma. The history of onset in the other cases was vague. In 2 cases the onset followed minor falls. Two other patients noted their first pain at the onset of the menstrual period. All patients were women within the child-bearing age, the average age being 30 years. The oldest patient was 38, the youngest 23 years of age.

In our group the duration of symptoms before diagnosis varied from seven months to fifteen years; the average was three years. Obesity was not a factor. The weight varied from 104 to 211 pounds (47 to 96 Kg.); the average weight was 146 pounds (66 Kg.).

The physical findings have not been significant with the exception that all patients presented constitutionally inadequate musculature and in only 4 cases was a positive straight leg test elicited. In these 4 cases a diagnosis of herniated disk was considered, and 1 patient was operated on for herniated disk without relief of symptoms. Since operation the symptoms have become progressively worse over a period of two years.

The sacroiliac test was positive in all cases, but, since the value of this test is questionable, no conclusion may be drawn from it at present.

LABORATORY DATA

In 2 instances the blood sedimentation rate was increased above normal. In 1 case only a transitory rise was noted, with subsequent return to normal. All other laboratory tests gave consistently negative results.

DIFFERENTIAL DIAGNOSIS

The most important single differential diagnosis to be made is to distinguish osteitis condensans ilii from arthritides, especially the Marie Strümpell type, which is similar in appearance roentgenographically and represents the category in which these patients have in the past been placed. In both diseases the pain may grow progressively worse, but in osteitis condensans ilii the disease, as far as we have observed it, has remained localized to the affected ilium, while in nearly all cases of arthritis the disease has slowly progressed to involve the entire spine. Rheumatoid arthritis of the Marie-Strümpell type occurs predominantly in the male, while osteitis condensans ilii has in our experience been present only in the female. In rheumatoid arthritis the sedimentation rate is consistently and persistently elevated, which has not been true in our present series of cases of osteitis condensans ilii.

Summary of Twenty-Three Cases

Case No.	Age, Years	Onset	Radiation	Straight Leg Test	Duration, Years	Sedimentation Rate	Weight, Pounds	Comment
1	38	Delivery	0	0	5	16	104	
2	35	Delivery	0	0	4	2	110	
3	32	Delivery	+	?	2	51-16	195	
4	29	No trauma	+	?	3	50	130	
5	39	No trauma	+	0	2	11	121	
6	30	Delivery	+	0	15	6	143	
7	33	No trauma	+	0	15	76	133	Rheumatic arthritis
8	24	1 week delivery	+	0	2	26	124	
9	35	Fell	0	0	4	..	142	
10	31	Delivery	0	Slight + 0	7½	31	107	
11	39	Delivery	+	0	1	..	130	
12	31	Pregnant	+	+ right and left	3	..	190	
13	38	Fell	+	0	12	18	171	
14	26	0	+	+ left	3	63	118	
15	23	0	+	+	2	..	...	
16	36	?	0	0	?	32	211	
17	26	.....	..	..	..	..	...	Rheumatic arthritis
18	29	? worse with period	+	?	3	..	...	
19	28	.....	..	..	..	..	...	
20	28	? worse with period	0	..	8	15	118	
21	30	.....	+ Bilateral	0	7 months	..	118	
22	26	.....	..	..	..	..	...	
23	26	.....	..	..	..	..	...	
Average	31	.....	..	Positive in 4 cases	3 years	Elevated in 2 cases, 20 normal	138	

Pain in low back and pelvis..... 23 cases
Radicular pain..... 13 cases

ETIOLOGY

The cause of this disease is unknown. One theory presented previously is that following trauma, usually of childbirth, there is interference of blood supply to the inferior margin of the ilium adjacent to the inferior margin of the sacroiliac. The blood supply to this particular portion of the ilium is not well described, but in the roentgenogram the nutrient arteries are seen to lie lateral to the bone usually involved.

TREATMENT

Conservative treatment consisting of rest, baking and massage and a supportive belt is usually successful in relieving the periodic attacks of pain. In some instances, however, the disease is incapacitating. Bending will bring on an attack which will require days to weeks of bed rest and care to alleviate. In these instances and in those cases in which relief is not obtained by conservative measures, operative fusion of the sacroiliac joint should be considered.

THE ROENTGENOGRAM

Routine roentgenograms of the lumbosacral spine do not show the sacroiliac articulations in their entirety, and because this condition appears most frequently in the female in whom the sacrum tends to be of the

horizontal type, special views of the sacroiliac articulations are essential before correct interpretation can be made. We routinely take a 45 degree angle view of the sacroiliac joint in all cases in which the symptoms are referable to the lumbar spine in order that we may see the sacroiliac articulations and the sacral foramens in their entirety. The 45 degree angle view has been well described on numerous occasions and need not be described further except to say that it is an essential exposure in order to make a correct diagnosis of disease of the sacroiliac articulations.

In a study of the sacroiliac articulations in cases of osteitis condensans ilii it is well to remember that the auricular portion of the ilium extends behind the anterior edge of the sacroiliac joint, so that the portion of the ilium which lies behind the sacrum may give the appearance of disease of the sacrum and even of the joint. As the name implies, osteitis condensans ilii is characterized by dense sclerotic bone with obliteration of the trabeculae of the auricular portion of the ilium and the portion of the ilium adjacent to the sacroiliac articulation. The line between normal and abnormal bone is distinct. The abnormal bone is similar to that seen with Garré's sclerosing osteitis and appears on the roentgenogram as if this portion of bone were underexposed. The disease in all of our cases was symmetrical, although in some of the cases previously reported it was limited to one ilium and there are reported cases of the disease in the low lumbar vertebrae, in the os calcis and in the femurs. Perhaps the disease seen in other bones may have been the result of a mono-osteitic type of Paget's disease or of embolic manifestations.

The important finding on the roentgenogram, then, consists of dense bone involving the auricular portion of the ilium and the portion of the ilium adjacent to the sacroiliac articulation. The degree of involvement may vary in individual cases, but in all cases the articulation remains intact and the sacrum is not involved, as shown in the accompanying table.

REPORT OF CASES

CASE 1.—A woman aged 38 entered the clinic on April 23, 1943 complaining of pain in the lower part of the back and in the left thigh of twelve years' duration. About twelve years before entry she fell backward, stretching her left leg. This was followed immediately by pain in the left thigh. The pain disappeared but soon episodes of pain in the low back began, with extension down the left thigh and up between the shoulder blades, accompanied by pain extending down to the left foot posteriorly, not aggravated on coughing or sneezing. The pain was severe at night, and sleeping on a hard bed gave no relief. Two years before she entered the clinic the coccyx had been removed because of pain. The pain had persisted following operation and had been severe enough to keep the patient from working. She stated that if she bent over to pick up something the leg became so sore that she was unable to walk for a few days She had had one child prior to the onset of pain.

Physical examination revealed that the patient was obese and of chunky build. The back motions were free of pain. The straight leg raising test gave negative results bilaterally. The ankle and knee jerks were sluggish Over all of the back and especially over the iliac crest there was tenderness superficially, worse on pinching a mass of subcutaneous fat. The tenderness was present also on the lateral side of the left thigh. On direct pressure over the left sciatic notch there was tenderness, but this was present also on pinching the fat mass and did not occur on pressure farther down the course of the sciatic nerve. There was subcutaneous tenderness over the back up to the shoulders. The patient had gained 30 pounds (13.6 Kg.) in fourteen months.

Laboratory examination revealed hemoglobin 101 per cent, red blood cell count 4,820,000, white blood cell count 7,700, differential count normal. The Hinton test gave negative results. The sedimentation rate was 18 mm. per hour.

A diagnosis was made of lumbosacral arthritis and sclerosing osteitis of the ilia, and the patient was advised regarding weight reduction, physical therapy and muscle training.

Roentgenograms taken of the lumbosacral spine showed asymmetrical facets of the lumbosacral region, with some narrowing of the intervertebral space of the lumbosacral junction with reaction on the right (fig. 1). There was increased density around both sacroiliac joints on the iliac side, more pronounced on the right, as a result of sclerosing osteitis. The coccyx had been removed. The roentgenologist's interpretation was lumbosacral arthritis with sclerosing osteitis of the ilia.



FIG. 1.—Osteitis of lower third of the ilium adjacent to the sacroiliac joint, with slight involvement of the auricular portion. The sacroiliac joint appears normal. The lesion is symmetrical.

CASE 2.—A woman aged 31 entered the clinic on Nov. 8, 1943 complaining of backache of seven years' duration and vaginal discharge of two years' duration. About six months following the birth of her first child, seven and a half years before, she first noticed back pain. The difficulty was not associated with lifting or moving. The pain was relieved by wearing a girdle throughout the day. She had a feeling as though her "insides were going to fall out," a sensation that "something would come out of her vagina during evacuation." Frequency and urgency of urination were present. Two and a half years before coming to the clinic, and about six months following the birth of the second child, she noted a vaginal discharge.

Laboratory examination revealed hemoglobin 104 per cent, red blood cell count 5,000,000, white blood cell count 10,000, differential count normal. The Hinton test gave negative results. The sedimentation was 8 mm. She weighed 107 pounds (48.5 Kg.).

The patient was seen by members of the Department of Bone and Joint Surgery, who made the following note: The

patient described a low grade backache localized to the left sacroiliac area with occasional reference to the left gluteal area and left sciatic notch. Pain was present much of the time. There was no sciatic pain. The spine motions were normal. There was tenderness over the left sacroiliac region, the left gluteal region and at the left iliolumbar ligament. The sacroiliac test gave negative results. Reflexes were normal. There were no sensory changes.

Roentgenographic examination was made (fig. 2) and the roentgenologist's report was as follows: "Anteroposterior and lateral views of the lumbosacral spine show condensing osteitis of both iliac bones. The process is symmetrical. The sacrum appears to be normal. The joint spaces are normal. Interpretation: Condensing osteitis of the ilia."

The patient was advised to continue the use of the back brace and to have physical therapy.

CASE 3.—A woman aged 28, mother of 1 child, first came to the clinic on Sept. 8, 1939 complaining of backache of eight years' duration and a tired feeling in the lumbar spine. The pain extended to the umbilicus and sometimes up between the shoulders and was worse with menstrual periods. It was present in the morning before arising but was relieved somewhat after she was up and had put on a girdle. It recurred in the afternoon. Weather did not affect the pain. At the age of 16 years she was first seen by an orthopedic consultant, who said that her pelvis was not properly alined. She stated that she may have had poliomyelitis at the age of 9 years.

The patient was examined by members of the Department of Bone and Joint Surgery. The spine was flexible. The pelvis was tilted down to the left. The left shoulder was slightly lower than the right. Lumbar lordosis was exaggerated. There was no gross paralysis in the extremities. A ¾ inch lift under the heel was advised and roentgenograms of the lumbosacral spine were ordered (fig. 3).



Fig. 2.—Osteitis condensans ilii showing involvement of the middle two thirds of the ilium adjacent to the sacroiliac articulation. This shows sharp demarcation between normal and abnormal bone and normal joint space.

The roentgenologist's report was as follows: "The anteroposterior and lateral views of the dorsal and lumbar spine show a scoliosis convex to the left in the lumbar region, with rotation of the body to the side of the curve. The bones of the lumbar spine otherwise appear normal. There is moderate reaction around both sacroiliac joints, more marked on the right. Interpretation: Scoliosis of the lumbar spine and bilateral sacroiliac arthritis."

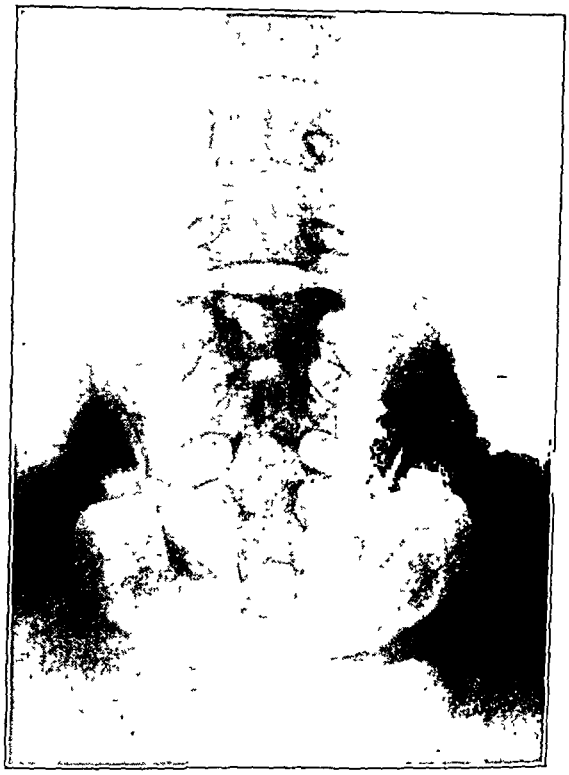


Fig. 3.—Osteitis condensans ilii with involvement of the entire ilium adjacent to the sacroiliac joint.

The hemoglobin was 80 per cent and the red blood cells numbered 3,900,000. The Hinton test gave negative results. In addition to the lift to the heel, infra-red treatment was given.

The patient was not seen again until Dec. 8, 1943, at which time she complained of pain in both hips and in the lower part of the back. She stated that she had never had an acute attack of pain; it had been referred down the posterior aspect of the legs to the foot but never to the toes. Coughing and sneezing had no effect. Standing or riding horseback produced a tired feeling with achy pain. The backache increased just before and during the menstrual period. About one year before her second visit she began having pain in both hips, more noticeable on assuming the erect position after sitting for a while. After she moved about the pain was relieved, but the attacks had become progressively worse.

On examination the patient appeared to be well nourished and intelligent. She weighed 123 pounds (56 Kg.) and was 5 feet 4 inches (163 cm.) tall. At this time there was slight lumbar scoliosis.

Blood examination revealed hemoglobin 98 per cent, red blood cell count 4,260,000 and white blood cell count 7,800. The differential count was normal. The sedimentation rate was 15 mm. per hour.

The spine was again studied. Anteroposterior and lateral views of the lumbosacral spine, pelvis and hips showed a bilateral condensing osteitis limited to the iliac bone. Otherwise the bones were normal, except for a rotary scoliosis of the lumbar spine to the left.

This patient, followed over a period of three years, has not obtained relief of pain, which has definitely increased during the last year.

CASE 4.—A woman aged 31 came to the clinic complaining of low back pain and sciatica of three years' duration. There was no history of injury. The onset was about three years previous to entry, at which time she stooped to pick up something and was then unable to straighten up. She was in bed for about one month following this attack. Since then she had had two or three attacks precipitated by lifting or stooping. The pain was in the low back and was dull and aching in character, with sharp pain running down the back of the right thigh, through the posterior portion of the calf and the ankle. It was relieved when she rested and was worse on coughing and sneezing during an acute attack. She also had pain in the upper portion of the spine, extending down the spine She had had four pregnancies

On physical examination the patient was 5 feet 4 inches (163 cm) tall and weighed 190 pounds (86 Kg). She was obese and had a waddling gait Physical examination was not significant other than for tenderness over the lumbosacral spine, inadequate musculature and increased lumbar lordosis.

The patient was advised to wear a low back support and was referred to the Department of Internal Medicine for a reduction regimen.

Laboratory examination revealed hemoglobin 98 per cent, red blood cell count 4,890,000, white blood cell count 7,150 and a normal differential count. The Hinton test gave negative results The sedimentation rate was 1 mm. in one hour. Roentgenographic examinations of the lumbar spine, anteroposterior and lateral views, showed a moderate osteitis of both sacroiliac joints without narrowing of the joint space (fig. 4). The bones otherwise appeared normal



Fig. 4.—Osteitis condensans ilii showing involvement of the lower two thirds of the ilium.

The patient was seen again eleven months later She had lost 23 pounds (10 Kg.) but the backache and sciatica had continued

CASE 5.—A single woman, aged 26, first came to the clinic on Jan 15, 1943 complaining of pain in the left buttock of three years' duration. The pain extended halfway down the thigh There was low backache, which was worse on coughing. Three weeks before entry she had had the most severe attack of pain; it had disturbed her sleep and had been present on arising in the morning.

Physical examination revealed that the patient appeared to be healthy and was not in obvious distress. She weighed 118 pounds (53.5 Kg.). Examination gave negative results except for slight pain on the left on attempting the leg raising test.



Fig. 5.—More advanced stage of disease, with involvement of the auricular portion of the ilia.

Laboratory examination revealed hemoglobin 96 per cent, red blood cell count 4,730,000 and white blood cell count 8,700. The differential count was normal. The Hinton test gave negative results. The sedimentation rate was 63 mm. per hour.

The roentgenologist's report was as follows: Anteroposterior and lateral views of the lumbosacral spine, pelvis and hip showed a low grade dense osteitis of both sacroiliacs, the process being symmetrical. There was slight narrowing of the joint spaces (*fig. 5*). The bones otherwise were normal.

COMMENT

This series of 23 cases in which the chief complaint was recurrent attacks of chronic low back pain represents a group in which in the past the diagnosis has been arthritis. In 8 of the 23 cases the pain occurred following or during pregnancy and in 8 cases there was radicular pain. The roentgenographic changes noted were common to all 23 patients, namely a condensation of bone of the inferior medial margins adjacent to the sacroiliac articulation, with the joint space and sacrum remaining normal.

The etiology of osteitis condensans ilii is unknown and any attempt to explain the cause of the pain resulting from these changes has been unsatisfactory. These cases must not be placed in the category of chronic arthritis.

Conservative treatment, namely heat and massage, has in most instances relieved the periodic attacks of pain, but for those patients who have long periods of incapacitation, operative fusion of the sacroiliac articulation on the painful side might justifiably be considered.

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Special Article

THE AMERICAN RED CROSS

ANNOUNCEMENT OF NEW POLICY GOVERNING THE PARTICIPATION OF RED CROSS CHAPTERS AND CIVILIAN BLOOD DONOR SERVICES

DEVELOPMENT OF THE POLICY

As early as 1937 the American Red Cross authorized a few selected chapters to carry on an experiment in the enrolment of volunteer blood donors to be available on call from hospitals and physicians for blood donations free of charge to those not able to pay for them. Under the stimulus of the war, the blood plasma program of the Office of Civilian Defense and the Red Cross blood donor service for the armed forces, a demand arose from many communities for local blood or plasma banks for civilians. The national organization responded in March 1942 by providing that, on approval by the national medical director, chapters might participate in such undertakings on certain specified conditions. Chief among these were the requirements that the project must be sponsored and operated by the local medical society, the city or state health department or a specially qualified hospital laboratory and that the chapter's participation must be limited to the procurement of volunteer blood donors and the services of its volunteer workers.

By 1943 state departments of health had become interested in the establishment of statewide blood donor services. In Michigan Red Cross chapters were authorized to cooperate with the state department of health under the conditions prescribed for local blood and plasma banks.

By 1944 the successful use of plasma and other blood derivatives for the armed forces and the association of the American Red Cross with the procurement of blood for this purpose had resulted in a widespread demand that the Red Cross, out of the abundance of its experience, render a similar service to the civilian population. The Medical and Health Advisory Committee of the American National Red Cross recommended that a study be made as to the need for continued Red Cross activity in civilian blood donor services. Accordingly, the study was undertaken and consultation held with the United States Public Health Service, the Board of Trustees of the American Medical Association, the Conference of State Medical Society Secretaries and editors of state medical journals, the Association of State and Territorial Health Officers, the American Hospital Association and others. There was general agreement that the Red Cross should authorize its chapters to cooperate with state and local health departments and other reliable medical and health agencies in the procurement of blood for civilian use.

By 1945 several states, cities and counties were engaged in or planning programs to supply blood and blood derivatives for civilian use, and chapter participation in a dozen or more of these programs had already started or was under discussion. The special Medical and Health Survey Committee of the American National Red Cross reviewed the whole matter and made detailed recommendations to the chairman concerning a sound basis for Red Cross participation in civilian blood donor services. The question was carefully considered also by the administrative and technical staffs of the American National Red Cross, with the result that previous instructions governing the participation of chapters in local blood or plasma banks have been superseded by the following policies, principles and procedures.

THE POLICY

Chapters of the American Red Cross desiring to do so may participate in civilian blood donor services only on the receipt of authorization from the area manager. Such authorization may be granted only when the following conditions are met:

(*a*) That the responsibility for technical operations, staff and equipment rests with a reliable medical or health agency.

(*b*) That participation of the chapter is limited to the recruitment or enrolment or both of volunteer donors and the provision of nontechnical staff and equipment.

(*c*) That the community is not serving as a source of blood for the Army and the Navy or, if it is, that the amount of blood required for civilian needs is obtainable over and above the needs of the armed forces.

(*d*) That participation of the chapter is limited to one program of volunteer blood donor service for civilians in any one community. If two or more medical or health agencies wish to sponsor programs in the same locality with Red Cross participation, a joint arrangement shall be developed.

(*e*) That the sponsoring medical or health agency meets the minimum technical standards specified by the American National Red Cross. These will be prescribed, in conformity with all applicable government requirements, by a national advisory committee of specialists in the field of blood transfusion and blood substitutes to be appointed by the chairman of the American National Red Cross.

(*f*) That the service as set up in each individual case is officially approved by the health department having jurisdiction, the appropriate medical society and the hospital agency.

(*g*) That the service is designed to serve all acceptable hospitals and clinics and all physicians licensed to practice medicine and surgery in the communities where the service is conducted.

(*h*) That no charge is to be made physicians, hospitals, clinics or patients for the blood or blood derivatives produced under the program. In other words, the costs of donor recruitment, donor center operation, the collection and transportation of blood, the processing of plasma and other by-products, and the distribution of whole blood and its derivatives must be met by other means than a charge to physicians, hospitals, clinics or patients for any of the products furnished for use.

(*i*) That the care and protection of donors is to be wholly the responsibility of the sponsoring medical or health agency.

(*j*) That the sponsoring medical or health agency agrees that the cooperating chapter or chapters will be the sole donor recruitment and enrolment agency for the program. This will avoid the confusion of the public and the consequent loss of effectiveness of appeal that would ensue if responsibility should be shared with other agencies in the community. However, it should be understood that cooperative relationships may be established with local agencies which are interested in assisting the chapter by recruiting donors from their personnel or their constituencies.

(*k*) That blood donors are to be recruited on a voluntary basis and blood is not to be accepted from any person paid to donate.

(*l*) That the Red Cross is to be responsible for seeing that there is adequate publicity for donor recruitment, to acquaint the public with the purposes for which its blood is to be used.

(*m*) That the chapter is in a position to finance its part of the project without financial assistance from the national organization.

(*n*) That the American National Red Cross is permitted to draw on reserves of blood or blood derivatives as occasion may require for use in disasters or other emergencies.

ADMINISTRATION OF THE PROGRAM

1. *In Chapters.*—An application for authorization to participate in a civilian blood donor service must be submitted by the chapter chairman to the area manager for approval before the chapter may take part in such a project. When authorization from the area manager has been received, the chapter will appoint a Civilian Blood Donor Service Committee to conduct and supervise the chapter program. This committee should include representatives from appropriate chapter services, the medical society, the health department and the hospitals. The chapter committee on Civilian Blood Donor Service will look to the area medical director for advice and guidance in the conduct of the program.

2. *In the Area Offices.*—The conduct of the program in the areas is a function of the area medical director. He will maintain liaison with public and private medical and health agencies operating programs to supply blood and blood derivatives and will supervise the civilian blood donor service operations conducted by the chapters.

3. *At National Headquarters.*—Under the general supervision of the national medical director, the director of Civilian Blood Donor Services will maintain liaison with the national advisory committee of specialists in the field of blood transfusion and blood substitutes. He will prepare the technical standards for the guidance of the sponsoring medical and health agencies in the procurement and processing of human blood, and the necessary basic instructions covering the policies and procedures for the guidance of chapters in the procurement and enrolment of donors. He will give general supervision to the operation of the program and will be available as a technical consultant through the area offices.

CHAPTER PARTICIPATION

Authorization will be granted to Red Cross chapters to participate in civilian blood donor services only in case the chapter and the sponsoring agency meet the terms and conditions stipulated by the American National Red Cross. This requirement is in the interest of giving to the civilian population the benefit of the intensive experience gained by the American National Red Cross and the agencies associated with it in the operation of its blood donor service for the armed forces. It will also encourage the establishment, on a nationwide basis, of proper standards of donor procurement and enrolment and of blood procurement and processing. The continuance of the American Red Cross in the field of blood donor service, for which its name and emblem have virtually become the symbol during the war, should inspire public confidence and stimulate a more ready response on the part of volunteer blood donors. This should facilitate the widest possible distribution of the products of blood donor services to those who need them.

Medical and health agencies which now have or are planning a program to furnish blood and blood derivatives for civilian use and are interested in obtaining the assistance of Red Cross chapters should contact their chapter if the territory the program is to serve is within an individual chapter's jurisdiction, or the appropriate area office of the American National Red Cross if the program is to serve a territory involving the jurisdiction of more than one chapter.

Clinical Notes, Suggestions and New Instruments

EOSINOPHILIC GRANULOMA OF BONE

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Eosinophilic granuloma of bone was reported simultaneously in 1940 by Otani and Ehrlich [1] and by Lichtenstein and Jaffe.[2] Since then about 30 cases of this condition have been described.

Eosinophilic granuloma is a destructive bone lesion, which may be either single or multiple. It is characterized histologically by the presence of large mononuclear cell histiocytes and collections of eosinophils. The prognosis of the lesion is excellent.

ETIOLOGY

The cause of the condition is unknown. Trauma has been felt to be responsible by some; others have postulated a virus infection. The lesion is generally considered to be of an inflammatory nature, although all attempts to isolate an organism from the lesion have been unsuccessful.[3]

Eosinophilic granuloma is seen most commonly in children and in young adults. Males are more frequently affected.

CLINICAL FEATURES

The symptomatology is referable primarily to the skeleton.[4] The lesions are often solitary, involving the bones of the skull or pelvis and the vertebrae, ribs or long bones. Flat bones are more often involved. Cases with multiple lesions have been reported, as many as twenty-five in 1 case.[4] Patients complain of pain, swelling and tenderness in the region of the bony destruction for several days to months before the condition is discovered. Other symptoms that may be encountered are muscle spasm and muscular atrophy. Lesions may be asymptomatic and picked up only by x-ray examination. When multiple lesions are present, only few of them may cause discomfort. There may be slight fever, some elevation of the leukocyte count, anorexia and weight loss. Eosinophilia of 4 to 11 per cent has been observed in some cases. All of the blood chemical findings are characteristically normal.

X-ray examination reveals a destructive, well localized lesion.[5] In Farber's [4] series the lesion did not expand the cortex but some eroded it. The lesions developed rapidly and showed little periosteal reaction. Jaffe,[3] however, reports that in areas of cortical perforation periosteal bone formation is noted. He also observed expansion of the cortex. The bone destruction may result in spntaneous fracture.

PATHOLOGY

Characteristically, in the early stage, when the patient first has complaints, the lesion appears cystic and hemorrhagic and contains a soft yellowish brown material. Microscopically the lesion is granulomatous. Sheets of large, pale mononuclear

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1. Otani, S., and Ehrlich, J. C.: Am. J. Path. **16**: 479, 1940.
2. Lichtenstein, L., and Jaffe, H. L.: Am. J. Path. **16**: 595, 1940.
3. Jaffe, H. L., and Lichtenstein, L.: Eosinophilic Granuloma of Bone, Arch. Path. **37**: 99 (Feb.) 1944.
4. Green, W. T., and Farber, S.: J. Bone & Joint Surg. **24**: 499, 1942.
5. Hatcher, H.: Eosinophilic Granuloma of Bone, Arch. Path. **30**: 828 (Sept.) 1940.

cells with granular cytoplasm are seen, which may have finely vacuolated cytoplasm or appear "foamy." Eosinophils are also seen scattered throughout, either singly or in clumps. These may be seen in the early stages and be absent in the healing stage. Phagocytic giant cells may be observed near the necrotic material. A sprinkling of lymphocytes, plasma cells and polymorphonuclear leukocytes may be seen, but there is no abscess formation. The characteristic cell is not the eosinophil but the large mononuclear cell.

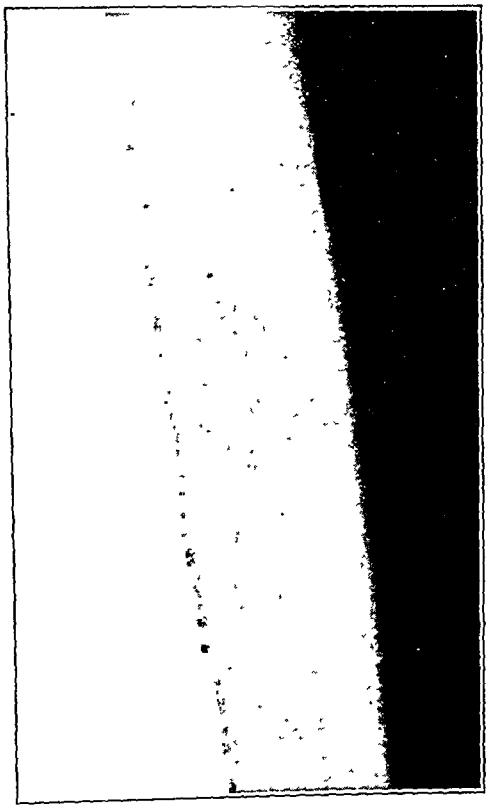


Fig. 1.—Lesion of eosinophilic granuloma in the shaft of the femur. The lesion is circumscribed and shows destruction of the cortex. The periosteal reaction is not readily seen in this view.

According to Farber the variation in the histologic picture represents stages in the evolution of the lesion. In the early destructive stage mononuclear cells, eosinophilic leukocytes and myelocytes, lymphocytes, plasma cells and neutrophils are seen. In the intermediary stage the eosinophils have disappeared and "foam" cells are noted. In the late stage there is replacement by connective tissue and eventually bone formation. Healing may also occur simply by resolution.[3]

TREATMENT AND PROGNOSIS

Eosinophilic granuloma runs a benign course, with recovery in all reported cases. However, if multiple lesions are present the prognosis must be guarded because visceral lesions may also be present and the patient have Hand-Schüller-Christian's disease.[4]

The treatment is entirely empirical. Good results have been obtained after curettage or after small doses of radiation. It has been shown that some cases with multiple lesions will heal spontaneously if left alone. Biopsies from solitary lesions are often made to prove the diagnosis. This procedure is equivalent to curettage. Often this procedure results in prompt relief of the pain. It is advisable to remove all recognizable pathologic tissue while doing the biopsy, unless it involves great technical difficulties or if the lesion is too extensive. Both treated and untreated lesions resolve in several months to a year.

REPORT OF CASE

Clinical History.—R. P., a white youth aged 17 years, was admitted to Bellevue Hospital complaining of pain in the left knee and anterior portion of the left thigh for two months. Six months before admission he contracted gonorrhea, which was successfully treated with sulfonamides. He was asymptomatic until two months before admission. Since the onset of his present illness he was treated at the outpatient department of another hospital as having gonorrheal arthritis. He had lost 18 pounds (8 Kg.) in the past two months and felt weak and tired. At the time of admission he was unable to bear weight on his left foot.

The systemic review was negative. The past history, other than that mentioned, was not pertinent. The family history was noncontributory.

Physical Examination.—The patient was fairly well nourished. He was in obvious distress, complaining bitterly of pain in the left knee and anterior portion of the left thigh. The knee was not swollen or reddened. There was only slight pain on movement and no reduction in the range of motion. The left thigh was not red or swollen. However, palpation revealed an area of extreme tenderness over the bone at the junction of the middle and upper thirds. No mass could be felt on admission, but a definite mass could be felt in this location after two weeks of hospitalization. The remainder of the physical examination detected nothing unusual. There was no urethral discharge, and prostatic massage yielded no fluid.

Laboratory Examination.—The temperature on admission was 99.4 F. and remained about 100. The leukocyte count was 12,400, with 62 per cent polymorphonuclear leukocytes, 34 per cent lymphocytes and 4 per cent monocytes. The red blood cell count and hemoglobin were normal. The blood calcium, phosphorus, acid and alkaline phosphatase and cholesterol were normal.

X-ray examination of the left thigh revealed a single, well circumscribed, intramedullary destructive process involving the left femur at the junction of the middle and upper thirds, with osteoperiosteal proliferation. X-ray examination of the left knee and hip as well as the remainder of the skeleton gave normal results.

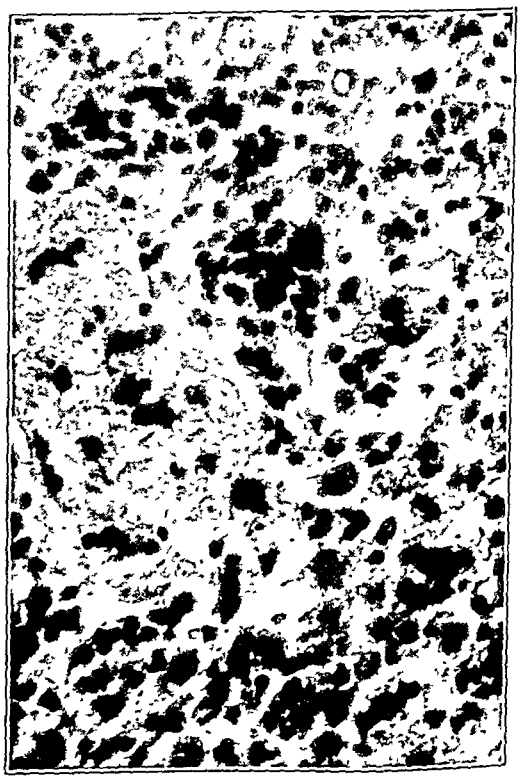


Fig. 2.—Section of tissue curetted from the lesion of the femur seen in figure 1. Large mononuclear cells with pale staining nuclei are seen throughout. The clumps of dark cells represent eosinophils.

Course.—In view of a solitary destructive bone lesion in a young adult, the diagnoses of Ewing's tumor or eosinophilic

granuloma were postulated. Those favoring the diagnosis of Ewing's tumor felt that large doses of radiation were indicated as soon as possible, because of the almost uniform fatality of the tumor. Biopsy was thought to be contraindicated because of the possibility of spreading the tumor. Those favoring the diagnosis of eosinophilic granuloma felt that a biopsy was justifiable before instituting radical therapy. It was decided to do a biopsy. Up until this time the patient required constant sedation because of the pain in the left leg. An incision was made in the anterior portion of the left thigh and a large portion of the bony lesion and underlying marrow were removed. The marrow was yellowish brown and appeared necrotic. The wound healed promptly and the postoperative course was uneventful. Almost immediately following biopsy the patient's pain entirely disappeared; his appetite increased and he started to gain weight. His temperature fell to normal and remained there. His leukocyte count also returned to normal. Repeated differential examinations of the blood failed to reveal any eosinophils. X-ray examination of the lesion one month after biopsy showed considerable reduction in the size of the lesion. The patient was able to walk without pain at this time.

Pathology.—The pathologic report was eosinophilic granuloma of bone. The histologic sections revealed granulation tissue composed principally of large mononuclear cells with granular, faintly staining cytoplasm and oval or reniform nuclei. There was extensive necrosis of portions of the tissue. Scattered throughout the granulation tissue were many eosinophils and a moderate number of plasma cells, lymphocytes and polymorphonuclear leukocytes. Periosteal bone formation was rather conspicuous.

COMMENT

The importance of eosinophilic granuloma is in its differential diagnosis. Because of the x-ray appearance it may be indistinguishable from a neoplastic or other inflammatory lesion. Lesions have been found in all bones except those of the hands and feet. In the case of a solitary lesion in a long bone the site of the lesion is of importance in the diagnosis. If the lesion is in the epiphysis, giant cell tumor should be excluded; this usually occurs in an older age group. Lesions in the metaphysis must be differentiated from a solitary bone cyst; this usually expands the cortex. If the lesion is in the diaphysis, Ewing's tumor must be considered. Other solitary lesions to consider in the differential diagnosis include osteomyelitis and tuberculosis and syphilis of the bone. Multiple lesions simulate multiple myeloma, metastatic bone tumors (neuroblastoma and lymphoma), Hand-Schüller-Christian's disease and osteitis fibrosa cystica.

In our case Ewing's tumor was considered in the differential diagnosis. Ewing's tumor usually causes more pain than eosinophilic granuloma, but in the case presented there was considerable pain. Periosteal bone formation is also more pronounced in Ewing's tumor. Since the prognosis of Ewing's tumor is very poor and its treatment radical, such as extensive irradiation or disarticulation, it is important to establish a correct diagnosis. The only way to do this is by biopsy of the lesion.

The presence of large mononuclear histiocytes or "foam" cells seen microscopically in eosinophilic granuloma has led to much speculation as to its relationship to Letterer-Siwe and Hand-Schüller-Christian's disease.[6] Histologically, the bone lesions of these two conditions are very much like those of eosinophilic granuloma. It has been thought that these three conditions may be the result of the same unknown infectious process, eosinophilic granuloma being the most benign and localized form, being limited to the skeleton.

Letterer-Siwe's disease, which runs a rapid, febrile course, is seen in children and is characterized by hepatosplenomegaly, generalized lymphadenopathy, anemia, purpura and bone lesions.[7]

Hand-Schüller-Christian's disease is a more protracted illness and in typical cases presents the triad of exophthalmos, bony defects of the skull and diabetes insipidus.

The relation of these two diseases to eosinophilic granuloma is based on microscopic findings. They may well represent variations in degree of the same basic process. Certainly there is no clinical alliance, since eosinophilic granuloma attacks only the skeleton and is benign.

6. Mallory, T. B.: New England J. Med. **227**: 955, 1942. Green and Farber.[4]
7. Gross, P., and Jacox, H.: Am. J. M. Sc. **203**: 693, 1942.

SUMMARY

Eosinophilic granuloma is a benign bone lesion seen principally in young males. Pathologically, it is distinguished by the presence of large mononuclear cells. Eosinophils may or may not be present, depending on the age of the lesion. Clinically, pain, swelling and tenderness are noted. The diagnosis is made by biopsy, which is necessary to distinguish it from neoplastic lesions. Lesions may heal spontaneously or following curettage or small doses of radiation. The prognosis is excellent.

HUMAN COCCIDIOSIS

R. M. KISKADDON, M.D., AND R. J. F. RENSHAW, M.D.
CLEVELAND

Human infection with the intestinal protozoan Coccidium[1] is rare. Magath[2] reviewed 208 authenticated cases, approximately three fourths of which were found during World War I among soldiers in the eastern Mediterranean, and an additional 25 cases have been recorded to date.

Although infection usually does not give rise to symptoms, reports in the literature mention diarrhea, abdominal pain, lassitude and slight weight loss in association with coccidiosis. In contrast to the hemosporidia, the malarial parasites, coccidia of the human bowel, Eimeria and Isospora have not been proved pathogenic for man, although Priest[3] assumes cell destruction and invasion of intestinal epithelium by Isospora. The organism has never been found in intestinal tissue, and no specific lesion has been demonstrated. Many therapeutic agents have been used, including bismuth, iodide, quinine, gentian violet, emetine, anthelmintics and others without conclusive evidence of results.

The oocyst, the stage of development usually seen in fresh stool specimens, is ovoid, with a doubly refractile, smooth wall. One pole is smoothly rounded while the other is slightly truncated. The size varies from 21.75 to 40 microns in length and from 10 to 19 microns in width. When first passed it contains granular protoplasm with a clear space at each pole. This central mass divides into eight sporozoites.

Because of the rare occurrence of this organism in man, the following case of Isospora hominis infection coincidental with or superimposed on a chronic ulcerative colitis is reported:

REPORT OF CASE

A man aged 60 was admitted to the hospital because of incontinence of feces and chronic cough of six months' duration. He often passed flatus, frequently had a burning sensation at the anus and occasionally noted blood in the stools. There had been no abdominal pain or weight loss. The patient was carefully questioned about his contact with animals, since coccidia are commonly found in certain animals. He liked to hunt and handled game frequently. His last contact with game occurred seven months previously, when he dressed rabbits, a dozen squab and a few squirrels.

On examination the patient had a temperature of 100.2 F., pulse rate of 88 per minute, systolic blood pressure of 176 and diastolic pressure of 110 mm. of mercury. The liver was slightly tender and enlarged to 1.5 cm. below the right costochondral margin. The edge of the liver was sharp, and there were no nodules.

Roentgenologic examination revealed a slightly enlarged heart, and electrocardiographic changes were consistent with left ventricular preponderance, myocardial damage and intraventricular block. With a barium meal gastrointestinal roentgenologic examination showed a normal esophagus, stomach and duodenum. After introduction of a barium enema a few diverticula in the sigmoid colon were demonstrated, the rest of the

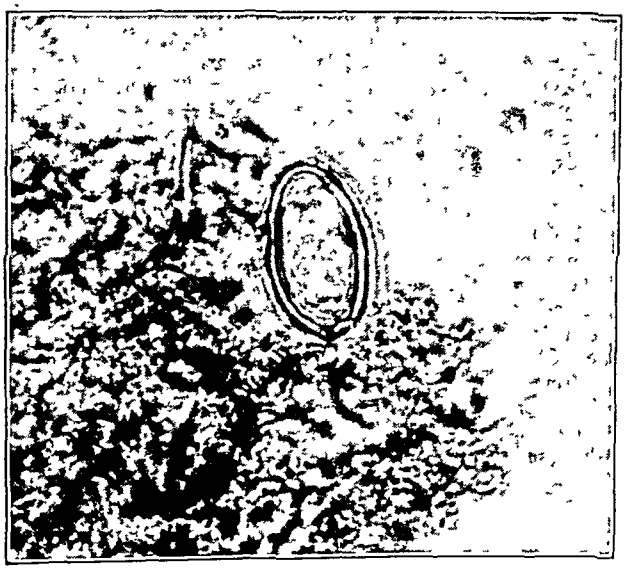
From the Cleveland Clinic.

1. Coccidiosis is not to be confused with coccidioidomycosis, an entirely different entity caused by Coccidioides immitis.
2. Magath, T. B.: Coccidia of Man, Am. J. Trop. Med. **15**: 91-129 (March) 1935.
3. Priest, R.: Case of Human Coccidiosis, J. Roy. Army M. Corps **68**: 317-319 (May) 1937.

colon being normal. The blood examination showed a severe secondary anemia with 4,200,000 erythrocytes and 47 per cent hemoglobin (7 Gm. with the Haden-Hausser hemoglobinometer), a leukocyte count of 8,950 and a corrected erythrocyte sedimentation rate of 0.68 mm. per minute. By the method used the rate is normal up to 0.45 mm. per minute. Consultation with an otolaryngologist confirmed a diagnosis of tracheitis.

Rectal examination revealed external hemorrhoids and poor anal sphincter tone. Proctoscopy for a distance of 25 cm. disclosed a granular, acutely inflamed mucosa, which bled on the slightest trauma but was devoid of ulceration. It had the appearance of Keefer's grade 2 chronic ulcerative colitis in an acute exacerbation.

Cysts of Isospora hominis were recognized [4] in a stool specimen. The parasite had an oval, smooth, doubly refractile wall and a central mass of granular protoplasm enclosed in an inner doubly refractile wall. The average size was about 10 by 7 microns. In some of the parasites, two or three round bodies were observed in the granular substance with no regularity of localization. Specimens were kept at 20 C., at room temperature, in a charcoal suspension and in an acid medium as suggested by Pons.[5] Although the organism was carefully and frequently observed for days and months after isolation from the stool, no division of the central body into sporoblasts was



Cyst of Isospora hominis (magnified) showing oval, smooth, doubly refractile wall and a central mass of granular protoplasm enclosed in an inner doubly refractile wall.

seen, and the small round bodies in the granular substance did not undergo change. The photomicrograph represents the parasite in the only form observed during a four months period.

During the patient's stay in the hospital stools were examined daily. A progressively decreasing number of coccidial cysts were observed, and none could be found after the seventh day. On the fourth day an attempt was made to recover the protozoa from the upper intestinal tract by duodenal drainage, but none were obtained. After the seventh day treatment for ulcerative colitis was instituted: 2 Gm. of succinylsulfathiazole in 200 cc. of water as a retention enema twice daily, three 500 cc. whole blood transfusions, ferrous sulfate and polyvitamin mixtures orally and crude liver extract intramuscularly.

On the eighteenth day proctoscopy revealed slight improvement in the appearance of the rectosigmoid mucosa. Blood studies revealed 6,000,000 erythrocytes and 78 per cent hemoglobin, with a color index of 0.65 and a volume index of 0.80. The erythrocyte sedimentation rate was normal. The tracheitis had completely subsided.

After discharge the patient continued the succinylsulfathiazole retention enemas, alternating ten days of treatment with seven days of rest. He was seen on the forty-fourth and again on the one hundredth day after hospital admission, and he reported much symptomatic improvement. He had three to nine stools every twenty-four hours, with only rare gross blood or pus. On both occasions proctoscopy revealed no further change. Examination of the stools showed a few epithelial cells and slight amounts of pus and occult blood but no coccidia. Three subsequent stool examinations between the one hundred and thirtieth and the one hundred and fiftieth days showed no coccidia.

COMMENT

Because division of the granular cytoplasm into sporoblasts and sporozoites was not observed in this case, there is some question whether the organism was a variant of Isospora hominis. There is also some question whether the organism was a sporocyst, because the average size (10 by 7 microns) compares favorably with the average size at the sporocystic stage (13 by 9.5 microns) reported by Magath.[2] We believe that the parasite in this case was a degenerate oocyst or a sporocyst of Isospora hominis.

It is of interest to note that the patient had a large tender liver. Stitt [6] mentions 5 cases of liver infection in men, and it is known that coccidia produce liver abscesses in animals. However, the result of the sulfobromophthalein liver function test was normal in this patient.

SUMMARY

A rare case of human coccidiosis superimposed on an ulcerative colitis was encountered. The only organisms isolated in this case were cysts of Isospora hominis. The infection cleared spontaneously with no specific treatment other than that for the ulcerative colitis.

Euclid Avenue at Ninety-Third Street, Cleveland 6.

4. The cysts were first recognized by Mr. Alfred Reich, chief technician of our laboratories. Dr. William S. Bray of the University of Virginia studied specimens and expressed the opinion that the cysts were atypical but were coccidia of the Isospora group.

5. Pons, R.: Coccidiose intestinale humaine à Isospora belli (Wenyon, 1922); consideration générales, Bull. Soc. path. exot. 18: 570 584, 1925.

FATALITY ASSOCIATED WITH THE ADMINISTRATION OF AMINO ACID DIGEST

A. R. Curreri, M.D.; O. V. Hibma, M.D., and P. P. Cohen, Ph D., M.D.
Madison, Wis.

The more recent literature on the parenteral administration of amino acid (protein digests) reveals that only occasionally are mild to moderate reactions encountered. Furthermore, it has been demonstrated that these reactions will subside either on reduction of the rate of flow of the infusion or on discontinuance of its administration. Our experience at the Wisconsin General Hospital with approximately two thousand parenteral administrations of amino acids has been similar to that of other investigators. Recently, however, 1 of our patients developed a severe and bizarre reaction which terminated in death. Since, to our knowledge, no mortality has been previously recorded with the use of amino acids, we present this case.

REPORT OF CASE

A white man aged 39, admitted for herniorrhaphy, presented no pertinent symptoms or signs other than those associated with right indirect inguinal hernia. Laboratory studies of the urine and blood were within normal limits. Hemoglobin was 17.7 Gm. The serologic reaction was negative. In view of the normal findings, this patient was selected for nitrogen balance studies. Accordingly, he was placed on a daily feeding program which consisted of the following: orally, 1,200 cc of orange juice whose nitrogen and carbohydrate content was known; parenterally, 1,000 cc. of 7.5 per cent glucose followed by 1,500 cc. of a mixture containing 5 per cent amino acids and 5 per cent glucose. An indwelling catheter was inserted into the urinary bladder to insure complete collection of the urinary output.

The first two days were uneventful. On the third day the patient developed a chill, headache, emesis and a fever of

6. Stitt, E. R.; Clough, P. W., and Clough, M. C.: Practical Bacteriology, Haematology and Animal Parasitology, ed. 9, Philadelphia, P. Blakiston's Son & Co., 1938, p. 440.

From the Departments of Surgery and Medicine, University of Wisconsin Medical School.

101 F. after 150 cc. of amino acids had been given. He was seen immediately, but the observer felt that we were dealing either with a moderate reaction or with an early cystitis. Nevertheless the fluids were discontinued, but unfortunately the remaining fluids were discarded by the nurse. Within three hours the temperature rose to 106 F., the blood pressure became imperceptible, the pulse was rapid and thready, the body took on a dusky red color and the patient was quite agitated. The progress was one simulating hypothalamic hyperthermia, shocklike state and renal failure. Supportive treatment consisted of parenteral saline solution and glucose, adrenal cortex extract, epinephrine and tepid sponges. On two occasions he was given intracardiac epinephrine. The patient died forty hours after the onset of symptoms.

Postmortem studies performed by our pathology department revealed generalized congestion of all the organs. The heart showed a minute acute abscess of the epicardium. There was congestion of the spleen with hyperplasia of the red pulp and leukocytic infiltration. The liver showed slender hepatic cells, hepatitis and infiltration of portal canals with lymphocytes and occasional polymorphonuclear cells. Chronic and acute cystitis was present. On gross examination of the brain there was demonstrable congestion and dilatation of the vessels. Microscopically some of the dilated vessels contained leukocytic thrombi made up largely of primitive blood cells. Many microscopic areas of perivascular degeneration were present. In addition there were many areas of endothelial congestion and destruction in all organs. It was concluded that these changes were the result of toxic chemical damage.

COMMENT

In reviewing this case it is difficult to state unequivocally the exact cause of death. We can consider four factors: (1) the presence of pyrogens in the glucose solution or tubing, (2) the presence of antigens or pyrogens in the amino acid solution, (3) extreme sensitivity of the patient to the drug and (4) the possibility of bacterial contamination in a previously opened container of amino acid solution.

The Wisconsin General Hospital prepares all saline and glucose fluids for parenteral use in the surgical section. These solutions are utilized only over a twenty-four hour period. A check of the solutions prepared and used at the time of this unfortunate reaction failed to present any other reactions whatever, even though 100 or more liters is used daily. Consequently we feel that we can rule out the glucose solution or tubing as a possible cause for this reaction.

The question of reactions due to antigens or pyrogens in the amino acid solution had been thoroughly studied by many investigators. Early in the history of the preparation of this agent it was shown that incomplete breakdown of protein, presence of minimal amounts of pork pancreas and a low p_H of the solution could either singly or in combination produce reactions. At the present time, however, the manufacturers test every batch of solution for the presence of these antigens or pyrogens. Furthermore, in a conference with the manufacturers of this particular amino acid preparation we learned that a thorough investigation of their records showed neither a serious reaction nor fatality from amino acids made up at the same time as the one used in this case. We would also point to the fact that the picture presented by this patient differed remarkably from those seen in 1939-1940 when we saw antigenic and pyrogenic reactions to these solutions. In those instances the principal features were a sudden pronounced hyperthermia, chill, nausea and vomiting, which subsided over a period of hours. At no time did we observe an extreme shocklike picture associated with hyperthermia as noted in this case.

During the period that this patient received amino acids, it was noted that several liters of solution contained a precipitate of tyrosine crystals. Such solutions were discarded in keeping with the manufacturer's instructions. It is certain that no precipitation was present in the ill fated solution.

While on the subject of precipitation, we wish to emphasize that amino acids should not be used in combination with strongly alkaline solutions. This fact has a very definite and practical value today, when (1) considerable amounts of sulfonamides are given intravenously and (2) employment by hospitals of itinerant nurses who fail to use care either in the handling or in the administration of intravenous fluids. For example, one of our new nurses poured some amino acid digest into a flask containing approximately 50 cc. of sodium sulfadiazine and walked out of the room. Immediately the resulting solution precipitated and turned milky white, owing to the precipitation of sulfadiazine. Fortunately the infusion was quickly stopped by a resident who happened to be at hand. In all likelihood the incompatibility of this solution applies only when the ingredients are mixed outside the body.

As amino acid solutions represent excellent mediums for bacterial growth and since bacteria break down amino acids to toxic amines, the theory was advanced that a previously opened bottle was employed. It has been our policy, especially since the manufacturers specifically so advise on their bottle labels, never to reuse a bottle of amino acids once it has been opened. It was indeed unfortunate that the remaining solution in this reported case was discarded, because the results of bacterial and chemical studies would have aided immeasurably in determining the cause of death.

This case was a rather bitter experience for us. Nevertheless we feel that the parenteral use of amino acids has a very definite place in the treatment of debilitated patients who cannot take foods orally. Sufficient evidence is now at hand to show the superiority of wound healing and more rapid convalescence when a positive nitrogen balance is maintained. If this reaction which resulted in death were to be the sole cause in deterring the use of this valuable adjunct, then blood transfusions, vitamins and most of our valuable drugs should be deleted from our medical armamentarium, since one or more deaths have resulted from their application. At the same time we definitely feel that these amino acids should be used with care, and that probably some one on the hospital staff should assume responsibility for (1) clearness of amino acid solution, (2) slow rate of administration, (3) certainty of *not mixing* amino acids with solutions of a high p_H and (4) discarding unused contents of a bottle once it has been opened.

Since we were unable to prove unequivocally that this death was due to the amino acids per se rather than to some extraneous factor or factors, we do not feel justified in stressing any additional potential dangers of parenteral amino acid administration other than those already known.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

RIBOFLAVIN (See New and Nonofficial Remedies, 1944, p. 613).

The following dosage form has been accepted:

PREMO PHARMACEUTICAL LABORATORIES, INC., NEW YORK

Tablets Riboflavin: 1 mg., 2 mg. and 5 mg.

PENICILLIN (See Supplement to New and Nonofficial Remedies, 1944, p. 18).

The following dosage form has been accepted:

BURROUGHS WELLCOME & CO., INC., NEW YORK

Penicillin Sodium: 100,000 Oxford unit bottles.

SYNTHETIC OLEOVITAMIN D (See New and Nonofficial Remedies, 1944, p. 623).

The following additional dosage form has been accepted:

MEAD JOHNSON & COMPANY, EVANSVILLE, IND.

Viosterol in Oil: 10 cc. bottles. Viosterol in corn oil.

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SATURDAY, JULY 7, 1945

THE ROLE OF ESTROGENS IN PHYSIOLOGIC HYPERPIGMENTATION

Davis and his associates [1] at the Lying-In Hospital of the University of Chicago administered diethylstilbestrol to a group of young women with primary amenorrhea after all other measures had failed. After starting administration of 1 mg. of diethylstilbestrol daily, these girls matured rapidly and their reproductive organs reached a normal state of development. The nipples, the areolas and the linea alba, it was noted, pigmented intensely. The degree of pigmentation far exceeded that seen during normal gestation. Administration of diethylstilbestrol to some 1,000 patients with menopausal complaints gave the usual satisfactory response, but the patients did not exhibit an increase in pigmentation in the usual localities, even though the total dosage of estrogens far exceeded the amount administered to the young girls with primary amenorrhea.

In an attempt to elucidate the mechanism of estrogenic pigmentation and the reason for the difference in response in primary amenorrhea and pregnancy, the investigators performed a number of animal experiments. Ten castrated young guinea pig males were injected every other day with 25 micrograms of diethylstilbestrol dissolved in 0.1 cc. of sesame oil. Five days after beginning, the animals began to show considerable pigmentation about the nipples. This pigmentation reached its maximum at the end of two weeks. A control group of animals in which sesame oil alone was injected did not develop pigmentation. Diethylstilbestrol applied locally to the nipple of a guinea pig likewise resulted in this phenomenon, indicating that the action of estrogens on the melanoblast cells in mammals is a direct one. A group of animals given 25 micrograms of diethylstilbestrol and 75 international units or 0.1 cc. of chorionic gonadotropin failed to display the phenomenon of estrogen induced pigmentation. Inhibition of pigmentation in this set of experiments is probably the result of chorionic cell activity. Pigmentation of pregnancy and artificially induced pigmentation by estrogens are both dependent on a pituitary-gonadal relationship. In this relationship estrogens can replace the absent or ineffective gonad when the anterior lobe of the pituitary is functioning normally. In these experiments neither prolactin, progesterone nor the adrenals appeared to play a role in the pigmentation. In pregnancy the increased amount of estrogenic substances present in the body predisposes to hyperpigmentation of the nipples, the areolas and the linea alba as well as to the characteristic deposition of pigment on the face with the production of the typical "mask of pregnancy." The hyperpigmentation is always limited to areas naturally containing pigment. The experiments confirm the role of the estrogens in physiologic hyperpigmentation. The hyperpigmentation observed in the young women treated with estrogens probably develops as a result of the establishment of a normal pituitary-gonadal relationship by the substitution of estrogens for the absent ovarian function. The authors suggest that a good pigmentary response in these young women is diagnostic of primary ovarian failure in the presence of a normal pituitary gland. The absence of hyperpigmentation in women treated with estrogens after the menopause is probably due to the anatomic and the functional changes of the anterior lobe of the pituitary gland.

Thus it appears that there are real differences between the pituitary-ovarian relationships in primary ovarian failure, pregnancy and the postmenopausal period.

1. Davis, M. Edward; Boynton, M. W.; Ferguson, J. H., and Rothman, Stephen: Studies on Pigmentation of Endocrine Origin, J. Endocrinol. 5: 138 (March) 1945.

MILK SICKNESS: A RETROSPECT

In an address before the Filson Club in Louisville, Ky., Philip D. Jordan [1] of Miami University, Oxford, Ohio, reviewed a valuable chapter in medical history of pioneer days in this country. The once mysterious "milk sickness" for over a hundred years was a scourge among many endemic ills which beset early settlers throughout the Middle West. It affected cattle and man alike. Little was written about it before the great period of colonization in the first half of the nineteenth century. The disease was variously designated as swamp sickness, tires, distemper or trembles. First heard of in Virginia and on the upper Ohio, it soon became common enough in Tennessee, Kentucky, Indiana and the Illinois country.

The symptoms, always incident to the drinking of milk, were dizziness, increasing lassitude, loss of appetite, nausea followed by vomiting, constipation, subnormal temperature, intense thirst and the odor of acetone. This condition in severe cases would develop into a typhus-like appearance with difficult breathing, pros-

1. Jordan, P. D.: Milk Sickness in Kentucky and the Western Country, Filson Club Historical Quarterly 19: 21 (Jan.) 1945.

tration and coma. The death rate was from 10 to 25 per cent.

Early medical literature teems with references to this disease. Early settlers feared it so greatly that they would carefully avoid any region where it appeared frequently. One such place was in southern Indiana, where Nancy Hanks Lincoln was known to have died of it in 1819. Low and swampy localities seemed to favor the prevalence.

The settlers knew that the illness was induced by the drinking of milk. They surmised that its cause might be a poison derived from some venomous substance or plant eaten by the cows. About 1840 the great pioneer physician Daniel Drake undertook a long journey into the Ohio country to trace the cause of the poison. His colleagues variously accused species of Rhus, or Bignonia, but in 1838 John Rowe, a farmer, announced publicly that the white snakeroot (Eupatorium ageratoides, or urticaefolium) was the plant which caused the trembles in cattle and man. This statement was not credited by Drake, and its truth was not recognized until 1917, seventy-nine years later.

The prognosis generally was none too good. Opium, hydrotherapy, blistering and calomel in large doses, whisky, bismuth, charcoal and lobelia tincture were tried, also sodium and potassium bicarbonate. As late as 1937-1938 21 cases occurred in Illinois, with a mortality rate of 10 per cent.

The suspicion gradually centered on the snakeroot (W. J. Vermilya, 1858; N. S. Townshead, 1873) and in 1906 E. L. Moseley showed that snakeroot fed to animals in the laboratory will produce "trembles." E. O. Jordan and his associates in 1908 isolated a bacillus (Bacillus lactimorbi) which would be subject of suspicion, but they did not assert that it was the causative agent. Finally, in 1917 the U. S. Bureau of Animal Industry announced that a poisonous substance, tremetol, had been isolated from the white snakeroot; others confirmed this discovery, and a treatment (saline purgation, fluids, alkalis by mouth, glucose intravenously, enemas, honey and whisky) was devised. Still a specific antidote for tremetol has not thus far been discovered.

The problem of the etiology seems simple, but the careful investigator knows that it only seems so. Cattle feed on hundreds of herbs still not analyzed. The "trembles" presents a mutable picture not uncommon to many intestinal infections or endemic troubles where in earlier days calomel, bleeding or opium was indicated by symptoms. Finally, many poisons show such a variation of the clinical picture that the presence of an unknown substance would confuse even the most experienced practitioner. But as Eupatorium ageratoides still grows in our soil, and as the rayless goldenrod of the Southwest also contains tremetol and causes the trembles, milk sickness may well remain in the textbooks.

MENTAL DECLINE AND ITS RETARDATION

The human life span has been extended from something like 29.4 years for the ancient Greeks to 59.3 for men and 62.8 for women in the United States of America. The number of people over 65 now reach the grand total of 9 million; statisticians anticipate 26 million past 65 in 1980. Thus the question of retardation of mental decline assumes great practical significance. George Lawton [1] of the Old Age Counseling Center, New York, points out that not all of the physical inadequacies of older persons are due to inescapable infirmities of old age. Much results from neglect of physical condition and failure to continue exercise. We gain mental stature quickly, particularly between 13 and 16 years, and lose it slowly. The ability to learn new facts reaches its maximum in the late teens and early twenties and then starts slowly declining. While there is a decrease in the amount of learning which persons acquire as they grow older, exceptional minds possess the ability to renew themselves continually and to exploit to the fullest their intellectual resources. Even ordinary persons have far more ability and learning capacity than they utilize. Part of the ostensible mental loss of older persons is simply the cumulative effect of poor habits of work. From the point of view of the best interests of most older persons, a regular job is necessary and desirable. Lawton believes that retirement is inadvisable for many types of persons.

Many a man or woman thinks creatively and makes invaluable contributions at age levels far beyond early youth. Lawton stresses that it is fear of aging, rather than the aging process itself, which often causes a functional loss in the mental realm, just as it does in the physical. Admitting the inevitable deterioration of our abilities with advancing age, it would be well to remember, as Lawton points out, that every handicap has two aspects. One is the handicap itself. The other is the way the handicap is used.

It is generally conceded that the higher the original intellectual endowment, the slighter the decline. Judgment, better integration of knowledge, practice over a long period of years will compensate for losses in motor dexterity and sensory acuity of the young. Indiscriminate and arbitrary shelving of men and women merely for age results in great loss to society and the individual. Based on his own experience, Lawton believes that retirement on pension, medical care and old age homes will not solve the problem of the older person. Rather he sees the necessity of schools for the aged, recreation centers, arts and crafts centers, sheltered workshops, adult playgrounds, marriage brokers and social clubs. Occupational therapy holds great

1. Lawton, George: Mental Decline and Its Retardation, J. Gen. Psychiat. 32:239 (April) 1945.

possibilities in the program of aiding the aged. Recent studies in geriatrics suggest that the medical profession is interested in the problems of the aged and that much constructive work is going to result from such studies.

Current Comment

POSTGRADUATE COURSES FOR VETERANS AND CIVILIAN PHYSICIANS

On page 751 of this issue of THE JOURNAL the Council on Medical Education and Hospitals of the American Medical Association presents its semiannual compilation of postgraduate continuation courses being offered in a wide variety of fields in the various medical educational institutions of this country. This list includes courses offered for the period of July 1, 1945 to Jan. 15, 1946. Before the expiration of this period another listing will be published. The present compilation is especially important and timely. It includes a number of courses which have been designed primarily to meet the needs of returning physician veterans. Already a large number of educational institutions are planning to meet such demands. Therefore the list has become considerably larger than any previous compilation. The variety of subjects covered is especially extensive, and the geographic distribution of the institutions offering this work is wide. It is hoped that the list will continue to grow as more institutions formulate definite plans for returning medical officers and that this and subsequent listings will become increasingly useful, especially to returning physicians who desire review and refresher courses.

VIVISECTION EXHIBITIONISM

Dr. Franklin Bliss Snyder, president of Northwestern University, Dr. George A. Gardner, acting dean of the Medical School, and Dr. Andrew C. Ivy of the physiology department, charged with cruelty to animals by Mrs. Grace Petkus, vice president of the Animal Welfare League, aided and abetted by Mrs. Irene Castle McLaughlin, were recently tried in a Chicago municipal court. After the testimony was heard, the judge dismissed the case. Reporters recognized the incident as merely another of the episodes involving the ex-actress and terpsichorean who seems to hanker continuously for the limelight and plaudits which once were hers. Said the Chicago *Sun*, in the issue of June 29, "That old courtroom drama, which might be called 'The Vivisection Blues' and which has played more return engagements here than 'Rose Marie,' was on the boards again yesterday, this time in the Chicago Avenue Court before Judge John R. McSweeney. Mrs. Irene Castle McLaughlin appeared again as the emotional chief witness, a role she created years ago, for medical science and against Hearst's Chicago *Herald-American*, which for a decade or so has been the play's angel. It was the consensus afterward that unless a happier ending can be achieved 'The Vivisection Blues' never can be taken on the road." The Chicago *Tribune* featured Mrs. McLaughlin's costume. The Chicago *Times* said "Irene's crying act leaves court cold" and in a semifacetious manner emphasized Mrs. McLaughlin's clothes. The *Daily News* just noticed the incident, but the Hearst *Herald-American* devoted a column on page 7 to saying "We haven't begun to fight." Inadvertently, Mrs. McLaughlin disclosed the real issue. "Well," she is reported to have remarked, "we got a university president in court for the first time, anyway." The antivivisectionists' purpose then is not the protection of animals but the heckling of scientists and, perhaps most important, getting their names and their pictures in the paper. We have seen la belle Castle's summer outfit; by next fall she will be ready no doubt to exhibit something special in furs from small animals trapped in the woods.

PENICILLIN VARIATIONS

After the discovery of penicillin and the rapidly expanded commercial production which made it readily available, a vast literature accumulated concerning the effects of this therapeutic agent on the course of many diseases. Some variations have been observed between the British and American products, particularly when the single dose technic is used. Recently an explanation for the variations [1] stressed the fact that a partitioning of the active components occurs in the course of isolation of penicillin from the Penicillium notatum cultures. The product obtained by growth in open flasks is called penicillin F or penicillin I by the British, while that produced by the tank method is called penicillin G or II. There is also a product designated penicillin X, III or allopenicillin. Since penicillin production by the tank-submerged cultures gives the greatest yield, this type of product is in most common therapeutic use; it is almost exclusively the G type penicillin. Evidence suggests that each fraction has therapeutic specificity. In the case of the gonococcus this is most striking; here the G fraction is less active than the crude penicillin, and the X fraction is more active than either of the previous two. However, the content of each fraction present in a single ampule is not known, since fractional assaying has not been considered practical up to the present. The various penicillins vary in proportion not only according to different methods of production but also from one batch of the drug to another produced by the same method. It is obvious that until penicillin can be produced in a chemically pure form the recognition of its variable complex nature should be considered in any attempt to evaluate its action against disease producing agents.

1. Editorial, Naval M. Bull. 44: 1083 (May) 1945.

MEDICINE AND THE WAR

ARMY

PROMOTIONS IN THE ARMY MEDICAL DEPARTMENT

The following promotions to the rank of brigadier general (temporary) were recently announced by the War Department:

Brig. Gen. Larry B. McAfee, as assistant to the Surgeon General of the Army, is serving as commanding general of Bruns General Hospital, Santa Fe, N. M.

Brig. Gen. Addison D. Davis, as assistant to the Surgeon General of the Army, is serving as commanding general, Carlisle Barracks, Pa., and as commandant of the Medical Field Service School.

Brig. Gen. George W. Rice, surgeon of an army in the Southwest Pacific Area since September 1944.

Brig. Gen. Edward Reynolds, as Chief, Supply Service, Office of the Surgeon General since May 1944. General Reynolds is charged with the procurement, storage and issue of all medical, dental and veterinary supplies for the Army.

Brig. Gen. Charles M. Walson has been Surgeon, Second Service Command, Governors Island, New York, since January 1944.

Brig. Gen. Elliott C. Cutler has been Chief Consultant in Surgery, Headquarters, European Theater, since July 1942.

MORE VETERINARIANS NEEDED

The director of economics stabilization recently directed that immediate steps be taken to bring larger numbers of nonfederally inspected meat producing establishments under federal inspection in order to meet the huge requirements of the armed forces. In line with this directive, several teams have been sent into the field to survey several hundred of these noninspected plants which it is believed can be made to qualify for limited federal inspection. Under agreement between the war food administrator and the secretary of war, signed in February 1944, when the Department of Agriculture cannot supply the inspection at plants brought under federal supervision, in order to contribute to military meat requirements, the inspection service is furnished by the Veterinary Corps. It is anticipated that as a result of the drive now being made to bring under inspection more plants, approximately 150 additional veterinary officers will be required for the program. Accordingly, a recommendation has been submitted to the War Department to raise the ceiling for Veterinary Corps officers to provide for this additional requirement in order to maintain health standards.

262d MEDICAL BATTALION AWARDED PLAQUE

The 262d Medical Battalion, now in action in the Philippines, recently received the Meritorious Service Plaque. The award was made by Gen. Walter Krueger, commanding general of the Sixth Army, who cited the battalion's high standard of efficiency in clearing and evacuating casualties on Leyte Island. The battalion is the third unit of the 2d Engineer Special Brigade to receive the Meritorious Service Plaque. The 262d Medical Battalion is commanded by Lieut. Col. A. E. Rosen, who has been with the unit since its organization at Cape Cod in June 1942.

BRONZE STAR MEDAL

Sgt. Carl E. Stuart, Medical Department, Walthill, Neb., was recently awarded the Bronze Star for his work among the American prisoners in the Philippines. While a prisoner of war he was wardmaster and hospital attendant from November 1943 to January 1945, caring for other American prisoners in the tuberculosis ward of Japanese Prison Camp Number One, Cabanatuan, Philippine Islands. Working under the most hazardous and primitive conditions with a minimum of protection from disease, he gave cheerful, untiring care to his patients even though subjected to constant interference and abuse from Japanese guards and while suffering himself from the ravages of prison life. Improvising equipment and laboring countless hours, he did his utmost for critically ill patients. On the arrival of an American liberation force he continued to care for his patients until all had been removed to friendly lines and he was convinced that medical facilities were available. Only then did he seek treatment for himself. His determined efforts, his loyalty to his suffering comrades and his inspiring conviction that the Japanese yoke would be lifted instilled in many desperately ill captives the will to live through their terrible ordeal.

FRONT LINE MEDICAL CARE SUCCESSFUL

Brig. Gen. Hugh J. Morgan, chief consultant in medicine, Office of the Surgeon General, U. S. Army, who recently returned from a nine week, 15,000 mile tour of the European and Mediterranean theaters of operation, reports that the Army's policy of moving medical care, as well as surgical care, nearer and nearer to the front lines has proved eminently successful.

The primary task of the medical corps is to keep soldiers on active duty, and this is especially vital in combat areas, where regiments, divisions and whole army groups function as a team, with each unit doing its special task. The quality of medical care given in operations areas which General Morgan visited is extraordinarily good, he said. There is the same supervision of all cases by specialists in specific fields of medicine as there is in the United States.

58th EVACUATION HOSPITAL

The 58th Evacuation Hospital, commanded by Col. Charles E. Spellman, formerly of Missoula, Mont., has averaged as many as a thousand cases weekly over a three week period. With a normal bed capacity of 400, the unit found facilities during the heaviest fighting on Cebu to accommodate and care for as many as 800 patients. After serving for more than a year at Camp Carson, Colorado, where it was originally activated, the 58th Evacuation Hospital went into actual operation on a small jungled island in the Admiralty group on March 6, 1944, and with the invasion of the Philippines, Colonel Spellman and his veteran crew set up shop in muddy Tacloban, capital of Leyte. Then followed the setting up of temporary bivouac near the cathedral town of Pardo, and in a few days the 58th followed the American division into the smoking ruins of Cebu City.

NUTRITION SURVEY COMPLETED

Major Marvin B. Corlette, chief, Civilian Nutrition Branch, Nutrition Division, Preventive Medicine Service, recently returned from a seven weeks tour in the European theater, where he was in charge of a nutrition survey team which worked primarily in the Netherlands. This team was with the first troops into Utrecht, Amsterdam, The Hague and Rotterdam after the German surrender. Major Corlette also made brief nutrition surveys in Belgium and Germany and visited the concentration camps at Belsen and Dachau, Germany, where he assisted in formulating plans for feeding starvation cases.

COLONEL SHULL GETS NEW ASSIGNMENT

Following a tour of duty in the Office of the Surgeon General of more than three years, Lieut. Col. Harrison J. Shull, M. C., departed from that office for his new assignment as consultant in medicine to the Sixth Army, in the Southwest Pacific.

Colonel Shull's successor as chief of the General Medicine Branch of the Medical Consultants Division is Major Frederick T. Billings, M. C., recently returned from overseas, where he was assigned to the Medical Service of the 118th General Hospital and also served on temporary duty as a consultant in medicine.

NEW APPOINTMENT

Lieut. Col. Fred E. Ball, formerly of Chicago, has been appointed District Consultant for Internal Medicine to the Air Surgeon. Now chief of Medical Services at the AAF Regional and Convalescent Hospital, Miami District, Colonel Ball is consultant for the Southeast District, which comprises the states of Tennessee, Mississippi, Alabama, South Carolina, Georgia and Florida. Dr. Ball graduated from the University of Minnesota Medical School, Minneapolis, in 1923 and entered the service in 1942.

AWARD OF MERITORIOUS SERVICE UNIT PLAQUE

The 45th Evacuation Hospital (Sm.) was recently awarded the Meritorious Service Unit Plaque "for superior performance of duty in the accomplishment of exceptionally difficult tasks during Dec. 2, 1944 to Feb. 16, 1945."

ARMY AWARDS AND COMMENDATIONS

Colonel Charles B. Odom

Col. Charles B. Odom, formerly of New Orleans, was recently awarded the Bronze Star. The citation accompanying the award read "for heroic achievement in connection with military operations against an enemy of the United States in Germany. On April 6, 1945 Colonel Odom, assistant surgeon, Headquarters Third U. S. Army, voluntarily undertook a daring mission behind enemy lines to give medical aid to wounded allied prisoners held in a prisoner of war camp at Hammelburg, Germany. Traveling at night by quarter-ton truck, braving enemy sniper and mortar fire and the constant threat of ambush, he reached the camp successfully and aided a Serbian medical officer in treating the wounded. The courage and skill and loyal devotion to duty Colonel Odom displayed are in keeping with the highest traditions of the military service." Dr. Odom graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1932 and entered the service July 15, 1942.

Captain R. Hills McArthur Jr.

The Soldier Medal was recently awarded to Capt. R. Hills McArthur Jr., formerly of Clio, Mich. According to the citation accompanying the award "The pilot had attempted to land his aircraft after a dive bombing mission with four phosphorus bombs still attached to the plane. At the first impact of landing one bomb exploded under the tail surfaces of the plane and caused the aircraft to turn over on its back and immediately to catch fire. Captain McArthur rushed to the scene of the accident and without regard for the hazards of pools of gasoline and oil, or to the danger of explosion of remaining bombs, which were emitting smoke, succeeded in removing the canopy. Then, by lying on his back in gasoline and oil and working under the most difficult conditions, Captain McArthur freed the pilot from his harness and parachute and carried him to safety." Dr. McArthur graduated from the University of Tennessee College of Medicine, Memphis, in 1937 and entered the service July 8, 1942.

Lieutenant Colonel Roy D. Arn

The Bronze Star was recently awarded to Lieut. Col. Roy D. Arn, formerly of Dayton, Ohio. The citation reads, in part, "Lieutenant Colonel Arn volunteered for temporary duty in support of a front line unit despite the fact that such duty was not commensurate with his rank, age or assignment to a fixed base hospital. He found the unit after an arduous and dangerous three day trip on foot over the most rigorous mountain terrain and immediately undertook the performance of major surgical procedures which resulted in the saving of many lives. He continued to render his services until the unit finished the combat operation. The enthusiasm manifested by Lieutenant Colonel Arn in volunteering for such an assignment and in the performance of fine surgical procedures which saved the lives of many men reflects great credit on himself and the service." Dr. Arn graduated from the University of Michigan Medical School, Ann Arbor, in 1926 and entered the service May 9, 1942.

Major Thomas Floyd Jr.

Major Thomas Floyd Jr., formerly of Abbeville, Ala., was recently awarded the Bronze Star "for outstanding professional services from June 6, 1944 to January 1945," when he served as a surgeon with the Army Medical Corps under combat conditions. Major Floyd's surgical team performed major operations on 1,040 casualties during this six months period Attached to a First Engineer Special Brigade, Major Floyd is member of a medical battalion that has been overseas twenty-seven months. He is stationed at a forward field hospital of the First Army, and his was the first army surgical team to operate east of the Rhine, at the Remagen Bridgehead. Dr. Floyd graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1907 and entered the service in September 1942.

Lieutenant Colonel Isidore A. Feder

The Bronze Star was recently awarded to Lieut. Col. Isidore A. Feder, formerly of Brooklyn, "for meritorious service in connection with military operations against the enemy as chief of medical service, 45th Evacuation Hospital, Semimobile, from June 17, 1944 to Aug. 1, 1944 in France. Lieutenant Colonel Feder expertly supervised the diagnosis and treatment of numerous medical cases. He displayed keen insight in properly distributing the medical services of officers, nurses and enlisted personnel to insure prompt and adequate treatment of the wounded. By his initative, professional knowledge and skill, Lieutenant Colonel Feder reflected credit on himself and on the military service." Dr. Feder graduated from Tufts College Medical School, Boston, in 1927 and entered the service Aug. 12, 1942.

Major Allen M. Boyden

Major Allen M. Boyden, formerly of Astoria, Ore., was recently awarded the Bronze Star for "meritorious service as Surgeon, Surgical Team 1, 3d Auxiliary Surgical Group. Arriving on the fire-swept invasion beach of Normandy on D day, Major Boyden immediately undertook his medical tasks. Despite a heavy flow of casualties he calmly and efficiently supervised the treatment of many wounded soldiers, although frequently subjected to enemy artillery and aerial bombardment. During subsequent operations on the continent he consistently performed his assignment in an outstanding manner. By his surgical skill and untiring efforts he set an example worthy of emulation." Dr. Boyden graduated from the University of Michigan Medical School, Ann Arbor, in 1932 and entered the service Oct. 27, 1942. He is now in Germany caring for prisoners and refugees from the notorious German camps.

Captain Nelson M. Black Jr.

The Soldier's Medal was recently awarded to Capt. Nelson M. Black Jr., formerly of Iowa City, "for outstanding heroism displayed at Army Air Base, APO 215, on Dec. 24, 1944. Immediately following the crash of a B-29 type aircraft loaded with bombs, Captain Black rushed to the scene and unhesitatingly faced the danger of the exploding ammunition, incendiary bombs and oxygen tanks, to exert his every effort in finding and rescuing the bodies of the dead and injured crew members from the blazing wreckage. This deed was performed at extreme risk of life, since, in addition to the other attendant dangers, many 500 pound demolition bombs on the verge of explosion from the excessive heat were in the area. The actions of Captain Black in the face of great danger were instrumental in saving the lives of several crew members and were a source of courage to other personnel comprising the rescue party. Such disregard for his personal safety in the execution of an act of courage reflects the highest credit on Captain Black and the Army Air Forces." Dr. Black graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1939 and entered the service Aug. 12, 1942.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

July 2, 1945.

Public Health Service Personnel Get Military Status

President Truman has by executive order given 3,000 U. S. Public Health Service members military status for the duration of the war. This action was taken under authority of the Public Health Service Act of 1944 and is effective July 21. The Public Health Service has no enlisted personnel, and its commissioned corps of around 3,000 includes physicians, dentists, sanitary engineers, pharmacists and other scientists and nurses. The President's order gives this personnel the same status, benefits, discipline and obligations of members of military establishments and provides uniformity in status and in discipline as between various members of the U. S. Public Health Service commissioned corps. Formerly some officers acquired veteran status while others did not, depending on their assignments. The order does not transfer administration of the Public Health Service either to the Army or to the Navy.

Curb Urged on Over Counter Sale of Sulfonamide Drugs

District of Columbia health officials have been asked to curb over the counter sale of sulfonamide drugs by the Committee on Public Health of the Medical Society of the District of Columbia, of which Dr. Edward J. Stieglitz is chairman. The committee also asked the District commissioners to assist District Health Officer Ruhland in effecting such restrictions if necessary. The committee endorsed the recommendations contained in the report of the subcommittee of the committee on public health relations of the New York Academy of Medicine, pointing out the dangers inherent in the use of the sulfonamide drugs. Editorially, the *Medical Annals of the District of Columbia* has expressed the hope that action on the committee recommendations, which was endorsed by the executive board, would be taken soon.

Hospital Center Critics Asked for Better Plan

With the Senate passed bill for a 1,500 bed medical center in the national capital delayed until completion of a Washington hospital survey in the fall, Senator Tydings, Democrat of Maryland, co-author of the measure, has challenged critics to come forth with a better plan. The bill is now before a subcommittee of the House District Committee. Budget Director Harold D. Smith urged delay until the survey and criticized managerial and financial plans for the new center. Said Senator Tydings "Simply to criticize the existing bill, without producing a better or less costly bill to improve or construct hospital facilities, is not helping the hospital situation of the District. In effect it is simply preventing any improvement to the crying needs for better and more modern hospitals and facilities to take care of the growing city."

One Third of Civilian Dentists in Armed Forces

Since 1940 one third of the civilian dentists of the country have gone into the armed services, it was testified before the subcommittee on health of the Senate Committee on Education and Labor. Illustrating the availability of dental care, it was reported that in California during 1940 there was 1 dentist for every 1,279 people, while South Carolina had 1 dentist for every 5,263. This information was disclosed at hearings on the proposal of Senator Murray of Montana to spend a million dollars to establish a National Institute of Dental Research and appropriate an additional $730,000 a year to keep it going. Senator Claude Pepper of Florida and Senator George T. Aiken of Vermont have jointly proposed that federal grants-in-aid be made to the states and local governments so that they can establish and maintain "adequate measures for the prevention, treatment and control of such [dental] diseases, including a dental care program for children, the training of personnel for state and local dental health work and the development and maintenance of effective means for the education of the public concerning dental disease." Dental neglect among children between the ages of 6 and 18 years is said to be such that only about 5,650,000 of the annual crop of 22,500,0000 decayed teeth are filled. The population over age 3 is said to have an accumulated need for 39,500,000 crowns and bridges, 20,000,000 partial dentures, 20,000,000 dental disease treatments and 125,000,000 prophylactic treatments.

Allied Surveillance of German Research Urged by Berge

Assistant Attorney General Wendell Berge told the subcommittee on war mobilization of the Committee on Military Affairs that allied authorities must exercise careful surveillance over German research programs. Pointing out that it was through research that Germany was able to prepare clandestinely for this war, he warned that German officials will endeavor to maintain the core of organized research personnel and technical facilities "on which their know-how depends." He said this war has demonstrated that the fields of major importance are synthetic chemistry, metallurgy, electronics and aerodynamics. When the war ended, he said, Germany was on the verge of developing "new and more terrible instruments of destruction, particularly in the field of long distance rockets and explosives."

Council on Medical Service and Public Relations

PREPAID MEDICAL CARE NEWS

Membership of Hospital Plan Enlarged

The Blue Cross Plan for Hospital Care showed the largest membership increase during 1944 of any year in its history on the enrolment of 163,039 subscribers, bringing the total membership to 747,317, in an announcement made by John R. Mannix of Chicago, executive director.

Medical Service Plan Corporation Authorized in Minnesota

During a meeting of the House of Delegates of the Minnesota State Medical Association at St. Paul on May 19 and 20 plans for creating a statewide voluntary nonprofit medical service corporation were authorized and set into motion.

Considerable discussion was given to the method of selecting the twenty-one incorporators to serve as the original board of directors of the corporation. In order to explain the provision for twenty-one incorporators Dr. A. W. Adson, chairman of the Committee on Medical Service, told the delegates that not only geographic representation of the profession was considered desirable but representation of various specialties as well. The arbitrary number of twenty-one was deemed necessary to provide both—two physicians from each councilor district plus three at large, the latter to be selected by the eighteen members representing the councilor districts.

Preparation of articles of incorporation and formulation of detailed plans after careful study of existing models of the various states were authorized.

The question of whether the Minnesota Medical Service plan will be coordinated with the Blue Cross, as in the case of Michigan, or whether some commercial sickness and accident insurance company will participate in the venture is a decision still to be made by the board of directors.

Bureau of Information

PROGRESS REPORT, JUNE 27, 1945

The progress of the Bureau of Information is not as rapid as is desired, but during recent weeks there has been a gratifying increase in the number of completed county summary sheets received from the state and county medical societies. This response is indicative of a whole-hearted effort on the part of the various societies to aid in the completion of this phase of the Bureau of Information.

The accompanying table gives the returns by county from each of the states as of June 27, 1945.

Summary Sheets Received from State and County Medical Societies

State	Number of Counties	Number of Counties Reported	Counties Unreported
County Returns Complete as of June 28, 1945			
Arizona	14	14	0
Arkansas	75	75	0
Connecticut	8	8	0
District of Columbia	1	1	0
Iowa	99	99	0
Kansas	105	105	0
Kentucky	120	120	0
Louisiana	64	64	0
Massachusetts	14	14	0
Minnesota	87	87	0
Missouri	115	115	0
Nevada	17	17	0
New Mexico	31	31	0
North Dakota	53	53	0
Ohio	88	88	0
Utah	29	29	0
West Virginia	55	55	0
Wisconsin	71	71	0
Total	1,046	1,046	0
Partial County Returns			
Alabama	67	65	2
California	58	10	48
Colorado	63	29	34
Florida	67	23	44
Georgia	159	59	100
Idaho	44	23	21
Illinois	102	101	1
Indiana	92	74	18
Michigan	83	49	34
Montana	56	45	11
Nebraska	93	51	42
New Hampshire	10	8	2
New Jersey	21	7	14
New York	62	58	4
North Carolina	100	26	74
Oklahoma	77	41	36
Pennsylvania	67	1	66
South Carolina	46	23	23
South Dakota	69	54	15
Tennessee	95	60	35
Texas	254	54	200
Virginia	100	51	49
Washington	39	25	14
Wyoming	23	13	10
Total	1,847	950	897
No Returns Received			
Delaware	3	0	3
Maine	16	0	16
Maryland	24	0	24
Mississippi	82	0	82
Oregon	36	0	36
Rhode Island	5	0	5
Vermont	14	0	14
Total	180	0	180
Total counties	3,073		
Counties reported	1,996		
Counties unreported	1,077		

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Survey of Medical Personnel Needs

Under a resolution submitted by Senator Downey, California, S. Res. 134, the Senate Committee on Military Affairs would be directed to make a complete investigation with respect to the relative needs of the armed forces and the civilian population for services of medical personnel to ascertain (1) whether, as a result of developments in the war, or through more efficient utilization of medical personnel, such personnel can be released from the armed forces for civilian service without impairment of the war effort; (2) the speed with which demobilization of medical personnel of the armed forces can be accomplished as the needs of the armed forces diminish; and (3) whether any further action is necessary to insure an adequate supply of trained medical personnel to meet the future needs of the armed forces and the civilian population of the nation.

Social Security Act

Senator Green, Rhode Island, has introduced S. 1188 to amend and extend the provisions of the Social Security Act so as to provide, among other things, hospitalization benefits and benefits for disabled workers. So far as the hospitalization provisions are concerned they are similar to those that were included in the bill introduced in the 77th Congress by Congressman Eliot, Massachusetts, which was analyzed in THE JOURNAL, Sept. 26, 1942, page 296.

Veterans Administration

The appointment of an advisory committee by the President to advise him and the Administrator of Veterans' Affairs with respect to the formulation and administration of programs for providing hospitalization and medical care to veterans is proposed by S. 1187, introduced by Senator White, Maine, for Senator Shipstead, Minnesota. It is contemplated that members of this advisory committee shall be outstanding persons in the professions of medicine, surgery, dentistry, hospital administration and nursing.

Two bills propose a liberalization and clarification of the laws pertaining to hospital treatment, medical care, domiciliary care and related services for veterans, S. 1203, introduced by Senator Johnson, Colorado, and H. R. 3522, introduced by Representative Rankin, Mississippi.

A bill introduced by Representative Rogers, Florida, H. R. 3594, would authorize the Administrator of Veterans' Affairs to reimburse any accredited hospital for hospitalization and treatment, for a period not exceeding ten days, of a veteran where such hospitalization and treatment was of an emergency character.

H. R. 3629, introduced by Representative Maloney, Louisiana, proposes an appropriation of $2,500,000 to erect a general medical and surgical hospital and domiciliary facility in or near New Orleans for the care and treatment of women veterans.

The term "Veterans Administration facilities" would be redefined by a bill introduced by Representative Sikes, Florida, H. R. 3630, to include any private hospital or institution for which the Administrator of Veterans' Affairs may deem it necessary and proper to contract in order to provide hospital care for veterans suffering from injuries and diseases.

Miscellaneous

Representative Priest, Tennessee, has introduced H. R. 3561, proposing to amend the Public Health Service Act to authorize grants to the states for surveying their hospitals and public health centers and for planning construction of additional facilities, and authorize grants to assist in such construction. This bill is substantially the same as the Hill-Burton Hospital Construction Bill, S. 191.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

New Secretary of Medical Board.—Dr. Leonce J. Kosminsky, Texarkana, has recently been elected secretary of the state medical board of the Arkansas Medical Society, succeeding Dr. De Veaux L. Owens, Harrison.

CALIFORNIA

Student Awarded Gold Headed Cane.—Dr. Guerne W. de Lappe, San Francisco, was awarded the gold headed cane given each year to a member of the graduating class of the University of California Medical School, San Francisco. According to the University of California Clip Sheet, the award of the cane is an old English custom which was revived in 1939 by Dr. William J. Kerr, professor of medicine. Each year he presents a cane to the senior medical student who, in the opinion of his classmates and the faculty of the division of medicine, has demonstrated the most striking qualities of a true physician. Dr. David J. New, Piedmont, formerly of Monrovia, received first honorable mention and Dr. Jack Donald Thorburn, El Segundo, second honorable mention.

X-Ray Survey Center Planned.—A mass x-ray survey plan, calling for the establishment of a permanent x-ray survey center open to the public five days a week, has been unanimously approved by the board of directors of the Sacramento County Tuberculosis and Health Association. The plan will make it possible to offer free x-rays to every family in the city and county in the next two years. An estimated 500 families daily will be sent direct invitations by mail giving them specific appointments for x-ray examination, these to be sent after the mailing of literature explaining the purpose of the county wide program and a summary of the tuberculosis problem in the area. It is hoped to have the plan in full operation by fall, according to the *Bulletin* of the National Tuberculosis Association.

ILLINOIS

District Meeting.—Dr. Glen W. Doolen, Davenport, Iowa, was elected president of the Iowa-Illinois Central District Medical Association at its annual meeting on May 24, succeeding Dr. Paul P. Youngberg, Moline. Other officers include Drs. Joseph K. Hanson, Moline, vice president; James Dunn, Davenport, secretary, and Florens E. Bollaert, East Moline, treasurer. Among the speakers at the meeting were Dr. James L. Mudd, St. Louis, on "Empyema" and Dr. Herbert E. Schmitz, Chicago, "Management of Prolonged Labor." Dr. Andrew C. Ivy, Chicago, addressed the dinner session on "Some Contributions of Medicine to Survival on a Raft at Sea."

Chicago

Personal.—Horace L. Sipple, Ph.D., formerly associated with the American Can Company, has been appointed director of the research and educational program of the Evaporated Milk Association.

Special Society Election.—Dr. Frederick R. Schmidt was recently chosen president of the Chicago Dermatological Society. Other officers include Dr. Maurice J. Reuter, Milwaukee, vice president, and Dr. Marcus R. Caro, secretary-treasurer.

Pigeons to Be Tested for Pneumonia Virus.—Itinerant pigeons in Chicago will be tested in the city laboratories of the state department of health to determine if they are carriers of a virus type pneumonia, the Chicago *Sun* reported June 21. Similar tests made at the University of California on pigeons taken from the streets of Philadelphia resulted June 20 in an order by the Philadelphia Department of Health for extermination of the pigeons in the squares and parks, the *Sun* stated. The tests disclosed that 45 per cent of the birds carried a virus which is said to resemble psittacosis. Two tests will be made to identify the virus—one a test of the pigeon serum for the presence of antibodies, and the other to isolate the virus in the pigeon tissue. Recent pigeon tests made in Detroit revealed antibodies in the pigeon serum.

Cancer Committee Opens Information Bureau.—The Chicago Cancer Committee announces the opening of the cancer information bureau at 139 North Clark Street, where facts concerning cancer control and information about facilities for the diagnosis and treatment of cancer will be made available to the public. The bureau is being established in cooperation with the Field Army of the American Cancer Society. Dr. George E. Wakerlin is chairman of the Chicago Cancer Committee, which was organized in 1941 under the leadership of Dr. Ludvig Hektoen to coordinate the activities of all groups engaged in cancer control work in the Chicago area, to encourage research and education of the public and to assist in the establishment of diagnostic and treatment facilities. Dr. Hamilton R. Fishback is chairman of the committee of the information bureau.

INDIANA

Personal.—Dr. John A. Davis, Flat Rock, was chosen president of the Indiana Tuberculosis Association at its meeting in Indianapolis May 9, succeeding Dr. James F. Spigler, Terre Haute.

License Revoked.—The state board of medical registration and examination on March 27 revoked the license to practice medicine of Dr. Frank Morse Nichols, Warsaw and Winona Lake, because of a narcotic conviction.

New Diagnostic Treatment Building.—On June 10 a new diagnostic treatment building was opened at Clearview, Evansville, which expands the bed capacity from 16 to 32. The building cost $55,000. Speakers at the opening included Dr. Clarence C. Herzer, president of the Vanderburgh County Medical Society, and Congressman Charles M. LaFollette. Clearview is a private hospital for patients suffering from mental and nervous disease, alcoholism or drug addiction. Dr. Albert L. Crane is one of the owners and physician in charge.

Members of Hospital Regulation and Licensing Council.—Members of the newly created hospital regulation and licensing council of the Indiana State Board of Health, appointed recently by the governor, are:

Dr. Eldo H. M. Clauser, chairman, Muncie.
Mr. Albert G. Hahn, vice chairman, Protestant-Deaconess Hospital, Evansville.
Sister Amelia, R.N., St. Elizabeth Hospital, Lafayette.
Dr. David R. Johns, East Chicago.
Olive M. Murphy, R.N., Bartholomew County Hospital, Columbus.
Dr. Benjamin P. Linvill, Columbia City.
Mr. J. B. H. Martin, administrator, Indiana University Medical Center, Indianapolis.

Ex officio members are Mr. Otto F. Walls, director, state department of public welfare, Indianapolis, and Dr. Thurman B. Rice, secretary of the state board of health, Indianapolis, who after July 1 was to be succeeded by Dr. Leroy E. Burney, New Orleans, recently named state health commissioner. The council was set up by the 1945 legislature with authority to license, inspect and regulate hospitals.

MARYLAND

Twenty-Fifth Conference of State Board of Health.—The Maryland State Department of Health recently held its twenty-fifth annual conference in Baltimore. Sessions were held at the Johns Hopkins School of Hygiene and Public Health and at the state department of health. Among the speakers were:

Dr. Charles H. Halliday, Baltimore, Tuberculosis Control in Maryland.
Dr. Edwin L. Crosby Jr., Baltimore, Importance of Hospital Licensing.
Dr. G. Foard McGinnes, St. Louis, The Blood and Blood Derivaties Program of the American Red Cross.
Dr. Myron E. Wegman, New York, Indices of Nutrition.
A. W. Hedrich, Sc.D., Baltimore, Role of the Public Health Nurse in Promoting Birth Registration.

MASSACHUSETTS

University News.—Dr. Lewis H. Weed, Baltimore, chairman of the division of medical sciences of the National Research Council, gave the commencement address at Boston University School of Medicine, June 22, on "Some Aspects of Medicine in the Years Ahead."

Alonzo K. Paine Given Distinguished Service Key.—On June 16 Dr. Alonzo K. Paine was awarded a distinguished service key by the trustees of Tufts College in recognition of exceptionally loyal service to his alma mater, Tufts College Medical School. This recognition is made to a small group of individuals each year and is a joint award of the alumni association and the trustees of the college. As president of the Tufts Medical Alumni Association Dr. Paine has been responsible for organizing and completing the drive for funds for a new medical school building, to be erected at the New England Medical Center.

MICHIGAN

Changes in Health Officers.—Dr. Verne L. Van Duzen, Belding, has been appointed director of health for the Mecosta-Osceola health department, effective June 1. Dr. Ira O. Church, Coldwater, has resigned as director of the Branch County Health Department. Dr. James J. Croley, Houghton, has been appointed director of health of Kalamazoo County.

State Health Department Creates New Peninsula Office.—Dr. Wilbert J. M. Menke, a member of the teaching staff of the University of Michigan School of Public Health and of the school of medicine, has been appointed director by the state health commissioner of the upper peninsula office of the Michigan Department of Health. The new office was created by the 1945 legislature and will have offices at the Pinecrest Sanatorium, Powers. *Michigan Public Health* reports that the new office was established to make possible a more effective public health program in the upper peninsula. The thirteen county health departments in the upper peninsula have operated in the past without the immediate assistance and supervision of the state health department. They have been isolated from the central office in Lansing by distance and from one another by a lack of coordinating supervision. Two counties do not have health departments.

MINNESOTA

State Medical Election.—Dr. Edwin J. Simons, Swanville, was elected president of the Minnesota State Medical Association at the meeting of the house of delegates in St. Paul May 19-20. He will succeed Dr. Edward L. Tuohy, Duluth, on Jan. 1, 1946. Other officers chosen include Drs. Max Alberts, St. Paul (deceased) and Winslow C. Chambers, Blue Earth, vice presidents; Benjamin B. Souster, St. Paul, secretary and William H. Condit, Minneapolis, treasurer. The house of delegates formed a nonprofit corporation which will be independent of the state medical association but whose board of directors will be made up of two physicians from each of the nine councilor districts and three at large. The first meeting was to be held June 17, according to the state medical journal. The journal also announced that the committee on sickness insurance of the state association has changed its name to the committee on medical care. At the time of this report it was not yet decided whether the medical service plan to be promulgated by the corporation was to be coordinated with the Blue Cross.

MISSOURI

Pilgrimage to Beaumont's Grave.—The Lloyd R. Boutwell Post, No. 136, American Legion, held memorial services at the grave of Dr. William Beaumont at the Bellefontaine Cemetery, St. Louis, May 30. This is an annual service of the Boutwell Post.

Personal.—Dr. Edward W. Cline, Platte City, health officer of Platte County, has been appointed to a similar position in charge of the newly merged city-county health department of Jasper County with offices in Joplin.——Dr. George A. Mellies was guest of honor at a dinner May 31 given by the staff of the Christian Hospital, St. Louis, in recognition of his completion of fifty years in the practice of medicine. He was presented with a wrist watch.

MONTANA

Board Election.—Dr. Cedric H. Nelson, Billings, was elected president of the state board of medical examiners April 2 in Helena, Dr. Edmund A. Welden, Lewistown, was chosen vice president and Dr. Otto G. Klein, Helena, was reelected secretary. Dr. Patrick E. Kane, Butte, was reappointed a member of the board for a seven year term.

Health League Takes Permanent Offices.—The Public Health League of Montana has established permanent offices in the Power Block, Helena. All communications should be addressed to Post Office Drawer 1142, Helena. The league will serve as a clearing house for public relations activities of various affiliated groups, aid in conducting programs of information regarding affairs and activities which affect public health, cooperate with existing public health agencies and protect the interests of the public through health campaigns, crusades and other activities. Mrs. H. W. Peterson, Billings, field commander, northwest region, Field Army, American Cancer Society, is president of the organization; Rev. Frank L. Harrington, Butte, representing the Catholic Hospital Association, is vice president; Milo F. Dean, Great Falls, representing the Montana Hospital Association, is secretary-treasurer. D. W. Bowler, Helena, has been selected league manager and Margaret Applegate, Helena, office secretary. In addition to Father Harrington, Mr. Dean and Mrs. Peterson, the directors of the league include Dr. James M. Flinn, Helena, Montana Medical Association; Mrs. Frances MacDonald, Great Falls, Montana State Nurses Association; E. A. Kuntz, Helena, Montana Optometric Association; Joe L. Markham, Butte, director at large; George Gosman, Dillon, pharmaceutical association; Harvey Fearn, Bozeman, Montana State Dental Association, and George Hutton, Billings, tuberculosis association.

NEW YORK

Ninety-Four Years of Age.—Dr. Frederick N. Winans, Franklin, celebrated his ninety-fourth birthday May 28. He practiced in Gilbertsville for twenty years and has been in Franklin fifty-one years.

Progress of Plan for Distribution of Blood Plasma.—Provisional plans for the organization of a statewide program to distribute blood plasma and blood derivatives in New York State have been drawn up by the state department of health, through its office of medical administration and division of laboratories and research, in collaboration with the New York State Association of Public Health Laboratories, the state hospital association and the Medical Society of the State of New York. The general distribution will be made through approved public health laboratories for the purpose of establishing a supply for the smaller urban and rural communities. While no charge will be made for the plasma, it is expected that individuals benefiting from its use will be made responsible for obtaining donors who will give blood for its replacement. According to *Health News,* other features of the projected service are the establishment of a center of information as to where blood of unusual types may be obtained on short notice and encouragement of the use of standardized equipment in all cooperating laboratories, making possible an interchange of facilities in emergencies. Of particular importance is the anticipated promotion of a continued graduate medical program, in cooperation with the state and county medical societies, which will provide information concerning the value and use of whole blood and its derivatives. The proposed program is being developed as a result of the passage of enabling legislation and an appropriation by the legislature of $100,000.

New York City

License Reinstated.—The license to practice medicine of Dr. Herman L. Kasha, revoked in 1941, was reinstated as of July 1.

Personal.—Philip S. Platt, Ph.D., executive director of the New York Association for the Blind, was chosen president of the Greater New York Council of Agencies for the Blind at its annual meeting, June 5. Berthold Lowenfeld, director of educational research, American Foundation for the Blind, was elected secretary-treasurer.

Dr. Freitag Surrenders.—Dr. Abraham Freitag, Brooklyn, who pleaded guilty recently to charges of diverting to the black market bandage material for which he had a priority, surrendered June 18 to U. S. Marshal James E. Mulcahy to begin a prison term of three years. He was also fined $100,000, which had not been paid at the time of this report (THE JOURNAL, June 16, p. 532).

Physician Receives Anniversary Volume.—Dr. Eli Moschowitz, consulting physician of the Mount Sinai Hospital, was presented June 27 with a special edition of the *Journal of the Mount Sinai Hospital* in commemoration of his recent sixty-fifth birthday. Dr. Moschowitz graduated at Columbia University College of Physicians and Surgeons in 1900 and served his internship at Mount Sinai. In 1920 he joined the staff of the medical service; in 1941 he was named attending physician and in 1944 consultant.

NORTH CAROLINA

Honor Physicians Over Seventy.—Nine Mecklenburg County physicians, seven of them more than 70 years old and the others to be 70 in September, were honored by the Mecklenburg County Medical Society at a dinner dance in Charlotte June 1. The physicians who are already 70 or more are Drs. Robert L. Gibbon, Albert M. Whisnant, Calvin S. McLaughlin, James G. Johnston, Thomas M. McCoy and James R. Alexander, all of Charlotte, and Thomas N. Reid, Matthews. The other two are Drs. Lorenzo D. McPhail and William M. Strong, both of Charlotte.

Southern Pediatric Seminar.—The twenty-fifth session of the Southern Pediatric Seminar will be held at Saluda, July 16-28. Among the speakers will be:

Dr. Samuel F. Ravenel, Greensboro.
Dr. Frank H. Richardson, Black Mountain.
Dr. Owen H. Wilson, Nashville, Tenn.
Dr. William L. Funkhouser, Atlanta.
Dr. Charles J. Bloom, New Orleans.
Dr. John LaBruce Ward, Asheville.
Dr. Francis B. Johnson, Charleston, S. C.
Dr. William Weston, Columbia, S. C.
Dr. Daniel Lesesne Smith, Saluda.
Dr. W. Ambrose McGee, Richmond, Va.
Dr. Angus M. McBryde, Durham.
Dr. Alfred A. Walker, Birmingham, Ala
Dr. Richard M. Pollitzer, Greenville, S. C.
Dr. Stewart H. Welch, Birmingham.
Dr. Wilburt C. Davison, Durham.
Dr. Oren Moore, Charlotte.
Dr. Oscar L. Miller, Charlotte.
Dr. Antonio J. Waring, Savannah, Ga.
Dr. Kenneth M. Lynch, Charleston.
Charles B. Bray, D.D.S., Birmingham
Dr. Joseph Warren White, Greenville, S. C.
Dr. Hamilton W. McKay, Charlotte.
Dr. Robert W. McKay, Charlotte.
Dr. Philip A. Mulherin, Augusta, Ga.
Dr. Luther W. Holloway, Jacksonville, Fla
Dr. Warren W. Quillian, Miami, Fla.
Dr. Madison Hines Roberts, Atlanta.
Dr. Mylnor W. Beach, Charleston, S. C.
Dr. Daniel Lesesne Smith Jr., Spartanburg, S. C.
Dr. Julian P. Price, Florence, S. C.
Dr. Frank Lee Bivings, Atlanta.
Dr. Jay M. Arena, Durham.
Dr. Robert B. Lawson, Winston-Salem.
Dr. Hughes Kennedy Jr., Birmingham.
Dr. Amos Christie, Nashville.

The participants will present papers, conduct clinics and hold various round table discussions. Dr. Daniel Lesesne Smith, Saluda, is registrar for the seminar.

OKLAHOMA

Paul Fesler Returns to University.—Mr. Paul H. Fesler has resigned as executive secretary of the Oklahoma State Medical Association to return to the University of Oklahoma School of Medicine, Oklahoma City, as administrator of hospitals. Mr. Fesler will continue with the state medical association on a part time basis pending the appointment of a successor.

Physician's Library Given to County Medical Society.—The medical library of the late Dr. John Frederick Bolton, consisting of about 100 volumes, has been transferred to the library of the Tulsa County Medical Society through the courtesy of St. John's Hospital, Tulsa. It will be placed in the special section to be indicated by a bronze plaque, presented to the medical library by Dr. Bolton's family. The *Bulletin* of the Tulsa County Medical Society announces that members of the Bolton family plan to keep the library active through the years by the addition of new textbooks.

PENNSYLVANIA

Personal.—Dr. Edward M. Iland, Coraopolis, has been appointed district medical director for Allegheny County, in the absence of Dr. Angelo M. Williams, Pittsburgh, who is in military service.——Dr. John Webb Vaughn, Bergery, was guest of honor at a dinner, May 10, in recognition of his completion of fifty years in the practice of medicine.

Survey of the Blind.—Miss Annette Dinsmore, field supervisor of the home instructors for the adult blind, Pennsylvania Council for the Blind in the state department of welfare, is securing some data in regard to deaf-blind persons in Pennsylvania. Her work is a part of the program of the American Foundation for the Blind to secure as much data as possible on a representative sampling of deaf-blind persons in order to assist in determining their greatest needs. P. C. Potts, assistant director, American Foundation for the Blind, New York, is planning to devote considerable time to the problem.

Philadelphia

Dr. Ingleby Resigns as Professor of Pathology.—Dr. Helen Ingleby, since 1924 professor of pathology at Woman's Medical College of Pennsylvania, resigned June 15 to head on a full time basis the division of pathology in the laboratories of the Jewish Hospital.

New Professorship in Ophthalmology.—On June 16 the University of Pennsylvania received a gift of $155,000 from the estate of the late Dr. George E. de Schweinitz, who died Aug. 22, 1938. According to the New York *Times*, the bequest will be used to establish a fund to support the department of ophthalmology and to create a professorship to be known as the "William F. Norris and George E. de Schweinitz Professorship of Ophthalmology." Dr. Norris was the first professor of ophthalmology at the medical school and Dr. de Schweinitz was professor from 1902 until 1929, when he became emeritus professor.

Special Society Election.—Dr. Gerald H. J. Pearson was chosen president of the Philadelphia Psychoanalytic Society at its annual meeting June 9. Other officers include Drs. George W. Smeltz, Pittsburgh, vice president, and LeRoy M. A. Maeder secretary-treasurer.

The Jarecki Lecture.—Dr. Harry C. Solomon, professor of psychiatry at Harvard Medical School, Boston, and head of the department at the Boston Psychopathic Hospital, delivered the eleventh annual Jarecki Memorial Lecture at the Jewish Hospital, May 2, on "The Effects of War on Psychiatry."

Pittsburgh

Medical Bulletin Dedicated to Women Members.—The *Pittsburgh Medical Bulletin* for June 2 was dedicated to the 58 women members of the Allegheny County Medical Society. Dr. Zoe Allison Johnston, elected in 1944, was the first woman to be chosen president of the society.

TENNESSEE

Personal.—William Henry Hollinshead, Ph.D., associate professor of anatomy at the Duke University School of Medicine, Durham, N. C., will be visiting associate of anatomy at the University of Tennessee College of Medicine, Memphis, during the summer quarter, according to *Science*.——Dr. Julian E. Williams, Blountville, recently resigned as health officer of Sullivan County.——Dr. John W. Shackelford has been appointed assistant health officer of the Memphis and Shelby County Health Department, succeeding Dr. W. D. Burkhalter (THE JOURNAL, May 12, p. 146).

UTAH

Personal.—Dr. Thomas J. Howells on May 18 was named director of the Salt Lake County Health Department. Dr. Howells has served as superintendent of the Salt Lake County General Hospital and also as health commissioner of Salt Lake City.——Dr. Edward L. Van Aelstyn, Price, has resigned as health officer of district number 3, including Carbon, Emery, Grand and San Juan counties, effective June 1, to enter private practice.

WASHINGTON

Physicians Sue Medical Society.—Drs. John M. Howell and Roy H. Blender, Renton, are said to have filed a suit in Superior Court against the King County Medical Society "to force the society to permit them to practice in the new Renton Hospital" according to the Seattle *Times*, May 25. The use of the hospital was said to be denied the physicians because they were not members of the society, it was stated. The King County Medical Service Corporation was also named a defendant in the suit. The plaintiffs accused the society of conspiring with the medical service corporation to acquire a "monopoly" for members of the society in practicing medicine in the county. It was said that the corporation and the society also were charged with conspiring to "eliminate competition" in furnishing medical and hospital services to the public on the prepayment or monthly payment plan. Others named as defendants include the Valley Hospital Foundation, which operates Renton Hospital; Dr. Harold E. Nichols, Seattle, president, and other officers and trustees of the society; Dr. Erroll W. Rawson, Seattle, who was identified as president of the medical service corporation but who no longer holds that office; Dr. Karl H. Van Norman, superintendent of Doctors Hospital, Seattle, and officers and trustees of the Valley Hospital Foundation. Dr. Howell and Dr. Blender are affiliated with the Medical Security Clinic, which has offices in Seattle, Renton, Kirkland, Winslow and Ravensdale.

WEST VIRGINIA

Tumor Clinic Formed.—A tumor clinic has been organized in Fairmont under the joint sponsorship of the Marion County Medical Society and the county health department. Nursing service and follow-up work is being provided by the personnel of the health department. The clinic will be held on the first and third Thursdays of each month.

Changes in Health Officers.—Dr. Elias W. Langs, U. S. Public Health Service Reserve, acting director of the division of communicable diseases, state health department (THE JOURNAL, January 27, p. 238), has been appointed health officer of Kanawha County, succeeding Dr. Albert M. Price, who

resigned some months ago and is now engaged in private practice in Charleston. Dr. Thomas E. Romine, Charleston, who has been acting county health officer, has been named assistant to Dr. Langs.

HAWAII

Territorial Election.—Dr. Eric A. Fennel, Honolulu, was reelected president of the Hawaii Territorial Medical Association at its annual meeting in May. Other officers include Drs. Louis A. R. Gaspar Jr., secretary, and Lyle G. Phillips, treasurer, both of Honolulu. Dr. Arthur Gordon Hodgins, Honolulu, was named president emeritus of the association.

Society News.—A recent meeting of the Honolulu County Medical Society was addressed by the following:

Dr. Martin H. Lichter, Critical Analysis of Medical Economic Problems in Hawaii.
Dr. Harold M. Patterson, Aims and Aspirations of the Territorial Association of Plantation Physicians.
Lieut. Col. Herman L. Meltzer, M. C., Some of the Medical Lessons Learned in World War II—Army.
Comdr. Albert W. Hobby (MC), Some of the Medical Lessons Learned in World War II—Navy.
Capt. Howard K. Gray (MC), Some of the Surgical Lessons Learned in World War II—Navy.
Col. Forrester Raine, M. C., Some of the Surgical Lessons Learned in World War II—Army.

Health Committee to Broaden Activities.—The chamber of commerce of Honolulu in May approved a plan for streamlining and broadening the scope of activities of its public health committee. According to the Honolulu *Advertiser*, Dr. Forrest J. Pinkerton, Honolulu, chairman of the committee, announced that as a result of the adoption of his reorganization plan the former Oahu health council, representing all social service and related health groups, would be reactivated, permitting virtually all public health activities to be coordinated through the relationship between the public health committee and other welfare and public health agencies. According to the new plan, certain ex officio members of the public health committee by virtue of their positions with other public health agencies will be discontinued and will have their representation through the Oahu health council. An advisory committee is to be organized from among the membership of the public health committee. Raymond G. Nebelung, new executive director of the health committee, is to be charged with coordination of the various groups, working under Dr. Pinkerton's direction, and a health specialist, Mrs. Allice Spillane, formerly with the Washington state health department, will be added to the staff.

GENERAL

Sir Alexander Fleming Tours United States.—Sir Alexander Fleming, London, discoverer of penicillin, is touring the United States as a representative of the British Ministry of Supply.

Pediatric Examinations to Be Held in Atlantic City.—The American Board of Pediatrics announces that the oral examination will be held in Atlantic City at the Hotel Claridge, December 7-9. This change was made because hotel reservations in New York were unavailable. The written examination of the board will be locally under a monitor, October 19.

Meetings Canceled.—The American Congress of Physical Medicine announced that its annual scientific and clinical session, scheduled to be held in New York, September 5-8, has been canceled. Marion G. Smith, B.Sc., 30 North Michigan Avenue, Chicago 2, is the executive secretary.——The annual convention of the American Academy of Ophthalmology and Otolaryngology which was scheduled for October has been canceled.

Medical Illustrators to Organize.—Twenty-five medical illustrators will meet at the University of Illinois College of Medicine, July 16-19, to create an association of medical illustrators. The session is the result of a two year study and speakers will include Dr. Morris Fishbein, Editor of THE JOURNAL; Dr. Eben J. Carey, Milwaukee; Dr. Malcolm T. MacEachern, Chicago; Thomas G. Hull, Ph.D., director scientific exhibit, American Medical Association, and Carl G. Hartman, Ph.D., Urbana, Ill. One session will be held at the Museum of Science and Industry, Jackson Park, Chicago.

Mental Hygiene Committee Comments on Psychiatric Facilities for Discharged Veterans.—On June 22 the National Committee for Mental Hygiene issued a statement through the United Press that figures recently made available "reveal a staggering need for the creation of psychiatric facilities for the care of mentally disabled veterans." This need was emphasized as a result of the estimate that 500,000 veterans had been discharged from the services for psychiatric reasons by the end of 1944. Facilities are also needed to aid the 1,500,000 men rejected for service because of psychiatric reasons, it was stated. A survey showed twenty-five states without a community clinic for psychiatric care and "vast areas in other states where no psychiatric help is available." Of the total number of established hospitals and clinics throughout the country, only 139 certified their preparedness to treat mental casualties. "With the best will in the world the Veterans Administration and the state vocational rehabilitation bureaus cannot provide psychiatric treatment when neither clinics nor psychiatrists are available," the announcement said. It further reported that the estimated cost to the taxpayer was $30,000 for every hospitalized psychiatric casualty of World War I.

Government Services

Estella Warner Goes to Kansas City

Dr. Estella Ford Warner, senior surgeon, U. S. Public Health Service, district three, with headquarters in Chicago, has been transferred to district seven, with headquarters at Kansas City, Mo., and with the title medical director. The change is effective July 1.

Grants in Aid for Cancer

Nine grants in aid totaling $79,377 were approved at the twenty-eighth meeting of the National Advisory Cancer Council recently at the National Cancer Institute of the U. S. Public Health Service, Bethesda, Md. The total is the greatest amount ever granted at one time by the council and will be expended as follows:

Harvard University, Boston, $24,500 for the study of the relation of steroid hormones to growth and tumors under direction of Dr. James H. Means. Drs. Fuller Albright and Joseph C. Aub will also participate.
Mount Sinai Hospital, New York, $10,775 for clinical studies on gastric cancer under the direction of Franklin Hollander, Ph.D.
Harvard University, an additional $10,000 for the study of the pathology of cancer of the stomach, peptic ulcer and gastritis, with Dr. Shields Warren in charge.
University of Cincinnati, Cincinnati, $10,000 for clinical studies of gastric cancer to be conducted by Dr. Leon Schiff.
Northwestern University, Chicago, $8,500 for research in cancer education. Dr. Andrew C. Ivy will supervise the work.
Haskins Laboratories, New York, $5,000 research on the virus-like agent in mammary cancer of mice. Paul A. Zahl, Ph.D., will direct.
Detroit Institute of Cancer Research, Detroit, $6,152 for study in relation of certain types of diets to induced cancer in rats with Wilhelmina F. Dunning, Ph.D., in charge.
New York University, New York, $3,000 in a study of Hodgkins disease by Robert Chambers, Ph.D.
University of Minnesota, Minneapolis, $1,450 studies on leukemia in mice, conducted by Dr. Arthur Kirschbaum.

Urge Expansion of Services for Children

A recommendation has been presented to President Truman for immediate expansion of health, welfare, education and other federal-state services for children with an additional $75,000,000 appropriation for the fiscal year 1946. The recommendation was made at the conclusion of a year's study by the National Commission on Children in Wartime, according to the New York *Times*. A $50,000,000 addition to the current $6,000,000 grants-in-aid appropriation to the states for maternal and child health services was recommended, this sum to be broken down into a $10,000,000 dental care program for young children, a $15,000,000 school health program and a $25,000,000 program for the care of mothers, infants and preschool children. A $25,000,000 increase over the less than $4,000,000 in current yearly grants for crippled children's services was asked, $15,000,000 of which would go to the victims of rheumatic fever and heart disease, which kill and cripple more grade school children than any other cause except accidents; the rest to be divided equally between orthopedic and other types of crippling such as diabetes, allergies and epilepsy. The *Times* states that the period of ten years was set as the logical limit on providing through federal and state funds such all inclusive service. It was recommended that after the fiscal year 1946 no maximum be specified for either maternal and child health or crippled children's services. Within the same ten years, the commission contended, this nation should provide child welfare services reaching into every county of every state and should have greatly expanded the community resources for care of children of employed mothers, for foster care for dependent children, for detention care of children who come before juvenile courts and for return of child waifs and runaways to their own communities.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 2, 1945.

The Problem of Medical Demobilization

The termination of the war in Europe does not promise much relief in the near future of the shortage of doctors in civil practice. In a letter to the *Times* Lord Moran, president of the Royal College of Physicians, says that they have fallen below the margin of safety. There is 1 general practitioner for 2,640 people in this country, while there is 1 for 350 men in the army. On the invitation of the director general of the Army Medical Service Lord Moran was able, with the registrar of the college and Prof. L. S. P. Davidson, to go to Belgium, the Netherlands and Germany to talk over problems of demobilization with medical officers in the army. They were able to hold ten meetings and to have many informal discussions with more than 1,000 medical officers. Many of these men had not seen their families for five years. They had been disturbed by the report that the release of doctors would not keep pace with general demobilization. The trouble is that the army medical authorities are still uncertain of their commitments in the war with Japan. They reckon that for every doctor required for a given force in Europe 3 doctors will be required in the Far East on account of the long lines of communication, wastage from tropical diseases and the lack of civil hospitals at the base, such as are provided in England. Meanwhile the army in Europe is saddled with responsibility not only for the soldiers but for the civilians of many nations. Only a third of the beds in military hospitals in Italy are occupied by British soldiers. Of 211,813 soldiers admitted to military hospitals in the Middle East in 1944 only 87,157 were British. Nevertheless, the army medical authorities have determined to solve this problem of demobilization and have set about ruthlessly cutting down establishments except in the Far East. They believe that they can release most of the general duty officers without replacement by men from general practice.

The position of specialists is less happy. In the first eleven demobilization groups there are 1,431 doctors, of whom 467 are specialists. The army contends that some of the latter can be released only if they are replaced by specialists not now in the army. However, it is hoped that the vast majority of both general practitioners and specialists in the first eleven groups will be demobilized by autumn.

The Central Medical War Committee (a medical body which controls medical recruiting) announces that doctors will be released from the armed forces in groups, determined by age and length of service. These releases will be possible partly owing to reduction in strength of the forces but partly also as a result of continued recruitment. One of the objects of the latter is to increase the releases. Arrangements will be made to transfer to civilian employment, out of their turn and with their consent, a limited number of doctors who are urgently required for work of national importance. They will be liable to recall to the forces if they leave the work for which they are transferred. It seems that at present little can be done to relieve the shortage of doctors in civilian practice. Indeed, every man and woman who can be spared is being sent to the forces. The main source of supply is a pool of young practitioners who have completed posts at hospitals. These are rarely allowed to accept even short term engagements in general practice, although urgent appeals for their services as assistants are made. Also they are not granted deferment to enable them to take examinations for higher degrees. Many civilian doctors are carrying intolerable burdens.

Arrangements have been made for the postgraduate training of doctors leaving the services. Those who joined within a year or so of qualifying are offered paid posts in hospitals. Those who were established in general practice before joining are offered a refresher course free of cost with traveling expenses paid and a subsistence allowance. For medical officers who were training for a specialist career before joining or are regarded as suitable for such training, paid posts of the "registrar" type in teaching and other hospitals will be provided.

Hospital Services in London and the Surrounding Area Inadequate

In 1941 the minister of health commissioned two physicians, Dr. A. H. M. Gray and Dr. Andrew Topping, to report on hospital services in London and the surrounding area and to make recommendations. Their report, which has just been published, shows that no adequate and comprehensive hospital service is attainable without considerable give and take on the part of both the local authorities and the voluntary hospitals. The most urgent and the most important single improvement would be in the medical staffing of hospitals. To make the best use of the specialists available, decentralization from London is urged with their appointment at the principal hospitals, termed "district hospitals," in the surrounding area. Payment for their services should be on a scale which will adequately repay them for breaking their ties in London. In quantity or in quality, or in both, accommodation is found deficient in every area. A large building program is needed to raise the standard to an adequate level.

The Promotion of Sociability at the Royal College of Surgeons

The council of Royal College of Surgeons has decided to institute monthly subscription dinners in the college for fellows and members of the college and members of the specialist associations linked with it. These will be held on the evening of the Wednesday preceding the second Thursday of the month. Applications must be made to the secretary at least a week before the date of the dinner accompanied by a payment of $4, the inclusive charge for each dinner. The council's object is to give those associated with the college opportunities of meeting socially more often. If it is found that the opportunity for dining in the college is properly appreciated, arrangements will be made to hold these dinners at shorter intervals. In the plans for the restoration and development of the college after the war damage it is intended that facilities for lunching and dining shall be greatly increased.

Low Mortality of American Wounded Treated in Britain

The medical department at the headquarters of the base in Britain of the United States Army has just stated that nearly 500,000 wounded American soldiers, the equivalent of some thirty divisions, have been evacuated from the continent of Europe since D day to United States medical installations in Britain. On February 8 casualties numbering 129,500 were in hospitals in Britain, which represented the peak number under care at any one time. There were ninety-nine hospitals and five big convalescent camps. The mortality among the patients was 0.26 per cent of total admissions. Approximately 61 per cent of all patients were returned to duty.

Belgian Visitors

A third group of Belgian professors is now visiting universities and research institutions in this country at the invitation of the British council. They include A. E. Michotte van den Berck, professor of experimental pathology at Louvain, A. E. Gratia, professor of parasitology and bacteriology at Liége, and J. A. H. Rodhain, director of the Institute of Tropical Medicine in Antwerp. The visit will last a fortnight.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, May 18, 1945.

Pharmacologic Study of a Curare-like Alkaloid

The therapeutic importance of curare is somewhat hindered by the disadvantages of its being difficult to obtain and of presenting a great variability of its pharmacologic properties; hence the reason why several investigators have in recent years proposed the use of some alkaloids with curare-like properties but easier to obtain and pharmacologically more constant, such as erythroidin hydrochloride, extracted from the seeds of Erythrina americana by Burman in 1940, or the synthesized alkaloid quinine methylhydrochloride, prepared by Harvey in 1940 and used by Bennett in 1941 in several clinical cases. Drs. Oswaldo V. Brazil, Roched A. Seba and J. S. Campos of the Instituto Vital Brazil of Niteroi, state of Rio de Janeiro, have published the first report of a series of systematic investigations on plants of the Amazon valley that could be used instead of curare. The report presents the results of the pharmacologic study of Chondrodendron platyphyllum, a plant of the Menispermaceae family abundantly found in that region of Brazil.

The watery extract of the plant and the alkali insoluble alkaloid from it possess the paralyzing activity, though of less potency than that of curare. The action also differs because this drug does not cause a previous stage of excitation in dogs, is more active when introduced intravenously and produces sudden muscular shocks in the posterior limbs of mice during the preagonic stage. The methylation of this alkali insoluble alkaloid increases its activity more than ten times on mice, rats and pigeons, making the methylated fraction more powerful than the majority of the samples of curare. Experiments performed on rats have proved that the action of the Chondrodendron methylated alkaloid is typically peripheral. The antagonistic action of neostigmine, which could prevent the death of the animals that had received two minimum lethal doses of either curare or the methylated alkaloid, suggested that the drug does not cause intense collateral toxic action on the circulatory system. The comparison between the minimum lethal dose for the mouse, the rat and the pigeon, of the curare sample used, of the watery extract of Chondrodendron, of its alkali insoluble alkaloid and of a methylated fraction of the latter showed a great difference of sensibility of the several kinds of animals to the various curarizing substances.

Intestinal Tuberculosis

Dr. José Feldman of the department of pathology of the University of Belo Horizonte, state of Minas Gerais, has recently published a paper in which he reports the results of the last 443 necropsies performed at that department with the aim of ascertaining the frequency of intestinal tuberculosis. Of the total of 443 necropsies, tuberculosis of all forms was present in 88 cases, or 19.8 per cent, with the following distribution of localization: respiratory system alone 28, respiratory and digestive systems 45, respiratory and other systems except the digestive 5, digestive system alone 6, and organs or systems other than respiratory and digestive 4. In 29 cases the disease was present under the form of generalized miliary tuberculosis, of which the respiratory and digestive systems were involved in 29 cases (100 per cent), the spleen in 21 cases, both kidneys in 10, the pericardium in 5, the meninges in 4, the tonsils in 3, the larynx in 1, the trachea in 2, the cerebrum in 1, the urethra and urinary bladder in 1 and the feminine genitalia in 5. In 12 of the cases of miliary tuberculosis the liver showed specific lesions without involvement of the gastrointestinal tract. The distribution of the tuberculous lesions in the different parts of the digestive system was esophagus 1, stomach 1, jejunum 2, ileum 15, cecum 11, colon 3, liver 25, peritoneum 18 and mesenteric lymph nodes 17.

Pulmonary Lavage for Diagnosis of Active Tuberculosis

Dr. Manoel De Abreu, a pioneer worker in the development of the miniature x-ray film for the mass detection of pulmonary tuberculosis, and also a distinguished practitioner of radiology at Rio de Janeiro, has just published a detailed description of his new method of pulmonary lavage for the diagnosis of pulmonary tuberculosis. Pulmonary (or bronchopulmonary) lavage consists essentially in the introduction of 40 cc. of isotonic solution of sodium chloride into the trachea through the intercricothyroid space ten minutes after a very slow injection of 10 cc. of a 0.5 per cent solution of a local anesthetic. After the introduction of the solution the patient's posture is slowly changed from upright to lateral, first to the right then to the left, and to a slight Trendelenburg position, to allow the various parts of the lungs to be in contact with the solution. The liquid is at last expelled through coughing and expectoration, the patient being in the genupectoral position. By this method the carriers and noncarriers of germs are definitely identified, and even the germ laden material discharged by each of the lungs can be ascertained. The technic causes little discomfort to the patient and is so simple and rapid that as many as ten or twenty examinations can be performed within a two hour period, if the proper equipment is at hand. The method is still in the experimental stage.

Brief Items

Drs. Luis Valverde Chinel and Vito Arce Reyeros, from Bolivia, arrived at Rio de Janeiro last month to follow a postgraduate course in bacteriology, parasitology and immunology at the Oswaldo Cruz Institute of Rio de Janeiro under fellowships awarded by the Division of Intellectual Cooperation of the Ministry of Foreign Affairs of Brazil. Dr. Reyeros is secretary general of the Bolivio-Brazilian Cultural Institute for the scientific interchange between the two countries.

Dr. J. C. Brassantini of Montevideo, Uruguay, now at Rio de Janeiro, was present at the last meeting of the National Academy of Medicine, where he read a paper on the roentgenologic diagnosis of pneumonia in the adult.

Marriages

ALBERT BENSEN VAN VRANKEN, Schenectady, N. Y., to Mrs. Mary Merriam Ross of Skaneateles in Syracuse, April 14.

STEWART INGLIS ADAM, West Collingswood, N. J., to Miss Phyllis Berrian Adams of Bedford Hills, N. Y., June 2.

JACK M. SIMMONS Jr., Denver, to Lieut. Anna Belle Longwater of Savannah, Ga., in Longview, Texas, recently.

HERBERT PECKOVER HARGETT, Maysville, Ky., to Miss Marion Hurlbut of Pelham Manor, N. Y., June 9.

NORBERT MENUHIN, Newark, N. Y., to Miss Marianne Grainer of Phelps in Rochester, May 27.

DAVID D. DEXTER, Richmond, Va., to Miss Edna Jane Nesbitt of Verona, N. J., and Richmond, June 9.

PAUL A. RIEMENSCHNEIDER, Cleveland, to Miss Mildred McCarthy of Manlius, N. Y., May 12.

JAMES R. ALLEN, Oakland, Calif., to Miss Lois Christine Armagost in Rochester, N. Y., June 2.

HARVEY CHADWICK PAULEY Jr., Belmont, Mass., to Miss Mildred Fraser of St. Louis, May 5.

ALDONA A. JUSKA, Oak Park, Ill., to Max R. Kennedy, D.D.S., in Nome, Alaska, April 19.

RONALD CLARE BISHOP, Almont, Mich., to Dr. Nancy Ventress Rider of Brooklyn, April 22.

PRESTON S. HOUK, Portland, Ind., to Miss Wilma Jean Curley in Detroit, April 7.

JAMES MATTHEW SAN to Miss Mary Alice Fisher, both of Durham, N. C., May 10.

KENNETH J. KELLEY, Grove City, Minn., to Miss Viola Carter of Ada, April 2.

Deaths

Luther Halsey Reichelderfer ⊕ Washington, D. C.; Columbian University Medical Department, Washington, D. C., 1899; formerly clinical professor of surgery at his alma mater, now known as the George Washington University School of Medicine; served as a member of the faculty of the Business High School, where he remained for four years as an instructor of mathematics; served as an intern at Garfield Hospital from 1899 to 1900 and was superintendent and chief resident physician from 1900 to 1907; medical director of the George Washington University Hospital, 1907-1908; member of the surgical staffs at Garfield, Children's and Tuberculosis hospitals until retirement from active practice in 1924; member of the consulting staffs of the Children's and Garfield hospitals; past president of the District of Columbia Commission on Licensure and the Medical Society of the District of Columbia; served as president of the board of commissioners of the District of Columbia; member of the Hippocrates-Galen Medical Society, Clinico-Pathological Society and the Association of Military Surgeons of the United States; one of the founders and life member of the American College of Surgeons; for many years an officer in the District of Columbia National Guard, serving as a first lieutenant and inspector of rifle practice, advancing to the rank of lieutenant colonel of infantry and chief surgeon; participated in a number of national rifle matches; during World War I was a lieutenant colonel in the medical corps of the U. S. Army in France; colonel, medical reserve corps, U. S. Army, not on active duty; since 1932 a member of the board of trustees of George Washington University, receiving the honorary doctor of laws from the university in the same year; died June 19, aged 71, of coronary occlusion.

Robert Hamilton Pierson ⊕ Colonel, U. S. Army, retired, Cazenovia, N. Y.; Syracuse University College of Medicine, 1898; Army Medical School, 1903, School of the Line, 1920, Army War College in 1922; entered the U. S. Army in 1902; promoted through the various grades to that of colonel on Feb. 18, 1929; retired for disability in line of duty on Jan. 31, 1933; served at military posts throughout the United States, Cuba, Alaska, the Philippines and the Panama Canal Zone; during World War I was chief surgeon on the Fifth Division staff, later becoming chief surgeon of the Sixth and Seventh Army; after the armistice, remained in Germany with the Army of Occupation; on his return to the United States, assigned to the Philippine Islands and spent considerable time in China, Japan and India on special government assignments; later appointed chief surgeon at Fort Sill, Okla., after which he was transferred to New York to become inspector instructor in charge of medical teaching in the New York National Guard; held the Distinguished Service Medal and the Silver Star; died in the Memorial Hospital, Syracuse, June 2, aged 70, of cerebral hemorrhage and diabetes mellitus.

James Evans Stowers ⊕ Kansas City, Mo.; Johns Hopkins University School of Medicine, Baltimore, 1913; specialist certified by the American Board of Surgery; member of the Western Surgical Association and the Kansas City Academy of Medicine; fellow of the American College of Surgeons; past president of the Kansas City Southwest Clinical Society and the Kansas City Surgical Society; chairman of the program committee of the Missouri State Medical Association; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; holder of the French Legion of Honor and the Croix de Guerre after four years of foreign service during World War I; on the consulting staff of the Ellis Fischel State Cancer Hospital, Columbia; on the staffs of St. Luke's Hospital, Kansas City General Hospital, Memorial Hospital, St. Joseph's Hospital and the Research Hospital, where he died April 30, aged 55, of coronary disease.

Joseph C. Dodds, Champaign, Ill.; Chicago Medical College, 1889; instrumental in founding and one of the original trustees of the Urbana and Champaign Sanitary District, serving on the board for many years; for many years a member and for ten years president of the Burnham Library board; for twelve years vice president of the Citizens State Bank; served on the staff of the State Hospital in Kankakee; district surgeon for the Illinois Central Railroad and for six years state medical director of the Modern Woodmen of America; superintendent and treasurer of the Twin City Ice and Cold Storage Company; died in the Burnham City Hospital, May 4, aged 80, of pneumonia.

Max William Alberts, St. Paul; University of Minnesota Medical School, Minneapolis, 1924; member of the American Medical Association; fellow of the American College of Surgeons; clinical assistant in surgery at his alma mater; recently elected first vice president of the Minnesota State Medical Association; served as president, vice president and secretary of the Minnesota State Board of Medical Examiners; served as vice president of the Minnesota Society for the Control of Cancer; attending surgeon, St. Joseph's, Charles T. Miller, Ancker and Children's hospitals and the Gillette State Hospital for Crippled Children; died June 11, aged 46, of coronary thrombosis.

Clare Fred Nesbitt Schram ⊕ Kingsport, Tenn.; Columbia University College of Physicians and Surgeons, New York, 1916; served as president and secretary of the Sullivan-Johnson Counties Medical Society; past president of the American Association of Industrial Physicians and Surgeons; medical director of the Tennessee Eastman Corporation and Holston Ordnance Works; for many years head of the medical department of Fairbanks, Morse and Company in Beloit, Wis.; treasurer of the Women's Field Army for Cancer Control; on the staff of the Holston Valley Community Hospital; died May 22, aged 61, of coronary thrombosis.

Ralph Beverley Ober ⊕ Springfield, Mass.; Harvard Medical School, Boston, 1901; specialist certified by the American Board of Surgery; member of the New England Surgical Society; fellow of the American College of Surgeons; served as a major in the medical corps of the U. S. Army during World War I; consulting surgeon and formerly president of the staff of the Springfield Hospital, where he served on the surgical staff for many years; for thirty-five years a member of the Massachusetts Mutual Life Insurance Company, serving as associate medical director; died in Sarasota, Fla., April 13, aged 66, of coronary thrombosis.

Roy Whittier Porteus ⊕ Bellefontaine, Ohio; Rush Medical College, Chicago, 1906; interned at St. Anne's and St. Elizabeth's hospitals in Chicago; served a residency at the Roselia Maternity Hospital and Foundling Asylum in Pittsburgh; clinical assistant, department of otology, rhinology and laryngology at his alma mater, 1913-1914; at one time fellow in rhinology and otolaryngology at the Mayo Clinic in Rochester, Minn.; retired member of the Illinois State Medical Society and member of the Association of Resident and Ex-Resident Physicians of the Mayo Clinic; died March 27, aged 63, of uremia and heart disease.

Russell Hall Birge ⊕ Cleveland; Harvard Medical School, Boston, 1898; assistant clinical professor of surgery at the Western Reserve University School of Medicine; fellow of the American College of Surgeons; served as chairman of the medical advisory board number 7 of the Selective Service and in the medical corps, U. S. Army, during World War I; past president of the Academy of Medicine of Cleveland and the Cleveland Medical Library Association; on the staff of the Lakeside Hospital, where he died May 16, aged 72, of dissecting and ruptured arteriosclerotic aneurysm of the abdominal aorta.

Edward Ackermann ⊕ Dover, N. J.; University and Bellevue Hospital Medical College, New York, 1909; died in the General Hospital April 4, aged 69, of peritonitis, gangrene of the bowel and mesenteric thrombosis.

William E. Alexander, Memphis, Mo.; University of Louisville (Ky.) Medical Department, 1894; died in St. Joseph's Hospital, Keokuk, Iowa, April 18, aged 72, of ruptured appendix.

Aaron Hirst Appel ⊕ Colonel, U. S. Army, retired, New York; Jefferson Medical College of Philadelphia, 1878; appointed an assistant surgeon in the U. S. Army in 1879; promoted to captain in 1884, major in 1897, lieutenant colonel in 1907 and colonel Jan. 28, 1910; retired June 6, 1911 at his own request after thirty years' service; returned to active duty from July 27, 1918 to July 10, 1919; died March 13, aged 88, of coronary thrombosis.

Bruce Elwyn Beeman ⊕ Lancaster, N. Y.; University of Buffalo School of Medicine, 1934; interned at the Millard Fillmore Hospital in Buffalo, where he served a residency in medicine and obstetrics; died April 27, aged 34, of chronic pulmonary tuberculosis and myocardial failure.

Allen Christopher Bradley, Bridgeport, Conn.; New York Homeopathic Medical College and Hospital, New York, 1901; served as a member of the Selective Service Appeals Board; died April 11, aged 69, of carcinoma of the prostate and hypertensive heart disease.

Maurice Joseph Butler, Newport, R. I.; College of Physicians and Surgeons, Baltimore, 1906; served as medical examiner for Newport County; local medical representative of the Veterans Bureau and a United States insurance examiner; died May 4, aged 61, of valvular heart disease and chronic *diffuse nephritis.*

Hugh Lester Charles ⊕ Atchison, Kan.; Chicago College of Medicine and Surgery, 1912; served in France during World War I; died April 13, aged 54, of coronary thrombosis.

Ugo A. D. Collelmo, Frontenac, Kan. (licensed in Kansas in 1907); honorary member of the Kansas Medical Society; member of the American Medical Association; died March 25, aged 78, of myocardial degeneration with cardiac thrombosis.

William Henry Conner, Batavia, N. Y.; Northwestern University Medical School, Chicago, 1907; served as passed assistant surgeon in the U. S. Public Health Service and on the staffs of various Veterans Administration facilities; major, medical reserve corps, U. S. Army, not on active duty; died April 28, aged 72, of coronary thrombosis.

Theodore W. Conzelman, St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1883; died in St. Anthony's Hospital April 28, aged 82, of arteriosclerosis.

William Arnice Cotter, Ozark, Ala.; University of Louisville Medical Department, 1909; member of the American Medical Association; served as president of the Dale County Medical Society; died in the Moody Hospital, Dothan, April 3, aged 62, of heart disease.

Howard Hubbell Davis ⊕ Cleveland; Western Reserve University Medical Department, Cleveland, 1910; received the Distinguished Service Cross for extraordinary heroism under fire overseas during World War I; on the staff of the Grace Hospital, where he died May 28, aged 62, of cerebral hemorrhage.

Frances Dickinson ⊕ Chicago; Woman's Medical College, Chicago, 1883; served as dean and president of the Harvey Medical College; honorary trustee of the Chicago Academy of Science; emeritus member of the Illinois State Medical Society; died in Orange City, Fla., May 19, aged 89, of coronary thrombosis and arteriosclerosis.

William West Duckering, Boston; Harvard Medical School, Boston, 1898; member of the American Medical Association; formerly on the staff of the Boston Dispensary; died May 3, aged 83.



MAJOR LUTHER CALDWELL HEIDGER, M. C., A. U. S., 1897-1944

Ethelbert L. Elmore, Puxico, Mo.; Barnes Medical College, St. Louis, 1905; member of the American Medical Association; died in the Missouri Baptist Hospital, St. Louis, April 24, aged 71, of carcinoma of the liver.

Leon Felderman ⊕ Philadelphia; Medico-Chirurgical College of Philadelphia, 1911; formerly president of the North End Medical Society; a captain in the medical corps of the U. S. Army during World War I, serving overseas; during 1924-1925 surgeon general of the Veterans of Foreign Wars; in 1928 presented with the French Legion of Honor; served as chairman of the local draft board number 77 from its inception in 1940 until he recently resigned; on the staffs of many hospitals in Philadelphia; died May 14, aged 54, of coronary thrombosis.

Frederick Abraham P. Fetherolf ⊕ Allentown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; fellow of the American College of Surgeons; served on the senior staff of the Allentown Hospital; died May 25, aged 64, of heart disease.

Warren Woden Foster ⊕ Washington, D. C.; Harvard Medical School, Boston, 1882; member of the Connecticut State Medical Society and the American Medical Association; served as medical examiner for the U. S. Bureau of Pensions; died in the Emergency Hospital May 3, aged 86, of annular carcinoma of the ascending colon.

Joseph R. Gaines, Las Animas, Colo.; St. Louis College of Physicians and Surgeons, 1891; member of the American Medical Association; for many years county physician; died April 30, aged 79, of carcinoma of the prostate.



CAPT. ADRIAN Z. LEON, M. C., A. U. S., 1911-1945

Boyd Emerson Gamble ⊕ Manchester, Pa.; Medico-Chirurgical College of Philadelphia, 1909; died March 30, aged 61, of carcinoma of the esophagus.

Arthur Harold Gaston, Mount Lebanon, Pa.; Cleveland Homeopathic Medical College, 1908; died in the Veterans Administration Facility, Aspinwall, February 13, aged 62, of pulmonary edema and hypertensive heart disease.

Harvey Landis Gerberich, Lebanon, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1906; died March 14, aged 72, of chronic sclerotic myocarditis.

William Hammond, Glen Olden, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1894; died in the Taylor Hospital, Ridley Park, May 15, aged 74, of injuries received in a fall.

KILLED IN ACTION

Luther Caldwell Heidger, Stratford, Conn.; University of Vermont College of Medicine, Burlington, 1921; member of the American Medical Association; interned at the Bridgeport Hospital in Bridgeport; in 1929 appointed medical examiner of Stratford; commissioned a captain in the Army of the United States (National Guard) on Sept. 16, 1940; his first assignment was at Fort H. G. Wright, New York, as medical officer of the 242d Coast Artillery; in February 1941, at his request, transferred to Randolph Field, Texas, to take a flight surgeon's course; sent to Jacksonville, Fla., and later to Albuquerque, N. M., where he was assigned to the 19th Bombardment Group and promoted to major; previously reported missing in action and believed to be a prisoner of the Japs; awarded the Distinguished Service Cross, Air Medal and the Purple Heart; killed in action in Mindanao, P. I., Sept. 7, 1944, aged 47.

Carlton Patrick Hogan, Burlington, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1930; member of the American Medical Association; commissioned a captain in the medical corps, Army of the United States, on July 3, 1942; killed in action in the European area Nov. 27, 1943, aged 39. [It has been impossible to obtain a photograph of Dr. Hogan.]

Adrian Zacharia Leon, New York; Université de Montpellier Faculté de Médecine, France, 1936; member of the American Medical Association, entered the medical corps, Army of the United States, as a first lieutenant on April 13, 1944; began active duty May 6, 1944; assigned to Brooke General Hospital, Fort Sam Houston, San Antonio, Texas; promoted to captain, a battalion surgeon serving with the Seventh Army; won the Bronze Star for "tirelessly and diligently treating the wounded under the most trying conditions", killed in action in Austria May 3, aged 33

Zed Thomas Hawkins, South Pasadena, Calif.; Eclectic Medical Institute, Cincinnati, 1893; member of the American Medical Association; honorary member of the Indiana State Medical Association; died April 26, aged 77, of heart disease.

George Burton Heinecke ⊕ Washington, D. C.; Columbian University Medical Department, Washington, 1892; at one time assistant demonstrator of anatomy at his alma mater, now known as the George Washington University School of Medicine; veteran of the Spanish-American War; for many years medical examiner for the Metropolitan Life Insurance Company and supervising medical inspector for the Royal Arcanum, a fraternal organization; died in the Emergency Hospital April 25, aged 73, of hypertensive heart disease.

Norris Cecil Hodge ⊕ Marianna, Ark.; University of Tennessee College of Medicine, Memphis, 1926; interned at the Memphis General Hospital, Memphis, Tenn.; secretary of the Lee County Medical Society; served as medical officer in the Arkansas National Guard; president of the Farmers and Merchants Bank of Marianna; died April 21, aged 45, of coronary thrombosis.

Ford W. Huff, Parsons, W. Va.; Maryland Medical College, Baltimore, 1904; died June 6, aged 67, of diabetes mellitus.

William Richard Janeway, Staten Island, N. Y.; Columbia University College of Physicians and Surgeons, New York 1907; member of the American Medical Association; past president of the Richmond County Medical Society; director of the New York Tuberculosis and Health Association for two years and chairman of the Staten Island Tuberculosis and Health Committee; interned at St. Luke's Hospital in New York; on the staff of the Staten Island Hospital; died June 16, aged 62, of cerebral hemorrhage.



MAJOR BENJAMIN RITTER, M. C., A. U. S., 1900-1945

Clara Lydia Kohls ⊕ San Francisco; University of California Medical School, San Francisco, 1927; died March 18, aged 48, of coronary occlusion.

Albert Arthur Krugg, Coffeyville, Kan.; Medico-Chirurgical College of Kansas City, Mo., 1898; member of the American Medical Association; served as a member of the city council and board of education; founder of the Coffeyville Hospital; author of "Facts and Fancies"; died February 17, aged 80, of diabetes mellitus.

Claud Armstrong Mathews, Austin, Texas; University of Texas School of Medicine, Galveston, 1911; member of the American Medical Association; examining physician for Selective Service Board number 3; on the staffs of St. David's Hospital, Seton Hospital and the Brackenridge Hospital, where he died April 10, aged 57, of subacute bacterial endocarditis.

Charles E. McClary, Syracuse, N. Y.; Rush Medical College, Chicago, 1886; member of the American Medical Association; on the staff of the Crouse-Irving Hospital; died March 6, aged 82, of coronary thrombosis and arteriosclerosis.

Henry Dudley Prescott, New Bedford, Mass.; Harvard Medical School, Boston, 1902; served on the staff of St. Luke's Hospital; fellow of the American College of Surgeons; died March 19, aged 68, of coronary occlusion.

Samuel I. Seidenberg, New York; University of Odessa Faculty of Medicine, Russia, 1910; member of the American Medical Association; resident in medicine at the Home and Hospital of the Daughters of Jacob, where he died February 4, aged 64, of cerebral thrombosis.

Sylvester Silburne Shannon ⊕ Crosby, Minn.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1906; village health officer and school doctor; on the staff of the Miner's Hospital; died March 28, aged 62, of heart disease.

William Spencer Sharp ⊕ Mesa, Ariz.; Medical Department of Tulane University of Louisiana, New Orleans, 1907; on the staffs of the Good Samaritan and St. Joseph's hospitals, Phoenix, and the Southside District Hospital; died April 30, aged 65, of heart disease.



LIEUT. MARSHALL J. ROGERS (MC), U.S.N.R., 1916-1945

Jonathan Mather Stafford, Essex, N. Y.; University of Vermont College of Medicine, Burlington, 1896; member of the American Medical Association; since 1908 health officer of Essex and county coroner since 1938; attending physician, Essex County Home since 1908; died March 23, aged 75, of coronary occlusion.

Bernard LeRoy Towle ⊕ Pawtucket, R. I.; Medical School of Maine, Portland, 1897; died in the Memorial Hospital February 6, aged 68, of cerebral hemorrhage.

Arthur Francis Weston, Keene, N. H.; Boston University School of Medicine, 1903; on the staffs of the Malden (Mass.) and Westboro (Mass.) hospitals and the Elliot Community Hospital; died in the Boston City Hospital March 23, aged 72, of carcinoma of the esophagus and stomach.

Wright Charles Williams ⊕ Peoria, Ill.; Miami Medical College, Cincinnati, 1903; member of the American Academy of Ophthalmology and Otolaryngology; on the staff of the Methodist Hospital; died May 12, aged 64, of leukemia.

Earle Montgomery Young ⊕ Mitchell, S. D.; Rush Medical College, Chicago, 1912; died March 21, aged 57, of coronary occlusion.

Edmund Kostanty Zaworski, Cleveland; University of Wooster Medical Department, Cleveland, 1909; on the staff of St. Alexis Hospital, where he died April 9, aged 62.

KILLED IN ACTION

Benjamin Ritter ⊕ New York; Middlesex College of Medicine and Surgery, Cambridge, Mass., 1926; University and Bellevue Hospital Medical College, New York, 1931; interned at St. Joseph's Hospital and Dispensary in Pittsburgh and the Rockaway Reach Hospital and Dispensary in Rockaway Beach, N. Y.; associated with the Mount Sinai Hospital; entered the medical corps, Army of the United States, on Feb. 25, 1943, as a captain; began active duty in the same grade on March 12, 1943; attached to the Normandy Base Surgeon's Office; promoted to major; posthumously awarded the Purple Heart; had been overseas twenty-two months; killed in action in France March 9, aged 45.

Marshall Johnson Rogers, Rule, Texas, Baylor University College of Medicine, Dallas, 1942; entered the U. S. Navy as an assistant surgeon with the rank of lieutenant (jg) on June 25, 1942; served an internship at the Naval Hospital in Jacksonville, Fla., began active duty in the U. S. Naval Reserve with the same rank on July 26, 1943; promoted to lieutenant in July 1944, served sea duty for eighteen months; killed February 21 by Jap aerial attack off Iwo Jima, aged 28.

Correspondence

ARTIFICIAL KIDNEY

To the Editor:—Referring to the editorial "Artificial Kidney" in the May 26 issue of THE JOURNAL, I would like to note that effective dialysis of the blood can also be achieved by using the living serous membranes instead of a semipermeable pipe system.

I revived nephrectomized dogs in uremic coma by perfusing their abdominal cavity with Ringer's, saline or isotonic dextrose solution (*Mitt. a. d. Grenzgeb. d. Med. u. Chir.* **39**:391, 1926).

During a perfusion lasting four hours, 3.968 Gm. of nonprotein nitrogen could be recovered from the perfusing fluid, whereby the protein nitrogen level in the blood of the animal dropped from 217 mg. per hundred cubic centimeters to 121.8. This procedure could be repeated and the life of the animal thus prolonged.

The feasibility of my technic of dialysis has been corroborated since then by a number of investigators (Heusser and Werder in 1927, Engel and Kerekes in 1927, Curtis in 1929 and 1930 and Jeney in 1932).

I also showed that intraperitoneal dialysis of the blood can easily be performed on human patients in local anesthesia without discomfort (*Wien. klin. Wchnschr.* **47**:851 [July 6] 1934).

Intact blood circulation and intact peritoneal cavity both are essential requirements for success.

STEPHAN ROSENAK, M.D.,
Gastro-Enterology Research Laboratory,
Mount Sinai Hospital,
New York.

DERMATOPHYTOSIS AND ONYCHOMYCOSIS

To the Editor:—The review by Montgomery and Casper of dermatophytosis and onychomycosis (THE JOURNAL, May 12, p. 77), as do so many papers on this subject, gives one the impression that these fungous infections can be cured without unusual difficulty. One notes in the discussion, however, Dr. Montgomery's confession that "the majority of extensive cases (of Trichophyton purpureum infection) are arrested and not cured." Unfortunately it is by these rebellious and long-standing cases that therapeutic skill is measured. For this reason it may be desirable to direct attention to two methods of treatment not mentioned in Dr. Montgomery's paper.

The first of these is freezing of the affected skin areas with ethyl chloride (*South. M. J.* **23**:1128 [Dec.] 1930). This method of treatment is regarded by some competent authorities as "probably the most effective single therapeutic agent."

The second method deals with chronic (toe) onychomycosis of the T. purpureum type, in which the entire thickness of the nail, and characteristically the entire nail, is involved. In the period 1933-1939 it was the policy of the U. S. Public Health Service in Havana, Cuba, to prohibit entry into the United States of refugees harboring chronic fungous infection of this nature. To expedite the entry of these unhappy individuals, no effort was spared to effect a "cure." After a year or more of interest as consultant to the service, it became evident to me that not a single actual cure had been brought about by the methods advocated by Dr. Montgomery—that is, removal of all affected nail areas and the continuous application of the strongest possible antimycotic remedies. Simple nail avulsion had also failed signally. It did not matter what later might be applied to the nail bed, or in what concentration. Regenerating epithelium invariably sealed off the budding nail plate, isolating it from all topical applications. When the nail plate finally emerged, it was always infected with the original fungus.

Accordingly, an operation was derived which aimed at the permanent ablation of the seriously infected toe nails (*Am. J. Surg.* **27**:145 [Jan.] 1935). It was learned that sharp curettage of the radix could not be depended on to prevent nail regeneration. Saucerization of overlying soft tissue and careful electrocauterization or fulguration of the radix were found to be necessary. Functionally these nailless toes were unhandicapped, and the cosmetic results were an improvement. Healing time for great toes averaged two months. These cures were absolute, not relative. Relapsing epidermophytoses and epidermophytids of many years' duration were finally susceptible to actual cure.

In a large series of operations performed under procaine digital nerve block, no serious complications were witnessed. Security of the digital circulation should, of course be manifest for this simple and effective operation.

K. P. A. TAYLOR, M.D.,
Lieutenant Commander, U.S.N.R.,
Clearwater, Fla.

THE CONTROL OF SCHISTOSOMIASIS

To the Editor:—Thirty years' close study of the control of schistosomiasis in Africa forces me to the conclusion that the natural enemies of snail hosts such as water beetles, river crabs, birds and lizards should be preserved, that chemicals interfering with wild life along the course of rivers should be avoided and that the present attacks on the iguana by natives and others should be controlled.

A steady infection among the natives in spite of improved education in places where chemicals have been used either to destroy the snail hosts or for mosquito control shows the mistake of such official efforts and adds interest to the effectiveness of removing river rushes and treating native carriers in other districts. Further use might well be made of burning cane or covering in portions of polluted streams occasionally, in view of the importance of small and easily overlooked snail hosts.

Increased efforts to control schistosomiasis and allied infections are needed in view of the spread of store keepers whose religion includes no clear teaching in regard to safeguarding the health of others and who allow human excreta and contaminated water to enter flowing streams, where they serve as constant means of infecting the primitive races, who are wont to collect and use water from running streams without water purification and who get their feet and hands contaminated by the free swimming larval parasites.

F. GORDON CAWSTON, F. Z. S., Durban, South Africa.

GAMMA GLOBULIN

To the Editor:—Comment in an editorial on gamma globulin in THE JOURNAL, June 9 (p. 442), gives the impression that only until recently has the origin of the globulins remained uncertain. Yet numerous investigators in the last fifty-three years have held views similar to those expressed in the papers referred to and to which no reference is made. Schmidt in 1892 first suggested that leukocytes, chiefly lymphocytes, are the source of fibrinogen. Moll in 1903 also suggested that some globulins arose from leukocytes. Müller in 1905 ascribed the source of fibrinogen to the lymphoid tissue of the spleen and lymph nodes. These and other references on the subject can be found in a study on "The Origin of Blood Proteins" (*Folia haemat.* **52**:187, 1934) in which substances having properties of fibrinogen, globulin and albumin were recovered from disintegrated lymphocytes.

HOBART A. REIMANN, M.D., Philadelphia.

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POSTGRADUATE CONTINUATION COURSES FOR VETERAN AND CIVILIAN PHYSICIANS

Compiled by the Council on Medical Education and Hospitals for Period July 1, 1945 to Jan. 15, 1946

Medical schools, hospitals, state medical societies and other medical educational institutions and organizations are providing the Council with a growing body of information on courses designed primarily to meet the needs of returning medical officers. These have been incorporated into the lists on these pages. They are not specifically designated for veterans, since most if not all of them may also be open to interested civilian physicians. Furthermore, all courses listed which were not designed primarily for physician veterans are also open to qualified returning medical officers.

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Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ALLERGY (See also Dermatology and Syphilology)			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Allergy	1 month, monthly	$200
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Massachusetts General Hospital	Clinical Allergy	July 9 thr. 20, 1945 2 weeks	50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Kings County Hospital	Allergy	Oct. 13, 1945 8 weekly sessions	20
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Roosevelt Hospital, New York	Allergy	Oct. 8 thr. 13, 1945 1 week	Members 20 Nonmembers 40
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Allergy in Relation to Internal Medicine	Oct. 22 thr. Dec. 14, 1945 8 weeks	60
	Allergy in Children	Oct. 26 thr. Dec. 14, 1945 8 weeks	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Allergy	Oct. 29, thr. Nov. 16, 1945 3 weeks, full time	200
	Allergy	Jan. 4 thr. Feb. 15, 1945 2 months, part time	25
	Symposium on Allergy	Jan. 7 thr. 11, 1946 5 days, full time	100
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Allergy	2 months, arranged	50
Vaughan Memorial Clinic, 201 West Franklin Street, Richmond, Va.	Fellowship in Allergy	6 months to 1 year, beginning Jan. 1 and July 1 each year	None
ANATOMY			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Surgical Anatomy on Cadaver	Oct. 8 thr. 20, 1945 2 weeks	125
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Applied Anatomy of the Head and Neck	160 hours, arranged	300
	Applied Anatomy of the Upper Extremity	60 hours, arranged	115
	Applied Anatomy of the Lower Extremity	60 hours, arranged	115
	Applied Anatomy of the Abdomen	130 hours, arranged	either sex 300 both sexes 500
	Applied Anatomy for the Orthopedic Surgeon	100 hours, arranged	275
	Applied Anatomy for the Anesthetist	100 hours, arranged	275
	Applied Anatomy of the Thorax	120 hours, arranged	275
	Applied Anatomy of the Urogenital System	160 hours, arranged	295
University of North Carolina School of Medicine, Chapel Hill, N. C.	Anatomy	Full time, quarterly	per quarter 100
ANESTHESIOLOGY (See also Anatomy and Obstetrics and Gynecology)			
University of Georgia School of Medicine, University Place, Augusta, Ga. At: University Hospital	General Anesthesia (Inhalation and Intravenous)	2 weeks, arranged, throughout year	150
	Regional Anesthesia	2 weeks, arranged, throughout year	150
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Inhalation Anesthesia	1 month, every month	200
	Regional and Intravenous Anesthesia	2 weeks, every 2 weeks	150
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Boston City Hospital, Harvard Teaching Service, Faulkner Hospital	Clinical Anesthesia	Tentative—arranged, monthly	50

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ANESTHESIOLOGY—Continued			
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Anesthesiology	3, 6, or 12 days, announced	$15, $25, $50
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Anesthesia: Diagnostic and Therapeutic Nerve Blocking	Oct. 23 to Nov. 23, 1945 4 weeks	50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Anesthesia	Sept. 1945 thr. Jan. 15, 1946 2 weeks, full time	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Regional, Spinal, Etc., Anesthesia	3 months, full time, 1st of any month	300
	Regional Anesthesia	12 sessions, arranged	75
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital and University	Anesthesia	6 months, Fall and Spring	Phys. in Serv. ½ fee Fee not stated
	Anesthesia	6 months to 1 year. Fall and Spring	
ARTHRITIS			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Arthritis	Oct. 17, 1945 8 weekly sessions	20
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Arthritis and Allied Rheumatic Disorders	Oct. 22 thr. 26, 1945 5 days, full time	45
	Arthritis and Allied Rheumatic Disorders	Jan. 8 thr. Feb. 26, 1946 2 months, part time	45
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Arthritis and Rheumatic Disorders	6 weeks, 3 mornings a week every 6 weeks	100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Abington Memorial Hospital	Etiology, Pathology, Physiological Deviations and Treatment of Arthritis	Oct. thr. Dec. 1945 Thursday mornings	25
BACTERIOLOGY			
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Clinical Bacteriology and Serology	Jan. 2 thr. 31, 1946 1 month, part time	100
University of North Carolina School of Medicine, Chapel Hill, N. C.	Bacteriology	Full time, quarterly	per quarter 100
CARDIOVASCULAR DISEASES (See also Electrocardiography)			
California Heart Association, 277 Pine Street, San Francisco At: Los Angeles and San Francisco	Postgraduate Symposium in Cardiovascular Disease	Oct. 18 thr. 25, 1945 3 days in San Francisco 2 days in Los Angeles	10 to 15
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Massachusetts General Hospital, Boston	Recent Advances in the Diagnosis and Treatment of Cardiovascular Disease	Nov. 5 thr. 10, 1945 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Peter Bent Brigham Hospital, Boston	Modern Diagnosis and Treatment of Heart Disease	July 2 thr. 31, 1945 4 weeks, daily	150
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Israel Zion Hospital	Clinical Cardiology	Oct. 16, 1945 4 sessions—once a week	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Elementary Clinical Cardiology	Oct. 2 thr. Dec. 18, 1945 Tuesdays, 1 to 4 p. m.	50
	Advanced Clinical Cardiology	Jan. 8, thr. June 6, 1946 Tuesdays, 1 to 4 p. m.	100
	Supplementary Clinical Cardiology	Oct. 2 thr. Dec. 18, 1945 and Jan. 8 thr. March 19, 1946 Tuesdays, 1 to 4 p. m.	50
At: Mount Sinai Hospital	Intensive Course in X-ray of the Heart and Great Vessels	Oct. 26, 1945 thr. Jan. 11, 1946 12 weeks, part time	30
	Bedside Clinics in Heart Disease	Oct. 22 thr. Dec. 10, 1945 8 weeks	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Cardiology	Dec. 3 thr. 7, 1945 5 days, full time	45
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Cardiology	20 hours, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Diagnosis and Treatment of Diseases of the Heart	3 weeks, 2 hours daily Arranged	75
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Philadelphia General Hospital	Advanced Cardiology	Nov. 26 thr. Dec. 1, 1945 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
Woman's Medical College of Pennsylvania, Henry and Abbotsford Road, Philadelphia 29	Clinical Cardiology	2 weeks, arranged	100
Washington State Medical Association, 218 Cobb Building, Seattle, Washington At: King County Hospital, Seattle	Refresher Course in Cardiology	Arranged	Arranged
CHEST DISEASES (See also Anatomy, Medicine and Radiology)			
California Tuberculosis Association, 45 Second Street, San Francisco At: various clinics and sanatoriums throughout the state	Post-Graduate Education	3 days to 3 weeks	None
Municipal Tuberculosis Sanitarium, 5601 North Pulaski, Chicago	Post-Graduate Course in Tuberculosis	Arranged, continuous	None
Mississippi State Sanatorium, Sanatorium, Miss.	Chest Diseases and Internal Medicine	2 to 6 weeks, entire year	None
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Diseases of the Chest (Advanced)	Oct. 26, 1945 thr. Feb. 8, 1946 16 weeks	50
At: Presbyterian Medical Center	Recent Advances in the Treatment of Bronchial Asthma, Bronchiectasis and Pulmonary Emphysema	Oct. 22 thr. Nov. 2, 1945 2 weeks, full time	40
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Acute and Chronic Diseases of the Chest	Jan. 3 thr. Feb. 28, 1946 2 months, part time	45
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Metropolitan Hospital Division	Clinical Pulmonary Diseases	1 month, arranged	100
	Diseases of the Respiratory System	1 month, arranged	100
Edward L. Trudeau Foundation and Columbia University At: Saranac Lake, New York and Bellevue Hospital, New York	Trudeau School of Tuberculosis	Sept. 10, 1945, 4 weeks (plus 2 weeks optional course following at Bellevue Hosp., N. Y. C.	100
Woman's Medical College of Pennsylvania, Henry and Abbotsford Road, Philadelphia 29	The Tuberculosis Problem	Oct. 1945, weekly lectures Arranged	Per lecture

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
DERMATOLOGY AND SYPHILOLOGY (See also Medicine and Physical Medicine)			
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15	Dermatology	1 month, arranged	40
At: Massachusetts General Hospital	Clinical Dermatology and Syphilology	6 weeks or 3 months part time arranged	50 or 85
	Diagnosis and Management of Syphilis	Oct. 5, 1945 thr. Apr. 26, 1946 7 months, part time	100
	Diagnosis and Treatment of Syphilis	6 weeks or 3 months part time, arranged	30 or 50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Practical Instruction in Diagnosis and Management of Syphilis	6 weeks or 3 months part time arranged	50 or 85
	Practical Instruction in Dermatological Allergy and Immunology	6 weeks or 3 months part time, arranged	50 or 85
	X-ray Treatment of Ringworm of the Scalp	Oct. 1, 1945 3 months, part time	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Dermatology and Syphilology	3 months, part time 1st of any month	Phys. in Serv. ½ fee 75
	Dermatology and Syphilology	6 weeks, part time 1st of any month	Phys. in Serv. ½ fee 50
University of Wisconsin Medical School, 416 North Randall Street, Madison, Wis.	Dermatology for Specialists	2 to 6 months, arranged	per month 100
DIABETES			
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15	Diabetes Mellitus in Relation to General Medicine	July 9, 10, 11, and Oct. 1, 2, 3, 1945	20
At: New England Deaconess Hospital			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Diabetes	Oct. 16, 1945 8 weeks on Tuesdays	20
At: Jewish Hospital			
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Diabetes Mellitus, Nephritis and Hypertension	Nov. 26 thr. 30, 1945 5 days, full time	45
	Diabetes Mellitus, Nephritis and Hypertension	Jan. 3 thr. Feb. 23, 1946 2 months, part time	45
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia	Diabetes Mellitus	2 to 4 weeks, 75 hours Arranged	150
At: [illegible]			
ELECTROCARDIOGRAPHY			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Electrocardiography and Heart Disease	Aug. 6, 1945, 2 weeks	150
	Electrocardiography and Heart Disease	Sept., Oct. and Nov. 1945 1 month	175
Michael Reese Hospital, 29th Street and Ellis Avenue, Chicago 16	Electrocardiography	Aug. 20 thr. Sept. 1, 1945 2 weeks, full time	110
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Electrocardiographic Diagnosis	Nov. 5 thr. 10, 1945 6 days	50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Electrocardiography	Oct. 15, 1945, 5 weeks, 15 sessions	20
At: Jewish Hospital	[illegible]	Oct. 16, 1945, 5 weeks, 15 sessions	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York	[illegible]	Oct. 4 thr. Dec. 20, 1945 Once a week	35
At: Montefiore Hospital	Advanced Electrocardiography	Jan. 3 thr. March 14, 1946 Thursdays, 2-4 p. m.	35
	Supplementary Electrocardiography	Oct. 4 thr. Dec. 20, 1945 and Jan. 3 thr. Mar. 14, 1946 Thursdays, 4-5:30 p. m.	35
At: Mount Sinai Hospital	Intensive Course in Clinical Electrocardiography	Oct. 26, 1945 thr. Jan. 11, 1946 12 weeks	35
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Electrocardiography	Oct. 29 thr. Nov. 2, 1945 5 days, full time	50
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Electrocardiography	15 hours, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Electrocardiographic Interpretation	2 weeks, 2 hours daily, arranged	75
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia	Electrocardiology and Cardiac Roentgenology	5 days, 30 hours Arranged	60
At: [illegible]			
ELECTROENCEPHALOGRAPHY			
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Electroencephalography	2 weeks, arranged	50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Clinical Electroencephalography	Jan. 14 thr. 19, 1946 6 days, full time	60
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia	Electroencephalography	36 hours, arranged 6 Thursdays	150
At: Graduate Hospital and Pennsylvania Institute			
ENDOCRINOLOGY (See also Medicine and Obstetrics and Gynecology)			
American College of Physicians, 4200 Pine Street, Philadelphia 4	Endocrinology	Fall 1945, 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
At: Northwestern University, Chicago			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Female Sex Endocrinology	Oct. 16, 1945 10 weekly sessions	20
At: Jewish Hospital			
At: Long Island College Hospital	Endocrine Diseases and Disorders in Children and Adolescents	Oct. 15, 1945 8 weekly sessions	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Endocrinology and Metabolism	Dec. 17 thr. 22, 1945	35
At: Mount Sinai Hospital			
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Endocrinology	2 weeks, arranged	100
ENDOSCOPY			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Practical Cystoscopy	2 weeks, every 2 weeks	150
	Urology and Cystoscopy	4 weeks, every 4 weeks	375
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Cystoscopy and Endoscopy	Oct. 1, 1945 thr. June 1946 15 weeks, part time	75
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Bronchoscopy	Oct. 1945 thr. Apr. 1946 3 weeks, arranged	250
At: Presbyterian Medical Center			

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ENDOSCOPY—Continued			
Temple University Medical School, Broad Street at Ontario, Philadelphia	Broncho esophagology	Sept 10 thr. 22, 1945 2 weeks	250 Phys in Serv. 50
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia	Bronchoesophagology, Gastroscopy and Laryngeal Surgery	2 weeks, 85 hours Arranged	250
At: Surgical and Anatomical Laboratories; the Graduate, University, Philadelphia and Mount Sinai Hospitals			
At: Graduate and Presbyterian Hospitals	Cystoscopy, Chromoureteroscopy and Pyelography	6 weeks, 36 hours Arranged	300
FRACTURES			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Fractures	Oct 19, 1945 10 weekly sessions	20
At: Kings County Hospital			
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Fractures and Allied Trauma	Arranged	150
GASTROENTEROLOGY (See also Proctology, Radiology and Surgery)			
American College of Physicians, 4200 Pine Street, Philadelphia 4	Gastroenterology	Fall, arranged	Members 20 Nonmembers 40 Phys in Serv. Free
At: University of Chicago			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Gastroenterology	Nov. 1, 1945 7 weeks, Thursdays	20
At. Beth El Hospital			
At: Jewish Hospital	Gastroenterology	Oct 9, 1945, 8 sessions, twice weekly	20
At. Greenpoint Hospital	Gastroenterology	Oct. 16, 1945 12 sessions, twice weekly	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Gastroscopy (Medical)	Oct. 22 thr. Nov. 3, 1945 2 weeks	30
At. Mount Sinai Hospital	Gastrointestinal Disorders	Oct 22 thr Dec 14, 1945 8 weeks	75
	Physiology of Digestive Tract	Oct 24 thr. Dec. 28, 1945 10 weeks	30
At. Presbyterian Medical Center	Gastroscopy	Oct 1945 thr. June 1946 Arranged	200
Columbia University—At: New York Post Graduate Medical School, 303 East 20th Street, New York 3	Gastroenterology	Oct 15 thr 19, 1945 3 days, full time	45
	Gastroenterology	Jan 2 thr. Feb 27, 1946 2 months, part time	45
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Gastroenterology	1 month, arranged	100
	Gastroscopy	1 month, arranged	100
	Peritoneoscopy	Arranged	75
At. Metropolitan Hospital	Gastrointestinal Surgery	14 sessions, arranged	200
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Gastroenterology	Oct 1, 1945, and Jan. 2, 1946 6 weeks, part time	50
	Proctology and Gastroenterology (also Cadaver Proctology)	Oct 1, 1945, and Jan. 2, 1946 6 weeks, part time	200 Phys in Serv ½ fee
New York University College of Medicine, 477 First Avenue, New York	Clinical Gastroenterology	Fall and Spring 5 months, once weekly	100
At: Bellevue Hospital			
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia	Clinical Gastroenterology	16 weeks, 500 hours Arranged	400
At. Graduate Hospital			
HEMATOLOGY (See also Pathology)			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Clinical Hematology	Oct 18, 1945 8 weekly sessions	20
At Jewish Hospital			
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Elementary Clinical Hematology	Oct 4 thr Dec. 20, 1945 Thursdays 2 5 p m	35
At: Montefiore Hospital	Clinical Hematology (Elementary)	Oct. 22 thr. Dec 13, 1945 8 weeks	50
At: Mount Sinai Hospital			
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Hematology	1 month, arranged	100
INDUSTRIAL MEDICINE			
University of Michigan School of Public Health, An Arbor, Mich.	Industrial Health	3 days to 2 weeks, arranged	10
	Rehabilitation and Replacement of Industrial Personnel	3 days, announced	
LEGAL MEDICINE			
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15	Seminar in Legal Medicine	Oct 1 thr. 6, 1945 6 days	25
MEDICINE, GENERAL (See also Chest Diseases, Electrocardiography, Gastroenterology, Obstetrics and Gynecology, Neurology and Psychiatry, and Surgery)			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Diseases of Colon and Rectum	Aug 6 and Oct 1, 1945 1 week	75
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Refresher Course for Ex Military Personnel	July 1, 1945, 3 months every 3 months	Res 75 Non Res 100
State University of Iowa School of Medicine, University Campus, Iowa City	General Medicine	3 months, arranged	100
University of Kansas School of Medicine, 39th Street and Rainbow Boulevard, Kansas City 3, Kansas	Refresher Course	Sept. 15, 1945, 8 weeks	
At. University of Kansas Hospitals	Internal Medicine	Oct. 15 thr 20, 1945	25
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Refresher Course	1 to 2 weeks, arranged	
Maine Medical Association, 142 High Street, Portland, Maine			
At: Boston	Internal Medicine	Oct 22 thr Nov. 3, 1945 2 weeks	Members 20 Nonmembers 40 Phys in Serv Free
American College of Physicians, 4200 Pine Street, Philadelphia 4			
At: University of Michigan Medical School, Ann Arbor	Extramural Postgraduate Course	Fall, 1 day weekly, 4 times	None
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.			
At: Various centers throughout the state	Personal Courses	Varying lengths, throughout the year	per month 25
At: University of Michigan Hospital			

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
MEDICINE, GENERAL—Continued			
Wayne University College of Medicine, 1516 St Antoine Street, Detroit	Medical Pathological Conference	July thr. Sept. 1945 1 hour weekly	
	Therapeutic Conference	July thr. Sept. 1945 ½ hour weekly	
	Hematology Clinic	July thr. Sept. 1945 ½ hour weekly	
	Gastroenterology	July thr. Sept. 1945 1 hour weekly	
At: Receiving Hospital	Seminar	July thr. Sept. 1945 1 hour weekly	
	Diagnostic Conference	July thr. Sept. 1945 2 hours weekly	
At: Eloise Hospital	Seminar	July thr. Sept. 1945 1 hour weekly	
	Diagnostic Conference	July thr. Sept 1945 1 hour weekly	
University of Minnesota Center for Continuation Study, Minneapolis 14	Medicine	3, 6, or 12 days, announced	15, 25, or 50
	Postwar Program in Medicine	Tentative, quarterly	
Mississippi State Sanatorium, Sanatorium, Miss	Chest Diseases and Internal Medicine	2 to 6 weeks, throughout year	None
Omaha Mid West Clinical Society, 1036 Medical Arts Building, Omaha At: Hotel Paxton, Omaha	13th Annual Assembly	Oct. 22 thr. 26, 1945	5 Phys in Serv. and Faculty and Students of Neb. Med. Schools Free
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At. Jewish Hospital	Hypertension and Nephritis	Oct. 17,1945 8 weekly sessions	20
At. Israel Zion Hospital	Pathology of Internal Medicine	Oct. 10, 1945 12 weekly sessions	50
	Peripheral Vascular Diseases	Oct. 9, 1945 8 weekly sessions	20
University of Buffalo School of Medicine, Department of Postgraduate and Continuation Work, 24 High Street, Buffalo	For General Practitioners	Sept. 24 thr. 29, 1945 1 week	30
Columbia University Faculty of Medicine, 630 West 168th Street, New York At Mount Sinai Hospital	Chemical Data	Oct. 24 thr. Dec. 12, 1945 8 weeks	25
	Geriatrics: Disease in the Aged	Oct. 25 thr. Dec. 20, 1945 8 weeks	25
	Kidneys: Arteries	Nov. 22, 1945 thr. Jan. 17, 1946 8 weeks	15
	Liver and Biliary Passage	Oct 24, 1945 thr. Jan. 2, 1946 11 weeks	40
	Peripheral Vascular Diseases	Oct. 23, 1945 thr. Jan. 8, 1946 11 weeks	35
Columbia University—At: New York Post Graduate Medical School, 303 East 20th Street, New York 3	Diseases of the Liver and Biliary Tract	Jan. 2, thr. Feb 27, 1946 2 months, part time	30
	Diseases of the Thyroid and Other Endocrine Glands, and Nutrition	Jan. 4 thr. Feb. 15, 1946 2 months, part time	45
	Peripheral Vascular Diseases	Dec. 10 thr. 14, 1945 5 days, full time	45
	Peripheral Vascular Diseases	Jan. 8 thr. Feb 26, 1946 2 months, part time	30
	Problems in Diagnosis	Jan. 7 thr. Feb 25, 1946 2 months, part time	45
	Psychological Aspects of Internal Medicine	Jan. 4 thr. Feb. 15, 1946 2 months, part time	25
	Seminar in Internal Medicine	Jan. 2 thr. Feb. 28, 1946 1 or 2 months, full time	1 month 125 2 months 200
New York Academy of Medicine, 2 East 103rd Street, New York 29 At: Academy and selected local hospitals	Contributions of the War Effort to Medicine	Oct. 8 thr. 19, 1945 2 weeks	5
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Physical Diagnosis	1 month, arranged	150
	Peripheral Vascular Disease	2 weeks, arranged	150
At: Metropolitan Hospital Division	Internal Medicine	1 month, arranged	150
	Diseases of the Liver and Biliary System	1 month, arranged	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Course for General Practitioners	3 months, arranged	150
	Course for General Practitioners	6 weeks, arranged	100
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Internal Medicine	1 month, 9 12 daily Offered monthly	Phys. in Serv. ½ fee 50
Duke University School of Medicine, Durham, N. C. At Duke Hospital	General Medicine	1 or 2 weeks or longer Arranged at any time	None
University of North Carolina School of Medicine, Chapel Hill, N.C. At University and various towns	Postgraduate Medical Course	6 to 8 weeks, arranged Fall, Winter, Spring	25
Ohio State University College of Medicine, 11th and Neil Avenues, Columbus 10, Ohio	Postgraduate Continuation Studies	2 weeks to 3 months Beginning July 1, 1945	per week 25
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Oregon, Portland	General Medicine	Fall 1945, 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
University of Oregon Medical School, Marquam Hill, Portland	General Refresher Course	Arranged	per month 75
Medical College of the State of South Carolina, Alumni Association, 16 Lucas Street, Charleston	Alumni Association Refresher Course	Oct 30 thr. Nov. 1, 1945 3 days	5
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Texas School of Medicine, Galveston	Internal Medicine	Nov 5 thr. 10, 1945 1 week	None
Medical College of Southwestern Medical Foundation, 2211 Oak Lawn, Dallas, Texas	Medicine and Pediatrics	2 months, arranged	75
Washington State Medical Association, Committee on Postgraduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital, Seattle	Refresher Course in Medicine	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison	Course for Specialists in Internal Medicine	2 to 6 months, arranged	per month 100
	12 Week Postgraduate Course (Various Subjects)	Arranged	125
At: Wisconsin General Hospital	Observation Course in Medical and Clinical Subjects	1 to 5 months, arranged	per month 100
	Observation Course in Medical and Surgical Subjects	1 to 5 months, arranged	per month 100

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
NEUROLOGY AND PSYCHIATRY (See also Medicine and Ophthalmology)			
Catholic University of America, Washington, D C.	Case Seminar in Psychotherapy	Oct 1945 thr June 1946 2 hrs a week	per semester 150
	Child Psychiatry	Oct 1, 1945, 4 months 1 twice a week	per semester hr 10
	Individual Clinical Conferences	Oct 1945 thr June 1946 2 hrs a week	As above
	Individual Conferences and Consultations on Literature and Technique	Oct 1945 thr June 1946 2 hrs a week	As above
	Psychopathology	Oct 1945 thr June 1946 1 hr a week	
	Seminar in Clinical Psychology and Psychotherapy	Oct 1, 1945 2 hrs a week	As above
At University and St Elizabeths Hospital	Introduction to Psychiatry	Oct 1945 thr June 1946 2 hrs a week	As above
At St Elizabeths Hospital	Clinical Psychiatry	Oct 1946 thr June 1946 2 hrs a week	As above
	Electric Shock Therapy	Oct 1, 1945, 4 months 1 hr a week	As above
	Neurology and Neuropathology	Oct 1945 thr June 1946 3 hrs a week	As above
St Elizabeths Hospital, Washington 20, D C.	Psychiatry and Psychosomatic Medicine	Arranged	
Institute for Psychoanalysis, 43 East Ohio Street, Chicago 10	Basic Principles of Psychodynamics	Oct 5 thr Dec 22, 1945 Alternate Fridays	15
	Development of the Personality	Winter quarter	
	Psychosomatic Medical Demonstrations and Discussions Using Clinical Material	Tentative	
The Menninger Clinic, Topeka, Kansas	Clinical Conferences (Case Seminar)	July 1, 1945 thr Jan 15, 1946 (except Aug 1945)	Arranged
Boston Psychoanalytic Institute	Civilian War Neuroses and Their Treatment	Sept 1945 thr Jan 1946 and Jan thr June 1946	None
American Institute for Psychoanalysis (Auspices of Association for Advancement of Psychoanalysis), 130 East 63d Street, New York	Clinical Conferences	Sept 27, 1945, 10 weeks	17 50
	Psychiatry and Psychoanalysis	Sept 28, 1945, 10 weeks	12 50
	Readings in Freud	Oct 1, 1945, 40 weeks	25
	Theory of Neurosis	Oct 2, 1945, 10 weeks	12 50
At New School for Social Research	Introduction to the Rorschach Method of Personality Diagnosis	Oct 3, 1945, 15 weeks	17 50
	The Psychology of Military and Civilian Casualties	Sept 28, 1945, 15 weeks	15
	Seminar on Meanings of Dreams	Sept 27, 1945, 15 weeks	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Clinical Neurology (Advanced)	Oct 22, 1945, thr Jan 11, 1946 12 weeks	35
At Mount Sinai Hospital	Neuroanatomy	Oct 22, 1945, 46 hrs	75
	Neuropathology	Oct 22, 1945, 30 hrs	60
	Neuroanatomy and Neuropathology	Oct 22, 1945, 76 hrs	100
At Neurological and Psychiatric Institutes	Trimester in Neurology and Psychiatry	Oct 1 thr Dec. 7, 1945 2 months, full time or part time	Full time 200
Columbia University—At New York Post Graduate Medical School 303 East 20th Street, New York 3	Neurology and Psychiatry for Pediatricians	Oct 15 thr 27, 1945 2 weeks, full time	75
	Neurological and Psychiatric Diagnosis and Treatment in General Practice	Nov 26 thr Dec 7, 1945 2 weeks, full time	75
	Psychoanalysis in General Medicine	Jan 2 thr March 27, 1946 Part time	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Introduction to Psychoanalysis	10 lectures, arranged	20
	Psychoanalysis and Psychiatry	15 sessions, arranged	30
	Readings in Psychoanalytic Literature	15 sessions, arranged	30
	Seminar in Psychosomatic Medicine	12 sessions, arranged	25
At Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Neurology	1 month full time, arranged	200
New York University College of Medicine, 477 First Avenue, New York At Bellevue Hospital	Neurology	3 months to 1 year Daily 9 a m to 5 p m	200 to 600
	Neuropsychiatry	3 months to 1 year Daily 9 a m to 5 p m	200 to 600
	Psychiatry	3 months to 1 year Daily 9 a m to 5 p m	200 to 600
Philadelphia Psychoanalytic Institute, 206 South 13th Street, Philadelphia 7 At Bellevue Stratford Hotel	The Delinquent Child	Oct 2, 1945 thr Apr 2 1946 Once weekly	Arranged
	Colloquim on Problems in Psychosomatic Medicine	Arranged	Arranged
	Orientation Course in Normal Behavior	Sept 18, 1945 thr March 26, 1946 Once weekly	Arranged
	Pediatric Psychiatry	Arranged	Arranged
	Psychopathology of Childhood	Sept 25 1945 thr Apr 30, 1946 12 sessions	12
	Seminar on Psychoanalytic Psychiatry	Arranged	Arranged
University [illegible] Graduate School of Medicine, 237 Medical Labc At Mc and	University, Philadelphia Penn Institute	Clinicobiologic Neurology and Psychiatry (A Special Faculty Course Designed for Staff Members of Mental Institutions) 10 weeks 250 hours Arranged	100
At Philadelphia Hospital	Clinical Psychiatry	8 weeks, 240 hours Arranged	100
Woman's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, Philadelphia 29	Psychoneuroses	Oct 1945 weekly lectures Arranged	per lecture 3
University of Wisconsin Medical School, 418 North Randall Street, Madison	Course in Neuropsychiatry for Specialists	2 to 6 months Arranged	per month 100
NEUROSURGERY			
University of Wisconsin Medical School, 418 North Randall Street, Madison	Neurosurgery for Specialists	2 to 6 months, arranged	per month 100
NUTRITION (See also Medicine)			
Columbia University—At New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Nutrition in Health and Disease	Oct 8 thr 12, 1945 5 days, full time	40

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OBSTETRICS AND GYNECOLOGY (See also Medicine, Pathology and Surgery)			
Chicago Maternity Center, 1336 Newberry Avenue, Chicago	Home Obstetrics	3 months, every 3 months	None
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Obstetrics	Oct 8, 1945 2 weeks	150
	Operative Gynecology	Aug 6, 1945 2 weeks	150
	Operative and Office Gynecology	Oct 22, 1945, 2 weeks	150
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Combined Obstetric and Pediatric Refresher	Aug 21 thr 26, 1945 1 week	10
	Obstetrics and Gynecology	2 weeks, beginning any Monday throughout year	10 Ill Phys Free
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Obstetrics and Gynecology	Jan 14 thr 18, 1946 5 days	25
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston 15	Clinical Obstetrics	Aug thr Dec 1945 1 month or longer	125
At Boston Lying In Hospital			
At Free Hospital for Women	Gynecology	July, Aug Sept, 1945 Arranged	per month 75
University of Minnesota Center for Continuation Study, Minneapolis 14	Obstetrics and Gynecology	Tentative, 3 6, 12 days Announced	15, 25, 50
Department of Health of State of Nebraska Division of Maternal and Child Health Lincoln 9	Intramural Obstetric and Pediatric Training—Postgraduate	Announced	None
At University of Nebraska College of Medicine			
At Various cities in Nebraska	Extramural Obstetric and Pediatric Training—Postgraduate	Aug 27 thr Sept 7, 1945 and Nov 19 thr 29, 1945	None
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Prenatal Care	Oct 18, 1945 8 weekly sessions	20
	Manikin	Oct 16 1945 12 weekly sessions	20
Columbia University Faculty of Medicine 630 West 168th Street New York	Observation Course in Obstetrics	1 month 1st of any month	100
At Margaret Hague Maternity Hospital	Practical Course in Obstetrics	3 months, full time 1st of any month	350 Maintenance supplied
At Mount Sinai Hospital	Recent Advances in Gynecology	Nov 12 thr 17, 1945 6 days	50
Columbia University—At New York Post Graduate Medical School 303 East 20th Street, New York 3	Diagnosis and Office Treatment	Oct 1 thr Dec 22, 1945 and Jan 2 thr Feb 2 1946 Arranged part time	40 60
	Gynecological Endocrinology	Oct 2 thr Nov 27, 1945 and Jan 3 thr Feb 26, 1946 2 months part time	100
	Seminar in Gynecology	Oct 1 thr Nov 30, 1945 2 months, full time	225
	Seminar in Gynecology	Jan 2 thr March 30, 1946 3 months, full time	300
	Surgical Anatomy as Applied to Operative Gynecology (Cadaver)	Oct 1945 thr Jan 1946 12 sessions, part time	200
	Symposium on Recent Advances in Gynecology	Sept 24 thr 29 1945 6 days, full time	50
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Clinical and Operative Gynecology (Cadaver)	6 weeks, arranged	175
	Obstetrics and Gynecology	Oct 1, 1945 2 months, full time	200 Phys in Serv ½ fee
Philadelphia Lying In Hospital, 8th and Spruce Streets, Philadelphia	Graduate Medical Course in Caudal Analgesia	July 1 thr Sept 15 1945 1 week, starting Mondays	50
Woman's Medical College of Pennsylvania, Henry Avenue and Abbotsford Road, Philadelphia 29	Practical Obstetrics	Arranged	Arranged
	Practical Gynecology	3 weeks, arranged	75
Medical College of Southwestern Medical Foundation, 2211 Oak Lawn, Dallas, Texas	Surgery Obstetrics and Gynecology	2 months, arranged	75
Washington State Medical Association Committee on Postgraduate Medical Education, 218 Cobb Building, Seattle	Refresher Course in Obstetrics and Gynecology	Arranged	Arranged
At King County Hospital		2 to 6 months, arranged	per month 100
University of Wisconsin Medical School, 418 North Randall Street, Madison	Obstetrics and Gynecology for Specialists		
OPHTHALMOLOGY (See also Medicine and Otorhinolaryngology)			
Children's Memorial Hospital, 707 Fullerton Avenue, Chicago	Postgraduate Conference in Neuromuscular Anomalies of the Eyes	Oct 28 thr Nov 2 1945	55
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Ophthalmology	2 weeks, every 2 weeks	50
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Clinical Course in Ophthalmology	Oct 1945, 12 months	per quarter 75
American Academy of Ophthalmology and Otolaryngology, 2 0 100 First Avenue Building, Rochester Minnesota	Home Study Course in Ophthalmology	Sept 1, 1945 thr May 1946	10
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Ophthalmoscopy (Elementary)	Jan 15 thr March 15 1946 2 months, part time	35
At Montefiore Hospital	Embryology of the Eye	Oct 24 thr Dec 12, 1945 8 weeks	40
At Mount Sinai Hospital	External Diseases of the Eye	Oct 29, 1945 thr Jan 17, 1946 12 weeks	25
	Extra Ocular Muscles	Oct 25 thr Dec 20, 1945 8 weeks	20
	Histopathy of the Eye	Oct 22, 1945 thr Jan 7, 1946 12 weeks	50
	Ophthalmic Surgery	Oct 24, 1945 thr Jan 9, 1946 12 weeks	100
	Ophthalmoscopy (Elementary)	Oct 22 1945 thr Jan 7, 1946 12 weeks	20
	Ophthalmological Neurology	Oct 26 thr Dec 14, 1945 8 weeks	25
	Physiological Optics	Oct 23, 1945 thr Jan 8, 1946 10 weeks	40
	Refraction	Oct 25, 1945 thr Jan 17, 1946 12 weeks	45
	Slit Lamp Microscopy	Oct 24 thr Dec 11 1945 8 weeks	30

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OPHTHALMOLOGY—Continued			
Columbia University—At: New York Eye and Ear Infirmary, 218 Second Avenue, New York	Anatomy and Physiology	1 month, arranged	40
	Anatomy of the Temporal Bone	1 month, arranged	45
	Bacteriology, Serology and Immunology	1 month, arranged	40
	Embryology	1 month, arranged	40
	External Eye Diseases—Ocular Therapy	1 month, part time, arranged	40
	Glaucoma Clinic	10 hours, arranged	40
	Histo-pathology of the Eye	3 months, part time, arranged	85
	Motor Anomalies	1 month, arranged	40
	Neuro-Ophthalmology	1 month, arranged	30
	Perimetry	1 month, part time, arranged	40
	Ocular Muscles	1 month, part time, arranged	40
	Operative Eye Surgery	1 month, part time, arranged	75
	Ophthalmoscopy	1 month, part time, arranged	40
	Orthoptics	1 month, arranged	40
	Physiologic Optics	2 months, part time, arranged	75
	Plastic Eye Surgery	6 days, part time, arranged	75
	Refraction	3 months, part time, arranged	100
	Slit Lamp Microscopy	1 month, part time, arranged	50
	X-ray	6 hours, arranged	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Anomalies of Ocular Muscles	Oct. 22 thr. 26, 1945, 6 days, full time	60
	Differential Diagnosis with the Slit Lamp	Nov. 5 thr. 9, 1945 5 days, part time	45
	Embryology, Histology and Pathology of the Eye	Oct. thr. Nov. 1945 and Jan. 2 thr. June 30, 1946 15 sessions, arranged	75
	Motor Anomalies of the Eye	Oct. 15 thr. 20, 1945 6 days, full time	75
	Ophthalmic Neurology	Nov. 5 thr. 9, 1945 5 days, part time	45
	Surgery of the Eye	Oct. 29 thr. Nov. 3, 1945 6 days, full time	75
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Ophthalmology	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	50
	Ophthalmology	Oct. 1, 1945 and Jan. 2, 1946 3 months, part time	275
	Otolaryngology and Ophthalmology (also Cadaver)	Oct. 1, 1945 and Jan. 2, 1946 3 months, full time	600
	Refraction	6 weeks, part time arranged	100
University of Rochester School of Medicine, 260 Crittenden Boulevard, Rochester 7, N. Y.	Thirteenth Summer Graduate Course in Ophthalmology	July 30 thr. Aug. 1945	Phys. in Serv. ½ fee 40
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Wills Eye Hospital	Ophthalmic Histology and Pathology	8 weeks, 96 hours Arranged	200
Virginia Society of Ophthalmology and Otolaryngology, Box 1685, [illegible] Station, Charlottesville	Postgraduate Course in Ophthalmology	Dec. 1945, 2 days	30
[illegible] of Virginia, Richmond			
[illegible] Medical School, 418 North Randall Street, Madison	Ophthalmology for Specialists	2 to 6 months, arranged	per month 100
ORTHOPEDIC SURGERY (See also Anatomy)			
State University of Iowa School of Medicine, University Campus, Iowa City	Orthopedic Surgery	1 year, arranged	110
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Injuries to Bones and Joints	Oct. 22 thr. Dec. 14, 1945 8 weeks	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Functional Anatomy in Relation to Orthopedics	Oct. 8 thr. Nov. 8, 1945 10 sessions	60
	Orthopedics in General Medicine	Oct. 15 thr. 20, 1945 6 days, full time	50
Washington State Medical Association, Committee on Post-Graduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital	Refresher Course in Orthopedics	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison	Orthopedics for Specialists	2 to 6 months, arranged	per month 100
OTOLOGY			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Histopathy of the Ear	Oct. 23 thr. Dec. 4, 1945	50
Columbia University—At: New York Eye and Ear Infirmary, 218 Second Avenue, New York	Clinical Otology	1 month, part time, arranged	40
	Operative Ear Surgery (Cadaver)	1 month, part time, arranged	110
	Anatomy of the Ear	1 month, part time, arranged	45
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Surgical Anatomy as Applied to Otology	Arranged, part time	per hour 10
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Anatomical Laboratory	Otologic (Cadaver) Operations	2 weeks, 20 hours Arranged	100
OTORHINOLARYNGOLOGY (See also Anatomy, Ophthalmology and Otology)			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Otolaryngology	2 weeks, every 2 weeks	50
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Broncho-Esophagology and Laryngeal Surgery	Oct. 15 thr. 27, 1945	100
	Refresher Course of Otolaryngology for Specialists	Sept. 24, 1945, 1 week	50
American Academy of Ophthalmology and Otolaryngology, 239-100 First Avenue Building, Rochester, Minn.	Home Study Course in Otolaryngology	Sept. 1, 1945 thr. May 1946	10
Washington University School of Medicine, Euclid Avenue and Kingshighway, St. Louis	Otolaryngology	Sept. 17, 1945. 8 months	600
Columbia University—At: New York Eye and Ear Infirmary, 218 Second Avenue, New York	Broncho-Esophagology	12 days full time or 6 weeks, part time, arranged	250
	Nasal Accessory Sinuses	1 month, part time, arranged	110
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Diagnostic Procedures in Otolaryngology	Oct. thr. Nov. 1945 and Jan. 2 thr. June 30, 1946 Part time, arranged	40 to 60
	Dissection of the Head and Neck	Oct. 1945 thr. Jan. 1946 Arranged	per hour 10
	Embryology, Histology and Pathology of Ear, Nose and Throat	Oct. thr. Nov. 1945 and Jan. 2 thr. June 30, 1946 15 sessions, part time	75
	Surgical Anatomy as Applied to Rhinology and Laryngology	Part time, arranged	per hour 10

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OTORHINOLARYNGOLOGY—Continued			
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Applied Anatomy of the Ear, Nose and Throat	80 hours, arranged	275
	Otolaryngologic Procedures	1 month, arranged	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Head and Neck Dissection	6 weeks, arranged	150
	Otolaryngology (Clinical)	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	75
	Otolaryngology and Ophthalmology (Clinical)	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, full time	100
	Otolaryngology and Ophthalmology (also Cadaver)	Oct. 1, 1945 and Jan. 2, 1946 3 months, full time	600
Virginia Society of Otolaryngology, Box 1685, University S[illegible] At: Medica[illegible]hmond	Postgraduate Course in Otolaryngology	Dec. 1945, 2 days	30
University of W[illegible], 418 North Randall Street, Madison	Otorhinology for Specialists	2 to 6 months, arranged	per month 100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Anatomical Laboratory	Rhinolaryngologic (Cadaver) Operations	10 days, 20 hours Arranged	150
PATHOLOGY (See also Medicine, Obstetrics and Gynecology, Ophthalmology and Otorhinolaryngology)			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	General and Special Pathology	Oct. 22, 1945 thr. Jan. 31, 1946 15 weeks	45
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Gross and Microscopic Pathology	Sept. 17 thr. Oct. 26, 1945 6 weeks, part time	75
	Gynecological Pathology	Jan. 8 thr. Feb. 4, 1946 6 weeks, part time	75
	Pathological Physiology: Functional and Chemical Aspects	Oct. 1 thr. 5, 1945 5 days, full time	45
	[illegible] Functional Aspects	Jan. 2 thr. Feb. 27, 1946 2 months, part time	30
	Blood Forming Organs and Surgical Pathology	Nov. 2 thr. 30, 1945 4 weeks, part time	75
		Sept. 18 thr. Dec. 27, 1945 15 weeks, part time	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Practical Laboratory Instruction in Pathology and Bacteriology	Arranged	Arranged
University of North Carolina School of Medicine, Chapel Hill, North Carolina	Pathology	Quarterly	per quarter 100
PEDIATRICS (See also Allergy, Cardiovascular Diseases, Endocrinology, Neurology and Psychiatry, Obstetrics and Gynecology)			
Children's Memorial Hospital, 707 Fullerton Avenue, Chicago	Postgraduate Course in Pediatrics	Oct. 1 thr. 27, 1945 27 days	100
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Course in Pediatrics	2 weeks or 1 month, every 2 weeks	60-100
Tulane University of Louisiana School of Medicine, 1430 Tulane Avenue, New Orleans	Pediatrics	Sept. 17, 1945, 2 weeks	75
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Pediatrics	Dec. 10 thr. 14, 1945	25
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on P[illegible] 1313 Bedford Avenue, Brooklyn 2 At:	Clinical Pediatrics	Announced. 3, 6 or 12 days	15, 25, 50
At:	Heart Disease in Childhood	Oct. 8, 1945 10 sessions, twice daily	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Clinical Pediatrics	Oct. 19, 1945 10 sessions, once a week	20
Columbia University—At: New York Post Graduate Medical School, 303 East 20th Street, New York 3	Symposium on Recent Advances in Pediatrics	Oct. 23 thr. Dec. 20, 1945 8 weeks	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Clinical Pediatrics	Oct. 8 thr. 13, 1945 6 days, full time	50
		1 month, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Pediatrics	4 weeks, part time	50
Southern Pediatric Seminar, Saluda, N. C.	Southern Pediatric Seminar	Arranged	Phys. in Serv. ½ fee
Medical College of Southwestern Medical Foundation, 2211 Oak Lawn, Dallas, Texas	Medicine and Pediatrics	July 16 thr. 28, 1945 12 days	25
University of Texas School of Medicine, 912 Avenue B, Galveston, Texas	Pediatric Refresher	2 months, arranged	75
Washington State Medical Association, Committee on Post-Graduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital	Refresher Course in Pediatrics	Oct. 22 thr. 29, 1945 1 week Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison	Pediatrics for Specialists	2 to 6 months, arranged	per month 100
PHARMACOLOGY			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Pharmacology: Recent Advances in Therapy	Oct. 24 thr. Dec. 12, 1945 8 weeks	25
University of North Carolina School of Medicine, Chapel Hill, N. C.	Pharmacology (Therapeutics)	Quarterly	per quarter 100
PHYSICAL MEDICINE			
Northwestern University Medical School, 303 East Chicago Avenue, Chicago 11	Physical Medicine	1 month, arranged	None
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Physical Therapy	Oct. 23 thr. Dec. 13, 1945 8 weeks	35
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	General Course in Physical Medicine	4 weeks, part time Arranged	100
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Physical Medicine	3 months daily Spring and Fall	Phys. in Serv. ½ fee 200
University of Wisconsin Medical School, 418 North Randall Street, Madison	Physical Medicine for Specialists	2 to 6 months, arranged	per month 100
PHYSIOLOGICAL CHEMISTRY			
University of North Carolina School of Medicine, Chapel Hill, N. C.	Physiological Chemistry	Quarterly	per quarter 100

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
PHYSIOLOGY			
Wayne University College of Medicine, 1516 St Antoine Street, Detroit	Seminar	July thr. Sept. 1945 1 hour weekly	
University of North Carolina School of Medicine, Chapel Hill, N. C	Physiology	Quarterly	per quarter 100
POLIOMYELITIS			
Postgraduate School of Physical Therapy, Warm Springs Foundation At. Georgia Warm Springs Foundation, Warm Springs, Ga	Treatment of Acute and Convalescent Poliomyelitis	First Monday of each month 5 consecutive days	None
University of Minnesota—At. University of Minnesota Center for Continuation Study, Minneapolis 14	Kenny Technique for Management of Infantile Paralysis	6 days, every other month	25
PROCTOLOGY **(See also Gastroenterology)**			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Proctology	Oct. 15, 1945 4 weeks, twice weekly	25
Columbia University Faculty of Medicine, 630 West 168th Street, New York At. Mount Sinai Hospital	Medical Proctology and Diseases of the Colon	Oct. 23 thr. Dec. 11, 1945 8 weeks	25
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Proctology	2 months, arranged	75
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Proctology	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	75
	Proctology (Cadaver) and Clinical Proctology and Gastroenterology	Oct 1, 1945 and Jan 2, 1946 6 weeks, part time Phys. in Serv. ½ fee	200
PUBLIC HEALTH **(See also Medicine)**			
University of Michigan School of Public Health, Ann Arbor	Public Health Economics	Announced. 3 days to 2 weeks	10
	Postwar Preparations for County and City Health Officers	Announced. 3 days	
University of Minnesota School of Public Health, Minneapolis 14	Public Health	Quarterly, 1 quarter	
University of North Carolina School of Public Health, Chapel Hill, N. C.	Public Health and Related Fields	1 quarter, arranged	100
RADIOLOGY **(See also Cardiovascular Diseases, Chest Diseases, Electrocardiography and Otorhinolaryngology)**			
American College of Radiology, 20 North Wacker Drive, Chicago 6 At: Various medical schools At. Philadelphia	Special Residencies	3 and 6 months, arranged	Arranged
	Postgraduate Course in	Fall, 1945. 2 weeks	
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	genology	2 weeks, every 2 weeks	70
		2 weeks, every 2 weeks	125
	X ray Therapy	2 weeks, every 2 weeks	110
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Boston City Hospital	General Roentgenology	July thr. Dec 1945 Monthly. 1 month, mornings	50
At. Peter Bent Brigham Hospital	General Roentgenology	July thr Dec 1945 Monthly 1 month, daily	100
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Radiology	Announced 3, 6 or 12 days	15, 25, 50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	X ray Diagnosis	Oct. 9, 1945 10 sessions, once weekly	25
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Advanced Cardiovascular Roentgenology	Jan 2 thr. March 14, 1946 2 months, part time	40
	Advanced Roentgenology of the Thorax	Nov 27, 1945 thr. Jan 29, 1946 2 months part time	40
	Elementary Cardiovascular Roentgenology	Oct 4 thr. Dec 20, 1945 2 months, part time	50
	Elementary Roentgenology of the Thorax	Oct 2 thr. Nov 20, 1945 2 months, 1 day per week	40
	Supplementary Cardiovascular Roentgenology	Oct 4 thr. Dec 20, 1945 Jan 3 thr March 14, 1946 2½ months, part time	35
At. Columbia Presbyterian Medical Center	Radiological Physics	Jan 9 thr May 1, 1946 16 weeks	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Radiology	2 months, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Diagnostic Roentgenology and Radiotherapy (Advanced)	First of any month 6 weeks or 3 months, Phys in Serv ½ fee full time	150 300
New York University College of Medicine, 477 First Avenue, New York	Radiology	Spring and Fall 3 month, 3 days a week	100
SURGERY **(See also Anatomy, Chest Diseases, Gastroenterology, Medicine, Ophthalmology, Otology, Otorhinolaryngology, Pathology and Proctology)**			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Gall Bladder Surgery	June 25 thr. Oct. 1, 1945 1 week	100
	Surgery of Colon and Rectum	June 11, Sept 10 and Nov. 5, 1945. 1 week	100
	Surgical Technique	2 weeks, every 2 weeks	200
	Thoracic Surgery	2 weeks, every 2 weeks	125
	Vaginal Approach to Pelvic Surgery	July 9 and Sept. 17, 1945 1 week	100
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Traumatic and Emergency Surgery	Nov. 5 thr. 10, 1945	25
Maine Medical Association, 142 High Street, Portland, Maine At: Boston	Refresher Course	1 to 2 weeks, arranged	Arranged
Wayne University College of Medicine, 1516 St. Antoine Street, Detroit	Chest Conference	July thr Sept 1945 1 hour weekly	
	Surgery Conference	July thr. Sept 1945 1 hour weekly	
	X ray Conference	July thr. Sept 1945 1 hour weekly	

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
SURGERY—(Continued)			
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Surgery	Announced 3, 6 or 12 days	15, 25, 50
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Surgery of Gastro intestinal Tract	Oct. 22 thr. Nov. 16, 1945 4 weeks	150
At: Presbyterian Medical Center, Mount Sinai Hospital, New York Postgraduate Hospital, and Roosevelt Hospital	Symposium on General Surgery	Oct. 22 thr. 26, 1945 5 days, full time	75
Columbia University—At: New York Post Graduate Medical School, 303 East 20th Street, New York 3	Blood Transfusion; Blood and Plasma Bank	Arranged, 12 hours	35
	Diagnosis and Management of Diseases of Liver and Gall Bladder	Nov. 7 thr. Dec 19, 1945 7 sessions, part time	100
	Diagnosis and Treatment of Trauma	Oct 22 thr. 27, 1945 6 days, full time	50
	Dissection and Surgical Anatomy	Oct. 1945 thr. Jan. 1946 24 hours	150
	Seminar in Traumatic Surgery	Sept. 24 thr. Oct. 6, 1945 11 days, full time	90
	Surgery of the Gastrointestinal Tract	Jan 2 thr. March 27, 1946 13 sessions, part time	200
	Surgical Anatomy as Applied to Colon and Rectal Surgery	Oct 1945 thr. Jan. 1946 12 hours, part time	100
	Surgical Anatomy as Applied to Thoracic Surgery	Oct. 1945 thr. Jan 1946 12 sessions, part time	200
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Surgical Technique	Arranged. 75 hours	375
	Peripheral Vascular Disease	Arranged. 14 sessions	200
	Thoracic Surgery	Arranged 36 hours	250
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Clinical and Operative (Cadaver) Surgery	Arranged. 6 weeks, full time	200
	Combined Surgical Course	Oct 1, 1945 and Jan 2, 1946 3 months, full time	350
	Surgical Operative Clinic and Lecture Course	Oct 1, 1945 and Jan. 2, 1946 6 weeks, full time Phys. in Serv. ½ fee	100
Oklahoma State Medical Association, 210 Plaza Court Building, Oklahoma City At Various areas throughout Oklahoma	Surgical Diagnosis	Arranged 10 weeks	9
Meharry Medical College, 1005–18th Avenue North at Heffernan Street, Nashville, Tenn.	Office Surgery	October 1945 1 week	20
Medical College of Southwestern Medical Foundation, 2221 Oak Lawn, Dallas, Texas	Surgery; Obstetrics and Gynecology	Arranged. 2 months	75
Washington State Medical Association, 218 Cobb Building, Seattle, Wash At. King County Hospital, Seattle	Refresher Course in Surgery	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison At: Wisconsin General Hospital, Madison	Surgery Course for Specialists	Arranged. 2 to 6 months	per month 100
	Postgraduate Course	Arranged. 12 weeks	125
	Observation Course in Medical and Surgical Subjects	Arranged. 1 to 5 months	per month 100
THERAPY			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At. Mount Sinai Hospital	Diagnosis and Therapy	Oct 22 thr. Dec. 24, 1945 9 weeks	50
	General Bedside Therapy	Oct 22 thr. Dec. 10, 1945 8 weeks	25
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Therapeutics	Arranged. 1 month	100
TROPICAL MEDICINE			
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Tropical Medicine	Jan 2, 1946 5 months	300
	Tropical Medicine and Parasitology	Dec. 10 thr. 21, 1945 2 weeks	50
University of Michigan School of Public Health, Ann Arbor, Mich.	Tropical Diseases	Announced 3 days to 2 weeks	
Wayne University College of Medicine, 1516 St Antoine Street, Detroit	Tropical Medicine and Parasitology	July thr. Sept. 1945 Twice weekly, part time	
Medical Society of Milwaukee County, 208 East Wisconsin Avenue, Milwaukee At: Marquette University School of Medicine	Tropical Diseases	Tuesday nights, 4 weeks	Nominal
UROLOGY **(See also Anatomy)**			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Urology and Cystoscopy	4 weeks, every 4 weeks	375
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Long Island College Hospital	*Urology*	First of each month 1 month or longer	per month 25
Columbia University—At: New York Post Graduate Medical School, 303 East 20th Street, New York 3	Advanced Course in Urology	Nov. 1 thr Dec. 29, 1945 2 months, full time	250
Woman's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, Philadelphia 29	Female Urology	Arranged 16 weeks 3 hours per week	100
University of Wisconsin Medical School, 418 North Randall Street, Madison	Course in Urology for Specialists	Arranged. 2 to 6 months	per month 100
VENEREAL DISEASE **(See also Dermatology and Syphilology)**			
Bureau of Social Hygiene, New York City Department of Health, 125 Worth Street, New York At Central Clinic	Postgraduate Course in Venereal Disease	Sept 1945 thr. Jan 1946 10 weeks	None
	Postgraduate Course in Diagnosis and Treatment of Venereal Disease	Fall 1945 15 sessions	None
	Practical Seminar in Diagnosis, Treatment and Control of Venereal Disease	Arranged. 1 morning a week	None
University of Pennsylvania At: Institute for Control of Syphilis, 3400 Spruce Street, Philadelphia	Applied Venereal Disease Epidemiology	Arranged 3 months	Arranged
	Essential Basic Training Course	Arranged. 6 months	125
	Intensive Review Course	Arranged. 4 weeks	50
	Intensive Training Course in Venereal Disease Control	Arranged 10 days	25
	Venereal Disease Review Course	Arranged. 3 weeks	35

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Lease of Space and Facilities to Physicians on Percentage of Physicians' Net Income Not the Practice of Medicine by Hospital.—The Temple Sanitarium, a corporation for profit, contracted in 1923 with Dr. J. M. Woodson to convey to him a parcel of land on which he was to erect, at his expense, a building, a part of which he was to use as an eye, ear, nose and throat clinic and a part of which was to be used by the corporation for general hospital purposes. The corporation agreed to send to Woodson all of its patients needing his specialized services and to reimburse to him 33⅓ per cent of the cost of the land and building he erected. In turn, the corporation was to be entitled to receive one third of the net income from the operation of the clinic. The contract was to continue in force until 1933. Woodson received title to the land and erected a building thereon, which was used for the purposes contemplated in the contract. Thereafter the corporate name of the Temple Sanitarium was changed to Scott & White Hospital. Woodson died in 1930 and his two sons, Drs. W. B. and B. P. Woodson, succeeded to his interest, the corporation waiving an option in the original contract permitting it to terminate the contract on Woodson's death. When the original contract, as supplemented, terminated in 1933, it was renewed until 1943, with an additional proviso that the corporation should have the option either to extend for ten years that contract when it expired in 1943 or to purchase the interest of the Woodsons. Shortly before expiration of the contract the corporation served notice on the Woodsons of its intention to purchase their interest under the terms of the contract. The Woodsons refused to comply, and Dr. W. B. Woodson filed a suit for partition against his brother, Dr. B. P. Woodson, and the corporation, asserting that each of the parties owned an individual one-third interest in the property and the building erected thereon. After institution of suit the defendant, Dr. B. P. Woodson, conveyed his interest to the corporation. The trial court denied partition and decreed specific performance of the contract in favor of the corporation against Dr. W. B. Woodson, who then appealed to the court of civil appeals of Texas.

Among other things, the plaintiff, Dr. W. B. Woodson, contended that the contract under which the corporation asserted the right to acquire his interest in the property was illegal and void because the corporation was engaged in the practice of medicine and surgery. At the trial to show that the corporation was engaged in the practice of medicine the plaintiff offered evidence that the corporation had collected medical fees during the twenty years the contract was in force and that the corporation apparently had physicians in its employ on a salary basis in connection with other medical services rendered in the portion of the building used by the corporation. He also sought to introduce in evidence a statement of the assets, liabilities and net proceeds of the corporation from its activities during the twenty year period. The trial court, however, excluded this evidence and the appellate court held that it acted properly. The present suit, said the appellate court, involves a specific written contract pertaining only to one specialized type and character of the medical and hospital services apparently being offered in the building in question—that of eye, ear, nose and throat practice. Whether or not the contract in question is ultra vires and whether or not the corporation thereby became engaged in the practice of medicine must be determined, as far as the suit on the contract is concerned, from the terms of the contract itself. Evidence as to what other contracts the corporation may have made with other physicians, how it may have operated other services in connection with the hospital it operated, what it paid other physicians engaged in services distinct and apart from the eye, ear, nose and throat clinic, and what profits and losses it may have made or suffered from the operation of other services are not admissible to test the validity of the specific contract sued on. The contract, being specific in all its terms as to the rights and duties of the parties thereto, must be interpreted and its validity determined according to its own provisions and not by what other contracts with other physicians relating to other services may have been.

Having reached that conclusion, the court did not deem it necessary to determine what constitutes the practice of medicine by a corporation. A corporation organized for profit, said the court, cannot practice medicine or employ physicians as its agents to do so for it. Obviously, under the medical practice act of Texas, a license to practice medicine can be issued only to a natural person. It is not controverted that all persons engaged in the operation of the Woodson eye, ear, nose and throat clinic, under the contract, were licensed physicians, and it is clear that Woodson and his associates under that contract were neither employees nor agents of the corporation. They were more in the nature of independent contractors and the percentage of the net proceeds collected by them and paid to the corporation was rather in the nature of rentals and as compensation to the corporation for services it rendered to the Woodsons in sending to them its patients needing specialized treatment and for otherwise caring for such patients. It is not controverted that the Woodsons were entirely independent of the corporation as to diagnosis, treatment of patients and operations to be performed, using their own judgment. They fixed and collected their own fees, kept their own books and accepted full responsibility to their patients for the nature and character of their services, and an express provision in the contract held the corporation harmless against any action or claim that might be made against it growing out of malpractice, negligence, unskilled service or mistreatment of any patient, employee or visitor by persons connected with the clinic. In brief, the Woodsons retained specifically the same relationship with, and responsibility to, their patients, whether such patients came to them of their own accord or were sent by the corporation, that they would have maintained had the contract not been made and as if the Woodsons had operated their specialized clinic on their own responsibility. Under the circumstances we think it clear that the Woodsons did not act as agents or employees of the corporation, that their acts were not the acts of the corporation, and that the corporation as such was not engaged, as far as the contract is concerned, in practicing medicine through them as agents. The judgment of the court in effect permitted the corporation to compel the plaintiff to convey his interest in the property to the corporation.—*Woodson v. Scott & White Hospital, 186 S. W. (2d) 720 (Texas, 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, June 30, page 688.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, July 16-18. Part III. Various centers, June. Exec. Sec., Mr. L. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, May 27. Final date for filing application is Jan. 31. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Fall, 1945. Final date for filing application is Aug. 1. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, October 24. Final date for filing application is Aug. 1. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

14:233-264 (April) 1945

Acute Pharyngitis and Tonsillitis: Treatment with Sodium Sulfathiazole Gargle, with Experimental Studies on Extent of Absorption. B. H. Wiesel and R. S. Teague.—p. 234.
Treatment of Extensive Burns, with Report of Case. F. H. Chaddock Jr.—p. 236.
Planning for Medical Care in Postwar Period, with Particular Reference to Alabama. J. Newdorp.—p. 239.

14:265-284 (May) 1945

Intravenous Morphine. H. Smith and S. Schotz.—p. 265.
*Fox Rabies. H. N. Johnson.—p. 268.
Medical Practice of the Past. R. E. Hale.—p. 271.

Fox Rabies.—Johnson says that whenever fortuitous circumstances have allowed wild canine species such as the fox or coyote to become abundant in a region where rabies is enzootic in dogs there is a constant threat of a serious epizootic of rabies. The gray fox species has become unusually abundant in several of the Southern states. During the past seven years fox rabies has been reported in Alabama, Arkansas, California, Georgia, Illinois, Iowa, Indiana, Kansas, Kentucky, Louisiana, New York, Pennsylvania, North Carolina, South Carolina, Ohio, Tennessee, Texas, Virginia, West Virginia and Wisconsin. In certain areas where foxes were usually abundant true epizootics of rabies developed. In one county in which fox rabies was prevalent 2,900 dogs were vaccinated within a period of three weeks. Four dogs developed rabies after vaccination, all within a period of thirty days. It is probable that these dogs were exposed before vaccination. Fourteen foxes, later proved rabid, were killed by fox hounds which had been vaccinated, and none developed rabies. No further cases of rabies have developed among vaccinated dogs in this county. The author cites several other outbreaks of fox rabies. In most instances the actions of rabid foxes are quite characteristic. Foxes are normally timid and avoid human habitations; those killed while invading farm yards in daytime have consistently been proved rabid by laboratory examination. Of the fox specimens submitted to the Alabama State Health Department, 31 were reported positive for rabies in 1943 and 32 in 1944. Nine persons were known to have been bitten by rabid foxes in 1944. It is essential that action be taken to reduce the number of gray foxes in areas where rabies is present. It is not necessary or practical to attempt to exterminate foxes, but their number must be reduced to a level where contact infection from fox to fox will not be frequent enough to maintain rabies. For the protection of their dogs and of their sport, fox hunters should aid rather than oppose such control measures. It is important that the heads of foxes and other wild animals such as skunks and coyotes be sent to laboratories for examination, so that there will be definite evidence of the extent of the disease.

American Journal of Clinical Pathology, Baltimore

15:35-86 (Feb.) *1945*

Mycetoma Pedis in United States and Canada, with Report of 3 Cases Originating in Louisiana. E. L. Burns, Emma S. Moss and J. W. Brueck.—p. 35.
Alveolar Cell Carcinoma of Lung. K. Ikeda.—p. 50.
Fibrocystic Disease of Pancreas: Study of 14 Cases. A. H. Baggenstoss and R. L. J. Kennedy.—p. 64.
Preliminary Study of Blood Chemistry Findings in Scrub Typhus. S. P. Gottfried.—p. 71.
Mechanism of Desensitization in Allergy. H. A. Heise.—p. 77.

Annals of Internal Medicine, Lancaster, Pa.

22:475-638 (April) 1945

Treatment of Subacute Bacterial Endocarditis with Penicillin. J. E. Paulin and C. J. McLoughlin.—p. 475.
Inhalation of Penicillin Aerosol in Patients with Bronchial Asthma, Chronic Bronchitis, Bronchiectasis and Lung Abscess: Preliminary Report. A. L. Barach, F. H. Silberstein, E. T. Oppenheimer, T. Hunter and M. Soroka.—p. 485.
Penicillin Therapy at University of Minnesota Hospitals: 1942-1944. W. W. Spink and W. W. Hall.—p. 510.
Septic Pulmonary Infarction: Report of 8 Cases. H. H. Hussey and S. Katz.—p. 526.
Meningococcic Meningitis: Report of 165 Cases. A. H. Meyer.—p. 543.
*Infectious Mononucleosis: Study of 96 Cases. J. H. Press, E. L. Shlevin and A. P. Rosen.—p. 546.
Phlegmonous Gastritis as Manifestation of Sepsis. L. J. Sachs and A. Angrist.—p. 563.
Acute Plasma Cell Leukemia. L. M. Meyer, J. Halpern and F. N Ogden.—p. 585.

Infectious Mononucleosis.—Press and his associates report 96 consecutive sporadic cases of infectious mononucleosis observed at the Jewish Hospital of Brooklyn over a ten year period. Infectious mononucleosis is an acute benign infection of unknown etiology characterized by irregular fever, swelling of the lymph nodes, sore throat, splenomegaly and lymphocytosis with the presence of abnormal lymphocytes in the peripheral blood stream; the blood serum may contain antibodies against sheep erythrocytes in high titers. The disease has been described also under terms such as acute lymphadenosis with lymphocytosis, monocytic angina, lymphocytic angina, lymphatic reaction and glandular fever. Diagnosis of infectious mononucleosis is in order in the presence of a suspected clinical picture when the hematologic findings are positive. The blood smear has been the most constant and characteristic single laboratory feature in the recognition of this disease. A positive Paul-Bunnell test is strongly confirmatory, but its absence does not preclude the diagnosis. It is sometimes necessary to repeat this test before a positive reaction develops. Because of the extreme diversity of manifestations of infectious mononucleosis the diagnosis may go unrecognized unless the disease is borne in mind and appropriate laboratory procedures are carried out.

Archives of Otolaryngology, Chicago

41:247-318 (April) 1945

*Penicillin in Mastoiditis and Its Complications. F. J. Putney.—p. 247.
Mechanism of Cochlea. P. Kellaway.—p. 252.
Congenital Atresia of Posterior Nares: Descriptions of Technics Used in Meeting Operative Difficulties and Report of Case. H. M. E. Boyd.—p. 261.
Disturbed Vestibular Function: Causes and Cures. M. F. Jones.—p. 272.
*Effect of Sulfathiazole in Chewing Gum in Certain Oropharyngeal Infections: Preliminary Report. N. Fox, R. G. Kesel, E. R. Neary and R. H. Herbine.—p. 278.
Tumors of Trachea. W. S. Tinney, H. J. Moersch and J. R. McDonald.—p. 284.
Lymphoid Hyperplasia of Nasopharynx: Study of 131 Autopsy Specimens. A. R. Hollender and P. B. Szanto.—p. 291.

Penicillin in Mastoiditis and Its Complications.—Infections of the mastoid and contiguous structures can be readily controlled by penicillin, provided the causative organisms are sensitive to the drug. Sterilization of the blood stream and control of spreading infections can be accomplished by systemic administration of penicillin, but surgical intervention is usually necessary to effect a cure. Local application of the drug has proved beneficial in the healing of persistently draining mastoid wounds. Putney reports 10 cases, among them 1 each of cerebellar abscess, epidural abscess, mastoiditis, thrombosis of the lateral sinus, petrositis and meningitis. Sulfonamide compounds were administered in 8 of the 10 cases without clearing the infection, but prompt response was obtained from treatment with penicillin. Penicillin in combination with adequate surgical intervention offers the most effective means of combating serious and life endangering otologic complications.

Sulfathiazole in Chewing Gum for Oropharyngeal Infections.—Fox and his collaborators point out that effective topical application of sulfonamides to diseased oropharyngeal tissues has been difficult because certain factors prevented the maintenance of a satisfactory concentration of the drug. The smooth oral mucosa is continually washed by saliva and does not lend itself favorably to treatment by powders, ointments or solutions. Beneficial results from the local application of sulfon-

amide drugs in the mouth have been reported, but they occurred in such areas as the alveolus of an extracted tooth or a cavity in the maxilla or mandible where the drug was sheltered from swallowing and salivary dilution The authors decided to use chewing gum as a vehicle On the basis of their studies on this medium, they arrive at the following conclusions 1 Chewing of gum appears to be a mouth cleansing process 2 From the standpoint of minimal systemic toxicity and maximal local antibacterial potency, sulfathiazole in chewing gum seems to be the preferable local chemotherapy for infections of oral and pharyngeal mucosa which are susceptible to sulfonamide compounds 3 Best clinical results are obtained in those conditions of the mouth and pharynx in which the beta hemolytic streptococcus is the preponderant etiologic organism

Bulletin of Johns Hopkins Hospital, Baltimore

76:93-154 (March) 1945

*Multiple Congenital Arteriovenous Aneurysms in Pulmonary Circulation J H Sisson, G E Murphy and E V. Newman —p 93
*Sulfamerazine in Treatment of Pneumococcal Lobar Pneumonia Analysis of 292 Cases A Genecin R C Austrian and R A Nelson —p 112
*Therapeutic Value of Penicillin Applied Locally, Based on Experience with Crude Material in Variety of Infections A M Fisher —p 134

Multiple Congenital Arteriovenous Aneurysms in Pulmonary Circulation—Sisson and his associates present the history of a woman aged 45 who had multiple congenital arteriovenous aneurysms in the pulmonary circulation The diagnosis established by angiography was confirmed at necropsy The clinical picture of 6 cases is summarized The usual symptoms are weakness, faintness and dizziness, dyspnea, chest pain and hemoptysis The signs are cyanosis, clubbing of the fingers, often visible hemangiomas, bruit over the chest, polycythemia and x-ray evidence of a localized opacity in the lung The diagnosis can be established by angiography, but this procedure may be dangerous in a patient with a circulatory shunt from the right to the left side of the heart The authors' patient died twenty-five minutes after the injection of diodrast This substance should be approached with caution in cases of hypertensive cardiovascular disease Treatment planned for the woman was pneumonectomy This operation had been successfully performed in 2 cases

Sulfamerazine and Lobar Pneumonia—Genecin and his associates employed sulfamerazine either alone or in combination with antipneumococcus serum or penicillin in 292 cases and found it effective Sulfamerazine, when given in daily dosages as small as 3 Gm per day after initial larger doses, produces high and relatively stable blood levels which are adequate in most instances to control pneumococcic pneumonia Toxic reactions were observed in 10 6 per cent of the patients These reactions were of the type seen following sulfadiazine No instances of peripheral neuritis were observed A small group of patients with particularly severe pneumococcic pneumonia were treated with sulfamerazine and penicillin The results were very encouraging

Crude Penicillin Applied Locally.—Fisher treated 95 cases of various types of infections with crude penicillin locally The results were good in 63 per cent, indefinite in 24 per cent and poor in 13 per cent The lesions which have shown the best response were the more acute or subacute lesions in which the bacteria are superficial or chronic lesions following surgical drainage with removal of all dead tissue Local penicillin therapy is not recommended to the exclusion of other methods but can be employed successfully in conjunction with its parenteral administration, with local surgical measures or with other antibacterial agents

Gastroenterology, Baltimore

4:121-204 (Feb) 1945

Gallbladder in Patients with Pernicious Anemia Study of Nonvisualization and Rate of Emptying E A Boyden and J V Layne —p 121
Acidity of Duodenal Contents in Health and Disease Review of Clinical Investigations. M. W. Comfort —p 135
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Statistical Evaluation of Amebiasis D C Browne, G McHardy and M A Spellberg —p 154
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Illinois, Medical Journal

87:165-216 (April) 1945

Rheumatic Fever as Public Health Problem J J Sievers —p 181
Rheumatic Fever in Childhood H W Elghammer —p 187
Treatment of Rheumatic Syndrome P Rosenblum —p 189
Diagnosis and Treatment of Carcinoma of Fundus Uteri H E Schmitz J F Sheehan and J E Towne —p 194
Vesicovaginal Fistula C W Trowbridge —p 197
Malignant Carcinoid (Argentaffinoma) of Ileum with Widespread Metastases J A Tuta —p 200

Journal of Clinical Investigation, Boston

24:127-250 (March) 1945 Partial Index

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Thiamine Deficient Diet in Tourniquet Shock in Rats L I Katzin and S L Warren —p 152
Study of Body Temperature and Water Content in Shock Produced by Continuous Intravenous Injection of Adrenalin, With and Without Anesthesia D E Scholz J H Schultz F G Pleune, K Fink, L T Steadman and S L Warren —p 154
Agglutinin Response in Patients with Meningococcic Meningitis H F Dowling R L Mayer, L K Sweet and Edith Dumoff Stanley —p 160
Bacteriostatic and Lytic Actions of Penicillin on Sensitive and Resistant Staphylococci W M M Kirby —p 165
Properties of Penicillin Inactivator Extracted from Penicillin Resistant Staphylococci W M M Kirby —p 170
Experimental Attempt to Transmit Primary Atypical Pneumonia in Human Volunteers J H Dingle and others —p 175
Effects of Testosterone and of Testosterone Propionate on Renal Functions in Man C Klopp N F Young and H C Taylor Jr —p 189
Influenza Virus Isolations and Serologic Studies Made in Boston During Winter of 1943 1944 M Finland Mildred W Barnes and B V Samper —p 192
Studies on Primary Atypical Pneumonia E C Curnen G S Mirick J E Ziegler Jr, L Thomas and F L Horsfall Jr —p 209

Journal of Nutrition, Philadelphia

29.223-288 (April) 1945

Basal Metabolic Rate of American Negro with Particular Reference to Effect on Menstruation of Female U S Maxwell and G Wakeham —p 223
Studies of Calcium and Phosphorus Metabolism in Chick III Some Time Relationships in Action of Vitamin D E W McChesney and N J Giacomino —p 229
Studies on Comparative Nutritive Value of Fats V Growth Rate and Efficiency of Conversion of Various Diets to Tissue in Rats Weaned at 14 days H J Deuel Jr and E Movitt, with technical assistance of Evelyn Brown —p 237
Studies on Carotenoid Metabolism V Effect of High Vitamin A Intake on Composition of Human Milk M Caroline Hrubetz H J Deuel Jr and B J Hanley with technical assistance of Martha Fairclough —p 245
Relationship of Glyceride Structure to Fat Digestibility I Synthetic Glycerides of Stearic and Oleic Acids K F Mattil and J W Higgins —p 259
Studies on Bone Fracture Healing I Effect of Vitamins A and D D H Copp and D M Greenberg —p 261
*Effect of Soy Flour on Nutritive Value of White Bread Frances F Volz, R M Forbes, W L Nelson and J K Loosli —p 269
Sulfur Balance of Nonlaying Molting and Laying Hen R T Holman M W Taylor and W C Russell —p 277
Availability of Vitamins in Foods and Food Products II Riboflavin Balances in Dried Liver, in a Liver Vitamin Concentrate and in Brewers and Bakers' Yeast B Sure with technical assistance of L Easterling —p 283

Effect of Soy Flour on Nutritive Value of White Bread—Volz and her associates state that the addition of 15 or 20 per cent of soy flour significantly improves the protein quality of bread, but the product is so different from white bread that it is not accepted by the average consumer Since 5 per cent of soy flour can be used without appreciably altering the appearance or flavor of white bread it seemed of interest to determine whether such an addition would improve the protein quality In a study on rats the authors found that the addition of 5 per cent soy flour significantly improves the growth promoting value of white bread which contains 3 per

cent of whole milk solids. White bread containing 3 per cent of milk solids gave 0.97 Gm. gain per gram of protein consumed and bread with 5 per cent soy flour, containing an equal amount of milk, 1.17 Gm.; this difference is significant. The biologic value of the protein of the white bread as determined by the Mitchell method was 43.3 as compared with 47.7 for the bread with 5 per cent soy flour.

Journal of Pediatrics, St. Louis

26:313-414 (April) 1945

Crying of Newly Born Babies: I. The Community Phase. C. A. Aldrich, C. Sung and Catharine Knop.—p. 313.
Fels Composite Sheet: I. Practical Method for Analyzing Growth Progress. L. W. Sontag and E. L. Reynolds.—p. 327.
Id.: II. Variations in Growth Patterns in Health and Disease. E. L. Reynolds and L. W. Sontag.—p. 336.
Late Behavioral Aspects Found in Cases of Prenatal, Natal and Postnatal Anoxia. Mary I. Preston.—p. 353.
Value of Serum Protein Determinations in Cases of Suspect Erythrodermia Desquamativa of Newborn. K. Glaser and S. M. Markson.—p. 367.
Roentgentherapy of Hemangioma of Larynx in Infants. H. H. Kasabach and C. P. Donlan.—p. 374.
Significance of Delayed Ossification in Treatment of Congenital Clubfoot. D. W. Leonard.—p. 379.
Paracolon and Proteus Bacilli in Feces of Healthy Infants. E. Neter.—p. 390.
Ingestion of Kerosene Complicated by Pneumonia, Pneumothorax, Pneumopericardium and Subcutaneous Emphysema. A. F. Lavenstein.—p. 395.
Accidental Hanging with Recovery: Report of 2 Cases in Children. Mildred Kemper and S. Gibson.—p. 401.
Pneumococcus Meningitis in Newborn: Report of Case with Recovery and Review of Literature. P. Hogg and C. D. Bradley.—p. 406.

Journal of Thoracic Surgery, St. Louis

14:83-186 (April) 1945

*Difficulties in Differential Diagnosis of Bronchogenic Carcinoma. R. G. Bloch, W. E. Adams, T. F. Thornton and J. E. Bryant.—p. 83.
Bronchial Adenoma. C. L. Jackson, F. W. Konzelmann and C. M. Norris.—p. 98.
*Problem of So-Called Bronchial Adenoma. E. A. Graham and N. A. Womack.—p. 106.
*Hamartoma (Often Called Chondroma) of Lung. J. R. McDonald, S. W. Harrington and O. T. Clagett.—p. 128.
Bronchial Adenoma Treated by Pulmonary Resection: Case Reports. J. M. Chamberlain and J. Gordon.—p. 144.
New Guide in Operation for Esophageal Hiatus Hernia of Diaphragm. P. E. Truesdale.—p. 160.
Thoracoplasty Binder. E. F. Skinner.—p. 171.
Use of Whole Blood Transfusion in Resections of Lung. T. F. Thornton Jr., W. E. Adams, J. E. Bryant and L. M. Carlton Jr.—p. 176.

Diagnosis of Bronchogenic Carcinoma.—Bloch and his associates say that, through routine chest fluoroscopy of all patients of the outpatient department of the University of Chicago Clinics, bronchogenic carcinoma in the early and nonsymptomatic stage, as well as advanced tumors unrelated to the patients' complaints, are found in appreciable numbers. The differential diagnosis in early cases is frequently difficult and cannot be established by the conservative methods of examination but only by surgical exploration. X-ray examination can never establish a definite differential diagnosis even in extensive involvements. Particular diagnostic difficulties are offered by excavated lesions which are not accessible to the bronchoscope. Extrapulmonary involvements and systemic disease frequently confuse and obscure the picture of carcinoma. The absence of tubercle bacilli from the sputum eliminated by excavating lesions is most significant in the diagnosis of neoplasm.

So-Called Bronchial Adenoma.—Graham and Womack stress that the so-called bronchial adenoma must be regarded as a potentially malignant tumor. Although it may pursue a nonmalignant course for many years, there always remains the possibility of the appearance of malignant qualities, such as invasion of neighboring structures, involvement of regional lymph nodes and the development of distant metastases. The authors cite a case in which there was a combined carcinoma and sarcoma with the presence of bone. The malignant transformation of both the epithelial and the connective tissue elements in this case seems to support the suggestion made by the authors in 1938 that a wide variety of tumors can be thought of as arising from a fetal bronchial bud which has failed either to develop normally or to atrophy. At that time they offered the conception that either the mesodermal or the entodermal elements could be the origin of later neoplastic growth which could include not only such recognized pulmonary tumors as chondroma, fibroma, lipoma and sarcoma but also the so-called adenoma, which is composed predominantly of entodermal or epithelial elements. It is rare, however, to find malignant transformation of the two elements in the same tumor. The presence of bone in this case, the authors feel, is in line with their conception that "mixed tumors" is a better designation for these tumors than "adenoma." The frequent inability to determine from a biopsy specimen whether or not the tumor has already become malignant makes the attempt at local removal through the bronchoscope both unwise and dangerous. Total pneumonectomy is the procedure of choice.

Hamartoma of Lung.—According to McDonald and his associates three benign pulmonary tumors, which were strikingly similar and unusual, were removed at the Mayo Clinic in the past three years. All tissues in these tumors corresponded with those found normally in the bronchi, although lacking in orderly arrangement. Such neoplasms are supposed to be the result of abnormal development of the bronchial anlage; therefore they have been called hamartomas (to fail, to err). This paper is based on a study of 23 cases of hamartoma of the lung. In 3 of these the tumor was removed surgically. In the remaining 20 cases the tumor was discovered at necropsy. The incidence of hamartoma of the lung in a consecutive series of 7,972 necropsies was 0.25 per cent. This tumor occurs more frequently than has been recognized. It is strictly benign and only occasionally causes symptoms. In most cases the diagnosis has to be made by roentgenographic examination. A hamartoma should be suspected in every case of solitary lesion of the lung. Frequently this tumor cannot be distinguished from other lesions of the lung until a specimen of the tumor is examined microscopically. Treatment consists in excision of the tumor. One should try to conserve as much pulmonary tissue as possible.

Minnesota Medicine, St. Paul

28:257-336 (April) 1945

Postwar Medicine in Minnesota—The Doctor. B. O. Mork Jr.—p. 281.
Postwar Medicine in Minnesota—Diagnostic Centers. A. H. Zachman.—p. 284.
Spontaneous Subarachnoid Hemorrhage. R. B. Radl.—p. 286.
Neuropsychiatric Viewpoint of Socialized Medicine. E. M. Hammes.—p. 290.
Electroshock Therapy in State Hospital. M. W. Kemp.—p. 294.

New England Journal of Medicine, Boston

232:463-490 (April 26) 1945

*Treatment of Bacterial Endocarditis with Penicillin: Experiences at Boston City Hospital During 1944. M. Meads, H. W. Harris and M. Finland, with technical assistance of Clare Wilcox.—p. 463.
New Pocket Prismatic Microscope. D. J. O'Brien.—p. 475.
Clinical Importance of Rh Blood Type. L. K. Diamond.—p. 475.

***Penicillin* in Bacterial Endocarditis.**—Meads and his associates present observations on 9 cases of subacute bacterial endocarditis caused by Streptococcus viridans and on 7 proved or probable cases of acute bacterial endocarditis due to other organisms, all of which were treated with sodium penicillin at the Boston City Hospital during 1944. In the 9 subacute cases the dose generally used was 25,000 units intramuscularly every two hours for two weeks. Seven of the patients are alive and have been free from evidences of active infection for one to eleven months. Two patients had recurrence of infection, 1 after four months and the other after only one month. It is not certain whether or not these recurrences represent reactivation of the original infection or reinfection. An additional fatal case of Streptococcus viridans endocarditis was treated. Improvement occurred in another extremely severe case with a characteristic clinical course of subacute bacterial endocarditis with multiple emboli, with survival three months after treatment, but no bacteria could be grown from the blood before penicillin was started. In the fatal cases heart failure resulted from extensive damage to cardiac structures. In the 7 cases of acute bacterial endocarditis small doses were generally used because of the greater susceptibility of the organisms. Three of these patients are living and well. The diagnosis in all the fatal cases was confirmed at necropsy but in those who survived it is only

highly probable. Heparin was used together with penicillin in 3 of the Streptococcus viridans cases and in 2 of those due to the pneumococcus. There appeared to be no benefit from this therapy to justify the additional effort and risk. Early and intensive treatment with penicillin maintained for an adequate period offers the best hope for recovery or arrest of infection in cases of subacute and acute bacterial endocarditis.

New York State Journal of Medicine, New York

45:817-928 (April 15) 1945

Sigmoiditis. A. Bassler.—p. 861.
*Gross Intracerebral Hematomas: Report of 16 Surgically Treated Cases. W. B. Hamby.—p. 866.
Practical Experience with Congenital Heart Disease. H. Green.—p. 877.
Factors Contributing to Failures in Biliary Tract Surgery. R. P. Dobbie. —p. 882.
Trauma in Relation to Peptic Ulcer. I. Gray.—p. 887.
Intestinal Helminths in New York and Vicinity. H. W. Brown.—p. 893.
Augmentation of Stilbestrol Effect in Menopausal Women by Vitamin C. L. Bonin.—p. 895.

Surgical Treatment of Intracerebral Hematomas.—Hamby says that, while the more common types of intracranial hemorrhage are well known, spontaneous, limited, removable intracerebral hematomas are less familiar. He reports 16 cases of gross intracerebral hematomas that were drained. There were 14 recoveries and 2 deaths. Cases due to cranial injury with skull fracture have not been included in this series. One of the two deaths was due to massive pulmonary atelectasis and the other to a fatal recurrent hemorrhage from a ruptured aneurysm of a major cerebral vessel. Seven of the cases were associated with cerebral arterial disease and 5 with intracerebral neoplasms (3 metastatic, 1 meningioma and 1 astrocytoma). One case was proved and 3 were suspected to be due to ruptured aneurysms of the major blood vessels. One case was of delayed post-traumatic intracerebral hemorrhage.

Pennsylvania Medical Journal, Harrisburg

48:657-752 (April) 1945

Avoidance of Difficulty in Biliary Surgery. H. E. Pearse.—p. 679.
Evaluation of Fenestration Operation for Otosclerosis. K. M. Day. —p. 684.
Treatment of Urinary Frequency in Women. W. Baurys.—p. 687.
American Medicine Tomorrow. M. F. Cahal.—p. 691.
Management of Epibulbar Malignancy. W. E. Fry.—p. 694.
Organization and Administration of Gynecologic Tumor Clinic, with Certain Observations Concerning Therapy. C. T. Beecham and T. L. Montgomery.—p. 697.

Radiology, Syracuse, N. Y.

44:319-424 (April) 1945

Roentgenologic and Pathologic Aspects of Pulmonary Tumors Probably Alveolar in Origin: Report of 6 Cases, 1 of Them Complicated by Torulosis of Central Nervous System. E. F. Geever, H. R. Carter, K. T. Neubuerger and E. A. Schmidt.—p. 319.
Roentgen Features of Eosinophilic Infiltrations in Lungs. H. Hennell and M. L. Sussman.—p. 328.
*Chronic Massive Pericardial Effusion Following Roentgen Therapy for Carcinoma of the Breast: Case Report. H. Blumenfeld and S. F. Thomas.—p. 335.
Observations on Over 100 Cases of Myelogenous and Lymphatic Leukemia, with Blood and Sternal Puncture Studies and Follow-Up of Several Years. B. Friedmann and L. M. Meyer.—p. 341.
Ileocecal Tuberculosis. M. R. Camiel.—p. 344.
Simple Method of Cardiac Measurements. F. Brunn.—p. 352.
Pes Planus: Method of Mensuration. M. Kaplan and M. Symonds. —p. 355.
Comparison of Physical and Biologic Methods of Depth Dose Measurement. C. Packard and F. M. Exner.—p. 357.
Measurements of Surface and Depth Dose Ratios from 70 to 1,000 Kv. F. M. Exner and C. Packard.—p. 367.

Chronic Pericardial Effusion Following Roentgen Therapy.—Blumenfeld and Thomas report the history of a woman aged 53 who presented herself with masses in the left breast and axilla. She was given within four days three doses of x-rays totaling 600 roentgens to a field including the left breast and axilla, also a single dose of 300 roentgens to the posterior axilla. Several days later a radical mastectomy was done. During the operation the patient was exposed to a dose of approximately 3,600 roentgens in air for the purpose of "sterilizing" residual cancer cells at the operative site. The x-rays were directed into the open wound, which was then closed. She was discharged following an uneventful recovery. Several months later the patient complained of cough with s tightness in the left shoulder and pain down the left arm. X- examination showed a shadow interpreted as roentgen pneu nitis. Six months later she reported abdominal distress. I ing the succeeding year she lost 25 pounds (11 Kg.), and co and abdominal discomfort persisted. At the end of the year October 1941, exertion dyspnea was observed for the first ti All the symptoms persisted for the following two years, in February 1944 the patient reentered the hospital with sy toms of myocardial damage. She died several weeks la From the necropsy studies it was concluded that the rema able thickening of the pericardium was probably the result the unusually intense irradiation of this region at the time the left mastectomy. The mechanical interference with heart movement was the principal cause of circulatory fail and the final illness. The left lung was extensively collap presumably as a result of irradiation. The literature aboun with references to the changes in the myocardium followi irradiation, but heretofore only passing mention has been ma of the effects of irradiation on the pericardium. Massive irradi tion of the open thorax is not to be recommended.

Rocky Mountain Medical Journal, Denver

42:241-328 (April) 1945

Pulmonary Emphysema: Newer Concepts. E. Mayer and I. Rappapo —p. 257.
Surgical Treatment of Funnel Chest. R. Nissen.—p. 264.
Reconstructive Surgery of War Wounded. P. D. Wilson.—p. 267.
Light and X-Ray Therapy of Tuberculosis. E. Mayer.—p. 274.
Conservative Operation of Air Cysts of Lung. R. Nissen.—p. 282.

42:329-408 (May) 1945

Tropical Otitis. I. W. Philpott and J. Chessen.—p. 345.
Postoperative Pulmonary Complications. V. L. Rees.—p. 347.
Need for Improvement in Medical and Psychiatric Concepts. F. (Ebaugh.—p. 352.
Epidemic Encephalitis in Colorado. W. C. Black, W. K. Absher an J. G. McDonald.—p. 354.

Surgery, St. Louis

17:1-640 (April) 1945

*Acute Pancreatitis. J. Morton.—p. 475.
Investigation of Cause and Prevention of Gas Pains Following Abdom inal Operation. H. H. Davis and T. M. Hansen.—p. 492.
Gastric Resection for Certain Acute Perforated Lesions of Stomach an Duodenum, with Diffuse Soiling of Peritoneal Cavity. J. D. Bisgard —p. 498.
*Survival After Gastric Resection in Carcinoma of Stomach. W. C Custer.—p. 510.
Creation of Gastric Pouch Following Total Gastrectomy. G. C. Engel —p. 512.
Prolonged Spinal Anesthesia: Description of Simplified Technic for Nupercaine. D. A. Roman-Vega and J. Adriani.—p. 524.
Pulmonary Complications Following Appendectomy and Herniorrhaphy. F. Hughes and S. S. Lambeth.—p. 533.
Cardiovascular Disturbances Following Pneumonectomy: Attempt to Correlate Blood Pressure and Intrapleural Pressure Changes. W. D. Seybold and O. T. Clagett.—p. 538.
Tuberculous Abscess of Thyroid Gland. K. P. Klassen and G. M. Curtis.—p. 552.
*Intrasternal Infusions and Transfusions. C. Reich, M. Y. Swirsky and E. Hunter.—p. 560.
Trench Foot. F. K. Boland Jr., T. S. Claiborne and F. P. Parker. —p. 564.
Observations on Treatment of Empyema Thoracis with Penicillin. B. Blades, J. E. Hamilton and D. J. Dugan.—p. 572.
Complicating Factors in Surgical Management of Varicose Veins, with Special Reference to Interruption of Sympathetic Nerve Impulses as an Adjunct in Treatment. H. G. Smithy.—p. 590.
Clinical Anatomy of Vertebral Veins. M. Norgore.—p. 606.
Homogenous Cartilage Grafts: Experimental Study. F. Young.—p. 616.
Traumatic Chylothorax: Report of Fatal Case Complicated by Ruptured Duodenal Ulcer. R. Florer and A. Ochsner.—p. 622.
Total Colectomy for Polyposis of Colon with Carcinomatous Degeneration, with Note on Postoperative Care. A. O. Wilensky.—p. 630.

Acute Pancreatitis.—Morton stresses that pancreatitis must be considered as a possibility in patients complaining of sudden severe epigastric pain. The serum amylase test is of greatest assistance in deciding whether the pancreas is involved. The test is easily carried out, is accurate and gives more important information than any of the routine laboratory tests. The author thinks that as long as surgeons operate without using the amylase test to help in their diagnosis there will be a mortality from acute edematous pancreatitis. Before the amylase

test was available and operation was necessary to decide the diagnosis, the author had 9 fatalities in 22 cases of pancreatitis. With the proper use of the amylase test he treated 29 cases of pancreatic edema without a death, not operating during the height of the reaction. There are two types of pancreatitis, acute edematous and pancreatic necrosis. Acute edematous pancreatitis can be diagnosed by the serum amylase test and the rapid improvement under conservative treatment. Pancreatic necrosis must be suspected when the patient fails to make improvement within a few days. In acute edematous pancreatitis operation should be deferred until the reaction has subsided. Acute edematous pancreatitis is followed frequently by chronic pancreatitis. Pancreatic necrosis is followed by abscess, diabetes and pseudocysts in some of those who survive. Conservative treatment of pancreatic necrosis or pancreatic abscess is disastrous. When either condition is suspected, operation is indicated. Biliary tract disease should be treated after an acute attack of pancreatitis if it has played a part in the onset. Any surgical manipulation about the lower end of the common duct or the head of the pancreas is likely to be followed by postoperative acute pancreatic edema. This can be demonstrated by the amylase test. There is a considerable danger of this in the resection of posterior duodenal ulcer perforating into the pancreas. It carries a mortality which should be taken into consideration in resections of duodenal ulcer.

Intrasternal Infusions and Transfusions.—Reich and his associates show that when shock is brought about by wounds, hemorrhage or burns there is usually urgent need for the parenteral administration of fluids. These fluids can usually be given by vein, but in some instances the veins are collapsed, thrombosed or absent or the vein areas are obliterated by wounds or burns. The bone marrow offers a ready channel for the administration of fluids in these cases. The present report is a study of the administration of various fluid mediums through the sternal marrow. The work was done on 35 patients in the general wards of a large city hospital. The authors conclude that intrasternal infusions of saline solution, glucose and plasma are practical, but the intrasternal transfusions of blood were unsuccessful. The sternal route is of great value in the treatment of shock.

Texas State Journal of Medicine, Fort Worth

40:621-672 (April) 1945

Choice of Treatment in Cancer. O. T. Woods.—p. 627
Pruritus Vulvae. Twelve Year Study. K. J. Karnaky.—p. 630
Advances in Treatment of Various Forms of Meningitis. R. L. Moore.—p. 637.
Spontaneous Fractures of Ribs in Healthy Individuals. T. B. Bond.—p. 642
Malignant Tumors of Testis. C. H. Frank.—p. 643
Treatment of Ocular Injuries Among Combat Troops. F. M. Whitsell.—p. 646
Carotid Cavernous Arteriovenous Aneurysm. C. E. Ball.—p. 653

United States Naval Med. Bulletin, Washington, D. C.

44:681-900 (April) 1945. Partial Index

Bacterids Provoked by Internal Sulfonamide Administration. C. C. Carpenter and P. L. Gorsuch.—p. 681
Abuse of Sulfonamides in Treatment of Acute Catarrhal Fever. R. A. Kern.—p. 686
Salivary Sulfonamide Levels After Chewing Paraffin and Chicle Vehicles. C. C. Pfeiffer and Helen L. Holland.—p. 695
Sulfadiazine as Prophylactic Agent Against Meningitis. E. R. Garvin.—p. 700
Skin Reactions to Dirofilaria Immitis Extract. R. W. Huntington Jr.—p. 707
Filariasis: Study of 737 Patients So Diagnosed. F. R. Smith Jr.—p. 719.
Intestinal Parasites Among Melanesians. H. K. Russell and J. O. Scott.—p. 727.
Large Scale Isolation and Identification of Shigella Organisms in Field. R. W. Getty and others.—p. 729.
Positive Dick Test Reactors: Relation of Incidence to Habitat. M. J. H. Grand and J. D. Purvis Jr.—p. 734
Certain Psychiatric Reactions in Operators of Antisubmarine Sound Gear: Report of 2 Cases. O. A. Will Jr.—p. 746
Experiences with Group Psychotherapy. J. D. Teicher.—p. 753.
Treatment of Atelectasis. E. C. Thompson.—p. 757
Treatment of Empyema. B. Battaglia.—p. 763
Mistakes in War Surgery. F. H. Bowen.—p. 777
Medical Problems in Construction Battalion. J. L. Hurlbut.—p. 793
Statistical Report of Malaria During One Year on Island X. C. D. Fowler, D. M. Roberts and E. D. Dillon.—p. 797
Gingivitis Among Submarine Personnel: Comparative Study. O. E. Van Der Aue and V. R. Cullen.—p. 811

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

67:141-272 (Sept.) 1944

*Pressure Effects Associated with Cervical and with Rudimentary and "Normal" First Ribs, and Factors Entering into Their Causation. F. M. R. Walshe, H. Jackson and R. Wyburn Mason.—p. 141.
Electrical Activity of Voluntary Muscle in Man Under Normal and Pathologic Conditions. G. Weddell, B. Feinstein and R. E. Pattle.—p. 178
Familial Tuberose Sclerosis with Calcification: Report of 2 Cases. L. J. Apley.—p. 258.
Creatine Metabolism in Relation to Pituitary Tumor. J. N. Cummings.—p. 265

Pressure Effects of Cervical and Normal First Rib.—Walshe and his associates present 5 cases of cervical and rudimentary first rib pressure. When an abnormal rib is present it is rarely the only relevant skeletal abnormality, for scoliosis and vertebral deformities are commonly associated with it. The bony abnormality consists of an abnormal upper thoracic outlet. This outlet is commonly asymmetrical and abnormally raised and tilted. The associated nervous and vascular symptoms are not accounted for by the abnormal rib alone, for there is evidence that the clavicle plays an important part in the compression of nerve roots and artery. The clavicle and the abnormal rib form the two arms of a vise in which these structures are compressed. This view does not exclude the role of a rib in exerting traction on and stretching and bending of the structures which cross it. Damage to the subclavian artery may lead to its aneurysmal dilatation, with or without the formation of clot within it. Thrombosis, when it occurs, leads to severe ischemia in the upper limb and sometimes to the production of emboli which lodge in the digital arteries and give rise to gangrenous patches, sometimes erroneously attributed to disorders of sympathetic innervation. Vascular symptoms in the upper limb are not due to disorders of sympathetic innervation but to mechanical interference with the blood flow through the subclavian artery. When symptoms of sympathetic paralysis occur, they are referable to the stellate ganglion. Of the components of the syndrome of a paralyzing lesion of this ganglion, Horner's oculopupillary syndrome is the most familiar. The factors leading to pressure symptoms affecting nerves and artery when no abnormal costal element is present, the so-called normal first rib and scalenus anticus syndromes, are discussed. Perhaps the essential factor is a dropping of the shoulder girdle. This leads to increased tension on nerve roots and subclavian artery and, by narrowing the space between first rib and clavicle, may lead to the compression of these structures by the clavicle during movements of the arm. The need for a more systematic x-ray study of the upper thoracic outlet in cases of suspected rib pressure is stressed.

Journal of Mental Science, London

90:1-152 (Jan.) 1945

Serum Gonadotropin and Testis Biopsy in Treatment of Schizophrenia. R. E. Hemphill and M. Reiss.—p. 1
Factorial Study of Some Morphologic and Psychologic Aspects of Human Constitution. W. L. Rees and H. J. Eysenck.—p. 8
Character Assessment from Handwriting. Olga Marium.—p. 22
Account of Lowenfeld Technic in Child Guidance Clinic, with Survey of Therapeutic Play Technic in Great Britain and U. S. A. P. M. Traill.—p. 43
Clinical and Biochemical Analysis of Case of Manic Depressive Psychosis Showing Regular Weekly Cycles. R. Klein, M. D. Prague and R. F. Nunn.—p. 79.
Physique and Effort Syndrome. W. L. Rees.—p. 89
Vestibular Reactivity to Caloric Stimulation in Schizophrenics: Preliminary Report. G. Fitzgerald and E. Stengel.—p. 93
Electric Convulsion Treatment in Patients Over 60. W. Mayer Gross.—p. 101.
Syndrome of Hysteroencephalopathy in Military Psychiatric Casualties. G. T. Stockings.—p. 104
*Schizophrenia in Military Psychiatric Practice. G. T. Stockings.—p. 110.
Delinquent Defectives. H. J. Ehrenwald.—p. 113
Comments on Shipley Hartford Vocabulary Test. E. J. G. Bradford.—p. 119

Schizophrenia.—Stockings separates schizophrenic cases into two distinct groups: one which responds to anoxic shock and one which responds to insulin. The dysoxic type is distinguished by depression of mood, slowing of cerebration, apathy

and general underactivity; it includes psychotic depressions, paranoid schizophrenia, catatonic stupors, simple schizophrenia and some types of alcoholic hallucinosis without dementia. Anoxic shock appears to have a specific stimulating effect on these cases. The dysglycolytic type is distinguished by overactivity, elation, motor excitement and rich variety of bizarre delusions and hallucinations. It comprises the acute manias, hebephrenic and catatonic excitement and paraphrenias. Insulin appears to have a specific tranquilizing effect in these cases and influences the underlying thought disorder. In acute dysoxic cases, e. g. acute catatonic stupors, application once daily for the first five shocks is found to be the optimum frequency, followed by application on alternate days. In milder cases shock therapy on alternate days is usually sufficient. Remission is usually obtained after seven to ten shocks. In dysglycolytic cases a course of twenty comas is usually sufficient. Complete remission may be expected in 70 per cent of all cases, improvement in 15 per cent and failure in 15 per cent.

South African Journal Medical Sciences, Johannesburg

9:111-150 (Nov.) 1944

*"Prothrombin Response to Vitamin K Test" in Differentiation Between Intra and Extrahepatic Jaundice. H. B. Stein.—p. 111.
Inhibitory Effect of Testis on Estrogen Sensitivity of Sex Skin of Male Baboon (Papio Porcarius). Christine Gilbert.—p. 125.
Study of Quantitative Interaction Between Estrin and Progestin in Rat. W. A. Odendaal.—p. 131.
Alum Precipitated Typhus Vaccine: South African Epidemic Typhus Vaccine Prepared from Gerbils (Genus Tatera). L. W. Osburn.—p. 143.

Intrahepatic and Extrahepatic Jaundice.—The response of the plasma prothrombin to intramuscular injections of 5 mg. of synthetic vitamin K has been shown to be of value in the differentiation between intrahepatic and extrahepatic jaundice. Stein reports observations on 27 new patients, bringing the total to 50 patients. He suggests that the test be called the "prothrombin response to vitamin K test." Of a total of 45 cases of jaundice (excluding 5 cases of hepatic cancer) the test was correct in 43 cases. In 21 cases of obstructive jaundice an effective response (prompt or delayed) was obtained in all; in 24 cases of hepatocellular jaundice an ineffective response (partial or complete) was obtained in 22. The method of performing the test and the interpretation of the results obtained are examined in the light of the work of other investigators, and special attention is drawn to the following points not stressed by others: 1. A satisfactory method for estimating plasma prothrombin must be used. 2. Parenteral administration of vitamin K, preferably in doses of 5 mg., should be used. 3. A fixed initial prothrombin level must be obtained before injecting vitamin K, in order to exclude a spontaneous rise in the prothrombin level, e. g. in cases of acute hepatitis during the recovery phase. 4. The test is of limited application, as it is of value only in cases of jaundice with an initially low prothrombin level—preferably with a prothrombin index of less than 75 per cent. Cases of combined intrahepatic and extrahepatic jaundice may lead to difficulties in interpretation, namely primary or secondary liver cancer with metastases in the portal glands, and biliary cirrhosis following long standing obstruction of the bile ducts. Except for these difficulties the test is of great value in differentiating between "medical" and "surgical" jaundice.

Pediatria e Puericultura, Bahia

13:117-152 (March-June) 1944. Partial Index

*Poliomyelitis of Pseudomyopathic Form. M. Gesteira.—p. 117.
Quinine Iodobismuthate in Therapy of Whooping Cough. G. O. de Paula Marques.—p. 139.

Pseudomyopathic Poliomyelitis.—According to Gesteira poliomyelitis of the pseudomyopathic type is characterized by sudden appearance of paralysis either after an infectious period typical for poliomyelitis or without such a period. Two or more members of the family become simultaneously ill, which is a rare occurrence in poliomyelitis. Early paralysis and consequent moderate atrophy are symmetrical and are regularly distributed in the proximal areas of the limbs, near the pelvic and scapulohumeral joints. There is a lordosis. The type of gait and posture is similar to that of myopathy. The hands become clawed or show a tendency to this deformity. In cases reported by the author the electrodiagnostic examination late in the course of the disease failed to show any reaction of degeneration, which suggests complete regression of paralysis.

Medizinische Klinik, Berlin

40:361-390 (June 23) 1944. Partial Index

Comment on Diagnosis and Treatment of Pancreas Necrosis and on Involvement of Pancreas in Cholelithiasis. F. Bernhard.—p. 361.
Roentgenologic Examinations During Pregnancy. A. Wiessmann.—p. 365.
*Immunization and Widal Reaction in Bacillary Dysentery. W. Schafer.—p. 367.
Treatment of Malignant Tumors of Genitals in Women. R. K. Kepp.—p. 369.
Uncommon Forms of Encephalitis: Typhus Without Fever and With Fatal Encephalomeningitic Course; Transient Encephalomeningitis. L. M. Kugelmeier.—p. 372.

Widal Reaction in Bacillary Dysentery.—Schafer examined serums for the presence of agglutinins in 150 soldiers who were immunized against bacillary dysentery. The Widal reaction was negative in 85, or 56 per cent. Serums in another series of 150 soldiers in the fall of 1943 were negative for agglutinins in 120 cases, or 80 per cent. The Widal reaction does not appear to be a satisfactory test of the immunizing effect of dysentery vaccines. The percentage of cases with agglutinins present in the serum was the same in immunized as in the nonvaccinated soldiers. A positive Widal reaction in soldiers not suffering from bacillary dysentery is not to be considered the result of immunization but suggests the existence of a ubiquitous causative factor. Latent infection with dysentery bacilli can play an important part. Since 1941, when the incidence of bacillary dysentery reached its height in the army, there has been a constant decrease in acute cases of bacillary dysentery, which was paralleled by a similar decrease in latent cases. Mass immunization of soldiers who have gone through several seasons of dysentery is not so necessary as for troops which have been brought for the first time from base areas to the battle front. Some secondary reactions to immunization such as diarrhea and pain in the joints or extremities are to be considered as specific allergic reactions against dysentery bacilli antigens in immunized persons with a latent infection.

Acta Medica Scandinavica, Stockholm

117:1-120 (April 17) 1944. Partial Index

*Reexamination of 79 X-Ray Treated Exophthalmic Goiter Patients Eight to Eighteen Years After Their Discharge. M. Bjørneboe.—p. 15.
Variation with Latitude of Steepness of Epidemic Curves of Poliomyelitis. H. Petersen.—p. 24.
Investigations on Content of Reticulocyte Ripening Substances in Plasma in Various Forms of Experimental Anemia. C. M. Plum.—p. 29.
Renal Rickets. J. Tomenius.—p. 43.
*Excretion of Hormones in Chronic Polyarthritis in Women: Sexual Function and Articular Disturbances in Women. H. Sjövall.—p. 69.
*Studies on Causation of Experimental Gastroprival Pellagra: III. Therapeutic Experiments on Pups with Preventive Parenteral Administration of Vitamin B6 Given Together with Vitamin B1, Lactoflavin and Nicotinic Acid Amide or Alone. S. Petri, F. Nørgaard, K. Trautner and W. Klaer.—p. 90.

Exophthalmic Goiter After X-Ray Treatment.—A total of 79 goiter patients were observed from eight to eighteen years after they had undergone x-ray treatment. Of the 71 considered in this report, 8 were later subjected to surgical treatment; 7 died, 12 are ill and 44 are well. The cause of death was thyrotoxic crisis in 2 and cardiac insufficiency in 4 cases. Of the 12 patients who were not well, 3 had cardiac insufficiency, 8 had a relapse of hyperthyroidism and 1 had myxedema. Slightly less than two thirds of the patients recovered with x-ray treatment. Reports on surgical treatment of exophthalmic goiter indicate a higher percentage of recovery, and the results are more rapidly obtained. The argument that x-ray treatment has no case mortality holds good only with certain reservations, for during the protracted treatment the patients are apt to die from thyrotoxic crisis or from the heart lesion.

Excretion of Hormones in Women with Polyarthritis.—Studies were made on 116 women with chronic polyarthritis and on 43 women with various orthopedic diagnoses. Attention was given to the relations between sexual function and joint disorders and a close connection was observed. The author stresses the high incidence of ovarian insufficiency in women with polyarthritis but does not believe that the separation

cases of a menopausal arthralgic type is justified. The processes involved are complex, but it is probable that endocrine factors play an important role in the etiology of chronic polyarthritis.

Causation of Experimental Gastroprival Pellagra.—In studies on experimental endogenous gastroprival pellagra Petri and his associates attempted to elucidate the etiology by means of various elective resections of the digestive tract together with therapeutic experiments. The studies were made on dogs instead of pigs and revealed that vitamin B_6 is the only one of the B vitamins so far investigated by the authors (vitamin B_1, nicotinic acid and lactoflavin) which alone exerts a distinct therapeutic effect on experimental gastroprival pellagra; i. e., it exerts its effect independently of the stomach.

117:199-416 (June 2) 1944. Partial Index

Investigations on Physiopathology of Erythrocytes: I. New Technic for Study and Differentiation of Granular Erythrocytes. A. Nizet.—p. 199.
Spontaneous Hypoglycemia Referable to the Presence of Adenomas in the Islets of Langerhans. S. Lups.—p. 261.
*Protective Value of Intracutaneous and Percutaneous Methods of BCG Vaccination: Comparative Experimental Investigation. K. Birkhaug. —p. 274.
Behavior of the Nucleolar Apparatus During Growth and Differentiation of Normal Blood Cells in Adult Stage. B Thorell.—p. 334.
*Can Rheumatic Infection Be Influenced by Artificial Tropical Climate? G. Edström.—p. 376.

Protective Value of BCG Vaccination.—Birkhaug says that, since it has been proved that BCG vaccine is harmless, attention must be concentrated on finding the best method for its administration. On the basis of an extensive survey and investigations he concludes that BCG vaccination performed either by the intracutaneous or by the percutaneous (multiple puncture or scarification) methods produces in guinea pigs a significant resistance against a virulent tuberculous infection. The multiple puncture BCG vaccination method produces the most potent resistance in guinea pigs. In nearly 5,000 children and adults the multiple puncture method produced 98 per cent positive tuberculin reactions with 1 mg. of old tuberculin in two months. An automatic apparatus performs forty punctures with one stroke. This multiple puncture method rarely produces a permanent blemish.

Rheumatic Infection and Artificial Tropical Climate.—Edström says that in 1941 one of the wards in the rheumatism department of the Lund Hospital was reconstructed into a tropical chamber; the air of the room has been kept at a constant temperature of 89.6 F. and its humidity at 35 to 40 per cent, a relatively warm but dry tropical climate. The ward beds were occupied during the past two years by 7 patients with rheumatic fever and 8 with chronic rheumatic polyarthritis. Of the 7 patients with rheumatic fever 6 became entirely free from symptoms and capable of working; 1 died of sepsis after an acute tonsillitis. Of the 8 patients with chronic polyarthritis 4 have become symptom free and capable of working. Two patients improved temporarily. One patient with a juvenile arthritis of the Still's disease type improved very much during the first treatment but after return to his home had a relapse, which could not be influenced by renewed treatment in the tropical ward. In 1 case the treatment was broken off on account of a mental depression. In 11 of the cases cultures from the throat at the beginning of tropical ward treatment showed hemolytic streptococci. In 9 of these cases the cocci disappeared during the stay in the tropical ward.

Acta Radiologica, Stockholm

25:1-80 (Feb. 29) 1944

*Roentgen Treatment of Carcinoma of Breast. H. Gylstorff-Petersen. —p. 1.
Carcinoma of Larynx and Hypopharynx: Roentgen Treatment and Results of Therapy. S. Mustakallio.—p. 13.
Experiences with New Method for Arthrography. K. Andersen.—p. 33.
Roentgenogram of Small Zenker's Pulsion Diverticulum in Various Phases of Swallowing. B. S. Holmgren.—p. 40.
Apparatus for Roentgenologic Examination of Stomach. Von Y. Seuderling.—p. 56.
*Studies on Relapses in Carcinoma of Uterine Cervix. S. Hultberg. —p. 59.

Roentgen Treatment of Carcinoma of Breast.—Gylstorff-Petersen reviews 601 cases of mammary carcinoma treated at the Radium Center in Aarhus between 1924 and 1936. Grouped according to Steinthal's classification, 25 per cent were in stage I, 59 per cent in stage II and 16 per cent in stage III. The five year survival percentages for the three groups were 43, 27 and 4 per cent respectively. The first stage patients operated on had a five year survival percentage of 73. Of the 308 patients given postoperative roentgen treatment 37 per cent survived more than five years. The author thinks that preoperative roentgen treatment is to be preferred to the postoperative. Of 113 inoperable patients treated by irradiation for carcinoma of the breast, 6 per cent were alive after five years' observation. The average age of the patients was 53 years. The results of the treatment were considerably poorer for those between the ages of 25 and 39 than for the older ones.

Recurrences in Irradiated Cervical Carcinoma.—Hultberg investigated the incidence of recurrences following irradiation of cervical carcinoma at the Radiologic Clinic in Lund, Sweden. Of 535 women who received irradiation during the period between 1927 and 1939, 281 obtained primary cure, but 90 of these later had a recurrence. The author discusses the possibility of reducing the risks of recurrences by means of extirpation of the uterus following irradiation and reports the results obtained with 16 patients who were treated by surgical intervention following irradiation. Twelve of these patients are alive and free from symptoms three and eight years after the operation. The microscopic examination of the tissues removed at the operation revealed in 7 cases cancerous residues in the cervix. In the remaining 9 cases no evidence of cancer could be established. The author suggests that more patients with cervical carcinoma should be operated on following irradiation.

Nordisk Medicin, Stockholm

21:45-84 (Jan. 7) 1944

History of Dicumarol. E. Jorpes.—p. 45.
Treatment of Arteriosclerosis with Potassium Iodide. V. Schmidt. —p. 49.

Hospitalstidende

Experimental Investigations on Significance of Various Regions of Stomach with Respect to Antianemic Principle in Liver (in Swine): II. Countereffect of Nicotinic Acid on Disappearance of Antianemic Principle in Liver on Resection of Fundus of Stomach. S. Petri, O. Bang, W. Kiaer and A. K. Nielsen.—p. 51.
Treatment of Schizophrenia with Acetylcholine Shock. Ruth Poort and A. Stigaard.—p. 55.
*Cases of Metastatic Ovarian Cancer with Primary Tumors in Gastrointestinal Tract. M. Winge.—p. 59.

Hygiea

Arthritis Deformans: Etiology and Treatment. I. Pathologic Anatomy. H. Bergstrand.—p. 61.

Metastatic Ovarian Cancer with Primary Tumors in Gastrointestinal Tract.—Winge discusses the structure and incidence of secondary carcinomas of the ovary in cases of primary tumors of the gastrointestinal tract. They are usually bilateral. The classic Krukenberg tumor contains abundant signet ring cells, but the lines of demarcation are vague. From 1937 to 1943 11 of these ovarian carcinomas, 1 a typical Krukenberg tumor, were seen in the Pathologic Institute of Bispebjerg Hospital, Copenhagen.

21:85-124 (Jan. 14) 1944

Present Problems in Treatment of Tuberculosis. J. Lundquist.—p. 85.
Bed Exercises in Prophylaxis Against Thromboembolism: Statistical Investigation in Puerperal Material. J. Mortens.—p. 93.

Hospitalstidende

*Anemia in Infectious Diseases. S. Dahl.—p. 99.
Arthritis Deformans, Etiology and Treatment: II. Fractures and Arthrosis Deformans. I. Palmer.—p. 103.

Anemia in Infectious Diseases.—Dahl says that in uncomplicated infectious diseases secondary hypochromic anemia, probably due to iron deficiency, occurs in from one fifth to one third of the cases; it occurs in complicated scarlet fever in 62.5 per cent of the cases. During an infection, a rise in sedimentation rate usually coincides with a fall in the hemoglobin percentage, and vice versa. When the sedimentation rate and hemoglobin percentage seem unrelated there is no anemia but at most a lowered hemoglobin content due to the patient's confinement to bed. Treatment of the anemia during the infection is apparently ineffective; when the infection subsides there is spontaneous recovery from the anemia.

Book Notices

Doctors at War. Edited by Morris Fishbein, M.D., Editor of the Journal of the American Medical Association. Cloth. Price, $5. Pp. 418, with illustrations. New York: E. P. Dutton & Company, Inc., 1945.

In some indefinite future, after the termination of the global war, the official histories of the Medical Services to our Army, Navy and Air Force will no doubt appear. Detailed, official, all embracing histories are contemplated. Previous medical histories of our wars repose on the shelves of the important libraries of the country, where they are consulted by specialists. Seldom are they perused by the doctor and probably rarely by any layman. For this reason "Doctors at War" is both timely and unique. The entire amazing story of the Medical Services to the Army, Navy, Air Force, industry and the civilian population is told here in a single volume by men who were largely responsible for the organization and the performance of the most gigantic task the medical profession of this country has ever been called to perform. Although dedicated to "the One Hundred and Eighty-Six Thousand Physicians of Our Country" it is written in a manner readily comprehended by the average reader. The volume was conceived, organized and edited by the veteran medical editor Morris Fishbein, who as chairman of the Committee on Information, Division of Medical Sciences, of the National Research Council came in contact almost daily with the various organizational phases of that task.

In the introductory chapter Dr. Fishbein presents a general outline and the scope of the task. The comparative figures compiled by Brig. Gen. Hugh Morgan speak for themselves. Thus, while the death rate in wounded in World War I amounted to 8.1 per cent it is only 3.3 per cent in World War II; meningitis mortality was 38 per cent in World War I and 4 per cent in World War II. The figures for pneumonia mortality were 28 per cent in World War I and 0.7 per cent in World War II. The annual death rate per thousand for all diseases in the Army, excluding surgical conditions, amounted to 15.6 per cent in World War I and 0.6 per cent in World War II. In the succeeding fifteen chapters the reader is privileged to follow step by step the history of the organization and the development of the medical units, the exciting recital of the heroic deeds on the battle front, the story of the important achievements and advances of preventive medicine, of the excellent work by the American surgeons working not infrequently under the very enemy fire.

Col. Leonard G. Rowntree, in the chapter "Fit to Fight," states that "war is a hard taskmaster but a great teacher. Medicine has learned much of the nation's strength, its steadfastness of purpose, its will to do, to win, to live and to be great and free. But it has learned also of the innumerable physical and mental defects, disabilities, disorders and diseases that now beset us. Let us hope that the lessons learned will not only have helped this nation to win the war but will also make us stronger and more productive in the postwar era."

The application of the newer knowledge in preventive medicine was made possible, according to Brig. Gen. James Stevens Simmons, by the combined efforts of the National Research Council, the Committee on Medical Research, the United States Public Health Service, the Bureau of Medicine and Surgery of the Navy, the Pan American Sanitary Bureau, the United States Department of Agriculture, the Coordinator of Inter-American Affairs, the American Red Cross, the International Health Division of the Rockefeller Foundation and most of the scientific institutions and societies in the fields of biology, medicine and public health. Problems investigated were those of nutrition, sanitation, protection against various infectious diseases in all the countries where American troops might be stationed, the Army's immunization and control of venereal disease, gastrointestinal diseases, the insect borne diseases and, in particular, malaria. Many of these problems were taken to the Division of Medical Sciences of the National Research Council and to the Committee on Medical Research of the Office of Scientific Research and Development, which arranged for the necessary investigations. The actual studies have been conducted by civilian doctors and scientists in the various laboratories and institutions of the country. The Committee on Medical Research has authorized, financed and supervised many projects for the Medical Department and has spent several million dollars in the search for answers to our problems. There have been hundreds of research projects dealing with different aspects of a wide variety of subjects, which include the control of infectious diseases, the discovery of new prophylactic and therapeutic agents against malaria and other tropical diseases, the discovery of effective insecticides and insect repellents, nutrition, fundamental studies of fitness and fatigue, transfusions and blood substitutes, shock, surgery, neuropsychiatry and aviation medicine. Extensive medical research is also being carried on through the Board for the Control of Epidemics, the Army Medical School and various laboratory and field installations of the Army.

Destruction of lice and the control of epidemic typhus became possible because of methyl bromide gas and the sensational new insecticide DDT. A striking example of the efficiency of the latter was demonstrated in Naples, when some two million civilians were deloused within a period of two months, thus checking the spread of epidemic typhus.

The low mortality of our wounded, we are told by Brig. Gen. Fred W. Rankin, was due to prompt surgical care by highly skilled specialists. It was made possible by a combination of two factors—the plan of medical service in the combat zone and the availability and proper utilization of young, formally trained medical officers. The plan of medical care in advanced battle zones was based on the principle that the sooner the wounded man receives adequate aid and subsequent definitive surgery, the more successful are the results. In addition, the full use of certain modern developments in medical therapy has played an important role in the establishment of that record. Among the most important of these are blood plasma and blood transfusion in the control of shock, chemotherapeutic agents such as the sulfonamides and penicillin in combating infection, newer methods in repair of injured nerves and defects of the skull and the treatment of chest wounds, abdominal wounds vascular injuries and the like. On reading this brilliant account one cannot but agree with Major Gen. Paul R. Hawley that our army has the finest medical service of any army in the world. The cream of the American medical profession serve with our forces, and aiding them is a group of consultants, nationally known specialists in their own fields.

Dr. Thomas Parran contributes a most informative chapter on the work of the United States Public Health Service. On that service rests the prevention of epidemic disease, the control of venereal disease in and around the camps, the prevention of industrial disease and the assurance of the health of the American people.

Aviation medicine is practically a new branch. The story of how the flight surgeons "kept them flying" is told in a chapter by Major Gen. David N. W. Grant.

The performance of the gigantic task described in this interesting volume is summarized in the last chapter, on the streamlining of the medical research for war by the National Research Council for War.

The book is timely in that it presents in one volume all the exciting information that has appeared in bits in the various periodicals, both medical and lay, and because of useful information on the many civilian and governmental activities which all add up in attaining the victory over a powerful enemy.

Radiologic Examination of the Small Intestine. By Ross Golden, M.D., Professor of Radiology, College of Physicians and Surgeons, Columbia University, New York. Fabrikoid. Price, $6. Pp. 239, with 75 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1945.

The author introduces this subject with a brief outline of the indications for a radiologic study of the small intestine, a description of his method for carrying out this detailed study and discussion of the use of the small intestinal enema (Schatzki). There follows an account of the known facts of developmental anatomy of the small intestine graphically clarified by four excellent diagrammatic drawings of the stages of rotation of the intestine. He then describes the gross and microscopic anatomy of the small intestine, following with a clear presentation of the present knowledge of the physiology of the various components of the intestinal wall, including a discussion of the intrinsic nervous plexuses, the muscularis

mucosae and the chemical mediator theory of the neuromuscular and neuroepithelial mechanism of the intestine.

A chapter is devoted to the normal radiologic appearances of the adult small intestine from the standpoint of motility and mucosal relief patterns. Of particular interest is the description of the independent motion of the mucosa illustrated by reproductions of roentgenograms showing normal changes in size, shape and direction of the mucosal folds. The author then describes briefly the physiology of the infant's small intestine, pointing out that the segmentation of the barium-containing intestine and the paucity of well developed mucosal folds may be due to a lag in the development of nervous control generally characteristic of the infantile state, improving as reflexes change and develop until the familiar adult type of motor activity and mucosal pattern occur.

Following chapters on peritoneal adhesions and ileus with special mention of the role of hypoproteinemia in the production of ileus and detailed description of the indications for and use of the Miller-Abbott tube in the diagnosis and treatment of ileus, the author launches into a discussion of the alterations in the appearances of the small intestine in primary and secondary nutritional disorders. He describes the variable clinical, radiologic and pathologic manifestations of these disorders and illustrates his text with reproductions of films and photomicrographs of the small intestine from cases of advanced nutritional disorders. He emphasizes the nonspecific nature of the radiologic findings, showing that they may occur in varying forms both in neurogenic states and in organic disease. The clinical improvement obtained by appropriate vitamin therapy and other nutritional measures in primary and secondary deficiency states is correlated with illustrative radiologic studies of cases showing partial or complete restoration of normal small intestinal motor function and mucosal pattern. Sclerosing mesenteritis and other diseases of the mesentery are discussed in relation to nutritional disorders.

In regard to intestinal allergy the author describes provocatively tested cases, but he concludes that "a diagnosis of intestinal allergy cannot be made on the basis of the roentgen examination alone at the present time."

Regional enteritis and tuberculous enteritis are discussed and illustrated, emphasis being placed on the use of pressure films for demonstration of mucosal abnormalities of the terminal ileum.

Illustrations of benign tumors, intrinsic and extrinsic malignant epithelial neoplasms of the small intestine, and lymphosarcoma of the small intestine are taken from the radiologic and pathologic findings of appropriate cases.

Developmental anomalies and defects, both of the small intestine and of the peritoneum (volvulus, atresias, duplications of the intestine, multiple diaphragms, internal hernia and Meckel's diverticulum) are discussed, and several of these are illustrated with reproductions of x-ray films. Similar treatment is given by the author to the effects of foods, drugs and emotion on the small intestine as well as the effects of various parasitic disorders, particularly amebiasis.

The text is further enriched by illustrative radiologic findings in unusual conditions, such as simple ulcer of the ileum, enlargement of the ileocecal valve, amyloidosis of the intestine and cathartic abuse. The concluding paragraphs are devoted to a discussion of the unexplained findings of Hale and Schatzki in the small intestine of patients with scleroderma.

This book is a valuable contribution to the literature on intestinal radiology and warrants well the attention of the radiologist, the internist and the abdominal surgeon. The author's style is clear and concise, the illustrations are well reproduced and the entire content is well indexed for ready reference. The book is documented by an extensive bibliography, which is as much a commentary on the author's approach to this subject as his thorough painstaking method of radiologic examination of the small intestine.

Special Diet Manual: Diet Lists. Paper. Battle Creek, Mich.: Kellogg Company. [n. d.]

This "manual" consists of a large folder, on the leaves of which are printed lists of foods commonly used in the various types of special diets. Included among the diets is one for use in allergy to egg, wheat and milk and others designated salt free, high and low residue and high iron, as well as light, soft and liquid diets. The principles of high vitamin and diabetic diets are given. In another section foods are tabulated according to increasing carbohydrate content. The folder contains a large pad of printed sheets on which are listed a great number of foods with the caloric value of their average servings. It is intended that these sheets be marked by the doctor and given to the patient as a diet list. Their usefulness in this way is questioned because of the time required to search through the lists for the foods desired and more particularly because of the lack of personalization which is generally desired. This material can be recommended as best suited for quick reference on special dietary treatment and food values.

Casualty Work for Advanced First-Aid Students. By A. W. MacQuarrie, M.B., Ch.B. Cloth. Price, $1.80. Pp. 231, with 41 illustrations. Philadelphia: Peter-Reilly Company; Edinburgh: E. & S. Livingstone, Ltd., 1944.

The methods described in this convenient pocket book were developed to meet "blitz" conditions endured by the civilian population of Great Britain. While these methods differ somewhat from those taught in the usual first aid courses, their basic principles are the same. They presuppose a sound knowledge of anatomy and physiology and experience in first aid work. Emphasis is placed on (1) immediate control of hemorrhage, (2) immobilization of all badly damaged tissues and (3) rapidity of delivery to the care of the surgeon.

The book can hardly be recommended as a continuation of the first aid course taught in this country, but it may be useful to specially trained rescue squads of fire and police departments and of hazardous industries. Certainly one would not trust the administration of morphine and nikethamide to the layman even though the "dosage is regulated by the medical officer" except in unusual situations in which relief, in the absence of surgical aid, is imperative. Nor is any good purpose served by advising that if whole blood or plasma is not available when needed "a fluid such as glucose gum saline solution may be used." Differential diagnosis is encouraged probably too much—to distinguish between genuine shock and hysteria in the midst of disaster may baffle even the ablest surgeon; and it hardly seems appropriate to explain the difference between cerebral hemorrhage, embolism and thrombosis.

Original and doubtless of great value to rescue squads is the section on transportation of injured persons. The diagrams are simple and clear. There is a good index. An amusing English idiom is the advice to begin the feeding of a starved person "with fluids and slops."

On Modern Syphilotherapy with Particular Reference to Salvarsan. By Albert Neisser. [Sammlung zwangloser Abhandlungen aus dem Gebiete der Dermatologie, der Syphilologie und der Krankheiten des Urogenitalapparates, Band I, Heft 1, 1911.] Translated by Isabelle von Sazenhofen Wartenberg. Biography and Bibliography by Frances Tomlinson Gardner. Reprinted from Bulletin of the History of Medicine, Volume XVI, Number 5, December, 1944. Boards. Price, $1. Pp. 42, with portrait. Baltimore: Johns Hopkins Press, 1945.

This interesting volume is reprinted from the *Bulletin of the History of Medicine* (**16**:469 [Dec.] 1944). Our California colleagues deserve sincere appreciation for emphasizing Neisser's contributions to venereal disease control, not only with relation to gonorrhea, but also of practical advantage still in syphilis.

Albert Neisser (1855-1916) was born near Breslau, where he took his degree in medicine in 1877. Two years later in Simon's Dermatology Clinic he had isolated the micrococcus of gonorrhea, which he named the gonococcus in 1882, when he became head of the Polyclinic. After work with leprosy he became interested in syphilis and went to Java to study the experimental disease in monkeys. Here he discovered the responsible organism but had been anticipated by Schaudinn at home. In 1907 Neisser joined Wassermann in studying an application of the serum complement reaction to the diagnosis of syphilis. In 1909 Neisser worked with Ehrlich. The present contribution, first given in 1911, is the result of this clinical experience with syphilis. In 1912 Neisser fractured his hip and later developed diabetes, from which he died. As Mrs. Gardner says, "It was Neisser's fate to perform too well too soon." His 141 contributions, in German, French, and English, are testimony to his professional devotion.

Mrs. Wartenberg's translation is clear and well worth reading by all interested in modern methods of syphilotherapy. Neisser insists on "energetic treatment in the period immediately following infection." Neisser claims to have proved that mercury is a spirocheticide. Accordingly, he insists on using mercurial preparations in conjunction with the new organic arsenicals, in particular arsphenamine as introduced by Ehrlich. He discusses toxic reactions to arsphenamine, with particular reference to nerve injury. Neisser offers a detailed discussion of his technic for treatment and emphasizes "several courses of treatment throughout three or four years, whether or not there are any symptoms."

Were Neisser still alive, he would undoubtedly be showing enthusiasm now for "rapid treatment methods." He would probably reach the same conclusion as he did in 1911: "Human indolence and stupidity will arrange that syphilis will never die out but will remain always a dangerous disease, but we know that new and wonderful weapons have been placed in our hands to combat it."

Dietética infantil. I: Alimentación del niño sano. II: Alimentación del niño enfermo. Por el Dr. José Espinasa Masagué. Monografías médicas "Balmis," 13. Paper. Price, 12 pesos per set. Pp. 191; 319. Mexico, D. F.: Compañía General Editora, 1944.

This book, in two volumes, is one of the "Monografías Médicas Balmis." It is an outline of the modern conceptions on dietetics of newborn infants and infants, with advice for the selection of proper food in accordance with the age of the infant and his condition either normal or in the course of diseases. The first book contains an introductory chapter on food and its constituents. The subject of vitamins is well discussed. In the other four chapters of the book the author deals with lactation, either natural or artificial, food after weaning, and technic in feeding normal infants. There are several tables with equivalents of food and formulas for preparation of artificial feeding and of food after weaning. In the second volume the author discusses infant feeding of premature infants and of infants either with abnormalities of the lips or normal but in the course of various diseases, especially diarrhea, gastric, cardiac and urinary diseases, acute and subacute infections, typhoid, anemia, convulsions and avitaminosis. The book is of value for physicians early in their building up of a pediatric clientele.

Nutrition with Sense. By Eleanora Sense. Cloth. Price, $2. Pp. 222, with illustrations by the author. New York: M. Barrows & Company, Inc., 1944.

In this compact little book much useful information and advice are found. The author covers nutrition from all aspects important to the householder. The early chapters provide simple accurate discussion of such fundamentals of nutrition as the place and function of carbohydrates, fats, proteins, vitamins and minerals in the diet. These terms are translated into foods as eaten, and up to date information is given on the effects of preparing and cooking. The nutritional facts throughout are presented simply and accurately. Problems of buying foods and their preparation for the table are considered, with rules for the proper cooking of various types of foods. Weekly menus are suggested for different seasons of the year, and a large portion of the book is devoted to recipes and directions for cooking. A limited number of tables giving nutritional value of foods are found at the end of the book. The criticism is made that in some instances the author goes beyond the bounds of normal nutrition by discussing nutritional therapy of disease conditions. This is scarcely warranted in this type of book. Otherwise the presentation can be recommended as excellent in outlining the facts of nutrition and guiding the student or housewife in the attainment of good nutrition.

The Examination of Reflexes: A Simplification. By Robert Wartenberg, M.D. Foreword by Foster Kennedy, M.D. Cloth. Price, $2.50. Pp. 222, with 7 illustrations. Chicago: Year Book Publishers, Inc., 1945.

At last the long awaited clarification of clinical reflexes has been achieved by a student of the nervous system. The multiplicity of reflexes named after their discoverers and rediscoverers and the confusion of a welter of classifications of reflexes has for too long been accepted uncritically. The author cuts through authoritative tradition and states a few unquestionable principles of reflex action. He then describes simply and accurately each clinical reflex and discards the accumulated junk of terminology based on different points of elicitation of the same reflex and the vanity of "discoverers." He ends his task with a simple but often unheeded statement: "Each new observation in clinical neurology should be subjected to a strict physiological interpretation." The book contains 465 references in the bibliography and detailed subject and author indexes. The book represents a vast store of knowledge based on clinical experience and a painstaking perusal of the literature. Its contents are based on sound physiology and should be carefully studied by all neurologists. The volume is a much better reference work for students of reflexes than most textbooks that have uncritically handed down errors from their precursors. It is a refreshing monograph and is highly recommended.

The New York Hospital: A History of the Psychiatric Service 1771-1936. By William Logie Russell. Cloth. Price, $7.50. Pp. 556, with illustrations. New York: Columbia University Press, 1945.

This book tells an interesting story of the psychiatric service in New York from 1771 to 1936, starting with an account of the earliest provisions for the treatment of the mentally ill in the state of New York. The story gradually develops into the building of the first hospital with its department of psychiatry, then the founding of the Bloomingdale Asylum, the state supervision and law, followed by the expansion of modern scientific psychiatry at Bloomingdale. This book is one of the best of its kind. It should be purchased by every psychiatrist, neurologist, psychiatric nurse and social worker. It will serve as an excellent guide regarding the various problems of mental illness as well as an excellent reference work for teaching.

The Human Body. By Logan Clendening, M.D. Fourth edition. Cloth. Price, $4. Pp. 443, with 106 illustrations by W. C. Shepard and Dale Beronius and from photographs. New York: Alfred A. Knopf, 1945.

The Human Mind. By Karl A. Menninger. Third edition. Cloth. Price, $5. Pp. 517, with illustrations. New York: Alfred A. Knopf, 1945.

These two books have been among the most successful of their type, having been purchased by many thousands, if not hundreds of thousands, of people. Dr. Clendening was able to revise his book before his untimely death, thus making a good book even better. Dr. Menninger has prepared a complete revision of his book with the assistance of many of his associates. It is an interesting work, adapted to persons preferably above high school age. The advances in psychiatry resulting from the extensive experience of the war have been incorporated.

The Neurologist's Point of View: Essays on Psychiatric and Other Subjects. By I. S. Wechsler, M.D. Cloth. Price, $3. Pp. 251. New York: L. B. Fischer, 1945.

Many of the chapters of this book have appeared in other publications, some quite outside the field of medicine, like the Menorah *Journal*. The author's interests extend from the neuropsychiatric problems peculiar to the Jewish people to the eternal conflict between the individual and society. There is a striking chapter on Sigmund Freud, with the conclusion that psychoanalysis will be remembered longest for the insight into normal and abnormal behavior which it has vouchsafed. A chapter entitled "A Brief History of Psychiatry" indicates a belief in a lessened incidence of hysteria and the opinion that the neuroses now develop on a higher psychic level than formerly because of changes in social and cultural conditions.

Poet Physicians: An Anthology of Medical Poetry Written by Physicians. Compiled by Mary Lou McDonough. Cloth. Price, $5. Pp. 210. Springfield, Illinois: Charles C Thomas, 1945.

Here are collected a variety of poems of interest to physicians and all of them by physicians. There are brief biographies of each of the poets concerned. The poems have been chosen largely for their medical flavor, although many physicians have written poetry quite outside the field of medicine. Such distinguished names as those of Sir Henry Head, Havelock Ellis, Sherrington, Oliver Wendell Holmes, Keats and Percival, the British laureate Robert Bridges and the immortal John McCrae set the tone of the entire volume. The book is supplemented by a cumulative index of poet physicians, some of whom might better be characterized simply as rhymsters. The book is a valuable addition to literary medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ANOCIASSOCIATION AND TREATMENT OF SHOCK

To the Editor:—I would greatly appreciate obtaining an authoritative appraisal of the work of the late Dr. George Crile as embodied in his book "Anoci-Association." Certain views were originally challenged by Dr. Cannon, yet I have the impression that theories on shock and management by transfusion are essentially original with Dr. Crile and that his work is being sustained. Modern writers do not seem to quote the contributions of Dr. Crile, and it was somewhat of a surprise to note that a recent article by Dr. Phemister in THE JOURNAL discussed at length the nociceptor mechanism. George F. Fasting, M.D., New Orleans.

ANSWER.—Crile and Lower in their book entitled "Anoci-Association," published in 1914, make the following statements: "From all of these observations we concluded that the ideal treatment [of shock] would be to fill the blood vessels with some fluid which would not pass through the vessel walls, would cause no chemical injury, would carry oxygen, and would always be immediately available. Human blood is the only fluid which possesses all of these qualifications." The experimental research referred to was first reported in the *Boston Medical and Surgical Journal* in 1908 (**158**:961). The experimental details were published in Crile's book "Hemorrhage and Transfusion" in 1909. In this book it is concluded that "transfusion is a better form of treatment for shock alone, or combined hemorrhage and shock, than any other known form of treatment." He even suggested that a transfusion prior to operation has prophylactic value, which procedure has recently been advocated in the presence of a moderate anemia or an anticipated blood loss during the operation.

Crile in "Hemorrhage and Transfusion" presented experimental evidence demonstrating the occurrence of hemoconcentration. As early as 1904 (*Am. J. Obst.* **2**:106, 1904) he stated "That is to say, the blood is transferred to the venous side. . . . The patient has been bled in his own vessels." This statement was based on his experiments on shock reported in 1899 (Surgical Shock, J. B. Lippincott Company), in which he reported the existence of an elevated venous pressure in traumatic shock. In this monograph he reported a decrease in "cardiac output," which was inferred chiefly from the pulse pressure record, and proposed his vasomotor exhaustion theory of the cause of shock. This concept was broadened in the book "Anoci-Association" into the "kinetic theory of shock." This hypothesis maintained that every adequate stimulus awakens associations, or "an ontogenetic or phylogenetic memory." These associations may be injurious, i. e. nociassociations, and it is the constant effort of the individual to reach a state of anociassociation. Noxious stimuli, traumatic or emotional, or noxious conditions, hemorrhage, infection, starvation, muscular exertion, cause "discharges of energy," which "when intense enough, produce extreme conditions called 'exhaustion' and 'shock.'" This theory was then applied to "the development of *the shockless operation through anociassociation.*" The patient was protected from emotional strain prior to and after the operation, the anesthetics were selected to exclude all stimuli from the brain, and the tissues were handled gently.

John Scudder in his book on shock (J. B. Lippincott Company, 1940) provides an excellent synopsis of the history of the signs and symptoms, the theories and the treatment of shock. A perusal of this book will reveal that all of the observations made in 1899 and 1909 by Dr. Crile had been made before; even blood transfusion for "shock" had been suggested by Heister as early as 1750 and had been used by John Hunter in 1776 and F. Jordan in 1881. But no one prior to Crile had investigated *the subject of shock so extensively. Further, Crile* placed blood transfusion on the therapeutic map, not only for shock and hemorrhage but for other conditions. However, it was the work of Landsteiner (1902) on blood groups and the development of the Kimpton-Brown tube method (1913), the syringe method (Unger 1915) and the sodium citrate method (Lewisohn, 1915) that rendered the use of blood transfusion widely applicable and utilizable in World War I. Crile made an outstanding contribution to the prevention of shock by teaching the importance of a proper preoperative and postoperative environment, of the selection of the appropriate anesthetics, and of gentleness in the manipulation of tissues.

His theory that shock is due predominantly to an exhaustion of the vasoconstrictor center has not withstood careful experimental analysis. The evidence indicates that this center remains reflexly active and perhaps hyperactive during the development of shock (Grodins, F. S., and Freeman, Smith: *Internat. Abstr. Surg.* **72**:1, in *Surg., Gynec. & Obst.*, January 1941). However, numerous investigators hold that either a decrease in vasoconstrictor tone or reflex arteriolar dilatation causes what is called primary shock or a moderate fall in blood pressure, from which recovery occurs spontaneously or which responds readily to treatment. The author of this answer holds with C. J. Wiggers (*Physiol. Rev.* **22**:111 [Jan.] 1942) that "extensive reflex arteriolar dilatation may occur as an incipient reaction during many catastrophes which lead to shock" and that "it should no longer be considered a sin to give thought to the possible role that the vasomotor center may play in determining the lethal character of peripheral circulatory failure." N. E. Freeman ("Burns, Shock, Etc.," Military Surgical Manuals, National Research Council, W. B. Saunders Company, 1943, vol. 5) says that "on the basis of clinical experience it is generally agreed that pain is a factor in the production of shock. Possibly the necessary use of anesthesia, in animal experimentation, so changes the physiologic reactions that shock cannot be produced by pain alone. . . . It seems likely, therefore, that the emotional state may play a significant part in the production of shock. Objective proof of this concept, however, is difficult to obtain."

Phemister (THE JOURNAL, April 28, 1945, p. 1109) properly emphasizes the view that a reduction in circulating blood volume is a more important factor in the genesis of shock due to tissue damage than nociassociations, according to existing evidence. His conclusion that blood and plasma transfusions irrefutably constitute the most effective treatment of shock confirms the statement made by Crile in 1909.

ELECTROMYOGRAMS OF TREMORS

To the Editor:—In THE JOURNAL Feb. 28, 1942, Dr. DeJong published the tracings of the tremor of paralysis agitans and of some fibrillations. Are there similar tracings of senile tremor, tremor of excitement or intention tremor also in the literature?

George H. Hoxie, M.D., Berkeley, Calif.

ANSWER.—No tracings of the specific tremors described in the query are available in the medical literature. Tremors of this type, however, have been recorded many times in laboratories, and electromyograms of the tremors in cerebellar diseases, athetosis and Sydenham's chorea have been published. New Work on the subject is about to be published in the *Archives of Neurology and Psychiatry.* This paper will give the electromyograms of patients suffering from neuroses precipitated by combat, and these will be contrasted with the tremors shown in Parkinson's disease, delirium tremens and the psychoneuroses of civilian life.

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Hoefer, P. F. A., and Putnam, T. J.: Action Potentials of Muscles in Rigidity and Tremor, *Arch. Neurol. & Psychiat.* **43**: 704 (April) 1940.

Hoefer, P. F. A., and Putnam, T. J.: Action Potentials of Muscles in Athetosis and Sydenham's Chorea, *ibid.* **44**: 517 (Sept.) 1940.

Brazier, M. A. B.: Tremors in Combat Neuroses: A Comparison with the Tremors of Parkinson's Disease, Delirium Tremens and the Psychoneuroses of Civilian Life; Electromyographic Studies, *ibid.*, to be published.

ALCOHOL AS A STERILIZING AGENT

To the Editor:—Please give me information concerning the efficacy of alcohol as a sterilizing agent. For example, when a tube of catgut has been opened and partly used, is it safe to put the remainder in a covered dish of alcohol and expect it to remain sterile? Again, for ordinary skin preparation and wiping prior to removing sutures or giving hypodermic injections, is the ordinary rubbing alcohol which contains some castor oil and some brucine as good as pure alcohol? Of course it is much cheaper for office and hospital use.

John H. Duncan, M.D., Sault Ste. Marie, Ont.

ANSWER.—Ethyl alcohol is an efficient disinfectant in certain concentrations. The most efficient strength is 70 per cent by weight (Price, P. B.: Ethyl Alcohol as a Germicide, *Arch. Surg.* **38**:528 [March] 1939). It is useful against contaminating organisms as well as the ordinary resident bacterial flora of skin (Price, P. B.: New Studies in Surgical Bacteriology and Surgical Technic, THE JOURNAL, Nov. 26, 1938, p. 1993). It is perhaps the best available agent for ordinary skin preparation and wiping prior to removing sutures or giving hypodermic injections. The solution should be properly prepared.

Alcohol is much less effective, however, in sterilizing catgut. It has been shown conclusively that alcohol will not sterilize raw catgut. One reason for failure is that the alcohol *does not*

come into contact with many organisms harbored in the cracks and folds of the strand. Another reason is that alcohol is ineffective against spores. Unquestionably a strand of heat sterilized catgut taken from a tube can be kept sterile in a covered dish of alcohol, but there is always a chance that the catgut may have been contaminated by handling or from the air, and there is no assurance that alcohol will completely counteract the contamination.

Many preparations of rubbing alcohol are in use. It is probably safe to say that most of them have relatively little skin disinfectant action. The concentration of alcohol in these preparations is usually too weak to be germicidal. After all, the primary purpose of "rubbing alcohol" is not to disinfect skin and it should not be expected to be a satisfactory substitute for germicidal preparations of alcohol. Brucine probably does not add anything to the disinfectant action of rubbing alcohol, and castor oil may actually lessen its germicidal effect. "Pure" alcohol is less effective than the 70 per cent, by weight, solution.

OLIGOSPERMIA AND STERILITY

To the Editor:—A white man aged 29 has oligospermia. He is in excellent health: his Hinton reaction is normal, as is his basal metabolic rate. He reported his last sperm count as 28 million per cubic centimeter; I did a recount and found 26 million. After a series of injections of antuitrin, the sperm count was found to be 12 million. Very much to my surprise, he told me that he had a 3 year old son who is in good health. When his wife did not become pregnant again after two years, both were checked and his condition was detected. Is it possible to have children with such a low sperm count, especially considering the fact that the motility of the sperm is very poor, and a high percentage of pathologic forms are present? If it is not possible to have a child with such a count, how can the change be explained since the patient has had no illness whatever since the last baby was born except an occasional cold?

M.D., Massachusetts.

ANSWER.—Moderate oligospermia is not inconsistent with fertility if the volume of the ejaculate is adequate and the motility and morphology of the spermatozoa are good. S. T. Meaker (*Human Sterility*, Baltimore, Williams & Wilkins Company, 1934) stated that pregnancy is improbable with sperm counts of less than 60 million, but he has since revised his opinion in favor of counts considerably lower. Poor motility inherent in the spermatozoa would be a serious fault; most cases of so-called necrospermia, however, are due to the fact that the specimen was not obtained and transported under ideal conditions. A high percentage of pathologic forms, on the other hand, present direct evidence of male infertility, all the stronger when the count is low.

The overall picture in this case is one of fertility so depressed that pregnancy, while not impossible, is definitely unlikely. It may well be that three years ago the semen was in all respects normal. Remarkable changes in male fertility, both for the better and for the worse, sometimes occur in a short space of months and without any reason immediately apparent. One must suppose that in cases of deterioration either the gonadotropic action of the anterior pituitary has diminished or the seminiferous tubules have become less responsive to stimulation. These phenomena may take place without obvious relation to the patient's general health.

A testicular biopsy would be informative. If this shows atrophy of the germinal epithelium, the outlook is unfavorable. In the absence of atrophy, attempts may be made to stimulate spermatogenesis. The first step should be a thorough survey of the patient's health and hygiene, with particular reference to such items as chronic focal infection, anemia, sex habits, diet, exercise and rest. Gonadotropic therapy is rational in theory though often disappointing in practice. The best results have been obtained from the combined use of pituitary and chorionic gonadotropins.

MEGAKARYOCYTES IN THROMBOPENIC PURPURA

To the Editor:—Are there any reliable methods for the determination of megakaryocytes in bone marrow? Are megakaryocytes increased in thrombopenic purpura? Can the response to splenectomy be predicted from the number of megakaryocytes?

Philip Pizzolato, M.D., New Orleans.

ANSWER.—The number of megakaryocytes can be counted in a certain standard area on a stained bone marrow film (Limarzi and Schleicher: THE JOURNAL, Jan. 6, 1940, p. 12) or the number can be determined in the counting chamber while making the usual total nucleated cell count. Both methods give only approximate values, as the quantitative estimation of any bone marrow cells by the puncture technic is open to considerable error. It usually suffices to know whether the megakaryocytes are increased, normal or decreased, and this information can be obtained from an examination of the bone marrow film under the low power objective. Each individual must familiarize himself with the normal number of megakaryocytes for the special technic employed. In thrombopenic purpura the megakaryocytes in the bone marrow are either normal or increased in numbers. It has not been established that the response of the platelets to splenectomy can always be predicted from the number of megakaryocytes. However, one should hesitate to remove the spleen of a patient in whom the megakaryocytes are definitely diminished or absent.

SUBCUTANEOUS AND INTRAMUSCULAR TEMPERATURE RESPONSE TO EXTERNAL STIMULATION

To the Editor:—Kindly furnish me with references concerning the penetrating effects of hot or cold baths on an extremity. In other words, what is the temperature at various depths beneath the skin after an extremity has been immersed in a bath of definite temperature for a definite time?

M.D., South Carolina.

ANSWER.—Determinations of the temperature changes produced within the living human extremities on exposure to hot and cold baths do not seem to have been made. However, such observations have been recorded for the temperature alterations from the application of the hot water bag and of the ice bag to the living human calf. Following the application of a hot water bag the skin surface temperature rose from 90 F. to a maximum of 110 F. within thirty minutes. The subcutaneous temperature rose from 91.2 F. to 105.5 F. in forty minutes and the intramuscular temperature (at a distance of about 2 inches beneath the skin surface) from 94.2 F. to 99.6 F. after fifty minutes. On the application of an ice bag the skin temperature fell to 43 F. in fifteen minutes, the subcutaneous temperature went to 70 F. in one hour and the intramuscular temperature to 79 F. after about two hours. While water is a more efficient agent for conductive heating or cooling, it appears reasonable to assume that the temperature changes described are of the same order as those taking place on the direct application of hot and cold water.

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Bierman, William: Physical Medicine in General Practice, New York, Paul B. Hoeber, Inc., 1944, pp. 5-7.

PENICILLIN AS PROPHYLAXIS TO POSTOPERATIVE INFECTION

To the Editor:—Would local and parenteral administration of penicillin be advisable as a prophylactic against infection and following cataract operation?

M.D., Louisiana.

ANSWER.—No. Penicillin is of value only in case the infection is due to an organism susceptible to the drug and then only when the blood and tissue concentrations of the drug are kept at a high level. It is obviously impossible to foretell what might be the infecting organism. Furthermore, intraocular infection following cataract extraction can be completely prevented by sterilization of the conjunctival sac before operation and by scrupulous asepsis during the operation.

WIRING IN FRACTURES OF THE JAW

To the Editor:—Who developed multiple loop wiring in fracture of the jaw? When was it first described?

Daniel Klein, Major, M. C., A. U. S.

ANSWER.—The principle of wiring the teeth in the upper and lower jaw as a means of fixation of fractures of the body of the mandible was first described by Thomas L. Gilmore in 1887. Multiple loop wiring, a modification of the Gilmore technic, was first described by R. T. Oliver in 1910 in an attempt to standardize the various methods employed.

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Gilmore, T. L.: *Archives of Dentistry* 4: 383, 1887.
Oliver, R. T.: A Method of Treating Mandibular Fractures, THE JOURNAL, April 9, 1910, p. 1187.

IMMUNITY TO PNEUMONIA

To the Editor:—I should like to know whether recovery from an attack of pneumonia of a known type confers immunity against a subsequent attack of that same type of pneumonia.

Frederick G. Murray, M.D., Cedar Rapids, Iowa

ANSWER.—Demonstrable specific immunity does occur after an attack of pneumococcic lobar pneumonia, but it is of brief duration. Finland and Winkler (*Am. J. M. Sc.* 188:309 [Sept.] 1934) mention 4 instances in which two attacks caused by pneumonia of the same type occurred within a year. Recovery from an attack of pneumococcic pneumonia, therefore, may not confer immunity against a subsequent attack.

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THE RELATION OF EFFORT TO ATTACKS OF ACUTE MYOCARDIAL INFARCTION

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In army experience the occurrence of acute myocardial infarction during or soon after strenuous effort is striking. The relation between effort and attacks of coronary occlusion or myocardial infarction has been the subject of considerable discussion because of the important clinical and other practical implications.[1] Thus, Master and his associates [2] analyzed the events preceding 530 attacks of coronary thrombosis and found that only 2 per cent followed unusual exertion, 5 per cent followed excitement and 37 per cent occurred during mild activity. They pointed out that, since half of the day of normal persons is spent in mild or moderate activity, one might well expect half of all attacks to occur during this period and concluded that effort is not a precipitating factor in causing myocardial infarction. These authors state that "although both angina pectoris and coronary artery thrombosis have the same underlying pathologic condition, namely coronary sclerosis, they differ entirely in respect to the exciting cause of the attack." Boas [3] as well as others [4] has challenged this point of view, stating that in his experience bodily effort directly may induce closure of a coronary artery with cardiac infarction or may initiate the syndrome of angina pectoris. Boas [5] states:

I fully agree with Master that coronary thrombosis very often occurs while the individual is at rest or asleep and that in many cases no antecedent injury or effort has taken place. But to argue from this that such accidents are not competent causes of coronary thrombosis appears incorrect. The fact that pneumothorax is due usually to pulmonary tuberculosis or to the rupture of an emphysematous bleb does not negate the fact that it may follow trauma to the chest; or that cerebral hemorrhage is caused usually by disease of the cerebral arteries that it may not be due to trauma to the head

As Bean pointed out, the fact that most motor accidents do not occur at speeds of 70 miles an hour does not prove that such speed may not be concerned in some motor accidents.

Most military personnel are called on to undertake strenuous effort and, particularly in the instance of some officers from civilian life, such effort is often decidedly unaccustomed. It therefore might be anticipated that if effort and myocardial infarction were causally related an increased number of such cases might be witnessed in the Army. This is indeed the case. The medical officers at practically every one of the many hospital installations which I have visited have witnessed one or more such instances. In each case unequivocal electrocardiographic tracings of myocardial infarction were observed during life and/or an acute fresh occlusion of one of the three major coronary arteries was disclosed at postmortem examination. In the 8 cases in which electrocardiographic tracings were made, the changes were characteristic. In the 3 patients who died before such tracings could be made, fresh thrombosis of a coronary artery was observed in 2 and fresh subintimal hemorrhage in the other case post mortem. The following 11 cases were selected from a larger available series because of the adequate available data and because they illustrate the varying relation between effort and acute myocardial infarction:

CASE 1.—A major in the Field Artillery, aged 35, had had "gas" with epigastric and substernal distress for about eighteen months, precipitated by nervousness or anxiety, relieved by "belching" and occasionally by vomiting, but not related to exertion, eating or change in weather. On the afternoon before the day of admission he played baseball and hit a home run. As he reached the home plate "suddenly everything went black." He collapsed to the ground. He recovered sufficiently after five or ten minutes to get up and after half an hour walked to his quarters. At midnight he suffered severe substernal distress, dyspnea and cough. When admitted to the hospital at 3:30 a. m. he showed labored respiration, cyanosis and heart sounds of poor quality. The blood pressure was 95/78. The white blood cell count was 16,400. X-ray examination of the chest revealed evidence of pulmonary engorgement; there was no evidence of a pulmonary infarct. Electrocardiographic tracings were characteristic of cardiac anterior wall infarction. The patient rallied somewhat during the day under therapy including oxygen, but then pulmonary edema and dyspnea increased, the pulse became weak and the patient died eighteen hours after the ball game.

On postmortem examination of the heart, scattered foci of fibrosis were seen throughout the apex, and one area of old scar tissue measuring 2 cm. in diameter was evident in the left anterior ventricular wall. Above the latter area, acute necrotizing myomalacia was revealed grossly and microscopically. The left anterior coronary artery showed advanced arteriosclerosis with narrowing and one old healed occlusion. About 4 cm from the origin of this artery, a fresh antemortem thrombus was found.

CASE 2.—A private aged 30 played volley ball immediately after calisthenics and developed substernal oppression and

1. Fitzhugh, G., and Hamilton, B. E.: Coronary Occlusion and Fatal Angina Pectoris. Study of the Immediate Causes and Their Prevention, J. A. M. A. **100**: 475 (Feb. 18) 1933. Sproul, John: A General Practitioner's Views on the Treatment of Angina Pectoris, New England J. Med. **215**: 443, 1936. Phipps, C.: Contributory Causes of Coronary Thrombosis, J. A. M. A. **106**: 761 (March 7) 1936. Paterson, French and Dock.[6]

2. Master, A. M.; Dack, Simon, and Jaffe, H. L.: Factors and Events Associated with Onset of Coronary Artery Thrombosis, J. A. M. A. **109**: 546 (Aug. 21) 1937.

3. Boas, E. P.: Cardiac Infarction Induced by Unusual Effort, J. Mount Sinai Hosp. **7**: 307, 1941; Some Immediate Causes of Cardiac Infarction, Am. Heart J. **23**: 1, 1942; Angina Pectoris and Cardiac Infarction from Trauma or Unusual Effort.

4. Paterson, J. C.: Relation of Physical Exertion and Emotion to Precipitation of Coronary Thrombi, J. A. M. A. **112**: 895 (March 11) 1939. French and Dock.[6]

5. Boas, E. P.: Angina Pectoris and Cardiac Infarction from Trauma or Unusual Effort, J. A. M. A. **112**: 1887 (May 13) 1939.

unusual dyspnea. He experienced persistent weakness for two days following this episode and then developed acute dyspnea, orthopnea and chest pain. *Physical examination on admission* disclosed orthopnea, dyspnea, ashen gray cyanosis, cold sweat, heart rate 100 per minute, weak cardiac sounds, gallop rhythm and a blood pressure of 124/80. The patient gradually improved during the following four days but showed evidence of pulmonary edema. Serial electrocardiographic tracings revealed progressive changes characteristic of anterior wall infarction. He gradually improved and was discharged from the hospital twelve weeks later.

CASE 3.—A private aged 37 experienced occasional vague substernal discomfort, unrelated to exertion, during ten days before admission. On the day before admission he ran a distance of 1 mile, immediately following which he experienced persistent weakness, which continued until he fell asleep. At 2 a. m. he was awakened by severe substernal pains, with numbness radiating to the left arm; he felt prostrated and had drenching cold sweat. He was admitted immediately to the hospital. Physical examination revealed evidence of shock with rales at both bases. The heart rate was 120 per minute. During the next three days the substernal oppression gradually subsided and the patient made an uneventful recovery. Serial electrocardiographic tracings showed pronounced changes characteristic of anterior wall infarction.

CASE 4.—A captain in the Signal Corps, aged 41, collapsed while on a hike and was dead on arrival at the hospital. Examination of the heart showed advanced arteriosclerosis of the left coronary artery and a fresh complete occlusion of the right coronary artery caused by friable atheromatous material.

CASE 5.—A first lieutenant in the Motorized Division, aged 26, while engaged on maneuvers during the night complained that he was dizzy and felt sick. He was taken to a nearby house, became acutely dyspneic and died within a few minutes. Examination of the heart revealed a fresh thrombus in one of several anomalous subdivisions of the right coronary artery. Old fibrotic changes were evident on the posterior wall of the left ventricle near the base.

CASE 6.—A captain in the Transportation Corps, aged 34, had felt perfectly well and was running an obstacle course, toward the end of which he had to scale a 12 foot wall. He felt perfectly well when he came to this obstacle. He failed to swing over it on the first attempt. On the second attempt he suddenly developed sharp chest pain, felt exhausted, had to gasp for breath, and broke out in profuse perspiration. The pain was initially substernal but soon radiated over the entire anterior chest and to the shoulders and arms. The substernal pain, very severe, subsided considerably during fifteen minutes and he finished the course without scaling the wall. At the end of about two and one-half hours the substernal distress disappeared entirely. Thereafter he repeatedly noted shortness of breath and mild substernal pain on exertion, disappearing in about five minutes on rest. He did not seek medical advice. These symptoms persisted and he had one severe attack following strenuous effort and was finally hospitalized. Physical examination showed a normal sized heart. The blood pressure was 106/84. Electrocardiographic tracings showed the characteristics in the first and fourth leads of a previous anterior wall infarction.

CASE 7.—An infantry colonel aged 56 had been assigned to sedentary duties for a period of two years and was then transferred to an infantry division for training and shipment overseas. To qualify for overseas duties he was required to complete the run of an obstacle course in a given period of time. Immediately after completion of the qualifying run, while taking a shower, he was seized with severe substernal pain and choking sensations and collapsed. He was immediately taken to the hospital. The findings on physical examination and the electrocardiographic tracings were characteristic of acute myocardial infarction. He made an uneventful recovery and was retired because of arteriosclerotic heart disease.

CASE 8.—A captain aged 47 was seized with precordial discomfort immediately after exercise in the gymnasium. He was advised to see a medical officer but did not do so despite the fact that he continued to have considerable precordial discomfort during the night. He sought medical advice the following afternoon. The electrocardiographic tracings were equivocal, and he was asked to exercise jumping on one foot while another electrocardiographic tracing was taken. Directly following this he collapsed and went into severe shock. He was then first seen by one of the officers in the medical service, who made a diagnosis of coronary thrombosis. The heart rate was slow, gallop rhythm was evident and the blood pressure was 100/60. His condition was critical, but under appropriate therapy he improved and eventually recovered. Serial electrocardiographic tracings were characteristic of posterior wall infarction.

CASE 9.—A staff sergeant in the Coast Artillery, aged 56, died suddenly during a tactical march with his unit. Postmortem examination revealed arteriosclerosis of all three coronary arteries. In the wall of the left anterior descending artery "areas of fresh hemorrhagic extravasation and mixed round cell infiltration" were observed.

CASE 10.—A first lieutenant in the military police, aged 44, returned from a 20 to 25 mile march, felt well, ate dinner and one hour later suddenly experienced substernal oppression. He collapsed, was unconscious for several hours and was transported to the hospital. He then experienced severe precordial pain, choking sensations and dyspnea. He gradually improved and was retired from the service. Serial electrocardiographic tracings were characteristic of posterior wall infarction.

CASE 11.—A private aged 31 had been a clerk in civilian life and after induction was assigned to similar duties in a finance department at a port of embarkation. He was then transferred for basic training. As part of the program of basic training he engaged in vigorous swimming in very cold water with his platoon for one and one-half hours. He got out of the water at 11:15 a. m. and while marching back to his barracks at 11:25 was suddenly seized with extremely severe viselike retrosternal pain, which, to quote his words, was "almost more than I could stand. I do not know how I made it back." He nevertheless marched the three fourths of a mile to his barracks, went to bed and was pale, drenched in cold sweat and dyspneic. The severe pain, after persisting one and one-half hours, subsided somewhat and he was admitted to the hospital. Physical examination revealed impending shock. But he rallied under appropriate therapy. The substernal distress disappeared after four days. Serial electrocardiographic tracings were characteristic of posterior wall infarction.

COMMENT

The question of the relation of effort to acute myocardial infarction is of considerable practical as well as theoretical importance. Legal decisions in civilian life and the line of duty determination in military service are often vitally affected. In case 7, for instance, although the officer had been in service for two years, it was initially decided that effort bore no relation to the attack of acute myocardial infarction and the line of duty determination was "no." Recognition of the relation of effort to acute myocardial infarction may be of great importance in diagnosis as well as in proper clinical management. Thus, failure to recognize the interrelation between effort and acute myocardial infarction in case 8 resulted in the continuation of exercise by the patient and even a request by a medical officer to undertake the effort of an exercise tolerance test.

The clinical experience illustrated by the foregoing cases emphasizes certain hitherto established facts which are not sufficiently kept in mind. The quality of cardiac pain is mimicked with fidelity by disease of other organs, and therefore a diagnosis of noncardiac disease is often mistakenly made. Clinical experience in the Army, as well as in civilian life, is in accord with that

of French and Dock,[6] who state that less than half of those who mentioned prodromal symptoms sought professional advice and that only 1 of the 14 cases with symptoms which suggested this condition had received a correct diagnosis and been treated before the fatal attack. In their communication, which has appeared since the present study was undertaken, they analyzed the findings in 80 fatal cases in which death seemed due to uncomplicated coronary lesions. They state that:

> Marching with a pack is considered as "vigorous exercise" and it is remarkable, in view of the soldier's chances for vigorous activity on or off duty, that about 40 per cent of these men had not had such exercise within a day or so of their final cardiac break.
>
> In 15 cases sudden death or the onset of severe pain in a fatal seizure occurred during vigorous or violent muscular effort. Twenty-six patients, or 35 per cent, had the fatal attack within one to several hours after "vigorous exercise."

Arteriosclerosis was the underlying pathologic basis of coronary occlusion in all cases.

Cardiac pain, particularly that of angina pectoris, is characterized by appearing during effort or emotional stress and by relief on rest. Appreciation of the importance of effort or excitement as a precipitating factor in angina pectoris or acute myocardial infarction should lead the physician to make direct inquiry regarding all attendant circumstances prior to the onset of the attack. Much significant information not spontaneously volunteered by the patient frequently will be uncovered. The appearance of distress on exertion or under emotional stress should indicate a tentative diagnosis of angina pectoris, of coronary failure or insufficiency, or of myocardial infarction[7] until such a diagnosis is clearly excluded on the basis of further evidence. In such a situation vigilance must be exercised for the signs or symptoms of myocardial infarction. In some instances, such as case 3, persistent weakness may be the sole finding, the significance of which may be corroborated only subsequently by progressive characteristic changes in later electrocardiographic tracings.

It is of interest that, aside from emotional stress and effort, other concomitant factors, such as exposure to cold or eating, which increase the work of the heart may superimpose their effect. Thus, in cases 7 and 11 exposure to cold by swimming and a cold shower may not have been entirely coincidental.

In the light of these considerations, medical officers should maintain close supervision over all those assigned to their care when they undertake strenuous or prolonged activities. The occurrence of substernal distress under these circumstances should cause the medical officer to advise cessation of such strenuous activity in order to forestall, when possible, the development of acute myocardial infarction. Even if myocardial infarction occurs, immediate enforcement of complete rest may be expected to influence the extent of the infarct and favor recovery. In any patient, previously well, who suddenly develops angina pectoris on rest or on exertion, one must suspect coronary narrowing or occlusion even if none of the signs of cardiac infarction appear.[7]

The several mechanisms which are operative in producing myocardial infarction are clarified by recent advances in our knowledge of the pathology of coronary arteriosclerosis and may be summarized as follows:

1. *Relative Ischemia.*—In previous studies that my associates and I have made on patients dying with acute myocardial infarction, no fresh thrombosis or occlusion was found by the injection plus dissection method of Schlesinger[8] in certain instances. It is logical to assume on the basis of actual pathologic findings and clinical experience that an artery narrowed by arteriosclerotic changes may transmit sufficient blood for the ordinary needs of the myocardium but may not be competent to transmit the increased blood flow required by the heart during effort. The heart muscle, under such circumstances, suffers from relative ischemia. If this is sufficiently prolonged, irreversible damage, i. e. infarction, results[9] (case 3). Sudden death may be due to the development of ventricular fibrillation or cardiac standstill because of myocardial ischemia in the absence of any fresh pathologic changes in the coronary arteries.

2. *Subintimal Hemorrhage.*—That coronary occlusion and coronary thrombosis frequently result from hemorrhages within the coronary arterial wall has been clearly demonstrated.[10] These pathologic studies offer an adequate basis for the sudden onset of symptoms of angina pectoris or of coronary occlusion. The formation of a hematoma within the wall of an artery may raise the intima and partially occlude the lumen. This early lesion was revealed in case 9, in which death occurred before there could be any further sequence of events. At times the hemorrhage may elevate the intima sufficiently to bring opposing surfaces together and completely occlude the lumen. In some instances the hemorrhage may rupture the intima, exposing a raw open hemorrhagic wound. This raw surface constitutes a favorable site for the development of a thrombus. Subintimal hemorrhage and subsequent thrombus formation may develop gradually over a period of many days or even a week or two and serve to explain some cases in which an appreciable interval separates the strenuous activity from the acute attack. It is not believed that subintimal hemorrhages occur in a normal artery but take place only in an atheromatous lesion.

The exact factors which determine hemorrhage from an intimal or subintimal capillary into the wall of an arteriosclerotic coronary artery have been the subject of speculation by various authors.[11] It has been suggested that intimal capillaries, since they arise directly from the lumen, are particularly susceptible to the transient increased coronary pressure induced by exertion or emotion. Intimal or subintimal capillaries are more liable to rupture if softening, which is a physical characteristic of atheromatous lesions, occurs and allows the pressure of blood within the capillary to dilate its walls to the extent that rupture is more prone to occur. The fragility of the capillary wall may also be affected

6 French, A. J., and Dock, W.: Fatal Coronary Arteriosclerosis in Young Soldiers, J. A. M. A. **124**: 1233 (April 29) 1944.

7 Blumgart, H. L.; Schlesinger, M. J., and Davis, D. Studies on the Relation of the Clinical Manifestations of Angina Pectoris, Coronary Thrombosis and Myocardial Infarction to the Pathologic Findings, Am. Heart J. **19**: 1, 1940. Blumgart, Schlesinger and Zoll.[9]

8. Schlesinger, M. J.: An Injection Plus Dissection Study of Coronary Artery Occlusions and Anastomoses, Am. Heart J. **15**: 528, 1938.

9. Blumgart, H. L.; Schlesinger, M. J., and Zoll, P. M.: Angina Pectoris, Coronary Failure and Acute Myocardial Infarction, J. A. M. A. **116**: 91 (Jan. 11) 1941.

10. Horn, H., and Finkelstein, L. E.: Arteriosclerosis of the Coronary Arteries and the Mechanism of Their Occlusion, Am. Heart J. **19**: 655, 1940 and the references cited in footnote 11.

11. Paterson, J. C.: Capillary Rupture with Intimal Hemorrhage as a Causative Factor in Coronary Thrombosis, Arch. Path. **25**: 474 (April) 1938. Wartman, W. B.: Occlusion of Coronary Arteries by Hemorrhage into Their Walls, Am. Heart J. **15**: 459, 1938. Wintermitz, M. C., Thomas, R. M., and LeCompte, P. M.: The Biology of Arteriosclerosis, Springfield, Ill., Charles C. Thomas, Publisher, 1938. Blumenthal, H., and Reisinger, J. A.: Prodromal Pain in Coronary Occlusion, Am. Heart J. **20**: 141, 1940. Nelson, M. G.: Intimal Coronary Artery Hemorrhage as a Factor in the Causation of Coronary Occlusion, J. Path. & Bact. **53**: 105, 1941.

by anoxemia, by the presence of local or general toxic factors and by impaired nutrition. In addition, one may speculate as to whether the capillary wall may not share with neighboring tissues the anoxemia due to relative insufficiency of blood flow during effort or emotion and thus be more liable to rupture.

3. *Rupture of Atheromatous Abscess.*—Attacks of acute myocardial infarction following effort may also arise as the result of coronary occlusion following the rupture of an atheromatous abscess,[12] as in case 4.

Recognition of the causal relationship of effort to acute myocardial infarction should not lead the medical officer or physician to ascribe every attack of acute myocardial infarction to preceding effort. The occurrence of acute myocardial infarction in the foregoing cases during or immediately after strenuous effort clearly establishes a causal relationship. As with most diagnostic problems in medicine, the relation of effort to an attack of myocardial infarction in a particular patient may be certain, may be probable, suggestive or improbable or may be considered to be nonexistent. The relation is considered definite if the following criteria are satisfied.

1. The development and increase of cardiac symptoms such as pain or substernal distress during or immediately following unusual effort (cases 1-9, 11).
2. Continuation of the symptoms after cessation of effort.
3. The presence of the clinical signs and symptoms of acute myocardial infarction.
4. Development of the characteristic electrocardiographic pattern of acute anterior, posterior or lateral wall myocardial infarction.

If several days intervene between effort and development of acute myocardial infarction, the relation cannot be considered definite unless there is a continuity of symptoms bridging the interval.

The pathologic mechanisms that have been described offer a rational basis for those cases in which no symptoms are experienced for several days or a week or more following unusual effort. The sequence of pathologic events revealed by postmortem studies indicates that subintimal hemorrhages may lead to a gradual growth of the hematoma within the arterial wall or to the gradual formation of an intra-arterial thrombus over the site of the subintimal hemorrhage. Under such circumstances or when the thrombus propagates slowly, particularly when some prior collateral circulation has been developed, a symptomless interval of considerable duration between effort and myocardial infarction is understandable. The occurrence of such a succession of events in a patient with a symptomless interval should, however, be accepted with great caution and is to be considered probable, suggestive or improbable according to the nature of the effort, the length of the symptomless interval and the presence or absence of the other criteria mentioned.

In a patient in whom postmortem examination discloses arteriosclerotic obstruction or narrowing of the coronary artery but no fresh changes, the possibility of relative ischemia causing cardiac standstill or ventricular fibrillation must be entertained.

The evidence brought forward in this communication and by others demonstrates the importance of effort in precipitating attacks of acute myocardial infarction in a small but definite proportion of cases and supports the ischemic theory of cardiac pain. That emotion may likewise be the responsible precipitating factor is generally recognized and is further supported by objective evidence for the existence of reflex factors.[13] If inordinate myocardial strain is avoided in those suffering from angina pectoris, and if, in those suffering from acute myocardial infarction, the diagnosis is made early and appropriate treatment is instituted promptly, many catastrophes doubtless can be avoided. Clinical evidence, experimental observations and our knowledge of the collateral circulation within the heart conform to these considerations.[14]

12. Leary, T.: Pathology of Coronary Sclerosis, Am. Heart J. **10**: 328, 1935.

SUMMARY AND CONCLUSIONS

1. The histories of 11 patients with acute myocardial infarction consequent to strenuous effort illustrate the relationship between the two.

2. The clinical criteria which must be satisfied to demonstrate this relationship are (*a*) the development and increase of cardiac symptoms such as pain or substernal distress during or immediately following unusual effort, (*b*) continuation of the symptoms after cessation of effort, (*c*) presence of clinical signs and symptoms of acute myocardial infarction and (*d*) the development of characteristic electrocardiographic pattern of acute anterior, posterior or lateral wall myocardial infarction.

3. The pathologic mechanisms which induce acute myocardial infarction during or soon after effort are (*a*) subintimal hemorrhages or the rupture of an atheromatous abscess following strenuous effort and (*b*) the occurrence of relative ischemia brought about by strenuous effort and resulting in a need for increased blood flow which the arteriosclerotic vessels are unable to meet.

13. Freedberg, A. S.; Spiegl, E. D., and Riseman, J. E. F.: Effect of External Heat and Cold on Patients with Angina Pectoris: Evidence for the Existence of a Reflex Factor, Am. Heart J. **27**: 611, 1944.

14. Blumgart, H. L.: Cardiac Pain, Research Nerv. & Ment. Dis. Proc. (1942) **23**: 327, 1943.

PENICILLIN IN THE TREATMENT OF PNEUMOCOCCIC MENINGITIS

A STUDY OF 67 CONSECUTIVE CASES

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During a period of nearly thirty-five years the members of the Division of Acute Infections of the Central Nervous System of the New York City Health Department have been studying the effect of the various forms of therapy in bacterial meningitis. Before the newer chemicals became available the case fatality in pneumococcic meningitis was 100 per cent.

The use of azosulfamide and sulfanilamide slightly improved the prognosis. The advent of the more potent sulfonamides marked a further advance in the treatment of this disease. In an unpublished series of 139 cases of pneumococcic meningitis treated with sulfapyridine, sulfadiazine, sulfathiazole or a combination of these (and specific serum when available) we obtained 49 recoveries. The recent introduction of penicillin led us to try the use of this drug in pneumococcic meningitis.

From the Bureau of Laboratories, New York City Health Department.
The penicillin used in these studies was furnished by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for experimental investigations recommended by the Committee on Chemotherapeutics and Other Agents of the National Research Council.

MATERIAL

This report is based on a series of 67 consecutive cases seen between Oct. 10, 1943 and May 1, 1944. The diagnosis was definitely established in each instance by culturing and typing the organisms from the spinal fluid.

TABLE 1.—*Age Distribution in 67 Cases of Pneumococcic Meningitis*

Age Years	Number of Cases	Number of Recoveries
	Number of Recoveries in Each Group	
Under 1	11	4
1 to 10	6	5
11 to 20	2	1
21 to 30	1	1
31 to 40	7	4
41 to 50	12	3
51 to 60	14	5
61 to 70	10	1
71 to 80	4	2
Totals	67	26

CLINICAL ASPECTS

Table 1 shows the age distribution of the patients in this series. The wide range in age is quite evident. It is also of interest to note that the number of patients under 1 year together with those above 50 years of age constitute more than half of the total number of cases. Most of the patients presented the typical picture of meningitis on admission. The individual patients showed considerable variation in the severity of the disease, but most of them appeared critically ill and 12 even moribund.

Consideration of the foci of infection is of the utmost importance. As shown in table 2, a definite focus in the ear or mastoid or both was found in 30 of these 67 cases. In 1 of the cases with otitis and mastoiditis there was also a petrositis. While this series shows a record of only 2 instances of definite sinus involvement, it is possible that this condition existed more frequently than it was recognized. In 1 instance there was a fractured skull and in 1 a head injury with a possible fracture. In 17 patients the presence of pneumonia was regarded as the probable primary focus. In 2 of these there was a complicating empyema and in 1 instance a vegetative endocarditis. There remained 16 cases in which the meningitis was preceded either by no obvious illness or by a simple upper respiratory infection. It is highly probable also that in not a few of the cases there were multiple foci of infection.

TABLE 2.—*Primary Foci of Infection*

Type of Focus	Number of Cases	Number Recovered
	Number of Recoveries in Each Group	
No known focus*	16	4
Otitis media with or without mastoiditis	30	15
Pneumonia	17	5
Sinusitis	2	0
Head injury	2	2
Total	67	26

* In this group were also included cases of simple respiratory infections.

BACTERIOLOGIC DIAGNOSIS

Diagnostic lumbar punctures were performed in all of the cases on admission. The cerebrospinal fluid showed varying degrees of turbidity. The cells were greatly increased in number with polymorphonuclears predominating. In the majority of instances the protein content was moderately to greatly increased. Sugar was either absent or considerably diminished in almost all instances. The diagnosis was confirmed bacteriologically in all cases. Stained smears of the cerebrospinal fluid showed varying numbers of gram positive diplococci in 63 instances. Pneumococci were grown from the fluid in all of the 67 cases. The organisms were typed in all the cases from the cultures and in many instances directly from the spinal fluid. The distribution of these types is shown in table 3. It may be of interest to note that when type III was recovered the meningitis was almost always secondary to otitis media, mastoiditis or sinusitis. Blood cultures were made in 49 of the cases prior to the institution of sulfonamide or penicillin therapy. These were positive in 33 instances.

TREATMENT

All the patients in this series were treated with penicillin. In all but 1 instance sulfonamides were used prior to the institution of penicillin therapy. Sulfathiazole alone was used in 1 case. In the remaining 65 cases sulfadiazine was employed either alone or combined with sulfathiazole. The total amount of sulfonamide given before penicillin was begun varied from 1.5 to 97 Gm., with an average of 22 Gm. The organisms isolated from the spinal fluid in every case were tested for sulfonamide sensitivity. In only 1 of these was there evidence of sulfonamide fastness. In 4 instances there was already evidence of a satisfactory clinical response to sulfonamide as well as a sterile spinal fluid at the time penicillin therapy was instituted.

TABLE 3.—*The Types of Pneumococci*

Primary Focus	Type of Pneumococcus																			
	1	2	3	4	5	6	7	8	12	14	18	19	21	22	23	28	33	34	36	40
Otitis, mastoiditis, sinusitis	3	..	10	2	3	1	1	1	..	3	..	2	..	..	2*	..	1	..	1	1
Pneumonia	..	..	..	2	1	..	2	2	5	..	..	..	1	1	..	1	..	1	..	..
Head injury	..	..	1*	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Unknown	1	1	..	..	2	1	..	2	6	1	2	2	..	..	..	..	..	..	..	..
Total	4	1	11	4	6	2	4	5	11	4	2	4	1	1	2	1	1	1	1	1

* = Fracture through mastoid.

TABLE 4.—*Duration of Illness Before Institution of Penicillin Therapy*

Days	Number of Cases	Days	Number of Cases
1	4	9	0
2	16	10	2
3	11	11	0
4	10	12	0
5	5	13	0
6	4	14	1
7	3	21	1
8	2	Unknown	8
Total			67 cases

The duration of illness before treatment with penicillin varied from one to twenty-one days. As shown in table 4, 41 of the 67 patients were treated within the first four days of illness.

Rammelkamp and Keefer [1] have demonstrated that penicillin administered intravenously or intramuscularly does not pass through the meningovascular barrier in significant quantities. Injected intrathecally,[2]

1. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, J. Clin. Investigation **22**: 425 (May) 1943.

2. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Toxicity of Penicillin Administered by Intrathecal Injection, Am. J. M. Sc. **205**: 342 (March) 1943.

penicillin is slowly absorbed from the subarachnoid space and may be detected in the spinal fluid thirty-one and one-half hours later. In subjects with meningitis absorption of penicillin after intrathecal injection was more rapid than in normals, but significant amounts of the antibiotic agent remained in the spinal fluid for a period of twenty-four hours. It was also demonstrated that lumbar injections resulted in a diffusion of the penicillin throughout the ventriculo-subarachnoid space. In the treatment of meningitis therefore it seemed necessary to use penicillin intrathecally as well as intravenously or intramuscularly.

All the patients in this series received penicillin intraspinally following the removal of an equal or somewhat larger amount of spinal fluid. Sodium penicillin was dissolved in isotonic solution of sodium chloride in a dilution of 1,000 units per cubic centimeter. The intrathecal dosage varied from 5,000 to 20,000 units and was administered at twelve or twenty-four hour intervals. In a few instances the drug was also administered intracisternally or intraventricularly and, in 2 cases, subdurally. The intrathecal administration of penicillin was as a rule continued for a varying number of days after clinical improvement was manifest and the spinal fluid no longer showed organisms or diminution in the sugar content. This precaution was necessary because of the frequency of relapses in this form of meningitis. The total intraspinal dosage varied from 10,000 to 700,000 units, with an average of 175,000 units. It may be noted that in 3 instances the intraspinal route of administration alone was used.

TABLE 5.—*Initial Response to Penicillin and Ultimate Outcome of Case*

Type of Response	Number of Cases	Recovery	Death
Good	28	21	7
Fair	11	5	6
None	28	0	28
Total	67	26	41

Penicillin was also administered intramuscularly in most of the cases and in 11 instances it was administered intravenously by the continuous drip method. There were only 2 patients who did not receive penicillin either intramuscularly or intravenously. For the intramuscular administration the drug was prepared in a dilution of 5,000 units per cubic centimeter of saline solution and administered in doses of 2,500 to 10,000 units every three to four hours. When the drug was used intravenously we employed the continuous slow drip method at the rate of 2,500 to 5,000 units per hour. The total amount of penicillin administered intramuscularly or intravenously varied from 20,000 to 1,840,000 units, with an average of 400,000 units. It may be of interest to note that in 2 instances following mastoidectomy the operative wound was irrigated from three to four times a day with a solution of penicillin in a dilution of 1 to 1,000 units per cubic centimeter. This was repeated for four and nine days respectively.

In all but 13 instances sulfonamides were discontinued at the time penicillin therapy was instituted. Four patients received also antipneumococcus serum intravenously or intramuscularly or by both routes. A mastoidectomy, unilateral or bilateral, was performed in 14 instances. Other nonspecific measures of therapy included the use of insulin for 2 diabetic patients and the not infrequent administration of transfusions in many instances.

RESULTS

In this series of 67 cases there were 26 recoveries and 41 deaths, a recovery rate of 39 per cent. It will be seen from table 1 that the mortality was higher in the extremes of life, which include infants under 1 year and adults over 50 years of age. There also appeared to be a relationship between the primary focus of infection and the mortality, as shown in table 2. Perhaps the most definite correlation existed between bacteremia and the outcome. Among 33 patients with a positive initial blood culture there were 10 recoveries, while among 16 patients with negative blood cultures there were also 10 recoveries. On the other hand there was no evidence of a correlation between the duration of illness prior to the institution of penicillin therapy and the penicillin therapy and the outcome.

As shown in table 5, an initial favorable response was noted in 28 instances. In 21 of these, improvement progressed satisfactorily terminating in recovery, and in 7 cases the improvement was only temporary, resulting finally in a fatal issue. There were 28 patients who at no time showed any evidence of a clinical response and who died. It should be noted that among those who died there were 8 patients who were treated for less than twenty-four hours and received a total of less than 80,000 units of penicillin. The fatal group included also 1 instance of severe congestive heart failure, 2 cases of diabetes mellitus and 1 instance of severe sulfonamide intoxication. It is probable that these associated conditions were factors contributory to death. In 2 instances the development of brain abscess either early or late in the course of the disease undoubtedly contributed to the death of the patients. There was 1 patient with meningitis, pneumonia and endocarditis who at the time of her death showed no evidence of meningeal involvement. This was confirmed by the necropsy findings.

As previously noted, sulfadiazine was continued in the treatment of 13 of the patients after penicillin was instituted. Of these, 5 recovered and 8 died.

SPINAL FLUID CHANGES DURING THE COURSE OF TREATMENT

We have already referred to 4 instances in which the spinal fluids were sterile at the time of institution of penicillin therapy. In the remaining 65 cases, organisms were found in the spinal fluid prior to the use of this drug. With the institution of penicillin therapy fairly prompt disappearance of the pneumococci was noted in a vast majority of the cases. For example, the spinal fluid culture became sterile within forty-eight hours in 53 cases, and a negative smear was obtained within seventy-two hours in 36 instances. However, it should be emphasized that the early disappearance of the organisms could not be relied on as an index of the control of the infection.

With regard to the spinal fluid sugar, a return of this substance to normal within five days was observed in 31 patients. It is important to note that 20 of these recovered. It would seem therefore that an early return of the sugar to normal may be regarded as a favorable prognostic factor. It is necessary to caution against misinterpreting as normal the rise in the spinal fluid sugar resulting from intravenous glucose infusions.

In this connection it may be noted that penicillinase was not used in the cultures of this series. The effect of this enzyme on spinal fluid cultures is at present under investigation in our laboratory.

Penicillin determinations were made on each specimen of spinal fluid withdrawn. In 48 instances the spinal fluid organisms were studied for sensitivity to penicillin. These details will not be discussed at present but will form the subject of another report.

As mentioned previously, positive blood cultures were obtained in 33 cases before the initial sulfonamide therapy. Following penicillin therapy a blood culture was available in only 15 of these patients, in 13 of whom it became sterile.

It is well known that pneumococcic meningitis at times shows a tendency to relapse. In our series there were 7 instances with one or more relapses. In these cases there was evidence, both clinical and laboratory, of control of the infection for periods varying from three to thirty days before the disease recurred. Four of the patients with relapses recovered and 3 died.

COMPLICATIONS

In 2 instances the meningitis was complicated by brain abscess. These terminated fatally. The presence of subarachnoid block was noted in 6 cases. It is possible that the intrathecal penicillin therapy contributed toward the development of the complication. In 1 instance a meningeal infection due to Bacillus prodigiosus was superimposed in the terminal phase of the patient's illness.

REACTIONS

In 3 instances there were local tissue reactions at the site of the penicillin injection. These cleared up fairly rapidly. There were no other untoward effects following penicillin therapy in this series of 67 cases.

COMMENT

It is clear from this study that the introduction of penicillin has as yet not solved the problem of the treatment of pneumococcic meningitis. While this antibiotic agent was highly effective in the treatment of an appreciable number of cases, it proved ineffective in the majority of instances. However, there is no doubt that the use of penicillin resulted in the recovery of some patients who had failed to respond to sulfonamide.

Several factors contribute to the difficulty in successfully treating pneumococcic meningitis. The most important of these in our opinion is the fact that the meningitis is usually secondary to one or more primary foci of infection, many of which cannot be completely eradicated. We are at variance with a recent report,[3] based on a small series of cases, which minimizes the importance of the removal of suppurative foci. In our experience the complete eradication of the primary foci of infection is of the utmost importance in the management of this form of meningitis. Of course, a patient may recover without an operation. On the other hand, we have had 7 cases in which a mastoidectomy resulted in striking improvement after there had been failure to respond to penicillin therapy. In this connection we wish to stress that not infrequently a severe mastoiditis may fail to present clinical symptoms and occasionally even radiographic evidence of involvement.

3. Waring, A. J., Jr., and Smith, M. H. D.: Combined Penicillin and Sulfonamide Therapy in the Treatment of Pneumococcic Meningitis, J. A. M. A. 126:418 (Oct. 14) 1944.

Among other factors which militate against the success of therapy is the frequent presence of bacteremia. For instance, in this series of 33 patients with positive blood cultures 23 died, and among 16 cases with negative blood cultures there were only 6 deaths. Sometimes the infection is so overwhelming that the patient succumbs before adequate therapy can be administered. Furthermore, there is much that is unknown in regard to the bacteriology of the organisms, particularly with respect to the virulence of the various strains.

The precise method of treatment must at present be regarded as tentative. A number of important problems in connection with the employment of penicillin still remain to be investigated. These include an evaluation of the use of massive doses of the drug and the treatment of the disease with a combination of penicillin and sulfonamide.

SUMMARY

1. Sixty-seven consecutive patients with pneumococcic meningitis were treated with penicillin intrathecally and also intravenously or intramuscularly. In all but 1 instance, sulfonamides were used prior to the institution of penicillin therapy.

2. Of these 67 patients, 26 recovered and 41 died, representing a recovery rate of 39 per cent.

3. Thirteen of the patients were treated with a combination of penicillin and sulfadiazine. Of these, 5 recovered and 8 died.

4. The factors contributing to the difficulty of successfully treating pneumococcic meningitis include the presence of primary foci of infection, which are frequently inaccessible, the presence of bacteremia in many instances, and the occasional appearance of the disease in a fulminating form.

5. While penicillin was highly effective in the treatment of an appreciable number of cases, it proved ineffective in the majority of instances. It is evident that further investigation is needed to solve the problem of the treatment of pneumococcic meningitis.

Blaise Pascal (1623-1662).—The "great moralist," Blaise Pascal, was also a great scientist. His "Thoughts" ("Pensées") and "Letters"—in which he said "Pardon the length of this letter; I have not time to write you a short one"—are gems of French literature. Yet the sincere Jansenist turned to the dice game and the trials of the gaming table to develop, after Cardan, an unscrupulous Italian mathematician, and with Fermat, a cryptic French attorney, the mathematical theory of probability on which much of modern scientific thinking rests. Current weather forecasting and present day meteorology, on which the fortunes of aerial warfare depend, could hardly have been born until some one had established what Pascal—with the help of his brother-in-law, F. Perier—proved in the "Great Experiment" on the Puy de Dome; namely, the weight of the mass of the air. Here quoted is "the story of the great experiment," published posthumously in 1663. Employing Torricelli's recently invented barometer, Pascal slew forever the myth that "nature abhors a vacuum." Pascal was a child prodigy; before he was 11 he had taught himself geometry, drawing figures with charcoal on the tiles of his playroom and giving his own names to the lines and curves which his doting father had forbidden him to study. A great mathematician, inventor of the adding (calculating) machine and the hydraulic press, Pascal has been honored by having a law (of fluid pressure), a triangle and a mystic hexagram named after him.—The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co., Inc., 1945.

THE METHYLENE BLUE TEST IN INFECTIOUS (EPIDEMIC) HEPATITIS

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The methylene blue test described by Franke [1] as a method for the detection of bilirubin in urine was used by Stokes and Neefe [2] in an outbreak of infectious (epidemic) hepatitis with results which indicated its possible value in the early diagnosis of the disease In further investigating a modified methylene blue test suggested by Franke and first employed by Fellinger and Menkes,[3] Neefe [4] found the modified test to be of value in determining the presence of biliary pigments in the urine in the preicteric stage of the disease and occasionally before a significant increase in the concentration of total serum bilirubin was found. Because of its simplicity the modified test, although somewhat less sensitive than the Harrison spot test, was employed during the course of an investigation of infectious (epidemic) hepatitis in the Mediterranean theater of operations from November 1944 to February 1945. The present report is confined to data obtained in the study of the preicteric, icteric and posticteric stages of cases of infectious hepatitis with jaundice.

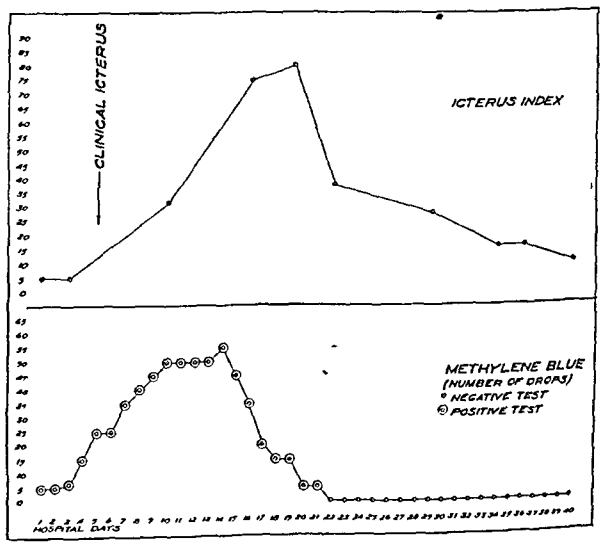
The modified methylene blue test was performed as follows: To 5 cc. of a prebreakfast urine specimen were added 2 drops of an 0.2 per cent aqueous solution of methylene blue chloride. If a green color resulted, more methylene blue was added dropwise and the last drop required to convert the green color to blue was recorded. Pipets were used which delivered 20 drops of the solution per cubic centimeter. Methylene blue chloride proved to be satisfactory in that the dye content of different lots showed little variation. When readings were made by natural light, no difficulty was found in determining the change from a green color to blue. If more than 5 drops were required to produce the color change, the urine was diluted with distilled water and methylene blue was again added drop by drop until the end point was reached. Correction was then made for the dilution factor. This was found to be necessary because the addition of more than 5 drops of methylene blue resulted in a color of such intensity that the end point was difficult to determine.

Methylene blue tests on the prebreakfast urine specimens of 1,000 patients with diseases other than hepatitis gave the following results: Seventy-four per cent of the urine specimens yielded a blue solution after the addition of 2 drops of the reagent, 24.3 per cent required 3 drops and 1.7 per cent required 4 drops in order to convert the resulting green color to blue. Thus in this series of 1,000 patients no urine specimens yielded a green reaction after the addition of 4 drops of the reagent. On the basis of the foregoing results a test of 5 drops or more was considered positive.

Daily methylene blue tests were performed on the morning urine specimens of 77 patients with hepatitis with jaundice. Of the 77, 44 were jaundiced at the time of admission to the hospital and 33 developed jaundice subsequent to the date of admission. The methylene blue test became positive in the 33 patients with preicteric hepatitis one to six days before scleral icterus made its appearance. The exact number of days during which the methylene blue test was positive prior to the appearance of scleral icterus is shown for each case in the accompanying table.

At the time when the methylene blue test first became positive, 12 of the 33 patients had normal icterus indexes while the remaining 21 patients had icterus indexes which were either at the upper limits of normal or were slightly elevated.

Thus from the foregoing data it was possible to suspect hepatitis in 33 patients one to six days before clinical icterus became apparent and in 12 of the 33 patients before the icterus index was elevated.



Methylene blue tests during the preicteric, icteric and posticteric stages

The methylene blue test also proved to be of value in following the course of these patients, in that titration of serial dilutions of the urines served as a rough approximation of the icterus index. However, after the height of jaundice had been reached and the patients' convalescence had begun, the methylene blue test became negative although clinical icterus was present and the icterus index was still elevated. The range of the icterus index in which the test became negative for the 77 patients studied was between 35 and 20 despite the fact that during the preicteric and early icteric stages the test was positive in the presence of a normal or slightly elevated icterus index. To illustrate these findings, the accompanying chart records the methylene blue tests during the preicteric, icteric and posticteric stages of 1 of the patients in the series.

Studies of urobilinogen excretion in these patients were conducted by Major Phillip Hallock and will be reported elsewhere. The results coincided with the findings of the methylene blue test, but the chief advantage of the latter test lay in its simplicity and

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Lieutenant Colonel Robert Hebbel and his staff at the 26th General Hospital gave assistance
This work was carried out under the direction of the Commission on Measles and Mumps of the Army Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, U. S. Army.

1. Franke, K.: Methylenblau, ein einfaches sehr empfindliches Reagens zum Nachweis von Bilirubin, Med. Klin. 27:94, 1931.
2. Stokes, J., Jr., and Neefe, J. R.: The Prevention and Attenuation of Infectious Hepatitis by Gamma Globulin, J. A. M. A. 127:144 (Jan. 20) 1945.
3. Fellinger, K., and Menkes, K.: Quantitative Bilirubin Determination in the Urine with the Methylene Blue Method, Wien. klin. Wchnschr. 46:133 (Feb. 3) 1933.
4. Neefe, J. R.: Personal communication to the authors.

the ease with which a large number of determinations could be made.

Of the 77 patients studied, 5 developed relapses characterized by the development of fever, abdominal pain, nausea, vomiting and enlargement and tenderness of the liver. In all 5 the cephalin cholesterol flocculation test which had previously returned to normal became strongly positive again and the methylene blue test likewise became positive. Four of the patients developed no rise in icterus index during the relapse, while the fifth patient became jaundiced for the second time. Thus the methylene blue test in these cases also served to warn of an impending relapse.

COMMENT

In February 1945, when the present studies had been completed, a report on the use of the methylene blue test in patients with liver damage due to tetrachlorethane was published by Myers.[5] In that study the test was performed by adding 2 drops of Loeffler's methylene blue to 10 cc. of urine. If a green color resulted, the test was considered positive; the test was repeated with increasing dilutions of the urine until the dilution was reached in which 2 drops of the reagent produced a blue color. Myers' findings in tetrachlorethane poisoning are similar to our results in infectious hepatitis in that the methylene blue test became positive prior to an elevation of serum bilirubin and subsequently became negative before the return of serum

Cases Showing Positive Methylene Blue Tests Prior to Jaundice

Number of hospital days preceding clinical jaundice	1	2	3	4	5	6
Number of cases showing positive methylene blue tests	7	10	5	6	4	1

bilirubin to normal limits. Thus in liver damage due to tetrachlorethane the methylene blue test permitted the prediction of impending icterus, facilitating the prompt removal of the patient from further exposure to the toxic fumes.

The exact mechanism of the methylene blue test is uncertain. Myers feels that the green color resulting from the addition of methylene blue to bilirubin is due primarily to a mixture of pigments. According to Reinhold,[6] chemical reaction occurs between methylene blue and bilirubin but his studies also indicate that the contribution of this reaction to the development of the green color is less important than is the effect of blending the blue with the yellow bile pigment. There appears to be no explanation at present to account for a negative methylene blue test during the convalescent stage of hepatitis when serum bilirubin is still elevated, whereas the test is strongly positive in the preicteric stage although serum bilirubin may be normal at the time. If the methylene blue test is a measure of bilirubin in the urine, a variation in renal threshold resulting perhaps from alteration in the availability of the bilirubin for renal excretion, or a chemical alteration of bilirubin may account for the foregoing findings. Further investigation will be necessary to clarify these points.

5. Myers, C. P.: Use of Methylene Blue in Testing for Bilirubin in the Urine, J. Indust. Hyg. & Toxicol. 27: 52, 1945.
6. Reinhold, J. G.: Personal communication to the authors.

SUMMARY

The modified methylene blue test for bilirubin in the urine employed in a study of infectious (epidemic) hepatitis with jaundice proved of value (*a*) in the early diagnosis of preicteric hepatitis, (*b*) in evaluating the course of the disease and (*c*) in the prediction of impending relapse. Because of the simplicity of the test, it appears most useful in large scale testing during the course of an outbreak of infectious hepatitis and in installations where complete laboratory facilities are lacking.

GAS GANGRENE

A STUDY OF 96 CASES TREATED IN AN EVACUATION HOSPITAL

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The high incidence of gas gangrene infection in modern warfare and the difficulties encountered in the treatment and cure of the disease have been and still constitute a major medical problem. It has been estimated that the incidence of gas gangrene in the African campaigns of 1942 and 1943 was as high as that encountered in France during the world war of 1914-1918. Although these anaerobic infections were not especially common in the Tunisian campaign (2 to 7 cases per thousand wounded) they were definitely more prevalent in Sicily (10 cases per thousand wounded) and were considered to have been the most troublesome infection encountered in forward military areas during the Italian campaign of 1943-1944 (20 cases per thousand). These figures acquire additional importance when MacLennan and MacFarlane[1] estimate that the case fatality of gas gangrene in the present war has been approximately 50 per cent.

Statistical data are not yet available on the incidence of the disease among those wounded in France. It is known, however, that during the period of September 1943 to and including December 1943 the incidence among the American troops in Italy approximated 6 cases per thousand battle casualties.

The problem of the diagnosis and treatment of gas gangrene is one peculiar to the level of medical care of the evacuation hospital. It is at this level that the disease is first encountered and also at this level that definitive treatment must be devised and executed. Since the operational activation of this evacuation hospital in France we have had the opportunity of studying and treating a larger number of cases of gas gangrene than would normally be seen in a medical unit of this type. The total number of cases of anaerobic gas producing infections treated at the eight different installations of this hospital from July 25 to Dec. 1, 1944 has been 96, which signifies a gross incidence of 9.5 cases per thousand admissions, or a corrected incidence of 16.0 per thousand surgical cases. This figure, although high, does not quite reach the proportions

The entire hospital unit cooperated in this work. Capt. R. E. Hultkrans, M. C., and Capt. E. N. Bookrajian, M. C., of the Surgical Service performed many of the operative procedures. Second Lieutenants Edna May Rutherford, A. N. C., and Angelina Russo, A. N. C., helped in compiling the statistics and gave untiring devotion in the care of the patients.

1. MacLennan, J. D., and MacFarlane, M. G.: Brit. M. J. 1: 683 (May 20) 1944.

(20 per thousand battle casualties) found in the early weeks of the Italian campaign in the British Eighth Army.

Because of this relatively large number, an attempt was made to determine what errors of omission or commission had been made and, if possible, to see what further measures could be taken both to reduce the incidence and to improve the treatment. With this in mind, various studies of our cases, individually and collectively, were made.

STATISTICAL STUDY OF GAS GANGRENE

1. *Incidence.*—In preparation for these studies a statistical review of all cases of gas gangrene diagnosed and treated at the various installations of this hospital in northern France was made. Only such cases as could be positively diagnosed as gas bacillus infections are included, and all questionable or doubtful cases are excluded from the series here reported. These cases, tabulated against the total number of surgical cases treated, are expressed in table 1, a study of which reveals the obviously high incidence of gas gangrene infection among the prisoners of war. These prisoners included not only Germans but also Czechs, Rumanians, Bulgars, Poles, Austrians and some Russians. With this group the incidence per thousand surgical casualties was 51.9, which is over six times the American

TABLE 1.—*Incidence of Gas Gangrene*

	Total	United States	Prisoners of War	Free French	Civilians
Surgical casualties	6,000	4,051	1,040	652	257
Cases of gas gangrene	96	32	54	8	2
Per cent of total cases of gas gangrene	100	33.3	56.3	8.3	2.1
Incidence per thousand surgical cases	16.0	8.0	51.9	12.3	7.8

incidence of 8.0, or four times that of the Free French, which was 12.3. Attempts at explanation of this will be made later. It has been our duty on two occasions to care for many such German wounded, the majority of whom, before their admission, had had no previous therapy other than the simplest of first aid measures. In 1 instance over 380 such prisoners, with all types of wounds, were brought at one time into the hospital, already nearly filled to capacity. These prisoners were taken from a nearby German sanatorium where neither doctors nor medical equipment were available. There resulted a tremendous backlog for surgery, and many of these wounded had to remain for several days before they reached the surgical tents. At the same time our incidence of gas gangrene reached its peak, with 22 confirmed cases within a period of three days. At another installation the relationship of German casualties, as compared with those of the combined American and French injured, was 2 to 1. At this time 386 surgical cases were completed in a period of less than four days. The incidence of gas gangrene at this time was 11 cases among the prisoners of war, 1 case in a French soldier and none among the American wounded.

2. *Criteria for the Diagnosis of Gas Gangrene.*—Many patients admitted to the hospital were already patently infected with gas gangrene at the time of admission. As our series of cases grew, we were able to establish various criteria for diagnosis so that these potentially dangerous cases could get surgical priority. The criteria for a tentative diagnosis of gas gangrene at admission or preoperatively was as follows:

1. History of:
   (a) Pain, especially with a feeling of tension, heaviness or tightness of the dressing. This was the most frequent and the most striking complaint and was present in almost 100 per cent of the cases in which an early diagnosis was made.
   (b) A clinical degree of toxemia, often coupled with definite mental changes. This was noticed in about 75 per cent of the cases admitted and varied greatly in degree and depth.
   (c) In more advanced cases a typical change in general skin color. This varied from an extreme pallor with a bluish brown tinge to a semibronzing not only of the skin around the wound but also of the face, the lips and the body in general.
2. A high pulse rate, usually over 110 and frequently above 120, out of proportion to either the degree of infection present or the degree of toxemia.
3. Elevation of temperature. A majority of those wounded in battle admitted to the hospital had normal or subnormal temperatures as a result of the inhibitory effect of early sulfonamide therapy. In all of the suspected gas gangrene cases the temperature was elevated regardless of sulfonamides, usually from 100 to 102 F. Here also the elevation of temperature was much higher than would be suggested by the degree of infection or toxemia.
4. Anemia, with a tendency to increase in severity. This usually was out of proportion to the amount of hemorrhage but in definite relationship to the length and severity of the toxemia.
5. The wound:
   (a) An odor, best described as "rotten or decaying meat" or "mousey," and entirely different from the odor of other gross infections or contaminations. This typical odor was present in only about a third of the cases which were diagnosed on admission. In the remainder it was either absent or was masked by the odor of Escherichia coli or other putrefactive organisms.
   (b) In early cases no remarkable change around the area of the wound. The crepitus, so often described was noted in only a few cases. Similarly the textbook description of the mottling or bronzing of the skin at the edges of the wound was not noted frequently. A few cases of subcutaneous, well demarcated edema were seen.

Tentative diagnosis was not made on any one single finding but rather on the correlation of several findings. With each such tentative diagnosis every attempt was made to get the patient in the best possible physical condition for surgery at the earliest possible moment, where the diagnosis was either corroborated or disproved.

It must be understood that under conditions such as are found in an evacuation hospital, and with only limited laboratory facilities available, the absolute diagnosis of clostridial infection is impossible. For similar reasons it has been impossible to classify the various types of anaerobes which are virulent gas formers. Final diagnosis was made by the gross appearance of the wound at surgery (at least two surgeons concurring) together with the clinical preoperative and postoperative course and laboratory findings. The criteria for diagnosis before and at surgery, and for determination of further therapy, consisted of:

1. Clinical course of the patient between admission and operation: Increases in pulse rate, temperature and degree of toxicity, with special emphasis on the last mentioned.

2. X-ray findings: X-ray facilities were of the best, and it was not infrequently that the radiologist reported gas shadows along muscle planes, other than shadows of imprisoned air, in his routine radiographic reports. X-ray evidence of gas was never used, however, for other than supportive information.

3. Microscopic examination of muscle smear: Thorough, careful and precise studies of muscle and exudate smears, stained by the Gram method, were made in every case. The pathologist examining these smears exercised most conservative judgment in pronouncing them to be positive. All doubtful specimens were considered negative. No case with "negative" smears, regardless of other findings, was considered to be gas gangrene.

4. Appearance of the wound at operation: Characteristic color changes and crepitation were not often found. What was noted frequently in all positive cases was a typical subcutaneous edema, which was present around the site of the lesion and which spread outward from that area in a rather well demarcated zone. Gas bubbles were found often but alone were not considered diagnostic unless they were more than localized and were present in the muscle planes. The most characteristic finding, however, was the typical picture of the muscle tissue itself. The muscles seemed to be affected individually and characterized by death of the tissue, an edematous appearance and color changes varying from a deep dirty brown through a green to a gray.

3. *Time of Diagnosis.*—Accordingly, with the foregoing classification as a basis, the diagnosis of gas gangrene was made at one of three stages in the clinical course of the patient: (1) on admission or soon after, (2) at the time of operation and (3) postoperatively. The result of this classification is expressed in table 2.

Thus, briefly, we were able to diagnose tentatively one third of all our cases of gas gangrene either at the time of admission to the hospital or shortly thereafter. With increasing experience, more and more cases are being thus classified. All these were later confirmed at operation. Similar tentative diagnoses were made in approximately 15 other cases, which, however, were later disproved. Of the total number 57.4 per cent were diagnosed for the first time at operation. Seven cases, or 7.3 per cent of the total number, either were misdiagnosed when the original débridement was done or the infection developed in these cases subsequent to surgery.

4. *Age and Sex Incidence.*—All cases reported here are in males. The youngest, aged 17, and the oldest, aged 44, were both prisoners of war. The average age for the entire group was 26.2 years. All patients were apparently in good physical condition at the time the injuries were received, nor was there any evidence of long standing malnutrition, avitaminosis or systemic disease present even in the captured Germans.

TABLE 2.—*Time of Diagnosis of Gas Gangrene*

	United States	Prisoners of War	Free French	Civilians	Total	Per Cent of Cases
Gas infection diagnosed as presumably present when first seen	6	27	1	..	34	35.4
Gas infection diagnosed at operation (not including the preceding, which were confirmed at this time)	20	26	7	2	55	57.4
Gas infection developing postoperatively	6	1	..	..	7	7.2
Total	32	54	8	2	96	100.0

5. *Agents.*—All infections included in this series in which gas gangrene developed, save 1, were the results of battle casualties. Of the total of 96 cases 48 cases, or 50 per cent, were the direct result of mortar or other high explosive shells; 17 cases, or 17.7 per cent, occurred subsequent to mine detonations; 10 cases, or 11 per cent, were due to booby trap explosions, and the remainder were due to gunshot wounds. The 1 case which was not a battle casualty occurred in a French civilian who received his injuries as the result of a fall from a fast moving motorcycle.

TABLE 3.—*Time Between Wounding and Therapy in 73 of 96 Cases*

	United States	Prisoners of War	Free French	Total
Wound to first dressing:				
Immediately	12	6	1	19
Up to 1 hour after injury	10	8	4	22
1 - 6 hours after injury	4	13	..	17
6 -12 hours after injury	..	8	..	8
12 -24 hours after injury	..	5	..	5
Over 24 hours after injury	..	2	..	2
Average time wound to initial dressing	12 min.	5 hrs. 40 min.	18 min.	
Wound to admission to hospital:				
1 - 2 hours after injury	1	..	..	1
2 - 6 hours after injury	12	1	..	13
6 -12 hours after injury	14	3	1	18
12 -24 hours after injury	1	14	3	18
1 - 2 days after injury	2	11	..	13
2 - 3 days after injury	..	7	..	7
3 - 4 days after injury	..	3	..	3
Average time wound to admission in hospital	14.7 hrs.	42.6 hrs.	15 hrs.	
Wound to operation:				
6 - 12 hours after injury	1	..	..	1
12 - 24 hours after injury	18	1	1	20
24 hours to 2 days after injury	8	8	2	18
2 - 3 days after injury	..	6	1	7
3 - 4 days after injury	1	2	..	3
4 - 5 days after injury	1	12	..	13
Over 5 days after injury	..	11	..	11
Average time to operation	1 day	3¾ days	1½ days	
Incidence per thousand battle casualties	8 per 1,000	51.9 per 1,000	12.3 per 1,000	

6. *Effect of Delay in Treatment.*—We have further attempted to determine what effect delay in first aid and delay in hospital treatment and surgery might have on the ultimate production and severity of gas gangrene. MacLennon [1] thinks that the disease develops so soon after wounding and runs so swift a course that delays and difficulties of treatment in the field are not the principal reason for its high incidence and mortality. However, this opinion is not commonly held. A thorough individual interrogation of 73 of the total number of 96 patients was made to determine the effect of this time relationship and was directed along the following lines: Questions were asked each patient concerning the exact time the wound occurred, the type of dressing applied and whether sulfonamides were used according to present army directives. The answers, in general, were definite and accurate, and data thus obtained were correlated with the emergency medical tag, the time of admission to the hospital and the time surgical operation was performed. This was tabulated, as previously, according to nationalities and contrasted with the incidence per thousand surgical cases, as determined in table 1. The data are set forth in table 3.

The shortest lapse of time between initial injury and the development of a true, severe gas gangrene infection occurred in an American soldier who, when operated on only six hours after having received a severe lacerating wound of the right thigh, was found to be thoroughly infected with the organisms. This case is to our knowledge the earliest case of gas gangrene reported. The longest time lapse between injury and surgery was in a German prisoner who lay wounded and unattended for thirty hours and who did not reach

the hospital until four days after injury. It was necessary to treat him medically for three additional days before operation could be performed because of his poor physical condition.

Actually we have not been able to determine over our entire period of activity the average time for cases in which gas infection did not develop to reach operation. As in the cases of those which did, this time lapse in the hospital was dependent on our backlog. Sample tests at the various installations, however, point to the fact that this delay was in excess of eighteen hours.

While the entire period from wounding to débridement is of vital importance in the development of gas gangrene, there can be no question that the time between the occurrence of the injury and the application of the initial dressing is the critical period. This is well exemplified by the present study. This average initial time lapse for the American wounded was twelve minutes, for the Free French eighteen minutes and for the prisoners of war five hours and forty minutes. It is during this period when the wound lies open, in contact with clothing, dirt and soil, that the infection is most likely to be introduced.

Similarly, this is reflected in the time interval which occurred between wounding and arrival at the hospital. An average of fifteen hours elapsed before Americans and French were admitted, while 42.6 hours passed before Germans were delivered to the hospital.

Further study of table 3 shows the same trend while at the hospital itself. The average length of time from injury to operation in the American and French groups was one and one-half days, in the prisoner of war group three and three-fourths days. The peak of American and French operations for gas infection was between one and two days after wounding, whereas in the German group, in which the delay was longer, it occurred between three and four days after wounding This in no way can be thought of as discrimination against the Germans. The delay here was necessarily greater because, in general, the Germans already showed more manifest signs of toxemia and cachexia and most of them needed considerable therapy before being able to withstand surgery. The importance of delay in both initial and definitive treatment is evident when a comparison of the prisoners of war group, with an incidence of 52 per thousand cases, is made with the incidence of 8.0 per thousand cases in the American group.

7. Early Use of Sulfonamide Compounds.—The higher incidence in the German group at one time was thought to be due to the absence of the initial use of the sulfonamides both locally and by mouth. After questioning a number of gas gangrene infected prisoners we were surprised to note that the number of Germans who received sulfonamide therapy from the very beginning almost equaled the number of Americans. All of the former received initial care by American Medical Aid men. All patients received sulfonamides at the hospital. Table 4 demonstrated the result of questioning along these lines.

Since, then, general health factors being equal and sulfonamides being used almost equally in the Allied and German groups, the main factor which could be proposed as having an effect on the development of gas gangrene is the time lapse between wounding and both initial therapy and definitive surgery.

Another factor has recently been noted which may in part also explain the greater incidence of gas gangrene among the prisoners of war. This is the observation, made at operation, that the wounds in this group of patients were much more highly contaminated by shreds and even large pieces of woolen clothing than were the wounds of either American or French soldiers. In checking this we have found that all the garments of the Germans in general showed greater evidence of wear, a greater friability and a much looser nap.

8. Types of Wounds.—Regardless of the gas infection, all wounds were classified as "severe" in the amount of damage produced. Twenty-eight (29 per cent) were of the penetrating type, with metallic fragments present in the tissue; forty-one (43 per cent) were of the perforating type, and the remainder (twenty-seven, or 28 per cent) were lacerating in character. Compound comminuted fractures were present in fifty-six (58 per cent) of all injuries.

9. Location of Infection.—We have analyzed all the injuries in which gas infections developed and divided them into five categories according to location: (1) shoulder, (2) upper extremity (which includes the upper arm, the forearm, the wrist and the hand, (3) buttocks, (4) thigh and (5) lower extremity (which includes the calf, ankle and foot). Multiple wounds were common (60 per cent), but for the purpose of this discussion only wounds infected with gas gangrene are considered. In only 1 case in which multiple wounds were present was gas bacillus infection present at more than one place. A study of all operative diagnoses over the four months of activity was made according to the listing given and the incidence of each type

TABLE 4.—*Sulfonamide Therapy Before Hospitalization*

	United States			Prisoners of War			Free French			Civilians		
	Number Questioned	No. of Cases Receiving Treatment	Per Cent	Number Questioned	No. of Cases Receiving Treatment	Per Cent	Number Questioned	No. of Cases Receiving Treatment	Per Cent	Number Questioned	No. of Cases Receiving Treatment	Per Cent
Sulfanilamide crystals in wound	28	20	71	43	24	55	8	8	100	2	0	0
Sulfonamides by mouth at initial dressing	28	24	82	43	24	55	8	8	100	2	0	0
	28	16*	57.1	43	20*	46.5	8	3*	37.5	2	0	0

* As nearly as can be determined. Cases in which decidedly irregular doses of sulfonamide orally were given are not included in these results.

TABLE 5.—*Incidence of Gas Gangrene According to Site of Infection*

	No. of Cases of Injury	No. of Cases of Gas Gangrene	Per Cent of Total Gas Gangrene	Incidence per 1,000 Injuries
Shoulder	704	8	8.33	11.2
Upper extremity	1,651	17	17.7	10.2
Buttock	483	27	28.1	55.4
Thigh	940	35	36.5	37.2
Lower extremity	1,201	9	9.4	9.7

of wound determined. Similarly the incidences of gas gangrene for the several locations were computed. These interesting statistics are presented in table 5.

By making a classification of all such cases of infection with gas gangrene, and by comparing these with the total number of injuries which have been classified similarly, the sites of predilection for the development of the disease were determined. Thus, while wounds of the buttocks made up slightly less than a third of our series, the incidence of gas infection in buttock injuries was 55.4 per thousand. A like finding is recorded in the case of wounds of the thigh, in which the incidence was 37.2 per thousand. On the other hand, wounds of the shoulder, the upper extremity and the lower extremity below the knee are less commonly infected. We have not, in this hospital, encountered any cases of primary gas bacillus infection of the neck, head, abdomen, back or perineum. Three cases were noted in which gas infection was present in a wound of an extremity and had spread to the trunk.

TREATMENT OF GAS GANGRENE INFECTION

The treatment followed in this series of cases is essentially that which is outlined in U. S. Army Circular Letter No. 178. Many modifications were and still are being made, and attempts at improving our technic and mortality rate are constantly being tried. These modifications and changes are reflected in the constantly decreasing mortality and morbidity as we have proceeded from one installation to another. For example, in our last installation there was only one death in 22 cases, and the average time for evacuation of gas cases was only slightly longer than for the average case without infection. This may be compared to our first setup, in which there was a mortality of 1 in 6 cases and the evacuation time was several days longer than for the average.

Treatment was divided into three stages, the preoperative, operative and postoperative. It was further classified as specific and nonspecific, the specific consisting of the use of penicillin and gas gangrene antitoxin, employed by various methods and utilizing various routes of introduction. Nonspecific measures consisted of general supportive treatment and the use of whole blood, blood plasma and sulfonamides.

1. *Preoperative Treatment.*—During periods of extreme activity, abdominal, chest and brain injuries received priority in surgery. However, when a preoperative diagnosis of gas gangrene infection had been made, regardless of the location of the wound, that case was also given the highest priority rating. The main essential of preoperative care was preparing the patient for débridement as quickly and as completely as possible. General supportive measures, treatment of shock and elevation of the blood count to as near normal as possible were considered to be of primary importance before the patient was ready for operation.

As is well known, the anemia resulting from gas gangrene toxemia is severe. We have noted repeatedly that when the blood count before operation was above 3.5 million, with a correspondingly high hemoglobin value, the traumatic shock occurring from extensive débridement was not as great as when lower blood values were present. We further noted that the patient was returned to the postoperative ward in better general condition, and postoperative therapy was greatly facilitated, when the blood picture approached normal before operation.

Thirty-one patients of this series were admitted to the hospital in shock. Excluding these, whole blood in quantities of from 500 cc. to 2,000 cc. (average 875 cc.) was administered preoperatively to 41 of the 65 remaining patients. Similarly, blood plasma in amounts ranging from 250 cc. to 750 cc. was given to 53 patients (average 400 cc.). Routine blood counts were not made preoperatively but are available for 23 cases. The average for these was a red blood cell count of 3.77 million with a hemoglobin (Tallqvist) of 80.5 per cent either after transfusion had been completed or immediately before operative procedures were started.

Sulfadiazine or sulfathiazole was administered by mouth routinely to all patients, starting with an initial dose of 2 Gm. and continuing with 1 Gm. every four hours. No basic difference was noted in the effects of these two compounds. Medication was continued up to the time the patient was admitted to surgery, and also routinely postoperatively until the patient was evacuated. The amount of sulfonamide drug varied from 3 Gm. minimum to 31 Gm. maximum. The average dose for the 96 patients was 10.2 Gm. preoperatively. No demonstrable effect of the sulfonamide compounds could be observed either in preventing the onset or in limiting the spread of the gas bacillus infection. Its general efficacy against other wound contaminants was easily recognized.

The sodium salt of penicillin was also used routinely postoperatively and was administered by intramuscular injection only. If, for any reason, operation had to be delayed, all patients with wounds of the buttock, thigh and perineal regions received 40,000 units every four hours. More recently we have given 20,000 units at two hour intervals, because when given in smaller and more frequent doses the blood level remains higher. All patients with other extremity and trunk wounds received 20,000 units every four hours. When gas gangrene had been tentatively diagnosed, the patient received the larger dosages regardless of the location of the wound. The smallest dose administered preoperatively was 20,000 units, the largest 960,000 units. The average amount of penicillin given preoperatively was 220,000 units. Although there was no way of determining exactly, we have not felt that penicillin per se had any major effect preoperatively in preventing the infection, in decreasing its severity or in preventing its spread.

The use of gas gangrene antitoxin preoperatively has not proved very successful in our hands. Arbitrarily, eighteen therapeutic doses were given in 4 cases in which it was thus used. In these cases, no appreciable change was observed; the toxicity was not relieved, nor was the postoperative course affected favorably in any manner. In 1 case a pronounced sensitivity to the serum developed, and it was necessary to desensitize the patient before more of the antitoxin could be given postoperatively. Furthermore, adequate or complete dosage could not be determined, as we were able to do postoperatively in a large number of cases. Therefore, since we felt that as it was not efficacious preoperatively, and since a certain amount of unnecessary harm could be done by administering large amounts of foreign protein [illegible] injection of antitoxin before operation was discontinued.

2. *Operation.*—We have confirmed, and it is not possible to overemphasize the fact, that early surgical débridement is the one single measure of vital impor-

tance in the prophylaxis as well as the treatment of gas gangrene. That such treatment should be completed as early as possible after the wound has occurred is demonstrated in table 3. Furthermore, we have noted repeatedly that, when operation was delayed for long periods the toxicity postoperatively was both deeper and prolonged and that the degree and intensity of the morbidity was likewise increased. We have estimated that the average time for all gas gangrene patients, regardless of nationality or the press of large numbers of patients to reach operation, after wounding was 3.1 days from the time that they were wounded. In order to emphasize the effect of this delay, in six of the eleven deaths which occurred directly as the result of gas gangrene the average wait before operation was longer than 5.2 days.

Not only is early surgical intervention important but also a thorough complete débridement of the wound is essential in the successful treatment of the disease. Reports of case histories of gas gangrene in the closing year of World War I have demonstrated this. Similarly a private communication from one of the nurses stationed at Corregidor prior to its fall in 1942 stated that gas gangrene was being handled quite successfully by extensive débridement and that neither sulfonamides, penicillin nor in many cases whole blood was available.

In accord with the best surgical principles, we have found that in operating on patients with patent gas gangrene, all foreign bodies, metallic as well as nonmetallic, such as splinters, pieces of clothing and dirt, had to be removed to prevent recurrence. Likewise, all damaged and infected muscles or muscle groups had to be cut away. Counterincisions to promote aeration and drainage have been employed more and more. From time to time, in hopes of saving a badly injured extremity, amputation was held off in spite of definite interference with blood supply. This was justified by the saving of an appreciable number of limbs. However, in a few cases in which the circulation was inadequate and moist gangrene supervened, pockets of gas infection were found at the time of amputation. Such cases constitute 3 of the 6 instances in which gas gangrene developed subsequent to primary operation. The importance of thorough débridement and likewise the secondary role of the chemotherapeutic agents with grossly incomplete operation is well exemplified by the following case:

CASE 34.—A private first class was wounded by a shell burst and shrapnel fragments on Oct. 6, 1944 at 10 a. m. Five minutes after he received his injury the wounds were dressed by medical aid men but no sulfanilamide powder was introduced. Sulfadiazine 3 Gm. was taken by mouth. The injuries consisted of extensive and numerous penetrating wounds of the right thigh, leg, foot and also the right arm. These wounds were complicated by compound comminuted fractures of both the right fibula and the right radius. Plasma 500 cc. was administered between the time the wound was dressed and 8 p. m., when he was received at this hospital.

During the twelve hours he remained in the preoperative ward he received 1,000 cc. of whole blood, 500 cc. of plasma, 5 Gm. of sodium sulfadiazine intravenously and 120,000 units of penicillin intramuscularly. Extensive débridement of all wounds was carried out at 8 a. m. October 7, twenty-two hours after being wounded. At this time the circulation of both the leg and the arm was good. Many pieces of shrapnel were removed and much muscle tissue was excised, but no suspicion of gas infection was noted. Because of the vastness of the injury the surgeon felt that the débridement was incomplete.

On the evening of the second postoperative day the soldier complained of severe pain in the right foot and leg. The temperature and pulse rate, which previously were normal, began to rise the following morning.

At 9 p. m. October 10 he was taken to the operating room for inspection of the wound. At this time moderately extensive evidence of gas gangrene (gas bubbles, myositis and edema) was found in the right thigh. Muscle smears at this time were positive. Amputation was performed above the level of the infection. The condition of the wound of the arm was good. Between the first and second operations he received 960,000 units of penicillin, 31 Gm. of sulfadiazine, 500 cc. of whole blood and 500 cc. of plasma.

There is no question that because of the extensiveness of the leg wound and because of the inability of the operator to remove all necrotic and dead tissue the gas infection was able to spread. Notes of incomplete débridement because of poor physical condition or because of critical systemic complications in the general condition of the patient were made in 2 other of the 7 cases in which gas gangrene developed postoperatively.

Routinely, approximately 5 Gm. of sulfanilamide crystals was dusted into wounds after the operation was completed. The maximum employed was 7 Gm., the minimum 4 Gm. We have found, as have others, that it was necessary only to dust the wound and that larger amounts caked and prevented drainage.

At the onset of this study, penicillin was not used routinely at the site of the injury. It was not until approximately two thirds of this series was completed that penicillin was used locally at the time of operation. We had felt that the rapidity of absorption of this drug was so great that local use was of no great importance. However, since dusting penicillin into the wound has become routine we have found that the length of postoperative morbidity has been decreased and that the postoperative course has been less stormy. It may be conjectured, since the gas bacillus grows in dead or dying tissue where the blood supply is absent or minimal, that penicillin given systemically cannot reach the infected area but that by local use the direct effect of the drug is utilized. When penicillin was employed locally it was mixed with the sulfanilamide before being placed in the wound. Twenty-two cases were thus treated with doses of from 33,000 units to 100,000 units dusted in the wound.

3. *Postoperative Treatment.*—Practically as important as the actual procedure was the care and therapy of the patient after reaching the postoperative ward. Treatment had to be carefully balanced between the condition of the patient and the amount of medication necessary.

Sulfonamides were used routinely in doses of 1 Gm. every four hours by mouth, or comparable doses intravenously when the oral route was not available. Although we, as most others,[2] feel that the sulfonamides have no effect against the clostridial organisms, they have a definite place in the therapy of gas gangrene because of their bactericidal or bacteriostatic effect on other virulent and putrefactive organisms. Sulfadiazine was given preference over sulfathiazole, since fewer side reactions were encountered, and was continued rou-

2. Hac, L. R., and Hubert, A. C.: Proc. Soc. Exper. Biol. & Med. 52:61, 1943. McKnight, W. B., Loewenberg, R. D., and Wright, Virginia L.: Penicillin in Gas Gangrene, J. A. M. A. 124:369 (Feb. 5) 1944.

tinely from the time the patient was returned from operation until he was evacuated or until special orders for discontinuance were written. The minimum dose postoperatively was 8 Gm. given to 2 patients who died within twelve hours of operation; the maximum was 60 Gm. The average amount administered was 26.3 Gm.

The most consistent characteristic effect of the toxemia resulting from the infection was the severe anemia produced in all cases. Eventually we discarded several cases from this series because both the toxemia and the anemia were absent. To our mind, both these factors must be present to verify any diagnosis of gas gangrene. This anemia was particularly severe and very difficult to combat. The average postoperative blood count was slightly under 3 million red blood cells per cubic millimeter, with a corresponding hemoglobin average of 62 per cent. Counts as low as 1.5 million were not exceptional. It was necessary to use whole blood in large amounts and at frequent intervals to combat this anemia. Over the entire series an average of 2.7 transfusions of 500 cc. of citrated blood was given. The maximum administered was 5,000 cc. over a period of seven days. Transfusion reactions were more common but not more severe with these patients than with average cases throughout the hospital. In general these consisted of mild to severe chills, with various degrees of hyperpyrexia, urticaria and in 1 case hemoglobinuria and oliguria. All such reactions subsided with appropriate therapy.

Furthermore it was noted that the result of a single transfusion was not nearly as permanent as might be expected. Increases in blood counts and hemoglobin noted a few hours after having received blood were almost obviated twenty-four hours later. This was not nearly as pronounced when the severity of the toxemia abated and may be interpreted as being due to the increased hemolytic effect of the toxins on blood cells, whose fragility may have been increased by standing in vitro.

The specific treatment of gas gangrene infection consisted in the active and aggressive use of penicillin and gas gangrene antitoxin, the former for its action against the organism themselves and the latter for overcoming the toxins produced by them. From the very beginning of this work our observations pointed to the fact that penicillin was active in combating clostridial infections only after débridement had been completed and when minimal foci were present. As our experience increased we felt more and more strongly that the amount of penicillin necessary to combat the infection successfully was insufficient and had to be increased. With the first half of this series an average of 480,000 units was given postoperatively, whereas in the second half an average of 730,000 units was administered. Several patients received as high as 1,200,000 units. At first this was all given intramuscularly. To provide a more rapid increase in the blood level we have recently begun to use penicillin intravenously, independently of the intramuscular route, in doses of 40,000 units together with the intravenous administration of gas gangrene antitoxin, as described in subsequent paragraphs.

Gas gangrene antitoxin was administered to 82 of the 96 patients in doses of from one to forty-four therapeutic doses. The term "therapeutic dose" is used to signify the amount of trivalent gas gangrene antitoxin which contains 10,000 units each of the antitoxins for Clostridium welchi and Clostridium septicum together with 1,500 units of the antitoxin for Clostridium oedematiens. Although Army directives state that eighteen therapeutic doses should be administered in every case, we have modified this procedure and attempted to regulate the amount given by the degree of toxemia. In our experience the antitoxin per se did not seem to have any inhibitory effect on the organisms themselves but was very efficacious against the toxins produced by the infection. To illustrate this the following case history is quoted:

CASE 54.—A private first class was wounded at 4 p. m., Nov. 9, 1944. The wound was dressed with sulfanilamide powder about ten minutes later. Sulfadiazine 3 Gm. was also taken by mouth. The patient was transferred to this hospital at 12:55 p. m. November 10. A tentative diagnosis of gas gangrene infection in a severe penetrating wound of the left thigh was made on admission.

Preoperatively he received 160,000 units of penicillin and 9 Gm. of sulfadiazine. At operation, ten hours after admission, an extensive débridement, with removal of many large metal fragments, was performed. Considerable devitalized, gray, necrotic and edematous muscle tissue was removed. Both muscle and exudate smears were positive. Two counterincisions, one on the medial and one of the posterior aspect of the thigh, were made to insure adequate exposure and drainage; 33,000 units of penicillin and 5 Gm. of sulfanilamide were dusted into the wound.

The patient was returned to the ward in a highly toxic and irrational state. His temperature was 103 F., pulse rate 180, hemoglobin 55 per cent, red blood cell count 2.7 million. Five hundred cc. of whole citrated blood was given, which was followed by an intravenous drip of nine therapeutic doses of gas gangrene antitoxin together with 40,000 units of penicillin over a period of three hours. A severe, generalized urticaria developed but the mental cloudiness partially disappeared. Following this another 500 cc. of blood was given and then another nine therapeutic doses of gas gangrene antitoxin together with 40,000 units of penicillin. Outside of an increase in the urticaria, the condition of the patient improved remarkably. He became mentally normal and the temperature dropped to 99.8 F. but the pulse rate remained high.

Antitoxin one therapeutic dose was given intramuscularly every twelve hours for four doses. Penicillin was also administered intramuscularly in doses of 20,000 units every two hours for a total of 480,000 throughout the entire time. Two transfusions totaling 1,000 cc. of whole blood were also given. Forty-eight hours after the intravenous antitoxin was completed the pulse rate and temperature rose and the patient was returned to the operating room for inspection of the wound. No change in the mental state was noted. On examination, a subcutaneous crepitus was present which extended to the axilla. Extensive longitudinal incisions were made and débridement of the infected tissues was carried out. Since he was moderately toxic on return to the ward it was necessary to give eighteen additional therapeutic doses of gas gangrene antitoxin intravenously over a period of six hours. These completely controlled the toxic state. He was evacuated on the seventh postoperative day. A total of forty therapeutic doses of antitoxin, 3,000 cc. of whole blood, 960,000 units of penicillin intramuscularly and 120,000 units intravenously and 31 Gm. of sulfadiazine were administered. Recovery from gas infection was complete as far as known.

Thus it is obvious that the antitoxin was able to control the toxemia in this case despite the fact that the organisms were still present and active in the wound. Likewise, despite the administration of the antitoxin, the organisms themselves were not inhibited. This was noted in all our cases which, when diagnosed

at the time of operation, required further operative procedures because of the spread of the infection. Such striking effect of antitoxin therapy did not occur in every case, but in a large majority we were able actually to gage the amount necessary by the response to the drug. If no untoward reactions developed with its use we usually considered eighteen therapeutic doses to be a minimum. However, no figure can be given for the total dosage which may be necessary to neutralize the toxin.[1] The following case summary illustrates the manner in which we have attempted in general to judge the amount of gas gangrene antitoxin necessary:

CASE 73.—A prisoner aged 42 presumably was wounded several days before he was picked up by American troops at 2:35 p. m. Sept. 14, 1944. There were dirty dressings covering multiple penetrating wounds of the left buttock and thigh, which were complicated by a severe compound comminuted fracture of the left femur. Wounds of the right calf and right foot also were covered with dirty dressings. All injuries were dusted with sulfanilamide and redressed, and 3 Gm. of sulfadiazine was given by mouth. Plasma 250 cc. also was administered at this time. He was evacuated to this hospital at 12:20 a. m. September 15.

On admission a blood pressure of 68/40 was recorded. Diagnoses of severe shock and of extensive gas gangrene of the left lower extremity were made. The patient was extremely toxic and irrational. The red blood cell count was 2,100,000. Hemoglobin was 50 per cent. Despite the administration of large amounts of fluid intravenously it was impossible to raise the blood pressure to normal limits for any length of time. During the forty-eight hours of preoperative therapy he received 2,000 cc. of whole blood, 2,000 cc. of plasma, 2,000 cc. of glucose 5 per cent in saline solution, 15,000 units of tetanus antitoxin, 440,000 units of penicillin and 8 Gm. of sodium sulfadiazine. Because of increasing coma and toxemia, and because of decreasing resistance, it was decided that operation was necessary, in spite of the precariously low blood pressure.

The patient was admitted to the operating room at 4 a. m. September 17. A high guillotine amputation of the left thigh was performed because of extensive loss of bone and extensive gas gangrene in the entire thigh and calf. Gas was found to extend into the abdominal wall above Poupart's ligament and to the entire left buttock region. Five hundred cc. of whole blood, together with 500 cc. of blood plasma was given during the amputation. Because the condition of the patient was becoming more and more critical, only counterincisions were made in the calf and buttock without any major débridements being carried out. Six Gm. of sulfanilamide was dusted into the wound.

On return to the gas gangrene isolation tent the blood pressure was 70/50 mm. of mercury, the red blood cell count 2,000, hemoglobin 50 per cent and temperature 104 F. The patient was toxic and irrational and appeared to be dying. One thousand cc. of whole blood followed by 500 cc. of plasma was introduced under pressure. This was followed by nine therapeutic doses of gas gangrene antitoxin in 700 cc. of saline solution. No appreciable change was noted, and another nine therapeutic doses of antitoxin were given over a period of three hours. The temperature dropped to 102.2 F. and the blood pressure remained constant at 70/50. At this time the patient seemed to be slightly less irrational and also seemed to be resting quietly at times.

Fifteen hundred cc. of blood and 500 cc. of plasma were again given, followed in turn by twelve additional therapeutic doses of gas gangrene antitoxin in 1,000 cc. of saline solution and glucose 5 per cent. Four hours after this was completed there was a noticeable change in the condition of the patient. The mental state appeared more normal, actions became purposeful and there was a general diminution in the toxemia. The pulse rate was 110, blood pressure 80/60, red blood cell count 2,800,000, hemoglobin 62 per cent and temperature 99 F. Since the patient had not urinated, catheterization was done and 100 cc. of thick viscid urine containing many red blood cells and 3 plus albumin was removed.

During the next twelve hours four additional therapeutic doses of gas gangrene antitoxin were given followed by 1,000 cc. of blood. Despite the facts that the blood pressure still remained at 90/60 and the anuria continued, the general condition of the patient seemed to be improving. To combat the faulty kidney function 500 cc. of 10 per cent glucose was given intravenously throughout the day. One hundred cc. of 50 per cent glucose and aminophylline in 10 cc. doses were also given twice during the twenty-four hour period.

On the third postoperative day the patient was decidedly edematous and began to show signs of uremia. Urinary function was not resumed and the patient died on the fourth postoperative day. During this entire period he received thirty-four therapeutic doses of gas gangrene antitoxin, 960,000 units of penicillin, 15 Gm. of sodium sulfadiazine, 500 cc. of blood plasma, 3,000 cc. of whole blood, 500 cc. of 10 per cent glucose, 300 cc. of 50 per cent glucose and 30 cc. of aminophylline.

Postmortem examination revealed signs of uremia, pulmonary edema and generalized anasarca. No evidence of gas gangrene was found in the amputation stump, and only old necrotic muscle tissue, with no gas involvement, was found in the other wounds.

It is our opinion that death here resulted from uremia following kidney failure which was secondary to the prolonged period of shock, and that, had the patient been able to overcome the anuria, he would also have overcome the gas gangrene infection.

Reactions to the horse serum, despite negative intracutaneous and ophthalmic tests, were common and were noted in 75 per cent of all our cases. These reactions were manifested by urticaria, chills and fever. We felt that because of the severity of the disease itself, as compared with the mildness of the reactions, they were not sufficient indication for cessation of therapy. This was proved repeatedly by experience, and we have felt justified many times in continuing the infusions despite the presence of these untoward effects. However, one severe anaphylactic reaction did occur. This manifested itself by severe respiratory embarrassment, dyspnea, orthopnea, cardiac irregularity with gallop rhythm, cyanosis and, three hours later, death. Epinephrine, ephedrine and aminophylline in large doses intravenously and intramuscularly were not effective. The reaction occurred after approximately 10 cc. (one-half the therapeutic dose) of the antitoxin had been administered.

The following briefly is the general procedure which we have developed, which has proved in our experience to be the most efficacious in the treatment of gas gangrene postoperatively:

1. Sensitivity test for horse serum immediately on return to postoperative ward, 0.1 cc. of undiluted serum intracutaneously and 0.1 cc. of a 10:1 dilution intraconjunctivally.

2. Nine therapeutic doses of gas gangrene antitoxin in 700 cc. of isotonic solution of sodium chloride as a continuous intravenous drip over a three hour period; 40,000 units of penicillin introduced through the rubber tubing at the start of infusion. A rest period of from three to four hours to observe the effect of the antitoxin. If anemia is present, 500 cc. of whole blood to be transfused at this time.

3. Repetition of 2 until signs of toxemia begin to abate. No limit has been set on the number of therapeutic doses of antitoxin to be administered.

4. Penicillin 20,000 units every two hours together with sulfadiazine 1 Gm. every four hours or, if the oral route is not available, 10 to 15 Gm. of sodium sulfadiazine intravenously per day. A minimum of 720,000 units of penicillin, not including that given intravenously, should be completed by the intramuscular route before therapy is completed.

5. One therapeutic dose of antitoxin every twelve hours intramuscularly after the completion of the intravenous therapy for a minimum of four injections.

6. Hemoglobin, red blood cell count, hematocrit, intake and output checked daily; whole blood as necessary.

Criteria of Cure.—In many cases it was difficult to evaluate a cure because it was often necessary to evacuate patients before we were sure that the disease was completely eradicated. Criteria therefore were limited to examination of the wounds to determine if further extension had taken place or to see if the wound was clean. Besides this, temperature and pulse had to be normal and all evidences of toxemia eliminated. Muscle smears were not made at time of inspection of the wound.

Mortality.—As has been stated, we have attempted to maintain a rigid and high standard of diagnosis. To the best of our medical and surgical knowledge all patients in this series treated for gas gangrene infection actually were infected with a virulent form of the disease. Likewise "prophylactically treated" cases or doubtful cases are eliminated from the scope of this discussion.

In an evacuation hospital, patients are rarely kept for long periods of time, but they are evacuated as soon as the surgeon considers them to be transportable. For this reason, and also because of the military situation, it was often necessary to evacuate patients before a definite cure could be determined. However, follow-up cards were included in each jacket as the patient was evacuated. The cooperation of medical officers in rear echelons has been excellent, and all cards of cases in which the outcome was doubtful have been completed and returned.

TABLE 6.—*Postmortem Findings in 15 Cases*

	Cases
Death due to anaphylaxis and serum reaction, gas gangrene still present in tissues	1
Death due to peritonitis from intestinal wounds, gas gangrene not found post mortem	2
Death due to traumatic irreversible shock, gas gangrene not present post mortem	1
Death due to anuria following profound prolonged irreversible shock, gas gangrene not present post mortem	1
Death due to uncontrolled gas gangrene infection (4 cases proved post mortem)	10

To the best of our knowledge, 15 patients of the entire series of 96 have died. Postmortem examinations were completed in about one half of these cases. When a postmortem examination was not made, the death was classified as being due to gas gangrene. A summary of these postmortem findings is included in table 6.

Thus, no pathologic evidence of gas gangrene could be found in 4 of the total of 15 cases in which death occurred after treatment for gas gangrene infection. All of these cases had complete anti-gas gangrene therapy before death. They can therefore be deleted, thus making the mortality rate for the series of 96 cases 11.5 per cent.

COMMENT

Various interesting data have been derived from this statistical and therapeutic discussion of a series of 96 cases of "clinical gas gangrene" treated in an evacuation hospital in northern France during the four months beginning July 25 and ending Dec. 1, 1944. An incidence of 16.0 cases per thousand surgical admissions with a mortality rate of 11.5 per cent has been noted. These cases represent not only American but also Free French, French civilian and prisoners of war casualties.

With the criteria for the diagnosis of gas gangrene, both preoperatively and at the time of operation, that have been outlined, as a basis, 35.4 per cent of our cases were diagnosed before reaching the operating room; 57.4 per cent were first noted at the time of operation; the remaining 7.2 per cent developed the infection postoperatively.

The highest incidence of gas infection (52 per thousand surgical cases) was found in the prisoner of war group. This was six times higher than the American (8.0 per thousand), four times higher than the Free French (12.3 per thousand) and seven times greater than the civilian (7.8 per thousand). This was probably due to delay in the initial dressing of the wound and also to the delay between wounding and definitive therapy. Evidence tended to point to the increased fragility and friability of the German clothing and the larger amounts of this clothing found in the wounds.

As has been suggested previously (Bailey [3]) we have shown that wounds of the buttocks were most prone to develop gas gangrene (55.4 per thousand cases), those of the thigh next (37.2 per thousand cases), shoulder (11.2 per thousand cases), upper extremity (10.3 per thousand cases) and leg (9.7 per thousand cases).

Active treatment of gas gangrene infection must begin early to produce maximal beneficial effects. Once clinical gas gangrene has developed, the therapy must center around radical surgery, laying the wound wide open, the lavish use of counterincisions and, if necessary, amputation of the part. In the entire series five upper extremities and seven lower extremities were amputated for this reason.

Surgery alone, however, was not completely efficacious in treating the infection. Sulfonamides, penicillin and gas gangrene antitoxin, together with the use of vigorous supportive measures, were of inestimable value in the saving not only of limbs but also of lives.

From our observations we have felt that the sulfonamide compounds were of little value against the clostridia themselves but had tremendous therapeutic effect against other contaminants of the wound. This is in agreement with many other observers. Hac and Hubert,[2] McKnight, Loewenberg and Wright [2] and others have demonstrated the inefficacy of sulfonamide compounds against the gas gangrene infection in both in vivo and in vitro experiments.

The value of penicillin has been a question for some time. There is no doubt that penicillin alone, or even complemented with gas gangrene antitoxin, is insufficient to inhibit the disease once infection has set in and has begun to spread. In vitro experiments [4] held promise that this drug would be of value in the treatment of clostridial infections. Animal experiments with penicillin have not carried over completely to man, and Keefer, Blake, Marshall, Lockwood and Wood [5] indicate that more clinical observation is needed in human cases before adequate conclusions may be drawn.

3. Bailey, Hamilton: Surgery of Modern Warfare, 1944, vol. 2, p. 275.

4. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Lancet 2:226, 1940. Chain, E.; Florey, H. W.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A.; Orr-Ewing, J., and Sanders, A. G., ibid. 2:226, 1940. McIntosch, J., and Selbie, F. R., ibid. 2:750, 1942.

5. Keefer, C. S.; Blake, F. G.; Marshall, E. K. Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the Treatment of Infections, J. A. M. A. 122:1217 (Aug. 28) 1943.

Jeffrey,[6] Cutler[7] and Harvey and Meleney[8] were disappointed with the effect of penicillin when used against Cl. sordelli and Cl. welchi. On the other hand, Herrell, Nichols and Heilman,[9] Kepl, Ochsner and Dixon[10] and others are satisfied that this drug is satisfactory in the treatment of the infection. We, from our observations, are heartily in accord with the latter. Penicillin in large doses, both locally, intramuscularly and intravenously, has helped in the reductions of both mortality and morbidity of the disease.

We furthermore are in accord with Herrell[9] and the British investigators[11] that penicillin alone is not efficacious and that it must be combined with the antitoxin and surgical operation. While penicillin may definitely inhibit the growth of the organisms, the neutralizing effect of the antitoxin is essential for the cure of the disease. However, we have found that the preoperative use of the antitoxin is not to be recommended. Moreover, we have been able in most of our cases to determine the amount of antitoxin needed postoperatively by judging the effect on the clinical course of the toxemia.

SUMMARY

1. Ninety-six cases of clinical gas gangrene infection were treated at an evacuation hospital in four months of service in northern France, an incidence of 16.0 per thousand battle casualties.

2. The incidence of gas gangrene was highest in the prisoners of war (62 per thousand battle casualties) and was considerably lower in Americans and Free French (9.9 per thousand and 12.3 per thousand respectively).

3. The development of gas gangrene is influenced by the time interval between the initial wound and the primary first aid dressing; also by the delay in accomplishing definitive surgery.

4. Gas gangrene is most prone to develop in wounds of the buttocks, thighs, shoulder and upper and lower extremities in the order named.

5. Radical, extensive, thorough and early surgery is the most important factor in the prophylactic and therapeutic treatment of gas gangrene.

6. Sulfonamides, both locally and by mouth, have little or no effect on the development of gas gangrene.

7. Penicillin in large doses was found to be an excellent adjunct in the chemotherapeutic treatment of gas gangrene. It is not sufficient in itself to control the infection but, when used in conjunction with surgery and antitoxin, has been of inestimable value.

8. Gas gangrene antitoxin appeared to have little value preoperatively. Its main value is the neutralization of the toxemia postoperatively. Furthermore, little effect against the organisms themselves was noted. The dosage could not be dogmatically determined, since it varied with the degree of toxemia. A minimum of eighteen therapeutic doses is recommended when no sensitivity or other contraindication is found.

9. Eleven patients of the total of 96 died as the direct result of gas gangrene infection, a mortality rate of 11.5 per cent.

6. Jeffrey, J. S.: Brit. M. J. 2: 656 (Nov. 20) 1943.
7. Cutler, E. C.: Brit. M. J. 2: 655, 1943; J. A. M. A. 124: 117 (Jan. 8) 1944.
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9. Herrell, W. E.: Nichols, D. R., and Heilman, Dorothy H.: Penicillin, J. A. M. A. 125: 1008 (Aug. 12) 1944.
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11. Discussion on Penicillin, Lancet 2: 638, 1943.

THE TREATMENT OF CERTAIN TYPES OF FRACTURES

WITH A V2A STEEL NAIL IN THE MEDULLARY CAVITY (THE KÜNTSCHER METHOD)

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Böhler[1] in his book predicted that "advances similar to the Sven Johansson treatment for fractures of the neck of the femur would enable us in the future to treat certain types of fractures of other bones in the same way." His words came true when in 1940 Küntscher[2] introduced his method. His experiments on animals had proved that fractures of the shaft of the long bones had healed very nicely by putting a V2A nail in the medullary cavity through a small opening in the epiphysial end. Since then he has treated many cases with excellent results and in 1944 Böhler published a third volume to his book giving the results in 500 cases.

As the nail finds its fixation in both the epiphysial ends without injuring the articular cartilages (in children great care should be taken to avoid the epiphysial disk) it will be understood that the best type of fracture for this method is the transverse one in the diaphysis. The nail in these cases gives a very exact reduction without chance for displacement. A few days after the operation—which should be done as soon as possible after the accident—the patient is able to walk about and to leave the hospital. In particular to elderly people this means a great advantage as it prevents a stiffening of the joints, atrophy of the muscles, decubitus and hypostatic pneumonia. The exact reduction of the transverse fracture with its frequent great displacement of the fragments and the quick mobilization form the best indication for the use of the Küntscher nail. In the more oblique type of diaphysial fractures only the exact reduction is in some cases already an indication. For compound fractures—if treated within the time limit of six to ten hours—the same indications are of value. Excellent results are also reached in the treatment of pseudarthroses, provided the fibrous tissue is removed and fresh bone surfaces are approximated.



Fig. 1 (patient A, man aged 52).—Closed transverse fracture of the femur.

Küntscher and later his collaborators (Maatz) used nails of different form and sizes in accordance with the type of bone. For the femur they use a straight type of nail and for the tibia and humerus a slightly curved one. Before the operation a very exact x-ray examination should be made of the width of the medullary cavity and the length of the bone. The reduction of the fracture

A more extensive publication on this subject will appear shortly.
From the Surgical Department of the St. Canisius Hospital, Nymegen (in the already liberated part of the Netherlands).
1. Böhler, L.: Technik der Knochenbruchbehandlung im Frieden und im Kriege, Vienna, Wilhelm Maudrich, 1942-1943.
2. Kuntscher, G.: Zentralbl. f. Chir. 67: 1145 (June 22) 1940; 68: 1837 (Nov. 21) 1942.

is done with the help of a special frame under fluoroscopic control, and special attention should be given not only to the exact reduction of both the fractured ends but also to the exact reduction of the axis of the whole bone in regard to the axial fixation of the nail in the spongy substance of the distal epiphysis. For the femur an opening is made in the trochanteric fossa just medial of the greater trochanter with a piercer, and a thin stiff nail is pushed toward the medullary cavity beyond the fracture into the distal fragment. Then the Küntscher nail is slipped over the thin wire, which then will be removed. For the tibia a weak spot just above the tuberosity and in fractures of the humerus both the epiphyses are used.[3]

As will be easily understood, a complete set of instruments and a large collection of nails, an excellent x-ray equipment, reduction frames and an extensive experience are needed if good results are to be obtained. X-ray controls in connection with the formation of callus must be made at regular intervals to determine the date of the removal of the nail. Through a small incision the perforated head of the nail, which all the months needed for consolidation remained outside the bone, is "hooked" with a special instrument, and without any force the nail is easily removed.

Though the method introduced by Kuntscher is an operative one, the extent of the operation is limited to a very small incision at the epiphysial end at the time of the application and the moment of the removal of the nail. Any type of anesthesia which gives complete relaxation of the muscles may be used.

Our own experience with the Kuntscher method is a very good one despite the many great handicaps we had and which were due to war conditions. We had at our disposal only a limited number of nails on the one hand and a very large number of war casualties on the other, who arrived in such numbers in our hospital that, even if we had had a sufficient number of nails, we nevertheless could not have handled them all in the required time limit for the treatment of compound fractures. In addition to these disadvantages we did not have x-ray screens to control reduction during operation, so we decided in some cases to open the fracture and to put the nail in the shaft—in case of a femur fracture in the proximal fragment—and hammered it retrograde in the epiphysis. Subsequently reduction was done and the nail brought in the distal fragment.

Our experience with the Kuntscher method may be divided into two groups: (1) closed fractures and (2) compound fractures.

1. We operated on 21 closed fractures of the femur, 5 of the tibia, 2 of the humerus, 2 of both radius and ulna, 2 of the fibula and 2 of the olecranon. Figures 1 and 2 show ideal types of transverse diaphysial fractures of the femur and humerus. These patients, aged 52 and 13 respectively, left the hospital after fourteen and eighteen days.

That also in the spiral type of fracture the result may be excellent is demonstrated by figures 5 and 6, of a spiral fracture of the femur in a child of 12 years, though a quicker mobilization than normal could not be obtained.

In cases of a fracture at the lower and diaphysial end of both tibia and fibula we put a thin V2A steel wire in the medullary cavity of the fibula, then reduced the very often greatly displaced tibia fragments under fluoroscopic control (in the x-ray department of the hospital) and applied a circular plaster of paris cast. To prevent possible formation of a pseudarthrosis (as might be feared to develop with an "intact" fibula) we had the patient mobilized soon after the operation.

In rare cases of epiphysial fracture the nail may be of great value, as is shown in figures 7 and 3 of a subtrochanteric fracture of the femur with a great displacement of the fragments. Fractures of the olecranon may also be treated with a Kuntscher nail.

Our 10 compound cases had at the time of their arrival in the hospital a complete revision of the wound



Fig 2 Fig 3 Fig 4

Fig 2 (patient A).—Immediately after Küntscher nail has been introduced ideal reduction, axis of the bone restored. Fig 3 (patient C).—Nail introduced ideal reduction of the fracture shown in figure 7. Fig 4 (patient D, girl aged 17 years).—Five months after operation, nail having been introduced four weeks after the accident, splendid consolidation, new bone around the nail bridging the defect, function 100 per cent.

—a splint and sulfanilamide locally as well as generally. In this way we were able to prevent infection of the wound to a large extent. If then, sometimes after weeks, we had a nail at our disposal, we placed it in the medullary cavity and covered the periosteum with muscle but left the wound completely open to enable drainage of the wound secretion. Kuntscher himself never went so far as to use his method in compound fractures secondarily. Probably he did not have to. But we had many cases with a complete fragmentation of the bone by shell or bomb fragments and a very substantial displacement of the bordering shaft fragments. We expected that the nail, besides an ideal

3 Nordmann. Arch. f. klin. Chir. **200**: 71, 1940.

restoration of the axis of the fractured bone, should enable the formation of new bone substance around that part of the nail which bridges the defect, as at least some of the bone splinters might furnish the necessary osteoblasts.

Other advantages might be obtained: easier and less painful handling of the extremity, the possibility of using the joints, the prevention of atrophy and last but not least the decrease of the wound secretions. In some cases traction should be exercised to forestall the shortening of the bone, which happened sometimes when the muscles retracted the distal fragment to the proximal one, in particular in cases in which a certain area had been split up into many small fragments. Though theoretically we considered the possibility of a developing osteomyelitis outside the place of the fracture, we never saw it happen. In this respect we attached great value to the use of sulfanilamide both locally and generally. All the aforementioned objectives were reached in most of our cases. Figure 4 shows a case of compound splinted fracture of the humerus in a girl of 17 in which bony reunion in ideal position was obtained.

Even in late cases of compound fractures the method may prove to be of value.

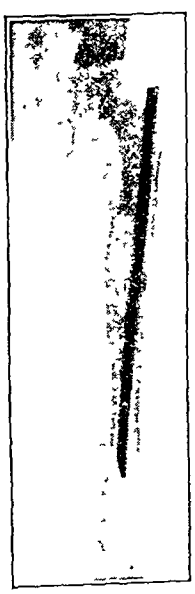


Fig 5

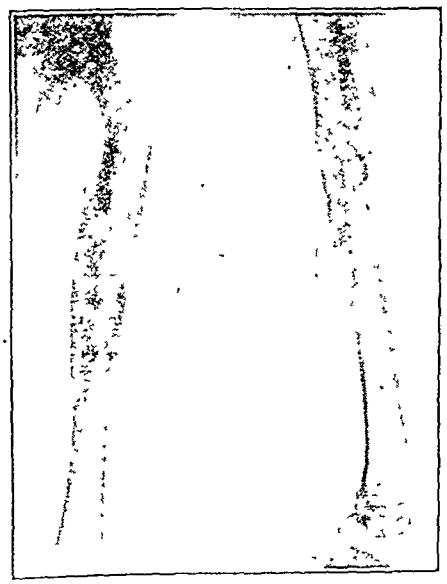


Fig 6



Fig 7

Fig 5 (patient B, girl aged 12 years).—Four months after operation perfect consolidation, with full restoration of the anatomy without shortening. Mobilized three weeks after operation; two weeks later, function 100 per cent. Fig 6 (patient B).—Appearance two weeks later. Fig 7 (patient C, girl aged 9 years).—Subtrochanteric fracture of the femur with great displacement of the fragments. See figure 3

Ascendency in Medicine.—A distinguished historian recently remarked that few nations which have achieved ascendency in medicine retain that preeminence for more than fifty years. French medicine gained a commanding influence in the Western World during the time of François Magendie; soon after he died, leadership passed largely to Germany; now it has come to England and the United States. Magendie's life coincided with the most critical period of French history: the chaos of the late eighteenth century, the French Revolution and the subsequent rise of democratic government and the appearance of physicians such as Corvisart, Bichat, Laënnec, Louis and Cruveilhier. Then came the rise of scientific medicine associated so intimately with the names of Flourens and LeGallois, but more particularly with the positive leadership of Magendie. —Olmsted, J. M. D.: François Magendie, New York, Schuman's 1944.

THE EFFECT OF PENICILLIN ON HEPARIN TOLERANCE

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AND
DONALD L. KESSLER, M.D.
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The occurrence of extensive visceral hemorrhages in 2 patients with bacterial endocarditis treated by penicillin suggested this study.

REPORT OF CASES

CASE 1.—Mrs. M. S., white, aged 37, entered St. Joseph Hospital May 5, 1944 because of intermittent chills and fever since November 1943, starting three weeks after the delivery of a normal child; weight loss of 20 pounds (9 Kg.) in six months; sudden onset of right hemiplegia on Jan. 30, 1944, which had improved considerably since its onset; moderate dyspnea, palpitation, and morning headaches. Physical examination showed pallor, emaciation, and evidence of an old right hemiplegia. The lungs were normal. The heart was slightly enlarged. There was a loud blowing systolic murmur over the mitral area. Serial blood cultures taken on admission showed hemolytic streptococci which developed in culture only after seven days. There was a moderate microcytic, hypochromic anemia. The white blood cells numbered 6,700 per cubic millimeter. The urine contained a small number of erythrocytes and leukocytes.

Between May 27 and June 8, 1944, 700,000 units of penicillin was given intramuscularly. Two days after receiving the first injection of penicillin the temperature was normal and there was spectacular symptomatic improvement. However, on June 21 she suddenly developed generalized tonic and clonic convulsions lasting for two hours, followed by contusion. She became comatose on June 23 and died on June 26.

The anatomic findings at necropsy were extensive spontaneous subarachnoid hemorrhage of the base of the brain secondary to a large hemorrhage of the pons, almost healed endocarditis of the mitral valve (hemolytic streptococci, clinical), small recent infarct of the left lung, ancient infarct of the spleen and cystitis of the urinary bladder.

The changes on the mitral valve were mild—only slight toughening—but the changes in the brain were extensive. A thin layer of hemorrhage in the subarachnoid area covered the medulla, pons cerebral peduncles, and portions of the cerebellum and temporal lobes. The pons contained an oval area of hemorrhage 2.5 cm. in diameter, and there was a perforation into the third ventricle. Both lateral ventricles and the third ventricle contained blood clot.

CASE 2.—Mrs. O. B., white, aged 22, five months pregnant, entered St. Joseph Hospital on May 12, 1944, complaining of a profuse vaginal discharge and dysuria for one month, chills, fever and multiple painful swollen joints for six days. The heart, lungs and abdomen were normal. Cervical and urethral smears and cultures showed gonococci. The patient was given a total of 24 Gm. of sulfamerazine in five days and was dis-

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charged on May 17, symptom free. One week later at home the patient had a recurrence of her symptoms and again received 20 Gm. of sulfamerazine.

On June 24 the patient entered the hospital complaining of chills, fever, malaise and a weight loss of 17 pounds (7.7 Kg.). Essential physical findings at this time were a seven months pregnancy; daily fever to levels as high as 104 F.; pallor; fine moist rales in both lung bases, moderate enlargement of the heart; loud blowing systolic and diastolic murmurs at the left base, a harsh systolic murmur at the right base and a soft systolic murmur at the apex; and liver enlargement 4 cm. below the costal margin. The spleen was not palpated. There were no petechiae. There was a moderate hypochromic microcytic anemia. The white blood cell count was 17,600 cells per cubic millimeter. The urine contained many erythrocytes and leukocytes but no albumin or sugar Serial blood cultures were negative after twenty-one days

On June 27 the patient, in the seventh month of pregnancy, went into labor and delivered a viable baby. Intramuscular penicillin was then started, and in the next twelve days 1,200,000 units was given. During the first five days 1,100 mg. of heparin also was given. In addition the patient received transfusions

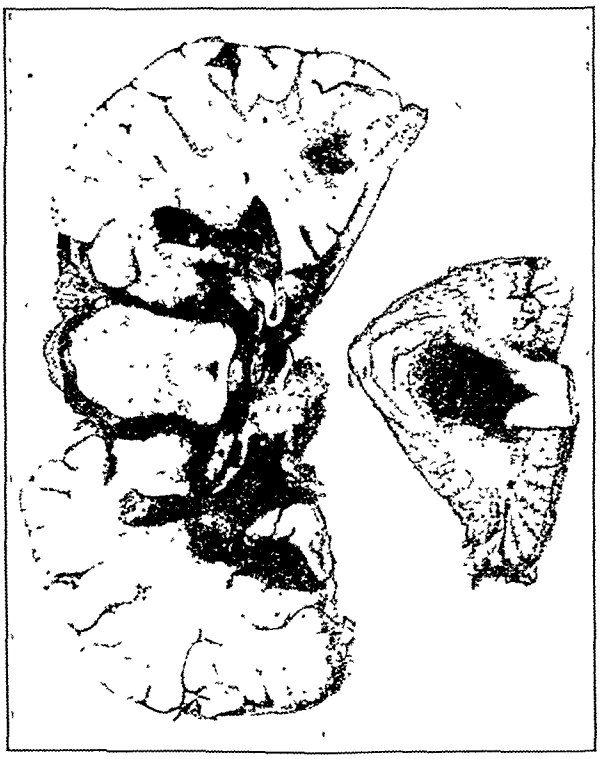


Fig. 1 (case 1).—A thin layer of hemorrhage in the subarachnoid area covers the medulla, pons, cerebral peduncles and portions of the cerebellum and temporal lobes. The pons contains an oval area of hemorrhage 2.5 cm in diameter, with a perforation into the third ventricle. Both lateral ventricles and the third ventricle contain blood clot.

of whole blood. The temperature gradually subsided and reached normal in seven days. However, the patient developed an intractable cough, and there were many coarse rales scattered throughout both lung fields The respiratory rate and pulse rate increased. The abdomen gradually became distended, and on July 7 there was a generalized anasarca. There was no abdominal pain or vomiting The patient developed anuria on July 9 and died on July 10.

The anatomic findings at necropsy were vegetative and ulcerative endocarditis of the aortic and tricuspid valves with erosion and perforation of both valves, acute perforated ulcer of the stomach with extensive hemorrhage into both the lesser and greater peritoneal cavities; extensive petechial hemorrhages of the peritoneum, pericardium, pleurae and serosa of the small intestine; pronounced dilatation of the right atrium; slight dilatation of the left ventricle, right ventricle and left atrium; retained placenta in an enlarged uterus; acute splenic tumor; cloudy swelling of all viscera; chronic passive hyperemia of the liver, and bilateral hypostatic pneumonia.

The greater peritoneal cavity contained air and over 1 liter of partially clotted blood. The lesser peritoneal cavity was also filled with clotted blood. High up on the posterior wall of the stomach was an oval perforation 1 cm. in diameter.

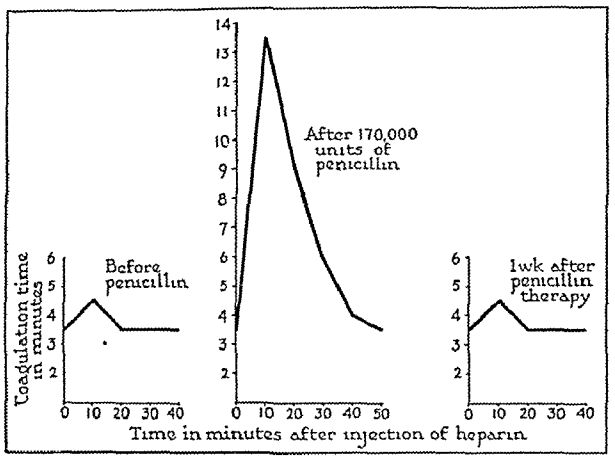


Fig. 2 (Miss S.).—Interlobar empyema.

Adjacent to the perforation there was a small zone of superficial ulceration. The wall at this site was not thickened. The serosa of the small intestine and the mesentery were mottled with large petechial hemorrhages. Similar but less extensive hemorrhages were observed in the pericardium and pleurae.

COMMENT

The 2 patients whose histories are recorded present the following points of similarity: proved bacterial endocarditis, early improvement by penicillin therapy and fatal termination from hemorrhage, 1 by extensive cerebral hemorrhage, the other by widespread, intraperitoneal, mesenteric and pleural hemorrhages. One patient received heparin, while the other did not. Although one might consider the hemorrhage in each patient to be only a manifestation of the sepsis, we felt that there was enough evidence to warrant a study of the effect of penicillin on the clotting mechanism, and particularly to study the effect of penicillin on the reaction of the blood to heparin. This is particularly important, because many clinicians use heparin in con-

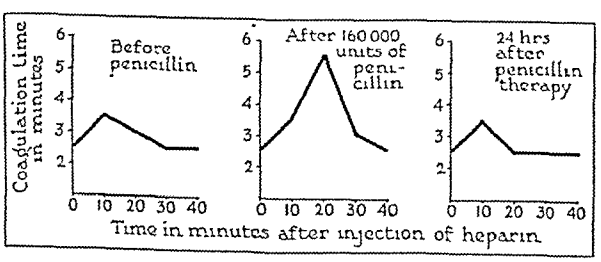


Fig 3 (Mrs. S.).—Hodgkin's disease (control).

junction with penicillin in the treatment of bacterial endocarditis.

Studies were made on a series of patients before penicillin was administered, during the course of penicillin therapy and after the penicillin had been discontinued. These included erythrocyte counts, hemoglobin determinations (Sahli), prothrombin times (Quick), platelet counts (Rees and Ecker) and heparin tolerance

curves (de Takats).[1] In each case the penicillin was administered intramuscularly in doses of 10,000 Oxford units every three hours. The total dosage of penicillin employed varied from 140,000 to 2,500,000 units. In the patients studied there was a variety of disease conditions present. One half of the patients studied had diseases which are not considered suitable for penicillin therapy and therefore served as controls.

Although in the 10 cases studied there were no significant changes in the erythrocyte count, hemoglobin, platelet count or prothrombin time, a definite change was produced in some patients in the heparin tolerance curve. The intravenous injection of 10 mg. of heparin produces a slight increase in the capillary coagulation time, usually maximal in ten to twenty minutes, and increasing the coagulation time to between four and seven minutes. When the maximal coagulation time is less than four minutes the response is classified as a "hyporeactor" and if it is over seven minutes the individual is classed as a "hyperreactor." In 2 patients of our series who had received penicillin (both "normal reactors" before penicillin was administered) a spectacular delay in coagulation occurred after the administration of 10 mg. of heparin, increasing the maximal response to heparin to seven minutes in 1 patient, and to thirteen and one-half minutes in another. In 5 cases mild increases of one to two minutes were noted, but these were not considered sufficiently high to justify any conclusion. In 3 cases no change occurred. Examples of the different types of response are shown in figures 2, 3 and 4.

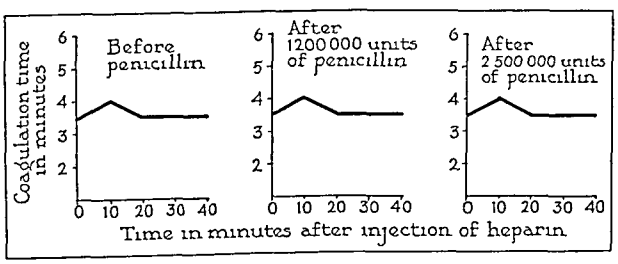


Fig. 4 (Mr. M.).—Subacute bacterial endocarditis

Symptomatic reactions of an allergic type developed in 2 patients. Alarming dyspnea, cyanosis, cough, tachycardia, sweating and weakness were produced by the heparin injected while a course of penicillin was being given. Similar severe reactions from intravenous heparin alone have been recorded by de Takats, and therefore penicillin cannot be incriminated as the offending agent here.

It is well known that some drugs, notably digitalis and the salicylates, change the tolerance to heparin. The patients in this series received only penicillin.

Although sweeping conclusions cannot be drawn from this small series, 2 patients demonstrated a definite increase in blood coagulation time during a course of penicillin, as measured by the heparin tolerance test. Minor changes in 50 per cent suggest a slight tendency of a similar nature in others. This tendency seems to be particularly important in the treatment of patients with bacterial endocarditis if heparin is used as an adjuvant to penicillin. These studies suggest that it is advisable to run heparin tolerance or heparin sensitivity tests as a precautionary measure if heparin and penicillin are to be used at the same time.

1. de Takats, G.: Surg., Gynec. & Obst. 77:31-39 (July) 1943

SUMMARY

Death from extensive visceral hemorrhages occurred in 2 patients who had received penicillin therapy for bacterial endocarditis, in spite of great symptomatic improvement following the initial doses of the drug, and in spite of almost complete healing of the endocarditis in 1 case. Subsequent studies on 10 patients receiving penicillin showed profound effects on the sensitivity to heparin in 2 patients, no effect on the heparin tolerance curve in 3 patients and slight but inconclusive increase in 5 patients. No change in the hemoglobin, erythrocyte counts, platelet counts or prothrombin times was demonstrated.

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INTRA-ARTERIAL INJECTION OF PENICILLIN FOR INFECTIONS OF THE EXTREMITIES

PRELIMINARY REPORT

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This report includes 24 cases treated for serious infections in the extremities. We present what we believe to be the first series in which penicillin was administered by the intra-arterial route. The excellent results obtained are noteworthy. These findings assume added importance at this time because 70 per cent of war casualties are associated with wounds in the extremities. An even higher percentage of traumatic lesions of the extremities are observed in war industries. Since these injuries are frequently complicated by infection, a preliminary report on the utilization of penicillin by the arterial route would seem to be timely.

HISTORY

The history of intra-arterial therapy dates back to 1914. In this year Goyanes[1] in Spain, Fiolle[2] in France and Heddaus[3] in Germany injected various drugs with more or less doubtful effect. A few years later, following the discovery of mercurochrome, occasional optimistic reports appeared in the literature. Dos Santos[4] and Lamas[5] in Portugal and Leriche,[6] de Fourmestraux[7] and Fredet[8] in France deserve credit for stimulating renewed interest in the intra-arterial method. The arterial route was utilized for the injection of mercurochrome, gentian violet, colloidal silver, acriflavine and other drugs and serums. Luccarelli[9] reported 36 cases in which the local pathologic con-

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3. Heddaus, A.: Beiträge zur Heilserumbehandlung des Tetanus, München. med. Wchnschr. 61:2186, 1914.
4. Dos Santos, Reynaldo: Arterial Injections with Stasis in the Therapy of Infections, Surgery 5:436-443, 1939.
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6. Leriche, R.: A propos de la therapeutique des infections par voie intra arterielle, Mem. Acad. de chir. 66:47, 1940.
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8. Fredet, M.: Les injections intraarterielles de mercurochrome dans le traitement des infections de membres des plaies atones et des ulcères variqueux, Cong. franç. de chir. 46:543, 1937.
9. Luccarelli, Vincenzo: Intra-Arterial Injection Therapy in Several Disorders of the Extremities, Policlinico (sez. prat.) 45:1945 (Oct. 31), 2038 (Nov. 7) 1938.

dition was favorably influenced in every case from the point of view of control of the infection. Many of his cases which ordinarily would have required incision and drainage were cured by only one intra-arterial injection. He observed that, "no doubt, the intra-arterially injected gentian violet causes changes in the local circulation, witnessed by the purple coloration of the parts most seriously injured, as well as sensations of heat followed by relief of pain and a sense of comfort in the affected limb." Recently the sulfonamides have been used with excellent results. In the present war the Russian authors A. and E. Titelbaum,[10] reported their results as "striking" in which 100 to 150 cc. of 0.85 per cent solution of sulfanilamide was used in 15 cases. Other Russian surgeons, especially Martinoff,[11] mention the prophylactic value of mercurochrome and sulfanilamide for extremity wounds during the present war. In these cases débridement of wounds was routine.

PHYSIOLOGIC CONSIDERATIONS

The physiologic basis of the intra-arterial method is directed toward local concentration of the therapeutic agent into the infected tissues. The standard methods of applying antibacterial drugs are oral, intravenous, intramuscular and topical. In addition, penicillin is also being administered intrathecally, intrathoracically and intra-articularly with excellent results, these methods proving the efficacy of direct or local concentration. On the other hand, topical application must be differentiated from what we have termed "direct" or "local" use by virtue of the proved data that the former is effective only superficially. The beneficial effects observed when penicillin is deposited in pleural or synovial cavities is unlike the usual local application on wounded surfaces probably because penetration of the drug takes place more readily in the former method. Herrell, Nichols and Heilman[12] have shown that the greatest blood concentration of penicillin, until now, has been obtained by the intravenous route. However, we have been able to reach higher blood levels by means of the arterial method. It is obvious that any drug introduced by any of the preceding routes except the arterial must necessarily be diluted by the volume of the circulating blood. On the other hand, the intra-arterial method implies a minimal dilution of the medicament whereby a higher concentration than by any other means results in the tissues nourished by the artery utilized for the injection. Furthermore, in the presence of inflammation the capillary permeability increases, thus allowing for greater filtration of the drug, which is deposited in greater concentration in the locus of infection and subsequently is released slowly to the general circulation. The fixation of the drug in the infected area is even more effective if, immediately following an intra-arterial injection, a tourniquet is applied proximally for ten minutes. By the method of stasis the concentration of the drug increases. Dos Santos [4] showed by arteriographic studies that the application of elastic compression retarded the passage of medicaments into the general circulation. He injected sodium iodide into the brachial artery and applied a tourniquet proximally. Fluoroscopy revealed that about fifteen minutes after the injection the shadow was visible; then the vessel gradually lost its opacity, "but the tissue gradually became more accentuated, obviously due to the fixation of sodium iodide in the tissue." Other experiments which illustrated the phenomenon of concentration were those of Leriche [6] and Goyanes,[1] who obtained anesthesia of an extremity following the injection of procaine into the vein and artery respectively only by employing the method of stasis. They failed to obtain anesthesia without the application of the pressure cuff. The toxic effects of procaine and absence of anesthesia were evidenced only in those instances in which the tourniquet was not applied. However, it is also of great importance to know beforehand that the molecular weight, p_H and transfusibility of the drug is physiologically adapted for contact and fixation in the involved tissues. Following intra-arterial injection the vasomotor response, increased warmth of the limb and flushing of the skin are noted. How much of this is due to reactive hyperemia following the release of the tourniquet, and what part of this vasodilatation can be attributed to the action of the drug itself has not been determined. Leriche [6] observed an increased temperature of the limb following injection of the femoral artery not only with procaine but with antibacterial substances. His patients indicated that during the injection a wave of warmth descended along the injected artery. Besides the concentrated and prolonged action of antibacterial substances by the arterial route, this procedure allows for greater mobilization of the immunologic forces of the body against bacterial invasion.

COMPLICATIONS

The employment of drugs approaching isotonic concentration for intra-arterial injection should obviate serious complications. Lami [13] notes that there should be no hesitancy about injection through an artery, since it is less fragile than a vein; because elasticity of the needle puncture in the artery wall closes more rapidly than in a vein. Huet and Bargeton [14] and Wilmoth [15] established by animal experimentation that solutions injected intra-arterially were safest when isotonic and with a p_H near that of the blood, thereby avoiding damage to the intima. In our experience we have never encountered arterial thrombosis. Only few serious complications are recorded in the literature and these apparently due to faulty technic or poor selection of the medicament. Dos Santos [4] mentions occasional arterial and venous spasm in the upper extremity, rarely in the lower extremity. He has eliminated this complication after its occurrence by sympathetic ganglion block with procaine. He has never seen arterial thrombosis resulting from this method. Pain, lasting only a few minutes, was occasionally observed during or shortly after injection. Some of our patients complained of moderate pain during the injection, but this disappeared immediately following deflation of the blood pressure cuff. The literature also mentions hematoma as a complication. In no instance have we had this experience, probably because of attention to technic which will be described in the following paragraph. Leriche [6] has not experienced toxic reactions when using the arterial route for the introduction of mercurochrome which were noted when the intravenous route was employed. In our series of 24 cases reported in this paper, no complications except for occasional moderate transitory pain were found.

10. Titelbaum, A., and Titelbaum, E.: Intra-Arterial Introduction of Drugs for Treatment of Local Inflammatory Processes of the Extremities, Khirurgia 5-6: 22, 1943.
11. Martinoff, D.: Intra-Arterial Injection of Antiseptic Drugs, Khirurgia 2-3: 17, 1943.
12. Herrell, W. E.; Nichols, D. R., and Heilman, D. H.: Penicillin: Its Usefulness, Limitations, Diffusions and Detection, with Analysis of 150 Cases in Which It Was Employed, J. A. M. A. 125: 1003 (Aug. 12) 1944.
13. Lami, G.: Direct Injection of Drugs into the Arteries, Paris, Thesis, 1937.
14. Huet, P., and Bargeton, D.: Sur quelques effets des injection intraartérielle, Presse méd. 44: 677, 1936.
15. Wilmoth, P.: Treatment by Intra-Arterial Injection, Presse méd. 47: 1249, 1939.

CONTRAINDICATIONS

Luccarelli [9] states that the intra-arterial method is contraindicated in hypotension, diabetes, nephritis and arterial incompetence, although he gives no justification for these beliefs. On the contrary, our experience leads us to disagree with this author's views. We have not found any contraindications in the intra-arterial method of utilizing penicillin. Arterial thrombosis as a disease entity might be considered as a possible hazard. We feel that it is of no significance other than that it would not lend itself to the introduction of the drug. Here the method of injecting the vein followed by stasis could be substituted. Furthermore, we have injected the femoral artery in the presence of advanced arteriosclerosis without any side-effects. Locally infected areas or thrombophlebitis may be considered as contraindications.

TECHNIC

We mention precautionary measures to be observed before outlining our technic of intra-arterial injection. We are in agreement with Wilmoth in cautioning against transfixion of the artery with the needle. This may be avoided by entering the artery obliquely. It is not essential that the needle be placed in the direction of the blood stream, as mentioned by many writers. Rhythmic jets of blood into the syringe must be observed before injecting. Our technic of intra-arterial injection is as follows:

We employ a 20 cc. syringe to which a gage 20 needle 2½ inches long is attached. In the lower extremity the injection is made into the femoral artery, piercing the skin in the crease of the groin. The left hand palpates the femoral artery, which is best felt above the inguinal crease, especially in obese persons. The artery is fixed between the index and third fingers of the left hand, and the needle is directed from below upward. Close proximity to the artery is noted when an arterial impulse is transmitted from the point of the needle to the syringe. A bright or light colored pulsating stream of blood appearing in the syringe, which contains 50,000 units of penicillin (10 cc.), indicates that the needle is within the lumen of the artery. In the upper extremity, depending on the location of the infection, the brachial artery is punctured at the elbow or more proximally. The blood pressure cuff, which has been applied proximal to the infected area at the beginning of this procedure, is inflated rapidly immediately following completion of the injection, which has been given at the rate of 1 cc. per second. The pressure in the cuff should be 280 to 300 mm. of mercury and is maintained for ten minutes. In order to avoid the possibility of hematoma formation, digital pressure over the puncture site is applied immediately on withdrawal of the needle.

Depending on the local effects and the systemic response (decrease in pulse rate and temperature), a second, third or even fourth intra-arterial injection may be necessary.

PENICILLIN DOSAGE AND EVALUATION

We have empirically used a dosage of 50,000 units of penicillin per injection in all of our cases. Although the clinical results were beyond expectations, the optimum minimal dosage is still left to be ascertained. In our series of cases reported in this paper we have dissolved 50,000 Oxford units of penicillin in 10 cc. of isotonic solution of sodium chloride. This may be regarded as being ideal for intra-arterial injection, since it is practically isotonic. The p_H of this solution as determined in our laboratories is 7.4 (p_H of blood is 7.3-7.5).

The bacterial flora commonly found in infections of the extremities is usually responsive to penicillin. The question arises how this drug of choice should be utilized to its best advantage. Romansky and Rittman [16] have described a new method for prolonging the action of penicillin by the medium of beeswax in peanut oil given intramuscularly. Fleming and his collaborators [17] in a recent paper mention the use of penicillin either by continuous administration with a low level for an extended period or by an intermittent method of high blood levels of penicillin for short periods. In the latter method the blood level is low before the succeeding injection is given. In most of our cases we found that a lapse of several days between injections did not alter the efficiency of our regimen, provided a careful clinical supervision was practiced, the status of the case being evaluated from day to day. This intermittent injection method was found to be advantageous by Bigger [18] in his experimental studies on the action of penicillin in vitro. He was prompted to conduct this investigation in seeking the cause for the not infrequent failures of penicillin action against staphylococci. He concluded that penicillin is bactericidal for Staphylococcus pyogenes in concentrations from 1/24 to 1 unit per cubic centimeter. In the serums of patients undergoing treatment, the concentrations are more commonly 1/16, 1/8 and 1/4 unit per cubic centimeter, while 1/2 to 1 unit occurs only occasionally. Furthermore, failure to sterilize broth containing Staphylococcus pyogenes is due to the survival of a small number of staphylococci called "persisters." It is believed that persisters are insensitive to penicillin because they are temporarily in a nondividing phase and because penicillin destroys only bacteria which are about to divide. Unlike resistant strains, descendants of persisters are readily destroyed by penicillin. Bigger [18] is of the opinion that there is good clinical evidence that many bacteria other than Streptococcus pyogenes and penicillin sensitive nonhemolytic streptococci also produce the same kind of "persisters." He concludes from his studies with staphylococci that the same might apply to other bacteria and suggests the use of the fractional or intermittent method of sterilization as employed to kill spores in culture mediums. During treatment all cocci in a susceptible phase should be killed by penicillin. During periods of absence of treatment, persisters should begin to divide and thereby become susceptible to penicillin. But, since the persister phase may be of long duration, several alterations of treatment would be required for the complete elimination of staphylococci from the body. Furthermore, it is desirable to maintain 1/2 to 1 unit per cubic centimeter for optimum effect. The wastefulness and impracticability of continuous intramuscular or intravenous injections of penicillin for long periods in the treatment of local infections in the extremities is apparent from the foregoing discussion. For these reasons the intra-arterial introduction of penicillin is ideal. The method is both local and economical. In our experience, one daily injection of 50,000 units of penicillin was sufficient to cope with even the severest infection. We have found concentrations as high as

16. Romansky, M. J., and Rittman, G. L.: A Method of Prolonging the Action of Penicillin, Science 100: 196 (Sept. 1) 1944.
17. Fleming, A.; Young, M.; Suel et, J., and Rowe, A.: Penicillin Content of Blood Serum After Various Doses of Penicillin, Lancet 2: 621 (Nov. 11) 1944.
18. Bigger, J. W.: Treatment of Staphylococcal Infections with Penicillin by Intermittent Sterilization, Lancet 2: 497 (Oct. 14) 1944.

4.4 units per cubic centimeter of serum in venous blood taken eleven minutes following release of the cuff and 3.6 units in twenty-five minutes.

WAR WOUNDS: SUGGESTED APPLICATION OF INTRA-ARTERIAL METHOD

Our experience with the intra-arterial injection of penicillin, especially in cases of severe infections complicated by diabetes and arteriosclerosis, prompts us to suggest the use of this method for war wounds. We believe that many lives and limbs could be saved by the utilization of the arterial route Experiences of this war have shown that, under the unfavorable or limited conditions near the battle fronts, even with the application of sulfonamide drugs and débridement primary wound closure is a risky procedure. At present the medical corps practices primary closure only for wounds of the head, face and chest, while in extremity wounds débridement without sutures is the accepted procedure. Occasionally secondary closure is performed. Wilson and Threadgill[19] report about 105 cases in which secondary closure of wounds was practiced in order to obtain "better cosmetic results, more rapid general improvement, and the avoidance of the possibility of protracted ulceration of a large cicatrix."

The following scheme of treatment of war wounds is suggested:

1. *Prevention of Infection.*—(*a*) The first intra-arterial injection of penicillin should be given as soon as possible. This simple procedure might be allotted to an advanced medical unit equipped with a sterile 20 cc. syringe, needle and penicillin Wherever possible, débridement should precede the injection.

(*b*) If débridement is deferred, a second intra-arterial injection following this procedure is advisable because the initial injection will not have destroyed the bacteria in the contaminated necrotic tissue which is deprived of its normal blood supply

(*c*) In some cases with minimal contamination and damage of the tissues a primary wound closure followed by intra-arterial injection could tentatively be attempted with or without débridement.

(*d*) Treatment of war wounds of the extremities by intra-arterial penicillin will unquestionably increase the number of cases suitable for early secondary closure and for skin grafting because fewer patients will develop infection. A secondary wound closure should be followed by an additional injection.

2. *Treatment of Infected Wounds of the Extremities.*—(*a*) Infected war wounds of the extremities should receive an intra-arterial injection of penicillin preceded by careful débridement and all pus pockets laid wide open. The number of penicillin injections will depend on the gravity of the case, so that supplementary injections should be given at intervals—every one, two or more days.

REPORT OF CASES

CASE 1.—D. K., a white woman aged 67, was admitted with the diagnosis of impending diabetic gangrene of the left foot complicated by infection. The left foot was much swollen and presented two draining sinuses, one between the first and second toes and another midway down the plantar surface. There were definite signs of cellulitis on the dorsum. The temperature was 101 F. On Sept 16 and 17, 1944 50,000 units of penicillin was given intra-arterially with considerable improvement. On the 19th an incision was made extending from the sinuses between the toes down to the sinus on the plantar surface. This was deepened to the subcutaneous tissues, which were excised and included necrotic and sloughing tendons and muscle, although no actual pus was visible. An additional incision was made on the dorsum of the foot beginning between the great toe and the second toe and extending for a distance of 2 inches. Necrotic tissue was removed. Petrolatum gauze was used for packing and 50,000 units of penicillin given intra-arterially. Bacteriologic examination of the smear showed Staphylococcus aureus, Streptococcus viridans and Escherichia coli. The temperature returned to normal postoperatively and the diabetic status was greatly improved. The wound remained clean and granulating except near the region of the heel on the plantar surface, which showed some necrosis. X-rays revealed osteomyelitis of the third, fourth and fifth metatarsal heads and corresponding toes. On October 2 extensive débridement (fig. 1) was performed including excision of involved bone and necrotic tendons and fascia on the plantar surface followed by 50,000 units of penicillin intra-arterially. This was repeated October 9 and November 7 and 20. The postoperative course was excellent. Healthy granulations appeared and the temperature remained normal. However, with the realization that the foot would be nonfunctioning even if complete healing resulted, it was deemed advisable to amputate below the knee. This operation was performed and followed by 50,000 units of penicillin intra-arterially. Healing occurred by primary union.

This patient was admitted with what is generally agreed on as a definite indication for emergency amputation because of pronounced arteriosclerosis with diabetes complicated by spreading infection on both the dorsum and plantar surfaces of the foot. The usual expected course without amputation would be a rapid spread of the gangrenous process and infection proximally up the leg with systemic reaction. In this case response to intra-arterial penicillin was almost immediate: relief of pain, return of temperature to normal and definite improvement in the diabetic status. Because of inadequate débridement and drainage (this being our first case) a second débridement was necessary before complete control was obtained. Unfortunately the gangrenous process had already destroyed a great portion of the foot, thereby leaving a limb which would be unsuitable for prosthesis. The amputation below the knee was elective. Primary healing of the sutured stump in the presence of infection is definitely attributed to the use of penicillin. This case demonstrated to us the absolute necessity for thorough débridement and drainage in the presence of necrosis and encapsulated pus, since it is agreed that penicillin will not act in such mediums.



FIG. 1.—Debridement in case 1.

CASE 2.—J. V., a woman aged 65, a Puerto Rican with diabetic arteriosclerotic gangrene of the second, third, fourth and fifth toes with osteomyelitis of the heads of the third, fourth and fifth metatarsal bones (fig. 2), had a purulent discharge and inguinal adenopathy; the temperature was 100 F. Smear showed Staphylococcus aureus. Penicillin 50,000 units was administered intra-arterially, repeated two days later with

19 Wilson, H., and Threadgill, F. D Secondary Suture of War Wounds, Bull. U. S. Army M. Dept., 1944, no. 82, p. 77.

extensive débridement, including amputation of the second to fifth toes and the corresponding metatarsal heads with excision of soft tissues. A third penicillin injection was given six days later. The wound immediately became clean and started to granulate within a few days.

Excellent results were obtained in a diabetic patient with suppurative gangrene. This type of case would

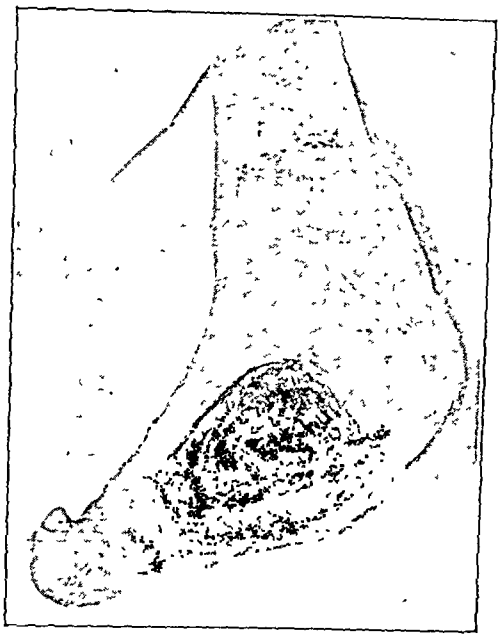


Fig. 2.—Appearance of foot in case 2

ordinarily require emergency amputation through the thigh.

Case 3.—A. S., a white woman aged 41, was in diabetic coma. There was moist gangrene of the left fourth toe with extension of infection into the plantar spaces. Emergency care was given for the coma. Intra-arterial penicillin 50,000 units on two consecutive days resulted in decided improvement. On the fourth day the injection was repeated and the involved toe was amputated, with débridement on the plantar surface. A smear showed Staphylococcus aureus and Streptococcus viridans. The postoperative course was good, but impaired circulation of the fifth toe required additional amputation, including the metatarsal head (fig. 3). Rapid recovery with complete diabetic control resulted. The wound filled in with scar tissue and the patient was able to walk.

In this case diabetic coma with spreading infection of the foot and gangrene of the toe was completely controlled by débridement and intra-arterial penicillin, resulting in a foot suitable for ambulation.

Case 4.—F. H., a white woman aged 56, had diabetic arteriosclerotic gangrene of the left foot including the second, third, fourth and fifth toes; osteomyelitis; cellulitis, and lymphangitis of the dorsum. Three doses of intra-arterial penicillin (50,000 units) were given, the first on the day of admission, the second on the following day when débridement of the left foot with amputation of the second and third toes extending into the intermetacarpal spaces was performed, and the third four days later. A smear showed Staphylococcus aureus. Complete control of the diabetic ketosis with granulation followed. The history revealed that sulfonamide drugs had been taken without avail before admission to the hospital.

In this case serious infection in the foot of a diabetic patient associated with gangrene of the toes responded rapidly to arterial penicillin therapy.

Case 5.—T. H., a Negro man aged 32, was suffering from a human bite on the dorsal surface of the left middle finger of five days' duration. The finger was diffusely swollen and accompanied by slight pain at the onset, which became progressively worse and on admission presented lymphangitis and axillary lymphadenitis associated with a temperature of 101.4 F. Intra-arterial penicillin 50,000 units was given, and drainage with excision of a small amount of slough was performed. The temperature was normal on the following day. Penicillin was repeated in forty-eight hours. The wound remained clean and the patient was discharged.

The usual difficulties encountered in human bites are due to the mixture of organisms in this type of wound. Ordinarily response to treatment is refractory, but with intra-arterial penicillin complete control resulted.

Case 6.—N. W., a Negro woman aged 63, had early diabetic gangrene of the second and fourth toes of the left foot. There were infected ulcers on the second, third, fourth and fifth toes, with osteomyelitis of the phalanges, cellulitis spreading into the plantar spaces, advanced arteriosclerosis and pronounced diabetes. Intra-arterial penicillin 50,000 units was given and disarticulation of the second to fifth toes performed; an elliptic incision included most of the ball of the foot, and the underlying soft tissues were excised. A smear showed Staphylococcus aureus and Escherichia coli. Penicillin was repeated on the second, fourth and tenth days. The postoperative course was excellent and granulations appeared within five days, filling in the wound completely within ten days.

This is similar to the first case except that a more complete removal of necrotic tissues at the onset proved more efficient.

Case 7.—M. N., a white woman aged 55, had a perforating ulcer on the plantar surface of the left foot, diabetes, persistent pain for the previous seven months, a moderately purulent

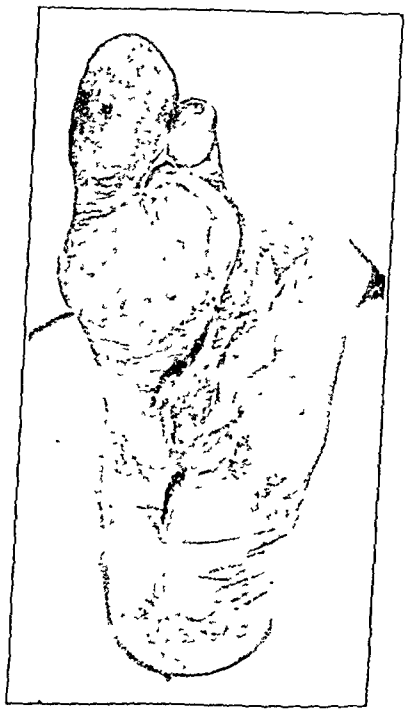


Fig. 3.—Foot in case 3 after amputations

discharge, the margins being covered by hard callus, and moderate arteriosclerosis. Excision of the ulcer and surrounding callus with intra-arterial penicillin 50,000 units was performed. The injection was repeated two days later. Infection was completely controlled and granulations were evidenced within one week. The patient was discharged completely healed two weeks later.

In the presence of arteriosclerosis with diabetes, an ulcer of the mal perforans type is nearly always refractive to treatment. The response to intra-arterial penicillin was exceptionally good.

CASE 8.—D. F., a white woman aged 65, with arteriosclerosis and an infected gangrenous ulcer on the second toe of the right foot with lymphangitis extending on the dorsum, complained of persistent pain. Intra-arterial penicillin 50,000 units was injected and repeated on the third day. Infection was completely controlled, leaving a clean ulcer. Pain was greatly relieved following the first injection.

This case is one of advanced arteriosclerosis complicated by lymphangitis. The danger of progressive moist gangrene in this type of case is recognized. To get results within twenty-four hours is extraordinary.

CASE 9.—E. G., a white woman aged 43, suffered from very large painful infected varicose ulcers on the left leg. A bilateral saphenous vein ligation had been performed five weeks before admission. Intra-arterial penicillin 50,000 units was given and repeated on the third day. Pain was completely relieved within twenty-four hours following the first injection. The ulcer appeared clean on the fourth day.

In spite of bed rest and recent vein ligation, infection of the varicose ulcer persisted until penicillin was given. The organisms found on initial smear were Staphylococcus aureus and streptococci.

CASE 10.—C. P., a Negro woman aged 27, with chronic gonorrheal pelvic inflammatory disease had tenosynovitis of the index finger with much swelling for the past five days, probably of gonococcic origin. Brachial intra-arterial penicillin 50,000 units was given and repeated in forty-eight hours. Immediate improvement was noted, with almost complete subsidence of pain. The patient was discharged two weeks later, completely cured, without limitation of movement of the finger.

This case of probable gonorrheal tenosynovitis readily responded to intra-arterial penicillin without surgical treatment.

CASE 11.—M. G., a white woman aged 56, whose left leg had been amputated through the thigh one month before admission, had diabetic arteriosclerotic gangrene, with infection of the right big toe. Intra-arterial penicillin 50,000 units and amputation of the big toe with the head of the metatarsal was performed and the injection repeated forty-eight hours later (fig. 4). The patient was discharged completely healed three weeks later. The original smear showed Staphylococcus aureus, Escherichia coli and Streptococcus viridans.

This case presents rapid healing, immediate clearing up of infection and rapid epithelization in a case of arteriosclerosis and diabetes complicated by infection.

CASE 12.—Z. A., a white man aged 57, had diabetic arteriosclerosis with cellulitis and lymphangitis on the dorsum of the right foot with much edema. Intra-arterial penicillin 50,000 units was given on admission and resulted in localization of the infection within twenty-four hours. The second injection with incision and drainage was performed forty-eight hours later and resulted in a clean healing wound. The smear showed Staphylococcus aureus.

The dreaded complication of infection in diabetic arteriosclerosis was completely localized in twenty-four hours and cleared up on the third day following a second dose of penicillin.

CASE 13.—D. F., a white man aged 68, had arteriosclerotic gangrene of the right middle toe with localized infection. Intra-arterial penicillin 50,000 units was administered and amputation of the toe was performed. Postoperatively the wound remained clean and granulated.

One injection of penicillin intra-arterially served to keep the wound clean and allowed granulation in spite of advanced arteriosclerosis.

CASE 14.—I. N., a white woman aged 68, had diabetic arteriosclerosis, with gangrene of all the toes of the right foot and moist gangrene of the entire plantar surface and distal part of the dorsum. The involved area was completely debrided and intra-arterial penicillin 50,000 units was given. The injection was repeated for the next four consecutive days. A smear showed gram positive cocci and diplococci and gram positive bacilli. The diabetic status was completely controlled within twenty-four hours. Insulin was not required and the temperature returned to normal. The patient was discharged with a healthy granulating wound.



FIG. 4.—Foot in case 11 after amputation of toe.

The use of penicillin intra-arterially apparently assumes complete control of infection, so that surgical local procedures may be performed which would ordinarily be contraindicated.

CASE 15.—M. J., a white man aged 75, had moist gangrene of the left foot, arteriosclerosis, lymphangitis extending half way up the leg, a temperature of 102° F. and generalized toxicity. A low thigh amputation was performed and the stump was closed without drainage immediately followed by intra-arterial penicillin 50,000 units, which was repeated daily for three injections. The stump healed in one week by primary union.

This case presents the extraordinary result of healing by primary union in an amputation stump closed without drainage in the presence of lymphangitis.

CASE 16.—M. D., a white man aged 52 with diabetes, presented arteriosclerosis, diabetic polyneuritis, hypertension and gangrene of the fourth right toe with spreading cellulitis extending to the dorsum of the foot. His temperature was 103.2 F. The involved toe was amputated and intra-arterial penicillin 50,000 units was given. The temperature subsided within twenty-four hours and penicillin was repeated the following day. However, in spite of the absence of infection the gangrene spread because of arterial insufficiency. The patient refused amputation. Three weeks later in the presence of advanced gangrene and spreading lymphangitis extending up the leg a low thigh amputation was performed with primary closure and resulted in healing by primary union.

In spite of pronounced infection and lymphangitis, primary closure of the stump is possible with the aid of intra-arterial penicillin.

CASE 17.—B. S., a white man aged 70, had necrotic ulcers of the right foot, arteriosclerosis, diabetes and infection. Intra-arterial penicillin 50,000 units was given and repeated four days later. Improvement was prompt and granulations appeared at the ulcer sites within one week. A smear originally showed Staphylococcus aureus.

Acute necrosis and ulceration in the presence of arterial insufficiency complicated by diabetes in a patient 70 years of age is always regarded with alarm. Penicillin prevented extension of infection and we are impressed by the rate of healing which, although delayed by arteriosclerosis, is nevertheless far more rapid than we have ever observed under any other method of treatment.

CASE 18.—P. B., a white man aged 74, was obese and had diabetic arteriosclerotic gangrene of the second toe and heel with infection. Intra-arterial penicillin 50,000 units was given and repeated four days later, resulting in complete control of the infection.

This is another example in which infection was completely controlled in the presence of pronounced arterial incompetence in a diabetic patient.

CASE 19.—N. Y., a white man aged 43, was suffering from dorsal subaponeurotic space infection of the left hand with lymphangitis and pronounced edema. Penicillin 50,000 units was injected into the brachial artery, and incision and drainage were performed. The smear showed Streptococcus viridans and aerobic and anaerobic gram positive diplococci in chains. Injections were repeated on the second and fourth days. Postoperatively the infection subsided completely within twenty-four hours.

The efficacy of intra-arterial penicillin is shown in a case of serious hand infection due to a mixture of virulent bacteria.

CASE 20.—J. O., a white man aged 42, had tenosynovitis of the index finger of the left hand with cellulitis. A bilateral incision followed by intrabrachial injection of penicillin 50,000 units was performed. A smear showed Staphylococcus aureus. The injection was repeated in twenty-four and seventy-two hours with complete control of the infection.

Rapid subsidence of infection in a case of tenosynovitis was obtained with the use of penicillin by the intra-arterial method.

CASE 21.—M. A., a Negro woman aged 39, had ulnar and radial bursitis of the right hand; her temperature was 102.2 F. Two injections of penicillin 50,000 units were given into the brachial artery within forty-eight hours. The swelling on the dorsum and the pain and limitation of movement of the fingers cleared up after three days without surgery.

In the presence of a serious infection without suppuration or necrosis, intra-arterial penicillin will control the infection and result in a cure without surgery.

CASE 22.—C. S., a white woman aged 47 with diabetes, arteriosclerosis and gas infection of the great and second toes extending into the plantar spaces, was given intra-arterial penicillin 50,000 units, and incision and drainage were performed. The injection was repeated on the second and fourth days. The smear showed aerobic Staphylococcus aureus, Escherichia coli and anaerobic Staphylococcus aureus. Complete control of the infection was evident within forty-eight hours.

A severe mixed infection with gas formers in the presence of arteriosclerosis and diabetes was readily controlled by the intra-arterial method.

CASE 23.—F. S., a white woman aged 65 with diabetes, arteriosclerosis and cellulitis of the dorsum of the right foot, was given one intra-arterial injection of penicillin 50,000 units, with complete control of the infection.

This case is another example of the excellent response to the intra-arterial method under adverse conditions.

CASE 24.—J. H., a white man aged 76, had an infected hematoma of the middle of the left leg with cellulitis, lymphangitis and inguinal adenitis. Intra-arterial penicillin 50,000 units was given. The following morning drainage was spontaneous. The injection was repeated and the infection completely controlled.

Intra-arterial penicillin assumed complete control of an infected hematoma despite the presence of suppuration. This result is only partly due to the spontaneous drainage.

COMMENT

These 24 case reports illustrate the excellent results obtained with the use of intra-arterial penicillin, especially in the severe intractable types of infection. Emphasis is placed on infection occurring in extremities as a complication of arteriosclerosis with or without diabetes. It is generally agreed that in cases of arterial insufficiency the primary objects in treatment are, first, to improve the collateral circulation and, second, to prevent infection, which in the greater percentage of cases is the precursor of moist gangrene. Tissues with poor blood supply are exceedingly vulnerable to infection. As previously mentioned, the intra-arterial method with stasis resulted in favorable vasomotor reactions when the circulation was not greatly impaired. Whether or not this side effect is attributable to reactive hyperemia is to be determined. Another noteworthy observation which deserves attention is that, in the absence of suppuration or necrosis, a single injection usually suffices for definite improvement or cure. It may be argued that the usual intermittent intramuscular injection of penicillin might also give good results. But certainly one can predict favorable results without reservation when the intra-arterial route is utilized because local concentration is most efficacious. The relief of pain is another outstanding result. Many patients have definitely been saved from major amputation. Again, a lower amputation site has become permissible because infection can be controlled. Primary closure of all amputation stumps in the presence of infection is now practiced in our surgical service. The value of this innovation is obvious. It is expected that subsequent studies will reveal a wider scope for the application of the method of intra-arterial injection with penicillin and stasis because of the high local concentration of the drug used by the intermittent method. Included in our technic is débridement of necrotic and devitalized tissues or incision and drainage in the presence of suppuration, performed prior to arterial injection. This is important because pus cavities and dead tissue are not reached by this or any other method of administering antibactericidal drugs. We realize that this preliminary report is incomplete from the standpoint of thorough investigation and research. Determinations of local tissue and systemic circulation concentrations of penicillin should be made in every case. These data are contemplated for subsequent publication.

SUMMARY

1. Twenty-four cases of severe infections of the extremities were successfully treated by the intra-arterial injection of penicillin.

2. The intra-arterial route allows for greater local concentration of penicillin.

3. Relief of pain is observed.

4. Amputation may be obviated in many cases.

5. Lower amputation sites are more frequently permissible.

6. Primary closure of the stump in the presence of infection is successful.

7. One injection may effect a cure in the presence of inflammation without suppuration or necrosis.

8. The method is economical and rapid in its effect.

1049 Park Avenue.

Clinical Notes, Suggestions and New Instruments

PRELIMINARY OBSERVATIONS OF THE GASTRIC MUCOSA IN PATIENTS WITH INFECTIOUS HEPATITIS

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LIEUTENANT ROBERT C. COGSWELL
MEDICAL CORPS, ARMY OF THE UNITED STATES

In view of the prominence of anorexia, nausea, vomiting and upper abdominal pain in the clinical picture of infectious hepatitis, and because of the paucity of information concerning the pathology of this disease, it was deemed advisable to make observations with the gastroscope to determine whether abnormalities might be found which would throw light on the pathogenesis, symptomatology and pathology of this condition. Patients with infectious hepatitis were therefore examined with the aid of the Schindler flexible gastroscope on the day following admission, except in 1 instance as noted. This report concerns 9 patients whose gastrointestinal symptoms were limited to their present illness. The clinical picture and laboratory findings of these patients were in complete accord with the diagnosis of infectious hepatitis. In every case the history indicated that the disease had been naturally transmitted and was not related to any preceding parenteral injection.

In 7 of the patients examined, the appearance of the mucosa was found to deviate from the normal, and in 2 no abnormality was noted. One of the 2 with normally appearing mucosa had noticed jaundice four days prior to admission, and the other had yellow scleras one month before coming to the hospital. Of the 7 patients whose mucosa was considered to be abnormal in appearance, the clinical course or picture of 1 patient was different from that noted in the other 6. This patient was admitted with epigastric pain, nausea, belching, sour eructations, anorexia and constipation, present to a moderate degree for approximately two weeks before admission and was examined twenty-five days after admission while free from icterus. The examination revealed findings which are generally interpreted as indicating superficial gastritis, i. e. bright, velvety appearing mucosa, with hyperemia, edema, increased highlights and adherent mucus involving the antral and distal fundic portions of the stomach. There were no ulcerations visible. He was discharged from the hospital and readmitted approximately two weeks later with a history that jaundice appeared the day of discharge and seven days after the first gastroscopy. He was reexamined on two occasions during the second admission while he was actually icteric, and a normal appearing gastric mucosa was observed. The remaining 6 patients were all examined with the gastroscope for the first time between four and nine days after the onset of clinical icterus.

In those cases in which deviations from the normal appearance of the gastric mucosa were observed, the area involved was always the antral portion of the stomach, and in some instances the abnormal appearing area extended into the fundus. The findings which have impressed us as being most distinctly abnormal gave the appearance through the gastroscope of being almost identical with small aphthous ulcers commonly seen in the mouth. Five patients in this series were observed to have these ulcerations. The lesions were small, apparently 2 to 5 mm. in diameter, shallow, ovoid or round, with a dirty white base, and in some instances were surrounded by a narrow red areola. They were found in the antrum and on the angularis and varied in number in a given patient from one to four. In 2 patients flakes of mucus were observed adherent to the mucosa of the antral region. Hyperemia and mucosal texture characteristic of superficial gastritis and the ulcerations coexisted in 4 of the aforementioned cases. In none of these patients was peristalsis apparently impaired.

Further study is essential before any conclusions can be formulated with regard to the relationship between the findings in the gastric mucosa which we have noted and infectious hepatitis. The lesion, in our opinion, may ultimately prove to be due to localization of a virus infection and may be either early or late manifestations of the disease or to be secondary to some physiologic disturbance resulting from infection with the virus of infectious hepatitis. On the other hand, the lesion may prove to have only an accidental relationship to infectious hepatitis and will not be found with regularity in cases of this disorder which are examined in the future.

Further cases are to be studied, and a more comprehensive report will be submitted subsequently.

From the Regional Hospital, Fort Benning, Georgia.

THE TETRALOGY OF FALLOT

REPORT OF AN UNUSUAL CASE

EDWARD W. MISKALL, M.D., EAST LIVERPOOL, OHIO

The tetralogy of Fallot,[1] consisting of pulmonary stenosis, right ventricular hypertrophy, interventricular septal defect and dextroposition of the aorta, is the most common combination of congenital cardiac defects attended by cyanosis.

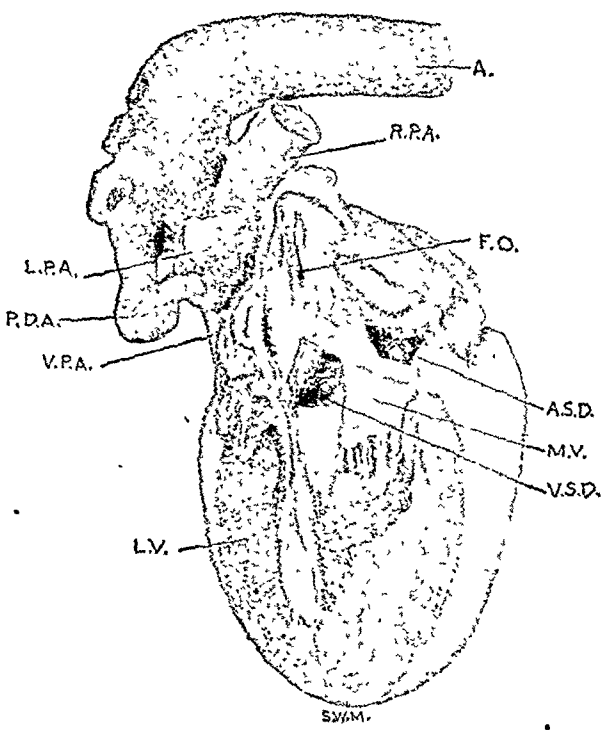


Fig. 1.—Appearance of the heart in the case presented. Part of the wall of the left auricle and left ventricle has been removed. The mitral valve has been divided longitudinally and the anterior flap reflected to expose the interventricular septal defect. *A*, aorta; *A. S. D.*, auricular septal defect; *F. O.*, foramen ovale; *L. P. A.*, left pulmonary artery; *L. V.*, left ventricle; *M. V.*, mitral valve; *P. D. A.*, patent ductus arteriosus; *R. P. A.*, right pulmonary artery; *V. P. A.*, vestigial pulmonary artery; *V. S. D.*, ventricular septal defect.

This case is presented because it had, *in addition* to the classic features of the tetralogy, an interauricular septal defect, a functional foramen ovale and a widely patent ductus arteriosus. The coronary venous sinus was received by the left auricle. There was no innominate artery. The right subclavian and the right common carotid arteries arose directly from the aortic arch.

REPORT OF CASE

B. A. P., a white girl aged 2½ years, seen July 23, 1944, had been cyanotic since birth. Clubbing of the fingers and toes was first noted at the end of the first year. Growth and development had been retarded. The birth weight was 7 pounds

1. Fallot, A.: Contribution a l'anatomie pathologique de la maladie bleue (cyanose cardiaque), Marseille med. **25**: 77, 138, 207, 270, 341 and 403, 1888.

11 ounces (3,487 Gm.). Fretfulness and dyspnea had been present since birth. There had been no acute infections, but there had been sudden attacks of increased dyspnea and cyanosis. These attacks came on without apparent cause at varying intervals. They lasted fifteen minutes to an hour and subsided spontaneously. There were no convulsions or syncope.

Physical examination showed considerable generalized cyanosis, with clubbing of the fingers and toes. A loud coarse systolic murmur was heard over the precordium, maximal at the base of the heart. A soft high-pitched early diastolic murmur was heard over the same area, but it did not fill diastole. No x-ray examination of the chest could be secured. An electrocardiogram showed extreme right axis deviation. Neither the liver nor the spleen was palpable.

The attacks of dyspnea increased in frequency and severity. The death of the patient occurred Oct. 12, 1944 in a particularly severe seizure that came on during a relatively mild upper respiratory infection.

The autopsy was limited to the chest. The lungs were moderately congested. The heart, which was globular, weighed 88 Gm. with the aortic arch attached (normal weight 45 to 55 Gm.). It contained two large auricles and two hypertrophied ventricles. A short fibrous cord, the vestigial pulmonary artery, located just to the left of the base of the aorta

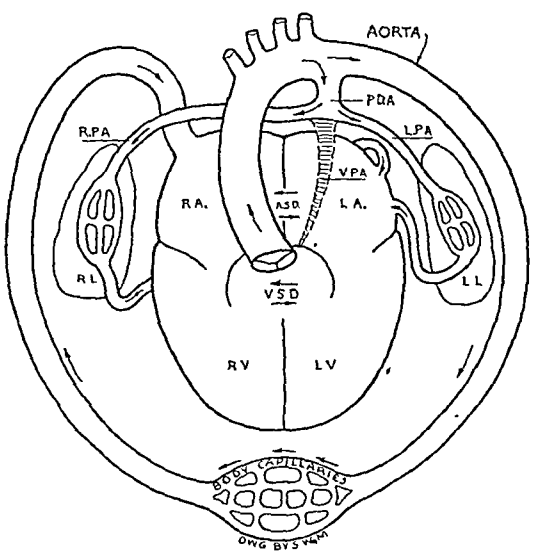


Fig 2.—Diagrammatic representation of the circulation in the case presented. The right common carotid and right subclavian arteries are shown arising directly from the aortic arch. *A. S. D.*, auricular septal defect; *L. P. A.*, left pulmonary artery; *P. D. A.*, patent ductus arteriosus, *R. P. A.*, right pulmonary artery; *V. S. D.*, ventricular septal defect; *V. P. A.*, vestigial pulmonary artery. The shading here indicates the complete impermeability of the vestigial pulmonary artery proximal to the patent ductus. Arrows indicate the direction of flow. Modified after M. E. Abbott and W. T. Dawson (The Clinical Classification of Congenital Cardiac Disease, Internat. Clin. **4**: 156-188 [Dec.] 1924).

(fig. 1), was proximally impermeable but expanded distally to meet the widely patent ductus arteriosus. From the latter, the right and left pulmonary artery branches arose. The right auricle received the superior and inferior venae cavae. The left auricle received the pulmonary veins and the coronary venous sinus. There was a rather large (and probably functional) patent foramen ovale. Posteroinferior to the foramen ovale was an interauricular septal defect 1 cm. in diameter. The auriculoventricular valves were normal. There was a large interventricular septal defect in the membranous portion of the septum which measured 9 to 10 mm. across. The aorta was dextroposed, overriding the defect, so that two thirds or more of the aortic cross section was on the right ventricular side and one third or less on the left ventricular side. The aortic cusps were normal. The coronary arteries were normal and arose in the usual location. The left and right ventricular walls each averaged 10 mm. in thickness. In the upper anterior aspect of the right ventricular wall was a roughly funnel-shaped cavity with its apex pointing to the left and upward. It was 12 mm. in length and 5 to 6 mm. in diameter at its ventricular orifice. This was apparently the vestigial pulmonary infundibulum.

COMMENT

Although this classic tetrad of congenital cardiac defects bears the name of Fallot,[1] who first completely analyzed and recognized it as a clinical entity in 1888, it had first been described by Sandifort[2] in 1777. Hope[3] (1842) also described several cases.

Congenital pulmonary stenosis may follow on a fetal endomyocarditis or it may result from developmental defects. White[4] is of the opinion that the pulmonary valve and infundibulum show evidence of fetal endocarditis more frequently than other parts of the heart because the chief burden of the fetal circulatory effort is theirs. If this occurs late, i. e. after the septums have closed, it may be the sole defect; more often, however, other defects are present, particularly those of the interventricular septum. In Abbott's[5] 1,000 cases of congenital heart disease there were 150 cases of pulmonary stenosis or atresia of the pulmonary infundibulum or valve, 35 cases of aortic or subaortic stenosis or atresia, 19 cases of tricuspid stenosis or atresia and 11 cases of mitral stenosis or atresia.

The developmental type of pulmonary stenosis results, according to Harris and Farber,[6] from delayed involution of the bulbus cordis and from failure of the interventricular septum to close completely. The aorta is frequently dextroposed in these cases, so that it overrides the septal defect and thus receives blood from both ventricles. Furthermore, disturbances in the normal process of torsion may produce the most bizarre anomalies.

Failure of a physiologic mechanism, rather than an embryologic malformation, is given by Kennedy and Clark[7] as the explanation of isolated patency of the ductus arteriosus. However, in this case the patent ductus arteriosus is obviously a compensatory mechanism for the much more serious tetralogy of Fallot.

The patent foramen ovale, while of sufficient size to be functional, was doubtless unimportant as compared to the large auricular septal defect (primitive ostium primum) located posteroinferior to the foramen ovale. In Abbott's[5] series of 1,000 congenital cardiovascular defects there were 36 interauricular septal defects due to persistence of the ostium primum. Eighteen of them complicated other defects, as in the case presented herewith. This type of defect adds to the work of the right auricle and ventricle by pouring an extra volume of blood into the right auricle through the septal defect. This direction of flow from left to right, Uhley[8] ascribes to the effect of gravity, since, as he points out, the right auricle lies below the left, the septum lying horizontally.

The altered cardiodynamics are shown in figure 2. The patent ductus arteriosus provides that some of the blood from the aorta reaches the right and left pulmonary arteries. The extra work imposed on the right side of the heart by the increased blood volume can be appreciated. The right auricle receives blood from the venae cavae and from the left auricle through the interauricular septal defect. The right ventricle must pump the blood it receives from the right auricle against the extra head of pressure that is present in the pulmonary circuit as the result of the patent ductus. The latter, however, may not be as great as is ordinarily present because of the already inadequate amount of pulmonary blood.

Little Building.

2. Sandifort, E.: Observationes anatomico-pathologicae, Lugd. Bat., P. v. d. Eyk et D. Vygh, 1777, cap. 1, fig. 1.

3. Hope, J.: A Treatise on the Diseases of the Heart and Great Vessels, Philadelphia, American ed. 1, from London ed. 3, Haswell and Johnson, 1842, pp. 449-460.

4. White, P. D.: Heart Disease, ed. 3, New York, Macmillan Company, 1944, p. 301.

5. Abbott, M. E.: Atlas of Congenital Cardiac Disease, New York, American Heart Association, 1936, chart I, pp. 60-61.

6. Harris, J. S., and Farber, S.: Transposition of the Great Cardiac Vessels with Special Reference to the Phylogenetic Theory of Situs, Arch. Path. **28**: 427-502 (Oct.) 1939.

7. Kennedy, J. A., and Clark, S. L.: Observations on the Physiological Reactions of the Ductus Arteriosus, Am. J. Physiol. **136**: 141-147 (March) 1942.

8. Uhley, M. H.: Lutembacher's Syndrome and a New Concept of the Dynamics of Interatrial Septal Defects, Am. Heart J. **24**: 315-... (Sept.) 1942.

COUNCIL ON PHARMACY AND CHEMISTRY

SECRETARY'S INTRODUCTION

For many years the Council on Pharmacy and Chemistry has considered claims for therapeutic usefulness offered on behalf of drugs sold to the medical profession and the general population for the prevention and treatment of infections of the feet. Frequently there was lacking adequate scientific evidence to support the claims. Almost equally lacking, unfortunately, were adequate standards for judging the actual comparative merits of such preparations. At its October 1942 meeting the Council proposed that several authorities in this field be invited to prepare a report on the status of fungicidal agents and offer criteria to aid in the evaluation of such preparations. The Council already has published criteria concerning antibacterial compounds (THE JOURNAL, *Feb. 20, 1943, p. 593). Dr. Fred D. Weidman, Dr. Chester W. Emmons, Dr. Joseph G. Hopkins and Dr. George M. Lewis accepted the Council's invitation and for the past two years have been carrying on investigations, the results of which are incorporated in the following report. The Council wishes to express its appreciation for the assistance provided by these investigators and has adopted their report for publication. This report is intended for all who are interested in the problem of treatment of infections of the feet and especially for medical practitioners, industrial surgeons and manufacturers interested in submitting preparations to the Council for inclusion in New and Nonofficial Remedies.*

AUSTIN SMITH, M.D., *Secretary.*

THE WAR AND DERMATOPHYTOSIS

WITH SPECIAL REFERENCE TO TREATMENT AND FUNGICIDE TESTING

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When it appeared inevitable that the United States would be drawn into the European conflict, fresh significance at once accrued to dermatophytosis. War, marching soldiers and their feet are inseparable problems. True, dermatophytosis had already achieved a real position in the medical sun. A ubiquitous annoyance in all strata of society, it occasionally became incapacitating. Notable advance had been made in studies of its pathogenesis, and the principles of treatment, at least, had become crystallized. However, both the general public and the medical profession appeared to be content with the more or less desultory course of events in the study of dermatophytosis, as long as it did not lead to important general constitutional sequelae and remained essentially a disorder of our lowly toes and feet. Indeed, it was the secondary dermatophytids of the hands that aroused most concern; industrial compensation suits often hinged around the question of dermatophytosis or no dermatophytosis.

Following the discovery that no less than 8 per cent of all hospital admissions in the Army and Navy were for cutaneous disease and that dermatophytosis ranked second on the list, certain government agencies as well as the Council on Pharmacy and Chemistry of the American Medical Association supplied funds and facilities whereby its problems could be inquired into more accurately. Among other things this involved a reconsideration of the pathogenesis. To what extent are the predisposing causes of importance, and to what extent are the fungi the exciting agents? Is the reappearance of the disease, once it has cleared up, a recurrence of the infection or is it a reinfection? In the way of prophylaxis, should our energies be directed the more against the predisposing causes or against the specific fungi in the premises, and have we been overemphasizing fungicidal chemicals in treatment?

These questions have been largely unanswered because many clinical studies made in clinics and offices and directed toward their solution have not included suitable control series. When these questions assumed importance among the armed forces there became available men requiring treatment and in sufficient numbers to provide treated and control groups of adequate size, a type of discipline which made control and follow-up studies possible, a reasonably uniform environment, well trained dermatologists and mycologists, professional assistants, and facilities and funds adequate for the study. Under these favorable conditions a better understanding of dermatophytosis of the foot has been gained and some advances in its control have been made. This report can cover only a few of the many studies which have been made under these conditions. By way of indicating the wealth of material, Peck studied 2,123 individuals in industry, Keeney had access to 128 naval cadets or more, and Weidman and Glass employed 116 prisoners at a penitentiary.

ETIOLOGY

After it was shown that dermatophytes [1] were the cause of certain intertrigos of the toes, it was assumed by many physicians that they were the cause in all cases of this condition. It now appears certain that bacteria [2] may be the cause in some cases. Hopkins [3] was unable to demonstrate fungi even after repeated microscopic examinations in as many as 30 per cent of military personnel with lesions of the feet. He concluded that

Most of the section on fungicide testing is unpublished. It was conducted by a subcommittee of the American Public Health Association working at the National Institute of Health. Drs. C. M. Brewer, E. G. Klarmann and G. G. Slocum were members of this subcommittee, and Dr. C. W. Emmons was the fourth member. The National Institute of Health gave permission for the publication of the results in advance of its own reports.

1. The commonest species in the United States are: 1. Trichophyton interdigitale (*synonyms Trichophyton gypseum, Trichophyton mentagrophytes,* Kauffman-Wolff fungus). "Trichophyton interdigitale" has been selected for the purposes of this paper because it is the more widely employed name. 2. Trichophyton purpureum (synonyms Trichophyton rubrum, Epidermophyton *rubrum and others*). 3. Epidermophyton inguinale (synonym Epidermophyton floccosum). A complete statement of synonyms can be found in the Manual of Clinical Mycology by Conant and others, Philadelphia, W. B. Saunders Company, 1944.

2. Mitchell, J. H.: Streptococcic Infection Simulating Ringworm of the Hands and Feet, J. A. M. A. **104**: 1220 (April 6) 1935.

3. Hopkins, J. G.; Hillegas, A. B.; Camp, E.; Ledin, R. B., and Rebell, G.: Treatment and Prevention of Dermatophytosis and Related Conditions, Bull. U. S. Army M. Dept., June 1944, No. 77, p. 42.

some of these nonmycotic lesions were due to infection by Staphylococcus aureus or to sensitization to S. aureus, shoe polish, fungicides, antiseptics and similar sensitizing substances. Hypostasis due to long standing and trauma account for other groups of these disturbances of the feet. However, the extreme point of view of Benedek [4] that fungi are only secondary invaders not etiologically related to lesions of the feet is untenable in view of the many instances of experimental production of dermatophytosis.[5] The facts seem to be that fungi cause the majority of intertrigos of the toes but that bacteria and sensitization are responsible for a considerable number. Improper hygiene of the feet seems to be an important predisposing factor.[6] The too frequent acceptance of the diagnosis of dermatophytid of the hands has likewise given place to a recognition of the role of sensitization to nonmycotic agents in the majority of these cutaneous lesions.

Recurrence versus Reinfection.—This subject is still under lively discussion. Every physician is familiar with the apparent cures, followed by outbursts. The answer to the question naturally hinges on whether the causative fungi are eradicated in the apparently cured cases or still remain on the skin, quiescent but still viable. The evidence from the laboratory is contradictory. Some authors have cultured the fungi from apparently normal feet, while others were unable to do so. On one point all dermatologists are agreed, namely that fungi can remain for long periods within diseased nails without provoking an inflammatory reaction; the nails thus constitute an innocent looking reservoir. On the other hand, with the fungi so ubiquitous on man and viable for as long as 433 days in dry scales,[5] it appears logical that some reattacks must be due to reinfection: the environment harbors fungi.

It would be desirable to know the relative importance of recurrence and reinfection, but that information is not now available because of the difficulty of determining that treatment has actually eradicated the fungus from the skin. This cannot be proved by culture studies because there is a significant number of failures to isolate a fungus when it is known to be present and it is impossible to take an adequate sample for the detection of a remote and inapparent focus. The role of reinfection, on the other hand, cannot be disregarded because we cannot know certainly that the fungus has been removed from shoes, clothing, floors and the like.

One of us (G. M. L.) believes that the species of fungus concerned offers an answer. Thus, Epidermophyton inguinale infections are easily cured; therefore a second attack should be a reinfection. On the other hand, Trichophyton purpureum ones are so resistant to treatment that some of the fungi remain viable on the skin and accordingly a reattack would classify as a recurrence. In a case of infection with Trichophyton interdigitale it may be either way; the fungi may or may not remain on the skin, depending on the manner in which the patient has been treated. Thus, an active tissue response to treatment leads to the eradication of the fungus. In any event, studies by Hopkins and his associates [3] indicated that no reliance could be placed on attempts to prevent reinfection. Dermatophytosis flared up when hot weather, heavy shoes and violent exercise reactivated quiescent lesions on the patient's own feet. Obviously, prophylaxis of dermatophytosis should be a two pronged drive; first and foremost, to destroy completely the fungi on the skin and, second in importance, to destroy them in shoes and other environment. It is such a short step between shoes and pedal skin that the two must be handled together.

PROPHYLAXIS

Sterilization of Previously Worn Shoes.—Obviously, rather severe limitations are placed on the choice of sterilizing agents when dealing with leather. Theoretically, gases are preferable to liquids, but Greene [7] found that even formaldehyde vapor did not satisfactorily penetrate into the cracks of the shoes. Accordingly, he devised the following methods for mass sterilization and reconditioning as needed in institutions and military establishments where suitable apparatus was available. Immersion in 1 per cent formaldehyde solution for five minutes sterilizes the entire shoe. For supplementary mechanical cleansing the shoes were washed in a 0.3 per cent soap solution, followed by washing in water for two minutes. The last traces of formaldehyde can be neutralized in a two minute bath of 0.5 per cent sodium bisulfite, but this is probably unnecessary. Pliability was restored by a bath in a 10 per cent oil emulsion for two minutes; 0.5 pentachlorophenol was incorporated in it to prevent development of mold during drying of the shoes. As to the choice of oils, the National Oil Products Company's "Tanoyle No. 1052" (a "cationic oil" consisting of a mixture of polyethyleneoamines, fatty oil and mineral oil) was preferred. Neatsfoot oil was emulsified with a 2 per cent solution of Armour and Company's "A. M. Coco B acetate" (coconut oil fatty acid converted to its acetate salt) but needed agitation to maintain the emulsion.

For the sterilization of small numbers of shoes, the following method can be substituted:

1. Cleanse the shoes of any extraneous débris or dirt. Use any mild soap and water.
2. Dry as well as possible with a dry cloth.
3. Put in each shoe a pad of cotton; spread it out to make an insole.
4. Pour onto this insole (in each shoe) 1 teaspoon of solution of formaldehyde U. S. P. diluted 1 : 10.
5. Put the shoes in a paper box, close the lid and wrap in paper. Allow the shoes to remain in this box for at least six hours.
6. Remove them from the box, throw away the cotton and air the shoes for twenty-four hours.
7. Apply saddle or harness soap liberally to all parts of the shoes, inside and out. Allow this to dry.
8. Polish shoes as usual and wear.

Hygiene of the Feet.—The prophylactic value of foot baths is probably negligible. Early reports of their value may have failed to take into account the increased and beneficial attention to foot hygiene which may have been but incidental to education about the condition and to the use of the foot bath. There are three vulnerable points; viz., maintenance of the chemical at fungicidal concentration, the short period of exposure and enforcement of use. Sodium hyposulfite, sometimes used, is completely worthless in in vitro tests of fungicidal value, and sodium hypochlorite deteriorates rapidly. The period of exposure is too short to be of value, Bonar and Dreyer [8] having demonstrated that Trichophyton in

4 Benedek, T.: Critical Survey of the Mycological Literature of the Year 1938, Mycopathologia 2:281, 1940.

5 Weidman, F. D.: Laboratory Aspects of Dermatophytosis, Arch. Dermat. & Syph. 15:415 (April) 1927.

6 Sulzberger, M. B.; Baer, R. L., and Hecht, R.: Common Fungous Infections of the Feet and Groins, Arch. Dermat. & Syph. 45:670 (April) 1942.

7. Greene, H. S.: Report on the Microbiological Flora and Sterilization of Used Shoes, J. Am. Leather Chem. A. 40:96 (March) 1945.

8 Bonar, L., and Dreyer, A. D.: Studies on Ringworm Fungi with Reference to Public Health Problems, Am. J. Pub. Health 22:970 (Sept.) 1932.

epidermal scales is killed by sodium hypochlorite only after an exposure of an hour. Finally, enforcement of use is difficult because of the reasonable aversion of persons to walking through a common, sometimes filthy, foot bath.

One of the more newly developed fungicides, sodium propionate, may be employed in 1 per cent concentration in powdered talc.

TREATMENT

The general hygienic measures already indicated should accompany the active, fungicidal treatment. As to the latter, the most important single item is conservatism. Do not overtreat. Every dermatologist is familiar with the severe chemical dermatitides which his patients often exhibit at the first visit and which must be corrected before proceeding in the more or less conventional ways. Such "horrible examples" are the result of disregard of the long established dictum that acute dermatoses should be treated with the mildest types of local applications; stronger, stimulating ones should be reserved for lesions in a subacute or chronic stage.

Accordingly, the choice of fungicide will vary notably in dermatophytosis, depending on the location of the lesion and the form that the inflammation takes in the individual case. This, together with methods of application, is available in standard textbooks[9] and in the very recent report by Hopkins and his associates.[3] For the purpose of this communication, only the results of tests of new fungicides will be recorded.

The most promising of these is paralleled in the use of sodium or calcium propionate in bread dough and dairy products for the purpose of inhibiting the growth of molds; they are marketed under the trade name of "Mycoban." After Peck and Rosenfeld[10] had demonstrated that propionate inhibited human pathogenic fungi, Keeney and Broyles[11] found it effective against various forms of ringworm and in otomycosis, thrush and blacktongue. It is used in 10 per cent concentration, both powder and ointment. Ointment was used at night on toes and soles; in the morning it was removed and the powder was dusted on. Their tabulation indicates excellent results. Lately, Keeney and his co-workers[12] have reemphasized the value of propionate-propionic acid ointment as satisfying the qualifications, "enumerated in this report, of an ideal preparation for the treatment of tinea pedis." They were inclined to prefer it to undecylenate-undecylenic acid ointment. Moreover, in some respects it was as effective as penicillin against bacteria.

At a penitentiary, Weidman and Glass[13] compared six different forms of treatment on 116 prisoners. Whitfield's ointment, as well as 10 per cent boric acid in powdered talc, were included as standards of comparison, more or less, against four proprietary substances: Zephiran (a mixture of alkyl dimethyl-benzyl ammonium chlorides), Cresatin (metacresyl acetate), Pomeio (potassium mercuric iodide) and Iodolate (iodocholeate). Surprisingly, the boric acid powder was highly efficient. Cresatin was equally efficient, while Whitfield's ointment followed rather closely. The remaining three preparations were found unsuitable in their hands. These studies were conducted in the winter, when the lesions were relatively quiescent. They renew attention to the value of boric acid and place Cresatin on the list of fungicidal agents that are useful against dermatophytosis.

Effects of Sweat on Fungicidal Value of Chemicals.—This subject has not been investigated but should be checked in future studies, just as the role of serum in modifying the effectiveness of certain disinfectants and antiseptics is well known in the bacteriologic field. On the one hand, sweat is said to have fungicidal value of itself;[14] on the other hand, sweaty feet predispose to dermatophytosis. An unrelated consideration is the effect that it may have on the fungicide.

Similarly, the role of detergents which might be combined with fungicides and which are applied to the skin as simple mechanical cleansers will have to be established. They may be incompatible. Data in the bacteriologic field will be found in papers by Baker, Harrison and Miller.[15]

STANDARDS FOR IN VITRO FUNGICIDE TESTING

The subject of standards for in vitro fungicide testing was brought to a head by the war. Several methods of testing fungicides had been advanced prior to the emergency, but all were open to criticism. A serious attempt had not been made to resolve the various methods into a standard one such as the phenol coefficient for bacterial disinfectants and antiseptics is. It is obvious that conditions among the fungi are different. Special consideration must be given to (1) the kinds of fungous cells (such as conidia) that are to be employed as test objects, (2) the selection of the standard fungicide that will be reasonably representative of fungicides (iodine, benzoic acid) and (3) the choice between liquid or solid mediums. These problems in in vitro tests, although they have been approached, have not been solved in sufficient completeness and detail to permit the establishment of a universally useful, single, standard fungicidal test, but headway is being made. A systematic and searching attack is being made in the matter by a subcommittee of the American Public Health Association composed of C. M. Brewer, C. W. Emmons (chairman), J. G. Hopkins, E. G. Klarmann, G. G. Slocum and F. D. Weidman.

It is urgent that a standard test be established promptly. Thus, with the prospect of large sales to our several war departments, manufacturers have been and are still asking themselves whether their proprietary disinfectants and antiseptics have value also against fungi. On inquiry they find that there is not any fungicide test that has been accepted as standard and that the routine phenol coefficient test of the bacteriologist will not suffice. True, the Bureau of Ships made a praiseworthy attempt,[16] but it erred at least in selecting "Trichophyton rosaceum" as the test object. This point will be covered further in this review and has been corrected by the Bureau of Ships. Incidentally, the circular just cited may serve, pro tem, as a pattern or basis of consideration for fungicide testing in all its aspects.

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9 The most comprehensive and well illustrated one in respect to dermatophytosis is Lewis, George M., and Hopper, Mary E.: An Introduction to Medical Mycology, ed 2, Chicago Year Book Publishers, 1943.

10. Peck, S. M., and Rosenfeld, H.: The Effects of Hydrogen Ion Concentration, Fatty Acids and Vitamin C on the Growth of Fungi, J. Invest. Dermat. **1**:237 (Aug.) 1938.

11. Keeney, E. L., and Broyles, E. N.: Sodium Propionate in the Treatment of Superficial Fungous Infections, Bull. Johns Hopkins Hosp. **73**:479 (Dec.) 1943.

12. Keeney, E. L., Ajello, L., Broyles, E. N., and Lankford, E.: Propionate and Undecylenate Ointments in the Treatment of Tinea Pedis and an In Vitro Comparison of Their Fungistatic and Antibacterial Effects with Other Ointments, Bull. Johns Hopkins Hosp. **75**:417 (Dec.) 1944.

13. Weidman, F. D., and Glass, F. A.: Arch. Dermat. & Syph., to be published.

14. Peck, S. M.; Rosenfeld, H., Leifer, W., and Bierman, W.: Role of Sweat as a Fungicide, Arch. Dermat. & Syph. **39**:126 (Jan.) 1939.

15. Baker, Z.; Harrison, R. W., and Miller, B. F.: Action of Synthetic Detergents on the Metabol[illegible] of P[illegible], Exper. Med. **73**:249 (Feb.) 1941; The [illegible] Detergents, ibid. **74**:611 (Dec.) 1941. [illegible] of the Action of Synthetic Detergents [illegible], 1941.

16 Dec. 1[illegible], Circular SNDb (1st), paragraph F 2b.

(*m*) Mycologic Checks on Therapeutic Results: More than in the case of the laboratory examinations for purposes of diagnosis, these will have value only of a kind supplementary to the clinical opinions because of the increased difficulty in laboratory demonstration of fungi in treated lesions. At the conclusion of therapy they should be made on the "cured" and "nearly cured" patients and again on the cured patients four weeks after cure. Positive results will have larger definitive value because they will indicate that the fungicide has not killed; negative ones will have the same (and lesser) significance as under other circumstances, namely that there is still an outside chance that fungi are still present but not demonstrable. In any event this mycologic check should be performed if for no other reason than to have the data at hand when making final evaluations. They may turn the balance when wavering in a decision as to cure or no cure. The competence of the examiner in recognition of fungi is of paramount importance.

(*n*) Grading of Results: "Cured," "almost cured," "improved," "stationary" and "worse" are suggested, but each worker is at liberty to select any system that suits his purposes. All workers, though, should go on record to themselves beforehand for their own guidance as to the criteria that they should follow in grading; from this there should be no deviation later. A subdivision like this into five grades reduces the number of cases available for subsequent statistical purposes and illustrates once again the necessity for numerous patients to begin with. Opinions of patients as to results should not be depended on too much; in cases of doubt they should be discounted. Patients commonly regard themselves as cured when itching ceases. It will be conducive to accuracy if the physician has an assistant who will independently grade the results, the final grading being decided in consultation on the spot

3. *Toxicity Tests.*—These should be performed depending on the individual circumstances surrounding the chemical concerned. Where there is a hazard the Bureau of Ships circular entitled "Disinfectant, Germicide and Fungicide," page 4, paragraph F.-2d should be followed. Ten healthy adult albino rats weighing between 150 and 250 Gm. should be employed, none pregnant. They should be fed as usual. Three-tenths cc. of the fungicide (standard strength) per kilogram of body weight should be slowly inserted obliquely into the peritoneal cavity. The animal should then be given the usual food and water and observed for untoward effects for seventy-two hours.

OTHER CONSIDERATIONS IN DERMATOPHYTOSIS

The "One Foot Treated, Other Foot Control" Technic.—Goldman and his associates [24] selected this plan in their studies of two phenylmercuric compounds. Its merit is by no means convincing. Considering the fact that the severity of ringworm on the one foot will seldom equal that on the other, and that these authors themselves observed spontaneous clearing of the control foot *pari passu* with the treated one, this method should be disregarded.

SCOPE OF SENSITIZATION IN DERMATOPHYTOSIS (EXTENDING TO BUERGER'S DISEASE?)

Although the scope of sensitization in dermatophytosis is not currently connected with war activities, it can have a bearing on members of the war forces both during and after the war. Claims for war disability may hinge on this newer development. Thompson [25] contends that the allergy of dermatophytosis may extend as far as to induce peripheral vascular disease which is of the order of, if not quite, Buerger's disease. Naide [26] has supported this thesis.

INDUSTRIAL MYCOSES IN WARTIME

Even prior to Pearl Harbor, dermatophytosis commanded attention because it was such a factor in workmen's compensation claims. After that, the additional factor of manpower in industry entered. The challenge to factory medical personnel was now shared by the United States Public Health Service. Peck, Botvinick and Schwartz [27] found that, although the fungi under laboratory conditions remained viable for at least seventy-two hours on cement, wood and copper impregnated flooring materials, the fungi could not be isolated from the flooring under field conditions. On pine wood it was viable for one week (the other flooring materials were not tested at this interval). It is not surprising to learn that native fungicidal substances are negligible in wood and cement, although more might have been expected from copper. It appears, then, that such flooring "is a possible but not likely source" for dermatophytosis and that copper impregnated flooring is not superior to others and scarcely merits the extra expense.

It is somewhat surprising that only 28 per cent of the 2,123 persons examined by Peck and his associates exhibited unequivocal clinical dermatophytosis, because statistics in other groups (students, inmates of institutions, members of the armed forces) have ranged consistently around 65 per cent. These workers were perhaps overconservative in diagnosing dermatophytosis, as they secured cultures from a goodly number of their "doubtful" cases. From calculations which we made on Peck's materials it appears reasonable to assume that upward of 50 per cent of the personnel in industry is affected by the condition.

Compulsory showers, with foot baths of hypochlorite solution, evidently did not reduce the incidence of dermatophytosis, as judged by a control group which did not receive showers. The tests lose much significance, though, because the foot baths were not rigidly administered.

It is surprising but gratifying that dermatophytosis and its allergic manifestations were not important factors in lost time among industrial workers. Most important too is the evidence of Peck and his associates in the dispute whether the allergy of dermatophytosis predisposes to the development of contact dermatitis. They concluded that it did not predispose. Industrialists should not discriminate against workers with positive Trichophytin reactions in the fear that they may be more susceptible to contact dermatitides. If 42 per cent of workers have a positive reaction, the risk would have to be accepted in any event; industry at large could scarcely visit unemployment on such a large fraction of labor. Naturally these considerations apply also to members of the armed forces in the establishments which are indispensable in the highly mechanized warfare of today, whether today or post war when disability allowances will have to be adjudicated

24. Goldman, L.; Hennigsen, A. B.; Ringelman, N. P.; Fox, H. H., and Hesselbrock, J.: Evaluation of a Fungicidal Agent for Fungous Diseases of the Feet, Arch. Dermat. & Syph. **47**: 569 (April) 1943.

25. Thompson, K. W.: Studies on the Relationship of Dermatomycosis to Ulceration and Gangrene of the Extremities, Yale J. Biol. & Med. **16**: 665 (July) 1944.

26. Naide, M.: The Causative Relationship of Dermatophytosis to Thromboangiitis Obliterans, Am. J. M. Sc. **202**: 822 (Dec.) 1941.

27. Peck, S. M., Botvinick, I. and Schwartz, L.: Dermatophytosis in Industry, Arch. Dermat. & Syph. **50**: 170 (Sept.) 1944.

SELF TREATMENT

The treacherous ground of self treatment has been thoroughly explored by us. Although there appears to be a consensus among dermatologists against self treatment, it remains that a large section of the public will still treat itself. It buys aspirin for headache and "rheumatic pains" and will use "rhinitis" tablets and benzedrine inhalers for colds in the head. Similarly, it will attempt to avoid proper medical treatment by buying proprietary preparations for athlete's foot as long as the condition remains in the milder form that does not incapacitate. Whitfield's ointment is probably more widely known than other forms of treatment, barring the ones widely advertised by proprietary houses. It must be granted that it is harmless in the hands of many people, but a canvass of his local dermatologic society by one of us (F. D. W.) shows that there is still a large factor of danger. Thus we are defeated in our attempts to compile a list of medicaments which could be recommended safely. Only one substance, boric acid, has therapeutic value and is safe for public use. Even here there is a hazard: the public may depend on it too much; i. e., for severer forms which demand the services of the physician.

It is in this light that the program which follows has been arranged. Naturally, prophylaxis is not as highly liable to criticism as treatment, and we feel quite satisfied with the recommendations under this heading. Under the heading of treatment, though, the patient is charged with the responsibility of deciding whether his case is a mild one, and few individuals are capable of even approximating an evaluation of their diseases—even athlete's foot. This, though, seems to be the lesser of two evils, i. e. whether to recommend a substance like boric acid which can do a minimum of harm, or to condemn any and all forms of treatment. The public is bound to practice self treatment of some kind and it may be better to encourage the use of boric acid than for the public to continue the use of iodine, camphorphenol mixtures and other damaging chemicals.

In any event, if self treatment is to be attempted at all it should not exceed the principles embodied in the following abstract. It represents a digest, adapted from the body of this review, which leads to practical therapeutic applications. It must not be regarded as a self-sufficient exposition of the matter; it is subject to all of the qualifications indicated in the body of this paper.

Prophylaxis.—1. Keep the feet clean and dry, with special attention to places between the toes. Dry these carefully but not so hard as to irritate the skin.

2. Air shoes and socks when not in use.

3. Under special conditions, keep the feet elevated when at rest (where the conditions predispose to intertrigo, as with marching soldiers).

4. Shoes should be selected that are as light and well aerated as is compatible with working conditions.

5. A dusting powder consisting of 10 per cent boric acid in powdered talc should be dusted on the feet and between the toes every night and morning.

Treatment.—1. Only the mild lesions that occur between the toes should be treated by the patient himself; i. e., where the lesions exhibit only scaliness and perhaps mild redness and fissuring. Considerable redness, moisture, pustule formation or pain call for the attention of the physician and the physician only. The patient must err on the safe side.

2. Such mild cases can be treated as follows:

(*a*) Observe regulations just laid down for prophylaxis.

(*b*) Nothing is safe as a local application except the boric acid foot powder mentioned under prophylaxis. If there is not any improvement within two weeks, consult a physician.

(*c*) Under no circumstances should the patient yield to the well meant recommendations of friends and to advertisements. Preparations containing iodine, mercury or sulfur are particularly dangerous, and sulfonamide preparations are notorious because they so frequently sensitize the individual to sulfonamide drugs which may be imperatively indicated later for a really serious ailment.

CONCLUSIONS

The war has added fresh importance to dermatophytosis. This has stepped up the tempo of investigation with the natural result that certain old ideas have been confirmed, others crystallized or nearly crystallized, some disproved and others newly established. Much of this work has a foundation of the highest reliability because under war conditions it was possible to recruit expert dermatologists and mycologists, together with an adequate supply of assistants, clinical materials, laboratory facilities and funds. The results accordingly, have high and probably enduring significance.

In the way of confirming old ideas, the incidence of dermatophytosis was again found to be high. The hygiene of the feet was paramount both in prophylaxis and in treatment, with the emphasis on the detrimental role of sweat. The "old reliable" Whitfield's ointment, and also boric acid powder, stood up well as fungicide preparations when compared with newer ones like sodium propionate and Cresatin.

Changes in concepts appeared; first, the current of opinion is sweeping bacteria into the scene as the cause of many infectious intertrigos that have hitherto been taken for granted as mycotic. Other foot conditions are due to sensitization to local applications such as shoe polish and medicaments, and to long standing hypostasis and trauma. As to the notorious repetition of attacks in dermatophytosis, opinion is swinging to the belief that they represent recurrences; the extent to which they are reinfections is probably minor. This point is not merely academic; it bears on prophylaxis by indicating that efforts should be directed at the feet more than the environment, thus saving bother and expense. Foot baths (hypochlorite and hyposulfite) are becoming discredited. Evidence has been submitted in the controversy whether dermatophytosis predisposes to contact dermatitis; namely, that it does not. This question is important for adjudicating disability claims in the armed forces and elsewhere.

Fresh information is represented, first, in the establishment of a definite technic for sterilization of shoes. In treatment, sodium propionate, undecylenic acid and Cresatin (metacresylacetate) have emerged as useful fungicides. Medicine is now surprised by the theories that Buerger's disease is an allergic expression of dermatophytosis and that little manpower was lost in industry as the result of dermatophytosis. Matters are rapidly coming to a head in the establishment of a standard method for testing fungicides, at least for dermatophytosis, and an outline has been submitted for the clinical evaluation of fungicides which should be useful to manufacturers and others. Too, a venture was made into the dangerous field of self treatment.

The foregoing record of accomplishment is a credit indeed to the numerous investigators who played a part where they could in the American war effort. Their benefits to medicine will far outlast the war.

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SATURDAY, JULY 14, 1945

NEOSTIGMINE AND NEUROMUSCULAR DYSFUNCTION

Neostigmine (prostigmine), a synthetic drug, was first used in the form of the methylsulfate for stimulating the intestinal tract and thus overcoming postoperative atony. A second and even more striking clinical application was soon discovered, based on its effect on the symptoms of myasthenia gravis. Even when the drug is given by mouth as neostigmine bromide, the decrease in muscle fatigue is often striking. Moreover, neostigmine will apparently inhibit cholinesterase, the chemical agent that destroys acetylcholine, an important factor in neuromuscular transmissions. Acetylcholine is found in nerve tissue and at the myoneural junction. One theory accounts for the effectiveness of neostigmine in myasthenia gravis on the assumption that inhibition of the cholinesterase at the junction permits an impulse to pass more readily and effectively from the nerve to the muscle. Not all investigators accept this explanation, but none disagree with regard to the powerful effect of the drug when given to patients with myasthenia gravis. There is some evidence, however, that neostigmine may affect spinal centers, as well as the myoneural junction, and possibly centers in the medulla or cerebrum. Kremer,[1] by using intrathecal injections of neostigmine, produced loss of muscle tone in man.

These studies have led to a trial of neostigmine in a wide variety of diseases in which muscular paralysis, spasm, tension or spasticity and cramps, painful or otherwise, are important symptoms. In 1944 alone studies were published also on the use of the drug in anoxia, homosexuality, pregnancy, amenorrhea, arthritis, goiter, morphine analgesia, colon dilatation and poliomyelitis.

Kabat and Knapp[2] have reported studies on patients with poliomyelitis indicating relaxation of muscular spasms, relief from pain, increasing the strength and improvement in muscular coordination after treatment with neostigmine. Trommer and Cohen[3] also noted good effect in the treatment of muscular spasm in patients with rheumatoid arthritis and some associated conditions. Kabat[4] has also indicated that this drug may have a useful function in treating hemiplegia, facial paralysis, cerebral palsy, chronic rheumatoid arthritis and subacromial bursitis. Over 50 patients with these various disorders were treated by subcutaneous injections of 1 mg. of neostigmine methylsulfate with 0.65 mg. or 0.43 mg. of atropine sulfate.

In the series treated by Kabat there were 8 patients suffering from persistent joint stiffness, pain and limitation of motion following various types of fractures. In 7 of these cases significant improvement was noted during one to two weeks of treatment. Seven patients with hemiplegia were observed with a favorable relief of their spasticity while under treatment. Similar results were reported in patients with hemiplegia due to cerebral palsy of the congenital type. Six patients with chronic rheumatoid arthritis were relieved in various degrees and, in general, Kabat felt that the results were encouraging enough to warrant further investigation with control procedures and other means of evaluation.

Schaubel[5] also has observed encouraging results with a similar form of treatment in cases of spastic cerebral paralysis.

Watkins and Brazier[6] have recently attempted to evaluate the muscle spasm in poliomyelitis by electromyographic studies. In the course of their work, seventy tests were made before and after the intramuscular injection of 1.6 mg. of neostigmine methylsulfate. At the period of maximum effectiveness of the drug, namely twenty minutes after the injection, there was less irritability exhibited in the electromyogram than during the control period. They point out that, in the treatment of poliomyelitis, neostigmine has not been used in a sufficient number of instances to justify the drawing of definite conclusions in regard to its value. Watkins and Brazier observed, moreover, the effect of only a single application and not the effect of repeated injections as used by Kabat. They conclude that the degree of change was not great enough to indicate a specific effect by neostigmine on muscle spasm. Two articles reviewing the effects of neo-

1. Kremer, Michael: Action of Intrathecally Injected Prostigmine, Acetylcholine and Eserine on the Central Nerve System in Man, Quart. J. Exper. Physiol. **31**: 337 (July) 1942.
2. Kabat, Herman, and Knapp, M. E.: The Use of Prostigmine in the Treatment of Poliomyelitis, J. A. M. A. **122**: 989 (Aug. 7) 1943.
3. Trommer, P. R., and Cohen, Abraham: The Use of Neostigmine in the Treatment of Muscular Spasm in Rheumatoid Arthritis and Associated Conditions, J. A. M. A. **124**: 1237 (April 29) 1944.
4. Kabat, Herman: Studies on Neuromuscular Dysfunction: I. Neostigmine Therapy of Neuromuscular Dysfunction Resulting from Trauma; II. Neostigmine Therapy of Hemiplegia, Facial Paralysis and Cerebral Palsy; III. Neostigmine Therapy of Chronic Rheumatoid Arthritis and Subacromial Bursitis, Pub. Health Rep. **59**: 1635 (Dec. 22) 1944.
5. Schaubel, H. J.: Prostigmine as an Adjunct in the Treatment of Spastic Cerebral Palsy, Physiotherapy Rev. **24**: 236 (Nov.-Dec.) 1944.
6. Watkins, A. L., and Brazier, M. A. B.: Observations on Muscle Spasm in Poliomyelitis: Electromyographic Studies on the Effect of Various Forms of Thermal Therapy and of Prostigmine, Arch. Phys. Med. **26**: 325 (June) 1945.

stigmine on patients with poliomyelitis appeared in THE JOURNAL last week.[7]

Although neostigmine may be of value in treating conditions other than intestinal atony and myasthenia gravis, the work presented by Kabat and others on its use in a large number of unrelated conditions is insufficient for critical evaluation. More carefully controlled studies will be required before a definitive statement with regard to its usefulness can be made.

HEALTH AND PHYSICAL EDUCATION LEGISLATION IN OREGON

The Forty-Third Legislative Assembly of the State of Oregon passed House Bill No. 53, entitled "An act to provide for programs of health instruction and physical education in all elementary and high schools of the state, to provide for the planning, supervision, direction and evaluation of such programs by the superintendent of public instruction, and appropriating money therefor . . ." and to repeal certain other sections of existing statutes. The bill, if one may judge from a story by Wilma Morrison in the Portland *Oregonian*, April 8, attracted little attention in the legislature and calls for only $26,000 a year from the taxpayers. The law provides that all school districts in the state of Oregon shall—not may—provide in their respective schools programs of health instruction and physical education for the development of health and physical fitness for all elementary and high school pupils in such schools. The purpose is to promote, develop and maintain among pupils at all levels "optimum physical growth, health and physical fitness." The bill prescribes what shall be included in health instruction programs, namely "personal hygiene, community health and sanitation, communicable diseases, nutrition, mental health, safety education, first aid, instruction in the choice and use of health services and health practices, instruction concerning the structure and functioning of the human body, the physiological effects of exercise, and such other instruction as the state superintendent of public instruction may deem important."

The program in Oregon is to be under the general direction of the superintendent of public instruction. Six mandatory functions are assigned to him: to (1) provide health examinations in the elementary and secondary schools, (2) provide and recommend program materials, (3) provide checks and standards by which the progress of individual pupils and the programs of schools can be evaluated and the schools rated "in terms of their meeting the purposes of this act," (4) coordinate the activities of governmental agencies which carry on functions in the schools related to the purposes of the act, (5) employ the necessary personnel and (6) make necessary rules and regulations.

Subordinate school officials in local governmental units are made responsible for carrying out the rules and regulations issued by the superintendent of public instruction. Exemptions are provided for constitutional or religious objectors who may wish to be excused from participation in the program outlined by the act.

Responsible officials in Oregon met at once in order to put the provisions of the act into effect. The superintendent of schools has created an Oregon Joint Committee on Health and Physical Fitness, headed by Dr. R. W. Leighton, dean of physical education at the University of Oregon. This is the group which formulated the bill. A prime force in getting the legislation passed was the Oregon State Federation of Women's Clubs. The appropriation is small, although Dean Leighton says it will be sufficient. With existing buildings and equipment, supervision from trained personnel and the setting up of standards, results should follow.

The Oregon act is said to be the first legislation of its type in any state. Legislation, or even the effective functioning of the program under such legislation as this, will not necessarily eliminate all physical unfitness and all sources of poor health. Much can undoubtedly be accomplished, but not in a year or in two years. Measurable results may take ten years. In the meantime, those who work in the program and those who appropriate money for its support must not become discouraged. Even with the best program functioning at the highest possible efficiency some conditions are not remediable in the present state of medical knowledge. The time is ripe for great progress toward improved health and physical fitness.

Current Comment

TRANSMISSION OF A SHOCK PRODUCING FACTOR

Shock is still one of the important causes of death of the injured soldier. While the symptoms and various physiologic responses of the shock syndrome are well known, the causative factors are still in doubt. One of the difficulties facing experiment in this field is the production of a reproducible shock syndrome. This has been accomplished to some extent by either traumatizing the leg of an experimental animal or by leaving a tourniquet on the leg for a time and then removing it. By using such a standardized technic Cannon and Bayliss concluded that there is a toxic substance emitted from the injured tissue which is responsible for the production of the general shock syndrome. Additional work has been attempted to show that a toxic agent is responsible for the initial

7. Brainerd, Henry; Katz, H. J.; Rowe, A. P., Jr., and Geiger, J. C.: The Clinical Manifestations of Poliomyelitis, J. A. M. A. 128: 718 (July 7) 1945. Fox, M. J., and Spankus, W. H.: The Value of Neostigmine in Acute Anterior Poliomyelitis, ibid. 128: 720 (July 7) 1945.

of shock. Recently Rapport, Guild and Canzanelli [1] produced shock by allowing a tourniquet to remain on the leg of a rabbit for two hours. To show the presence of a toxic substance the rabbit's leg was joined into the general circulation of a second, normal, rabbit. Thus the traumatized leg received all of its blood supply from the normal rabbit's circulation and in turn contributed its blood and tissue metabolites to the normal rabbit's circulation. This experimental procedure, called "cross circulation," is a common though difficult physiologic testing device. In the control experiments in which normal legs were cross circulated with a normal rabbit the animals survived for fifteen and a half hours. When the tourniquet treated legs were cross circulated with normal rabbits the animals survived only four and three-tenths hours. These observations seem to point to the possibility that a shock producing factor was transmitted in the blood. The knowledge that a toxic substance may be liberated from an injury which is of such extent that the host is thrown into shock may have considerable directive influence both in the prevention and in the treatment of the shock syndrome.

PROGNOSIS IN THROMBOCYTOPENIA

In a study of 30 cases of thrombocytopenic purpura Schwartz [1] showed that increased numbers of eosinophils in the bone marrow signify a favorable prognosis for spontaneous recovery, while scant numbers suggest a chronic course and the necessity for splenectomy. The marrow eosinophilia probably indicates an allergic state, while thrombocytopenia represents a sensitization reaction involving the megakaryocytes. Neutrophils were selected as cells for the basis of comparison, because eosinophils presumably arise from the same stem and because specific stimulation of the granulocytes does not occur in thrombocytopenic purpura. The number of eosinophils observed in counting 1,000 granulocytes of the neutrophilic series was determined on the basis of these studies. Schwartz feels that it is possible to divide cases of primary thrombocytopenic purpura, at least from the prognostic point of view, into two types: (*a*) those with increased numbers of eosinophils in the marrow and (*b*) those without increase in marrow eosinophils. Cases with high marrow eosinophils are probably due to sensitivity, are usually acute in onset and course, occasionally follow infection or ingestion of drugs or allergenic foods, have relatively benign course and are followed by complete clinical and hematologic recovery. Splenectomy is not necessary in these cases, and blood transfusions hasten recovery. Prognosis in cases with few eosinophils, arbitrarily below 50, are of poor prognostic outlook and require splenectomy. Correlation was not found between the marrow eosinophilia and peripheral blood eosinophilia. Schwartz is aware that prognoses based on the numerical variation of a certain cell must be made with caution and that a number of factors can influence the bone marrow at a given moment. It is suggested, however, that certain correlations do exist and that these may be utilized in helping to make prognosis and treatment of thrombocytopenic purpura more rational.

1. Rapport, D.; Guild, R., and Canzanelli, A.: Am. J. Physiol. **143**: 440 (March) 1945.
1. Schwartz, S. O.: The Prognostic Value of Marrow Eosinophils in Thrombocytopenic Purpura, Am. J. M. Sc. **209**: 579 (May) 1945.

THE 1942-1943 EPIDEMIC OF INFANTILE PARALYSIS IN MALTA

In the middle of November 1942 an epidemic of infantile paralysis began in Malta, reached its height in the latter part of December and was over by March 1, 1943. The outbreak included 483 paralytic cases, 426 in civilians and 57 in military service men. Owing mainly to circumstances connected with the bombardment of Malta, satisfactory study could not be made of the occurrence of civilian nonparalytic cases. Of the 483 cases, which include 40 simultaneous cases on the neighboring island of Gozo, 397 (82 per cent) occurred in children under 5 years of age. The case death rate in the civilians was 6.1 and in the service men (United Kingdom) 19.3 per cent. These and other facts to be cited are taken from the report of epidemiologic features of the outbreak by Seddon and his co-workers.[1] Like studies of other epidemics in isolated regions, their study presents results of interest in regard to the origin and spread of outbreaks of infantile paralysis. After thorough consideration of the circumstances, some of which are quite unusual, it seemed safe to conclude that the spread of the Malta epidemic was not promoted by the great overcrowding at that time, by the lack of food and vitamins, by possible contamination of food and water from the use of sewage for manuring or by the consumption of dried milk. As the epidemic developed rapidly at a time when flies were less numerous than at other seasons, "it is tolerably certain that the disease was not spread by flies." That the virus of the epidemic was an indigenous strain is indicated by the facts that a few sporadic cases of infantile paralysis have developed in Malta over many years, that civilians were attacked first, that the adult Maltese almost wholly escaped and that there was no evidence of the virus being brought in by service men. Seddon and his associates point out that the causal strain "cannot have differed greatly from the normal strain, since its pathogenicity was confined to the more susceptible groups of the indigenous population, who had presumably not had time or opportunity to become completely protected by the normal process of latent infection." They also note that the pattern of the epidemic corresponds to that of a respiratory type of infection. But why did the disease assume the paralytic form? "The virus is constantly with us, constantly infecting us, but only rarely getting through to attack the central nervous system. And the circumstances in which it loses its temper, so to speak, and gores us to the marrow we simply do not know." [2]

1. Seddon, H. J.; Agius, T.; Bernstein, H. G. G., and Tunbridge, R. E.: The Poliomyelitis Epidemic in Malta, 1942-1943, Quart. J. Med. **14**: 1 (Jan.) 1945.
2. Poliomyelitis in Malta, Annotation, Lancet **1**: 667 (May 26) 1945.

MEDICINE AND THE WAR

ARMY

ARMY MEDICAL OFFICERS REQUEST ROTATION OF ASSIGNMENTS IN SERVICE

NOTE.—The following communication received from five medical officers of the United States Army in Europe, including a major and four captains, is published so that it may receive consideration by the medical profession and by the officers in the Office of the Surgeon General. Contrary to our usual custom, the letter is printed without signature, since the officers specifically request that their signatures be not included. Certainly the point raised merits consideration.—ED.

To the Editor:—We are army medical officers on active duty for varying lengths of time ranging from thirty-two months to forty-eight months at a fighter station in England since November 1943 and are now about to go to Germany in the Army of Occupation. When we shall be relieved is a matter of speculation. Frankly, we've been thinking lately about the lack of rotation for medical officers and naturally the question arises "Are there not sufficient doctors in the United States to meet our country's military demands?" We think there are.

There are many conflicting reports reaching us concerning the procurement of medical officers for military service, none of which, however, are of an official nature. In order to ease our minds, and to be sure they need easing, we medical officers would like some clarification of the subject if possible. We would like the following information answered:

(*a*) The number of medical officers on active army service and naval service (excluding Veterans Administration).

(*b*) The number of medical school graduates since 1941 and the percentage of these in army service and naval service.

(*c*) The number of doctors under 45 years of age in civilian practice.

(*d*) The number of doctors being procured monthly for army service and naval service.

(*e*) The actual strength of the Army and Navy Medical Corps and the proposed strength necessary to defeat Japan.

(*f*) The number of medical officers in the Army and Navy being discharged monthly exclusive of those discharged for incapacitating medical defects.

We medical officers, like thousands of other doctors, entered the service voluntarily with the sincere belief that it was our duty and with the further belief that it was our war. We further believe that it is the war of everybody in the United States and that equal responsibility exists for every one to share in the conflict. In other words, from the view of the doctor in service, it is as much Dr. Jones's war as it is Dr. Smith's war. We are all familiar with the apparent ease with which many individuals escape military service and are of the opinion that the fault more often than not lies in our administrating agencies. We feel that inefficient medical administration has gone far enough and that if it is permitted to continue unchecked it will affect not only the medical future of the physician but also that of the layman.

We doctors in the service consider it our duty and privilege to attend the sick and wounded and would continue to feel that way if we knew we were not being forgotten. Reports are now reaching us that many doctors coming out of internships are permitted to go on their merry way into residencies, hospital appointments and practice and that there are many men of our age and training still in our home towns, unmolested by our procurement agency. If this is correct and it appears so, what about us already in service. Are we to carry the whole burden? Or isn't it their war too?

It appears now that officers are to be discharged on the *point system*, that is all officers except medical officers—why? Are medical officers now in service to be penalized for taking the trouble and sacrifices to earn a medical education? We cannot help but believe that the procurement of medical officers should go on strenuously as long as war exists and as long as doctors are needed in the service, so that a definite surplus should exist. In this way a discharge system could apply to the medical profession also, and no one doctor need worry that no relief is coming. In most cases rotation would go on in a most natural manner. The civilian supply of doctors would not be affected, for outgoing medical officers would take the place in civilian practice of newly "procured" doctors. Further, no one proportion of doctors would suffer degeneration of their medical knowledge and ability, as is the case now with tactical unit doctors whose main duty is holding sick call, treating colds, corns, epidermophytosis and small lacerations. Any worthwhile cases by reason of the army medical setup must be transferred to station or general hospitals many miles away for definitive treatment. As a result we see these patients only when they are transferred and then discharged to duty. As is readily seen, any professional ability we possessed on entrance into the Army is steadily deteriorating.

It is discouraging for us to see a War Department statement in the public press that the army quota for medical officers is filled and that it is contemplated that the procurement of doctors is to relax. The quota should never be filled as long as war goes on. Any quota should include plans for release of medical officers long in the service. It is conceivable that every doctor in the United States, with certain exceptions for age, disability and the like, would see military service if the war should last long enough, which is as it should be if our premise that it is everybody's country and everybody's war is correct. At this point it appears obviously to be correct. Should Dr. Smith go to war for his home and family? The answer is yes! Furthermore, should he go to war also for Dr. Jones's home and family? The answer is no! Let Dr. Jones go to war for his own family and home. For certain reasons they may not be able to go together or at the same time, but let them go consecutively. Are the newly graduated doctors to be permitted to engage in prolonged internships and even longer residencies, not to mention civilian practice, simply because it is expedient for the Army to solve the medical problem in this manner, or are these young doctors to be inducted into the service so that we who have already served three or more years may be released to take care of the country's civilian needs, not to mention the furtherance of our own medical education, which in most cases has been interrupted by our army service.

There are many physicians of our own ages who have been declared so-called "essential" doctors simply because of circumstances placing them in such a position. Let us not forget that the fallacy of this premise lies in the fact not that the individual doctor is "essential" but that the position is essential. We feel that it is high time many of these men were inducted and replaced by medical officers with years of service, who will be only too eager to become "essential" in their stead.

We are submitting the foregoing plea for your consideration in the hope that our voices added to those of many other medical officers, who even though they have not made public their sentiments are of the same opinion, will bring about a change in the policy of the U. S. Army toward medical officers. We realize that this policy cannot be affected directly by you, but there is no question in our minds that the most potent organ for public feeling in medical circles is the American Medical Association and that if the minds of American medical men are expressed by the Association the effect of its influence must certainly bring about changes in higher places.

Our only desire is "Let us be heard!"

SURGICAL CONFERENCE OF THE SIXTH SERVICE COMMAND

A two day surgical conference, sponsored by the Sixth Service Command and open to the medical profession, will be held at the John B. Murphy Memorial Auditorium, American College of Surgeons, 50 East Erie Street, Chicago, July 27-28. The conference will be opened by Col. Don G. Hilldrup, surgeon, Sixth Service Command, and the following papers will be presented:

Symposiums on Reconstructive Operations for Large Defects in Bone, Major Joseph Farrington and Major Carl G. Caspers, Mayo General Hospital, Galesburg, Ill.; Lieut. Col. Thomas Horwitz and Lieut. Richard Lambert, Vaughan General Hospital, Hines, Ill.

Osteomyelitis of the Os Calcis, Lieut. Col. Francis M. McKeever and Capt. Ronald M. Buck, Percy Jones Hospital Center, Battle Creek, Mich.

Late Closure of War Wounds Associated with Chronic Osteomyelitis, Lieut. Col. Thomas Horwitz and Lieut. Richard Lambert, Vaughan General Hospital.

Preliminary Report on the Use of Sheet Nylon in Surgery, Lieut. Col. Philip Lewin and Capt. I. Joshua Speigel, Mayo General Hospital.

Treatment of Decubitus Ulcer in the Paralyzed Patient, Lieut. Col. John H. Gibbon Jr. and Lieut. Leslie W. Freeman, Mayo General Hospital.

Derangement of the Patellofemoral Joint (Motion Pictures), Major Francis E. West, Gardiner General Hospital, Chicago, and Lieut. Col. Ralph Soto-Hall, Headquarters Sixth Service Command, Chicago.

Visceral Injuries Associated with Compound Fractures of the Pelvis, Major George B. Sanders, Vaughan General Hospital.

Surgical Technic of Amputations, Capt. Curtis M. Hanson, Percy Jones Hospital Center.

Plastic Repair of Injuries of the Penile Urethra, Lieut. Col. Justin J. Cordonnier, Gardiner General Hospital.

Experience in the Treatment of 170 Traumatic Aneurysms, Major Harris B. Shumacker, Mayo General Hospital, followed by a discussion by Col. Daniel C. Elkin, Ashford General Hospital, White Sulphur Springs, W. Va., and Comdr. Emile Holman, U.S.N.R., Naval Hospital, Shoemaker, Calif.

Primary Malignant Tumors of Bone, Lieut. Col. Joseph C. Bell, Major Gilbert W. Heublein and Major Sylvan E. Moolten, Percy Jones Hospital Center.

Continuous Spinal Anesthesia (Motion Pictures), Major Edward B. Tuohy, Percy Jones Hospital Center.

Peripheral Nerve Lesions:

(a) New Methods of Electrodiagnosis, Lieut. Yvo T. Oester, Percy Jones Hospital Center.

(b) Surgery of the Posterior Interosseous Nerve, Lieut. Col. Frank E. Mayfield and Lieut John H. Mayer Jr., Percy Jones Hospital Center.

(c) Surgical Treatment of Injuries of the Brachial Plexus, Capt. I. Joshua Speigel and Lieut. Richard H. Upjohn, Mayo General Hospital.

(d) One Stage Operations for Combined Bone and Nerve Defects, Major Joseph Farrington and Capt. I. Joshua Speigel, Mayo General Hospital.

Heavy Resistance Exercises (Motion Pictures), Capt. Thomas L. DeLorme, Gardiner General Hospital.

Surgery of the Sympathetic System:

(a) Causalgia, Lieut. Col. Frank E. Mayfield and Lieut. Jack C. Ulmer, Percy Jones Hospital Center.

(b) Vascular Disorders, Major Harris B. Shumacker, Capt. Paul R. Olsson and Capt. Kenneth L. Carter, Mayo General Hospital.

In connection with the conference, the following scientific exhibits have been proposed:

Urolithiasis in Patients with Femoral Fractures, Lieut. Col. Louis D. Smith and Capt. Stuart W. Russell, Mayo General Hospital.

Glass Cloth for Wound Dressings, Capt. Ronald M. Buck, Percy Jones Hospital Center.

Orthopedic Splints, Lieut. Col. Philip Lewin, Mayo General Hospital.

Continuous Local Penicillin Therapy in Maxillary Sinusitis, Major Richard P. Good, Vaughan General Hospital.

Femoral Fractures, Lieut. Col. Ralph Soto Hall, Headquarters Sixth Service Command, and Lieut. Col. Thomas Horwitz, Vaughan General Hospital.

Artificial Eyes, Capt. R. M. Grassle, Gardiner General Hospital Occupational Therapy, Vaughan General Hospital.

Surgical Repair of Skull Defects with Tantalum Plate (a review of existing technics), Capt. I. Joshua Speigel and Lieut. Howard R. Hamlin, Mayo General Hospital.

Dermometry, Lieut. Howard R. Hamlin, Mayo General Hospital.

Tendon Transplants, Lieut. Col. Philip Lewin and Capt. Albert O. Singleton, Mayo General Hospital; Capt. Charles Schroeder, Camp Grant Station Hospital, Ill.

MISCELLANEOUS

KELLOGG FOUNDATION EDUCATION PROGRAM FOR VETERANS

The president of the W. K. Kellogg Foundation, Dr. Emory W. Morris, has announced a program under which funds will be available to assist a limited number of medical schools in the United States and Canada in developing comprehensive programs of graduate and postgraduate medical education. The immediate objective of the program is to help extend educational facilities for medical veterans. The long range objective is to encourage schools to develop permanent programs of postgraduate medical education.

The foundation has long been interested in medical education, especially at the postgraduate level. It believes that medical schools should accept the responsibility of providing not only good undergraduate and graduate medical education but also continuing or postgraduate education for all the physicians practicing in the area which the school serves.

Under this program requests for funds have already been approved for the University of Illinois College of Medicine, the University of Minnesota Medical School, the University of Oregon Medical School, Columbia University College of Physicians and Surgeons, Cornell University Medical College and New York University College of Medicine.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

A. A. F. Regional and Convalescent Hospital, Santa Ana Army Air Base: The Cancer Problem in the Service, Lieut. J. S. Binkley, July 17.

A. A. F. Regional Hospital, March Field: Communicable Diseases, Major Norman Nixon and Capt. Charles D. Marple, July 17.

U. S. Naval Hospital, Long Beach: Penicillin and Its Use in Syphilis and Gonococcic Infections, Lieut. Comdr. W. W. Luemling, July 18.

U. S. Naval Air Training Station, San Diego: Classification and Diagnosis of the Anemias, Dr. Alvin Foord, July 20.

Station Hospital, Camp Cooke, Lompoc: Plastic Surgery in Defects of the Head and Neck, Dr. Edward S. Lamont, July 18.

Hoff General Hospital, Santa Barbara: Plastic Surgery in Defects of the Head and Neck, Dr. Edward S. Lamont, July 18.

Indiana

Billings General Hospital, Fort Benjamin Harrison: Peptic Ulcer, Gallbladder and Liver Diseases, Drs. W. D. Gatch and Lowell D. Snorf, July 18.

Wakeman General Hospital, Camp Atterbury: Chest Diseases and Diseases of the Larynx, Dr. Henry C. Sweany, July 18.

Wisconsin

Station Hospital, Camp McCoy: Plexus and Peripheral Nerve Injuries, Dr. Theodore C. Erickson, July 18.

Station Hospital, Truax Field: Endocrinology, Dr. W. D. Thompson, July 18.

Illinois

Gardiner General Hospital, Chicago: Bone and Joint Infections, Dr. David E. Markson and Major Sam W. Banks, July 18.

Station Hospital, Fort Sheridan: Repair of Bone in Fractures and Diseases, Drs. James R. Regan and Edwin Ryerson, July 18.

Vaughan General Hospital, Hines: Laboratory Diagnosis and Its Relationship to Medical and Surgical Treatment, Dr. Edwin F. Hirsch, July 18.

Mayo General Hospital, Galesburg: Blood Dyscrasias—Malaria—Filariasis, Dr. Raphael Isaacs and Col. Alexander Marble, July 18.

Regional Hospital, Chanute Field, Rantoul: Mental Hygiene and the Prevention of Neuroses in War, Col. William J. Blackwenn, July 18.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

July 9, 1945.

Fulbright Advocates Formation of Bureau of Scientific Research

Senator Fulbright has introduced a bill to establish a Bureau of Scientific Research in the Department of Commerce, which he says is designed to afford a medium through which new inventions may be properly developed with federal aid and made available to small industry or individuals who may desire to enter business. He believes it will be helpful to returning war veterans. "There is a real need for the utilization of existing patents in the interest of the people," he said, "and to encourage the latent inventive possibilities of the nation, through the elimination of existing handicaps and encouragement of small industries to seek and use such ideas." He explained that the bureau would be authorized to procure the services of leading scientists, engineers, chemists and other professional experts, to provide small enterprises with the best possible research facilities. The bill proposes to promote in the national interest the fullest and speediest introduction of new technics in science and invention and in manufacturing, communication and other phases of productive activity; also to promote the maintenance of free enterprise by making available to small and medium size business concerns scientific and technical inventions, products and processes and to establish a central scientific and technical office to assure the maximum use of these.

Facilities for Psychoneurotic Veterans Termed Inadequate

Newspaper reviews of the facilities for psychoneurotic war veterans charge that the medical profession is not prepared to care for these patients. "A staggering need for the creation of psychiatric facilities for the care of the mentally disabled" is reported by the National Committee for Mental Hygiene, which reports that twenty-five states do not have one community clinic for psychiatric care and that there are "vast areas" without doctors trained for this work. In the United States only 139 hospitals and clinics are ready to treat mental casualties. Only 30 neuropsychiatric hospitals are operated by the Veterans Administration, which has resulted in overcrowding and lack of outpatient care, according to the committee. While the war has increased the number of mental patients—half a million veterans have been discharged for psychiatric reasons and another half million are expected before war's end—the number of doctors to treat them has been reduced. A congressional inquiry revealed that care of psychoneurotic veterans is inadequate in veterans' hospitals, although the number of patients is growing. The situation is said to pose a big problem for Gen. Omar Bradley when he takes over the Veterans Administration.

Tuberculosis Experts Testify at Kelley Hearing

Army, Navy, Selective Service and civilian tuberculosis experts were to testify today and tomorrow before the committee headed by Representative Augustine B. Kelley of Pennsylvania to study aid to the physically handicapped. Hearings were to be resumed in room 429 of the Old House Office Building. Those who testified today were Col. Esmond R. Long, chief consultant on tuberculosis, Office of the Surgeon General, U. S. Army; Dr. Louis E. Siltzbach, Committee for the Care of Jewish Tuberculous; Capt. Robert Duncan, commanding officer of the Bureau of Medicine and Surgery at Bethesda, Md., U. S. Navy; Mr. Holland Hudson, National Tuberculosis Association and National Rehabilitation Council; Lieutenant Colonel Coatsworth, Selective Service System; Dr. Herman E. Hilleboe, U. S. Public Health Service Tuberculosis Control Division; Mr. Edward Hockhauser, Committee on Care of Jewish Tuberculous, and Mr. Edward K. Funkhouser, District of Columbia Tuberculosis Association.

Liberated War Prisoners Recovering Quickly

American prisoners of war released from German prison camps are recovering quickly and completely from malnutrition caused by starvation, according to a study based on 275 severe cases at the 217th General Hospital in Paris, released by the Office of the Surgeon General, U. S. Army. Lieut. Col. Don C. Wakeman, chief of medical service of the hospital, said that "a survey was made to determine the average daily gain of weight in uncomplicated cases of malnutrition, and those who had lost more than 25 pounds gained an average of 1⅕ pounds a day during an average observation period of twenty-five days." In milder cases six feedings a day are given of a high caloric and high vitamin diet, with supplementary vitamin preparations for those showing specific vitamin deficiency states. In the more severe cases there was inability to tolerate a sufficient quantity of food to allow recovery through feeding alone, and intravenous solutions, common blood plasma and transfusions of whole blood were necessary to get patients into condition where food would be tolerated. X-rays of patients with nausea, vomiting, diarrhea and intolerance to food showed changes in functions of the intestine resembling those of sprue. Considerable improvement was noticeable in two weeks.

Judge Vinson's Point of View Regarding Taxation

The medical profession may not be in complete harmony with the views on taxation of Judge Fred M. Vinson, chosen by President Truman to be secretary of the treasury in succession to Henry Morgenthau. While he believes that excess profits taxes on business should be repealed immediately after Japan is whipped, and he would write postwar tax bills to encourage capital taking job-making risks, he also believes that the personal income tax base should be broad, with lower exemptions than at present. Mr. Vinson is the fourth man with congressional experience to be brought into the Truman cabinet. The others are Secretary of State James F. Byrnes, Secretary of Agriculture Anderson and Secretary of Labor Schwellenbach.

Red Cross Launches Drive for Hospital Workers

The American Red Cross seeks 750 qualified social workers and 600 recreation workers for immediate duty in military hospitals rapidly filling with sick and wounded servicemen from the Pacific and European theaters. With demobilization in Europe, the wounded are returning so fast that the Red Cross has had to expand its hospital program.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Drugs

At the request of the administrator of the Federal Security Agency, S. 1217 was introduced July 2 by Senator George, Georgia, to provide for the free importation of substances, together with their containers and other articles in use at the time of importation for the protection or preservation thereof, entered or withdrawn from warehouse by or for the account of the board of trustees of the United States Pharmacopeial Convention, or the Council of the American Pharmaceutical Association, for use by or on behalf of that board or that council in connection with the establishment by that board or the Committee on National Formulary of standards for the manufacture or control of medicinal products.

Veterans Administration

Representative Rogers, Massachusetts, has introduced H. R. 3685, proposing that any veteran who as a result of service connected disability is so helpless as to be in need of a nurse or attendant shall be granted an allowance of $100 a month in addition to any pension or compensation to which he is otherwise entitled under laws administered by the Veterans Administration.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Prisoners Volunteer for Experiment with Bubonic Plague.—More than 100 San Quentin prisoners recently volunteered for the government's investigation of bubonic plague. Fifty selected men were inoculated with the new vaccine of the George Williams Hooper Foundation of the University of California under a research program sponsored by the Office of Scientific Research and Development, according to the San Francisco *Chronicle*.

Eric Liljencrantz Memorial.—The Hewlett Club of Stanford University School of Medicine has established the "Eric Liljencrantz Memorial Collection on Aviation Medicine" in the Lane Medical Library. Dr. Liljencrantz graduated at Stanford medical school in 1929 and was assistant professor of medicine (radiology) at the time he entered service. A bronze tablet commemorating the service and untimely death of Commander Liljencrantz has been set up at the Naval School of Aviation Medicine, U. S. Naval Air Station, Pensacola, Fla., where he lost his life in an airplane crash Nov. 5, 1942, while studying the physiologic effects of acceleration.

Diabetic Children's Camp Opens.—Camp Whitaker, said to be the only camp for diabetic children on the West Coast, will open for the eighth consecutive year from July 22 to August 19. The camp is under the direction of Dr. Mary B. Olney, assistant professor of pediatrics, University of California Medical School, San Francisco. It is located in the Sierras at an altitude of 5,600 feet, is 60 miles east of Fresno and adjoins the General Grant Grove section of Kings Canyon National Park. The camping period is divided into two periods of two weeks each at a cost of $35 each period plus transportation. There are several camp scholarships available. Applications should be made to Dr. Olney at the University of California, San Francisco.

GEORGIA

University News.—Dr. Edward J. McCormick, Toledo, Ohio, chairman of the Council on Medical Service and Public Relations, American Medical Association, gave the commencement address at the University of Georgia School of Medicine, Augusta, June 11, on the present trend in medical care.

Personal.—Dr. John H. Walker, Atlanta, has been appointed pediatric consultant to the division of maternal and child health of the Georgia Department of Public Health, succeeding Dr. Paul R. Ensign, who is now director of the maternal and child health division of the Kansas State Board of Health, Topeka (THE JOURNAL, April 21, p. 1066).——Dr. Rufus F. Payne, Atlanta, assistant health officer in Fulton County, has been appointed medical superintendent of the State Tuberculosis Sanatorium at Alto.——Dr. John M. Walton, Atlanta, has been named associate medical director of the Southeastern area of the American Red Cross.

ILLINOIS

Personal.—Dr. Willis I. Lewis, Herrin, was elected president of the Williamson County Health Council at its meeting May 14.——Dr. and Mrs. Emerson M. Brewer, Rantoul, observed their fiftieth wedding anniversary recently.

Chicago

Symposium on Forensic Medicine.—The committee on local medicolegal problems of the Institute of Medicine of Chicago, with assisting societies of physicians and lawyers, will hold a symposium on six Monday evenings beginning September 24 through October 29, the subjects selected being especially planned for pathologists, physicians, lawyers, toxicologists and others interested in forensic medicine. Each subject will be introduced with a formal discussion by a physician and a lawyer, followed by a panel discussion and question period. A complete program will be available later.

Industrial Health Committee.—The Chicago Industrial Health Committee is the name tentatively selected for an organization now being developed for Chicago and Cook County. The project is being formed to provide industrial workers in participating industries with continuous and authentic health information on vital health problems and to promote the utilization of procedures, such as Kahn tests, chest x-rays and vision testing, to be made available through cooperating health agencies as requested and available. The entire project will be set up as a health education program. The movement has been endorsed by the American Association of Industrial Physicians and Surgeons, the Council of Social Agencies of Chicago, the Chicago Medical Society and Chicago Health Department, the educational committee of the Illinois State Medical Society, the City of Chicago Municipal Tuberculosis Sanitarium, Chicago Dental Society, Chicago Society of Industrial Physicians and Surgeons, industrial hygiene division of the state department of public health, industrial nurses section of the Illinois State Nurses Association, the Cook County Public Health Unit and others. Efforts are now being made to obtain a full time executive secretary. Additional information may be obtained from Dr. Frederick W. Slobe, 2024 South Western Avenue.

Country Home for Convalescent Children Sold.—The University of Chicago has sold the property of the Country Home for Convalescent Children at Prince Crossing, near Wheaton, to Wheaton College, according to an announcement June 29. The Wheaton College Academy will be transferred in September to the new site and buildings, which will provide accommodations for 125 boarding and 75 commuting students. The sale reflects the fundamental changes in methods of treating crippled children since the Country Home was founded in 1914. While formerly the general method of treatment was largely by immobilization in casts, today bone and joint deformities and diseases are generally corrected or cured by surgery, with such relatively brief periods of convalescence that the number of patients in the Country Home has dwindled steadily. In a statement, Frederic C. Woodward, LL.D., chairman of the board of trustees of the Country Home, said that the changes in methods of handling orthopedic cases have so greatly reduced the time of convalescence that the home at no time in the past five years has operated at more than half of its bed capacity. In the last year occupancy has never risen above 20 per cent, making maintenance costly beyond all proportion to the benefits derived. There has also been a trend away from placing children in institutions, away from their family environment, he said; it is now considered better practice to keep the children at home as much as possible and provide medical care with a minimum of separation from the family. Transfer of the work to the campus will avoid further waste of charitable funds and ineffective use of medical personnel. The 18 patients now at the home will be transferred either to the University of Chicago clinics or to medical agencies from which they were referred to the home. The Country Home, founded by the late William J. Chalmers, of the Allis-Chalmers manufacturing firm, and his wife, became affiliated with the university in 1927 and was amalgamated in 1938. The several memorial funds which have sustained the home will be continued, with preservation of memorial tablets, under present plans, which call for the erection of a new building near the university within two years. This building will be established as a permanent memorial to Mr. and Mrs. Chalmers and will form part of the integrated medical center at the university, Mr. Woodward stated.

MASSACHUSETTS

License Changes.—The board of registration in medicine on June 6 took the following actions:

Dr. Julius Shubert, Boston, license revoked for not less than three years because of gross misconduct in the practice of his profession, as shown by collusion.

Dr. Pasquale E. Massa, Boston, license suspended for a period of one year because of gross misconduct in the practice of his profession, as shown by violation of the narcotic law and conspiracy to violate this law (THE JOURNAL, June 30, p. 679).

Dr. Ralph K. Coleman, Arlington, license restored to practice medicine in Massachusetts.

Medical Schools Combine in Commencement Exercises.—In the first ceremony of its kind, 292 recent medical and dental graduates of Harvard University, Tufts College and Boston University received army and navy commissions June 23 in combined exercises in the Harvard Medical School Quadrangle. The army commissions were awarded by Major General Sherman Miles, commanding the First Service Command, the Navy by Rear Admiral Felix Gyax, commandant of the First Naval District. Major General Norman T. Kirk, Surgeon General of the Army, gave the principal address. Other speakers were Leonard Carmichael, LL.D., president of Tufts, and James B. Conant, LL.D., president of Harvard. Daniel A. Marsh, LL.D., president of Boston, observed that the first combined exercises of the three schools of medicine demonstrated the spirit of cooperation in medical education.

MICHIGAN

Hardy Kemp Named Dean.—Lieut. Col. Hardy A. Kemp, M. C., secretary of the Army Medical Schc [illegible] has been appointed dean of the Wayne [illegible] Medicine, Detroit. Colonel Kemp graduat [illegible] versity School of Medicine in 1926 and prior to his entrance into the service was dean of the Ohio State University College of Medicine, Columbus, Ohio.

MISSISSIPPI

Personal.—Dr. Thomas K. Chandler Jr., Tunica, director of the Tunica County Health Department, has been appointed to a similar position in Coahoma County, succeeding Dr. Guy R. Post, who has become medical director of the crippled children's service and medical consultant of vocational rehabilitation for the state (THE JOURNAL, March 10, p. 606).——Dr. James P. Sharon, who has been acting director of the Marion County Health Department, Columbia, has resigned, effective May 15.

NEW JERSEY

Joseph Buch Dies.—Joseph G. Buch, director of the New Jersey Rehabilitation Commission and chairman of the state crippled children's commission, died at his home in Trenton, June 21, of coronary thrombosis, aged 63.

Special Society Election.—Dr. Harry J. Perlberg, Jersey City, was chosen president of the Radiological Society of New Jersey at its annual meeting May 16. Other officers include Drs. John L. Olpp, Englewood, vice president; Harry R. Brindle, Asbury Park, secretary, and William H. Seward, Orange, treasurer.

NEW YORK

Increased Fees in Relief Cases.—The Medical Society of the County of Erie was instrumental in having approved on June 14 an increase in fees for relief cases. The Erie County Board of Social Welfare voted the action, effective November 1, in conformance with the society's recommendations.

Prevalence of Rabies.—Quarantine of all dogs in Rochester and seven adjoining townships was put into force July 1 as a result of a certification of the existence of rabies issued June 26 by Dr. Edward S. Godfrey Jr., Albany, state commissioner of health, newspapers reported. Two cases of rabies in dogs reported within the week prompted the order. Positive diagnosis of rabies in a dog in Flushing, Queens, was formed by the New York City Department of Health, it was reported June 29, the first to be reported in the city since February and the first occurrence of the disease in the borough of Queens since August 1941.

New York City

Columbia to Receive Fund for Cancer Research.—On termination of a residuary trust set up under the will of Mrs. Edith Dunshee Converse, who died June 21, Columbia University will receive one half of the principal, the income to be used for the maintenance and equipment of a laboratory for research in the field of malignant diseases. The fund will be known as the "Edith Dunshee Converse Fund," newspapers report.

Student Prizes Awarded.—At the one hundred and ninety-first commencement of Columbia University, June 5, prizes to seniors included the Janeway prize to J. P. Cole for the highest marks in efficiency and ability. The Harold L. Meierhof Memorial Prize for the best work in pathology during the year went to George Lally Curran. Virginia C. Nichols was given the Dr. William Perry Watson prize in pediatrics, an award going to the student who has been in attendance on the regular course of instruction for at least two years and who has shown the most notable work in the study of the diseases of infants and children. Another feature of the commencement exercises included the presentation of the honorary degree of doctor of science to Edwin J. Cohn, Ph.D., professor of biochemistry, Harvard Medical School, Boston, and to Dr. Herbert S. Gasser, director of the Rockefeller Institute for Medical Research.

NORTH CAROLINA

David Young Named Superintendent of Mental Health.—Dr. David A. Young, assistant professor of psychiatry and neurology, University of Utah School of Medicine, Salt Lake City, has been appointed general superintendent of mental health for the four state hospitals of North Carolina, a newly created position. The appointment will be effective September 1. In making the selection, five candidates for the position were chosen to familiarize themselves with the position and, during the course of their study, their expenses were paid. The five considered were, in addition to Dr. Young, Colonel Lloyd J. Thompson, M. C., Lieut. Col. Walter E. Barton, M. C., Lieut. Col. Malcolm J. Farrell and Dr. Gaylord P. Coon, Boston. The new superintendent is to coordinate the work of the four state institutions in order that better medical and mental care may be available. The position was authorized by the 1943 general assembly and never filled. It was, however, given new emphasis by the 1945 assembly, which also set up a new hospitals board of control (THE JOURNAL, June 16, p. 532). The governor, following his appointments to the new board, also appointed a twelve man advisory commission to assist the board with Dr. Hubert B. Haywood, Raleigh, as chairman. The proposed program of better care includes a plan to buy a post hospital at Camp Sutton, Monroe, from the United States government, since it has been abandoned by the army. This, if carried out, will be used to take care of about 1,000 of the senile arteriosclerotic group in the other hospitals, freeing beds for the care of patients for whom there may be some hope of a cure.

OHIO

Fifty Years of Practice.—Physicians who have recently completed fifty years in the practice of medicine include Drs. Samuel L. Bernstein, Cleveland; Albert J. Bausman, Piqua, and Dr. Frank B. Gregg, Wellington.

Graduate Training for Returning Veterans.—On July 1 the Ohio State University College of Medicine, Columbus, launched a plan for postgraduate training designed primarily for returning veterans and other physicians who may wish to participate. Those who take the course will be required to spend full time in the university hospital or affiliated institutions of the medical school for a period of not less than two weeks nor longer than three months and will be under the immediate supervision of one of the members of the faculty whom they shall select and who shall serve as a counselor. Additional information may be obtained from Dr. Bruce K. Wiseman, Kinsman Hall, Ohio State University, Columbus 10.

Charles McKhann Named Professor of Pediatrics at Western Reserve.—Dr. Charles F. McKhann, assistant to the president in charge of research, Parke, Davis & Company, Detroit, has been named professor of pediatrics at Western Reserve University School of Medicine and director of pediatrics at University Hospitals, Cleveland. He succeeds Dr. Henry J. Gerstenberger as professor of pediatrics at Western Reserve and director of Babies and Childrens and Rainbow hospitals. Dr. Gerstenberger will become professor emeritus of pediatrics beginning with the next school year. The appointment became effective as of July 1, but Dr. John A. Toomey will remain as acting director of University Hospitals until September 1 and will also continue as professor of clinical pediatrics and contagious diseases at the school of medicine and in charge of the departments of contagious diseases at the university and city hospitals. Dr. Toomey was appointed acting director of pediatrics at University Hospitals when Dr. Gerstenberger was granted a leave of absence in July 1944 to devote most of his time during the next five or six years preparing a mass of clinical and scientific data for publication and writing a history of the Babies and Childrens Hospital and its predecessors (THE JOURNAL, Aug. 19, 1944, p. 1152). Dr. McKhann graduated at the University of Cincinnati College of Medicine in 1923. He served in various capacities at Harvard Medical School, Boston, and the Harvard School of Public Health from 1923 to 1940, when he went to the University of Michigan Medical School, Ann Arbor, as professor of pediatrics and communicable diseases. For a year in 1935 he was visiting professor of pediatrics at Peiping Union Medical College on a grant from the Rockefeller Foundation.

OKLAHOMA

Public Relations Program Approved.—The Oklahoma State Medical Association has activated a public relations program encompassing public and postgraduate education, postwar planning and plans to foster closer unity of county medical societies. The project designed for public education will use the press, radio, motion pictures and public speakers to present the importance of scientific medicine to the public. Postgraduate activities will include cooperation with a project now under consideration by the University of Oklahoma School of Medicine, Oklahoma City. The state department of public health and the state association will cooperate in the postwar program

to be of benefit of doctors returning from service. The interest of the state association in its county medical societies will be continued, and service will be expanded to assist the local units in carrying out service to the public.

New Board of Health Formed.—On June 15 the governor appointed the new nine member state board of health, created under the recently enacted house bill number 77, which stipulated that the new board be composed of a representative from each congressional district and one from the state at large, five to be members of the Oklahoma State Medical Association. The board members are:

Dr. Charles R. Rountree, Oklahoma City, board member at large, nine year term.
A. G. Reed, osteopath, Tulsa, first district, six year term.
Dr. Charles Edgar White, Muskogee, second district, five year term.
Dr. Tracey H. McCarley, McAlester, third district, three year term.
Dr. Catherine F. T. Brydia, Ada, fourth district, one year term.
Mr. Bert Loy, hospital administrator, Oklahoma City, fifth district, seven year term.
Mr. William F. Schumacher, engineer, Lawton, sixth district, two year term.
Dr. Victor C. Tisdal, Elk City, seventh district, eight year term.
Fred Seids, D.D.S., Perry, eighth district, four year term.

Officers are Dr. Rountree, chairman, Dr. White, vice chairman and Mr. Loy, secretary. At the organization meeting, June 22, Dr. Grady F. Mathews, Oklahoma City, was unanimously voted to continue as state health commissioner.

PENNSYLVANIA

District Meetings.—The annual meeting of the Eighth Councilor District of the Medical Society of the State of Pennsylvania met June 27 in Meadville. Among the speakers were Drs. Bernard Fisher, Pittsburgh, on "Penicillin vs. Sulfonamide Therapy—A Clinical Evaluation" and William Bates, Philadelphia, "Early Diagnosis of Carcinoma of the Rectum." Drs. Thomas O. Glenn, Bradford, and Franklin G. Haines, Warren, were presented with testimonials in recognition of their completion of fifty years in the practice of medicine. The Ninth Councilor District held its annual meeting in Punxsutawney June 28. Addresses were given by Dr. Fisher, Dr. John P. Henry, Pittsburgh, on "Thrombophlebitis: Its Modern Treatment" and Dr. Charles J. Barone, Pittsburgh, "Obstetrics in General Practice." Members honored for their completion of fifty years in the practice of medicine were Drs. Joseph J. Schultis, Butler; Howard B. Buterbaugh, Indiana; William A. Simpson, Indiana; Harry B. King, Reynoldsville, and Rose M. Dunn, Franklin.

Philadelphia

Alexander Wiener Receives Alvarenga Prize.—On July 14 the College of Physicians of Philadelphia is awarding the Alvarenga Prize to Dr. Alexander S. Wiener, serologist to the office of chief medical examiner of New York City, in recognition of his work on the various types of Rh factors and on their genetic transmission. On October 3 Dr. Wiener will give the Alvarenga Lecture before the college and the Philadelphia County Medical Society on "Rh Blood Factors in Clinical Medicine." The Alvarenga Prize was established by the will of Pedro Francisco deCosta Alvarenga, Lisbon, Portugal, an associate fellow of the college of physicians, "to be awarded annually by the college of physicians on each anniversary of the death of the testator, July 14, 1883." The college usually makes this award for significant published work and invites the recipient to deliver an Alvarenga Lecture before the college.

TENNESSEE

Dr. Burch Retires.—Dr. Lucius E. Burch on July 1 retired as professor and chairman of the department of obstetrics and gynecology at the Vanderbilt University School of Medicine, Nashville. Dr. Burch, who graduated at Vanderbilt in 1896, joined the faculty in 1902 as professor of gynecology. He was dean of the school from 1914 until he retired to become head of the department of obstetrics and gynecology.

PUERTO RICO

Status of Veterans Facilities.—Dr. Jaime Serra Chavarry, head of the insular office of the veterans administration in San Juan, left for Washington recently to confer with General Omar N. Bradley, newly appointed veterans administrator, on plans for the expansion of the veterans administration in Puerto Rico and possibly will urge that the federal government build a veterans' hospital on the island, it is reported. Under the present setup veterans are hospitalized by the administration in private clinics and hospitals, which receive payment from the federal government. These clinics and hospitals, numbering fourteen in all, have 1,000 beds available for veterans and a minimum of 100 beds for emergency cases at all times, which is considered insufficient for the large number of veterans that will return to this island after final defeat of the Japanese. The construction of a veterans hospital in Puerto Rico, however, would release 1,100 beds to the general public, in addition to providing the type of care and attention that federal supervision would guarantee. Present arrangements are inadequate. Simultaneously, the increase in requirements for the general public in island hospitals will add in the next three or four years to the burden of providing proper hospitalization and medical attention for the population.

GENERAL

Journal Honors Physicians.—A recent issue of the *Review of Gastroenterology* was dedicated to Drs. Samuel Weiss, New York, and Charles W. McClure, Boston, in honor of their sixtieth birthdays. Dr. Weiss has been editor of the *Review* since March 1934. Dr. McClure is a charter member of the National Gastroenterological Association and helped to organize the Boston chapter, of which he is secretary-treasurer.

Quinacrine Again Under Allocation Control.—Because of increased American and allied military requirements for quinacrine, popularly called atabrine, in line with the redeployment of troops to the Pacific areas, the War Production Board June 19 placed the chemical under allocation control of schedule III of order M-300, the general chemicals allocation order. Quinacrine, used for the treatment of malaria, was originally placed under allocation in April 1943, when increased military requirements for the chemical, to be used as a substitute for quinine, made the available supply inadequate to meet demands. However, lessened military demands later in the war made it possible to remove allocation controls in January of this year. It will be necessary to increase production of the drug in order to meet all requirements fully. With controlled distribution, adequate supplies of quinacrine will be assured for civilian use in malarial regions of the United States.

Form Corps of Poliomyelitis Emergency Volunteers.—The National Foundation for Infantile Paralysis is organizing a nationwide program to form and train a corps of poliomyelitis emergency volunteers to assist physicians, physical therapists and nurses in areas where infantile paralysis epidemics occur. The new corps will be called "PEVS." The initial phases of the program provide only for instruction in those areas where qualified teaching personnel, institutional facilities for the care of poliomyelitis victims and actual infantile paralysis cases exist or are anticipated during the coming year. If an outbreak occurs in an area where the volunteers have not been organized and trained, the foundation will be prepared to give emergency training assistance through emergency courses. The course, designed for eight lecture and demonstration classes of two hours each, will be scheduled for local convenience. The volunteers will be organized through the women's committees in charge of Miss Elaine Whitelaw, director of women's activities of the national foundation.

Social and Environmental Factors in Medicine.—The Milbank Memorial Fund has given a grant to finance a study by the Association of American Medical Colleges in cooperation with the American Association of Medical Social Workers on the teaching of the social and environmental factors in medicine. A committee of twenty-five physicians and medical social workers who are engaged in this teaching has been formed to direct the study, under the name of the Joint Committee on the Teaching of the Social and Environmental Factors in Medicine. The co-chairmen are Dr. Jean A. Curran, dean, Long Island College of Medicine, Brooklyn, and Miss Eleanor E. Cockerill, associate professor of social case work at the School of Applied Social Sciences, University of Pittsburgh. A centrally located project subcommittee has been set up under the chairmanship of Dr. Jonathan E. Rhoads, assistant professor of surgical research and acting director of the Harrison Department of Surgical Research, University of Pennsylvania School of Medicine, Philadelphia. The executive secretary of the study is Miss Harriett M. Bartlett, 49 Fruit Street, Boston 14. It is the aim of the study to bring together and analyze the experience of the group of medical schools in introducing students to the social and environmental components in medicine. Visits to selected centers will be made by members of the committee. The study is expected to last through 1945, at the end of which time a report summarizing the findings will be prepared.

Blue Cross Opens National Enrolment Office.—To assist in the enrolment of employees of national firms with plants or branch offices located in areas served by two or more Blue Cross hospital and medical prepayment organizations, the Blue Cross Plans of the United States will open a national enrolment office on July 16 in New York. The enrolment office will be an activity of the American Hospital Association's [illegible]

pital service plan commission, which coordinates the program of the Blue Cross Plans serving forty-three states, seven Canadian provinces and Puerto Rico, Clarence Rufus Rorem, Ph.D., Chicago, director, said in making the announcement. Headquarters of the national enrolment office will be located at 370 Lexington Avenue, room 1014, New York. The enrolment director will be Frank Van Dyk, who has served the New York City Blue Cross Plan for the past ten years and who will continue as vice president in charge of enrolment for Associated Hospital Service of New York in addition to his new duties. Mr. Van Dyk will represent the various Blue Cross Plans in their presentation of a uniform program to national firms, but each local state and community organization will conduct the actual enrolment and pay hospital bills for the local employees of a national firm or organization. As a further encouragement to national enrolment, the Blue Cross Plans have agreed to enroll the branch office or branch store employees of a national firm even though the number of employees may not meet the minimum group requirements of the enrolling plan. Blue Cross Plans have agreed also to accept transfers of membership when the employee of a nationally enrolled firm moves. Transfer of membership of the employee's family is also included.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended June 30 have been received from the division of public health methods, U. S. Public Health Service, as follows:

	Week Ended June 30, 1945	Week Ended July 1, 1944
New England		
Maine	0	0
New Hampshire	0	1
Vermont	0	0
Massachusetts	2	0
Rhode Island	0	0
Connecticut	1	0
North Atlantic		
New York	16	25
New Jersey	5	2
Pennsylvania	1	6
East North Central		
Ohio	*5	6
Indiana	3	0
Illinois	2	2
Michigan	0	0
Wisconsin	0	2
West North Central		
Minnesota	1	5
Iowa	1	0
Missouri	2	1
North Dakota	0	0
South Dakota	0	0
Nebraska	0	0
Kansas	1	1
South Atlantic		
Delaware	1	0
Maryland	1	1
Dist. of Columbia	3	0
Virginia	5	0
West Virginia	2	1
North Carolina	6	8
South Carolina	8	2
South Atlantic—Cont.		
Georgia	1	2
Florida	1	6
East South Central		
Kentucky	3	29
Tennessee	6	1
Alabama	7	1
Mississippi	*	3
West South Central		
Arkansas	1	4
Louisiana	1	4
Oklahoma	3	2
Texas	54	5
Mountain		
Montana	0	0
Idaho	0	0
Wyoming	0	0
Colorado	0	1
New Mexico	0	0
Arizona	0	0
Utah	0	0
Nevada	0	0
Pacific		
Washington	0	0
Oregon	1	5
California	12	13
Total	155	220
First 26 weeks		
1945 and 1944	1,270	1,002
Median, 1940-1944	776	

* No report received for current week.

LATIN AMERICA

Health Activities in Latin America.—*Visitors to the United States.*—Dr. Manuel Picco, Buenos Aires, Argentina, is to specialize in orthopedics at the Lahey Clinic, Boston, on a travel grant awarded by the Institute of Inter-American Affairs.——Dr. Victor Grossi, chief of the public health office of Valparaiso, Chile, has gone to the United States to carry on a tour of health and sanitation programs in several states.

Society News.—Dr. Dante Pazzanese has been chosen president of the newly created Sociedade Brasileira de Cardiologia, with headquarters in Campinas, São Paulo, Brazil. Other officers include Drs. Adriano de Azevedo Pondé, vice president, and Jose de Proenca Pinto de Moura, secretary. Dr. Leovigildo Mendonca de Barros is editor of the *Arquivos de Cardiologia*, the official journal of the society.

Personal.—Dr. Peter A. Clearkin, government bacteriologist of British Guiana, recently was the recipient of a decoration from King George VI of England for his work in 1944.——Dr. Antonio Peña Chavarria, director of the Hospital San Juan De Dios, San José, Costa Rica, has been granted a fellowship from the John and Mary R. Markle Foundation, through the Association of American Medical Colleges, according to *Tropical Medicine News*. It was to become effective early in May and will be utilized in visits to various medical centers in the United States. The fellowship was granted Dr. Peña in recognition of the great services rendered by him to instructors from medical schools of the United States and Canada, who for the last eighteen months have been gaining practical experience in tropical medicine in San José under his direction.——Eric G. Ball, Ph.D., associate professor of physiologic chemistry at Harvard Medical School, Boston, is giving a series of lectures at the School of Medicine of the University of Brazil in Rio de Janeiro, where he will direct research in cellular respiration, according to *Science*. His trip is under the joint auspices of the Brazilian government and the department of state of the United States.——Brig. Gen. Henry C. Dooling, M. C., who was on a thirty day mission in the battle areas of the Mediterranean theater, has returned to his activities as chief health officer of the Panama Canal. While in Italy, General Dooling met Major Gen. Morrison C. Stayer, M. C., who preceded him as chief health officer of the Panama Canal. Col. Albert R. Dreisbach, M. C., acted as chief in General Dooling's absence.

Division of Child Welfare in Rio Branco.—A division of child welfare has been recently established in the territory of Rio Branco, Brazil, according to the *Child*. This division will engage in preventive and curative work under the general supervision of the National Children's Bureau in Rio de Janeiro. The present plans provide for medical and dental care and improvement of nutrition for all children and youth in the municipalities. The territory has been divided into fifteen districts, in each of which will be established a maternity home, a milk station for children, a day nursery and a kindergarten.

Smallpox Vaccination of Civilian Residents.—On June 1 the health department of the Panama Canal started smallpox vaccination of about 300,000 civilian residents in the Canal Zone and the cities of Panama and Colon. Authority for the undertaking is derived from board of health ordinance number 5, approved in 1915, which provides that all persons living in these communities must submit to the vaccinations at intervals of not more than five years. A similar campaign was conducted in 1940.

Argentina's Plan for Health.—The National Health Department, an agency of the Ministry of the Interior, which is said to dominate unrestrictedly the health and sanitation activities in Argentina, proposes, through a national sanitary plan and enforcement measures now being formulated, to carry on an intensive drive against cancer, cholera, bubonic plague, heart diseases, pneumonia, yellow fever, smallpox, exanthematous typhoid, diphtheria, mumps, scarlatina, whooping cough, lethargic or epidemic encephalitis, infantile paralysis, grip, tuberculosis, leprosy, rabies and trachoma.

Conference on Tropical Dermatology.—A course on tropical dermatology will be conducted in Mexico City August 6-18 under the direction of Dr. Fernando Latapi, professor of dermatology, Universidad Nacional Facultad de Medicina, Mexico, D. F., and with the cooperation of Secretaria de Salubridad y Asistencia Publica. Applications to take the course should be sent to Dr. Latapi, Zacatecas 220-6 Mexico, D. F., Mexico. Additional information may be obtained from Dr. Leon Goldman, University of Cincinnati College of Medicine, Cincinnati 1. The program, prepared at the request of Dr. Howard Fox, New York, has been made up especially for American dermatologists and will include a summary of general information, the presentation of clinical cases and laboratory demonstrations, such as bacteriology, parasitology, mycology and histopathology:

Dr. Jesus Gonzalez Urueña, Tropical Characteristics of Mexican Dermatology.
Dr. Salvador Gonzalez Herrejón, Pinta
Dr. Manuel Martinez Baez, Onchocerciasis
Dr. Julio Bejarano, Syphilis
Dr. Latapi, Leprosy.
Dr. Antoni[illegible] d Tinea Capitis.
Dr. Jorge [illegible] s
Dr. Oswal[illegible] Venereum.

FOREIGN

Personal.—Dr. John A. Nixon, Bristol, was appointed Dr. Alexander Black lecturer for 1945 for the Royal College of Physicians of Edinburgh.

National Institute of Physiology in China.—*Science* reports that equipment for a National Institute of Physiology in China, devoted entirely to the study of developmental physiology, is now being purchased in the United States by the future director of the institute, Dr. Shu Chu Shen, who is working in the Highpolymer Research Bureau of the Polytechnic Institute of Brooklyn. Dr. Shen is in the United States as a representative of the ministry of education of the Chinese government. It is planned to establish the institute in Shanghai after the war, since it is advisable to have it near a seaport. One of the first projects will be the investigation of the nutritional status of Chinese children with a view to improving the content of foods with essential minerals and vitamins.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 9, 1945.

The Treatment of Advanced Starvation

The conditions in German prison camps and in occupied countries have brought to the front the problem of the treatment of advanced starvation. At the Royal Society of Medicine Dr. H. E. Magee opened a discussion on this subject, particularly on the use of protein hydrolysates. He worked for several years on the physiology of absorption and found that as fasting continues there is a progressive diminution in the absorptive powers and protective functions of the intestinal mucosa. The columnar epithelium is progressively disorganized, exposing the intestine to irritation by undigested foods with resultant diarrhea. Parenteral feeding, by injection of amino acids to reconstruct the mucosa, is indicated. These should be used by the body as building materials but in starvation are apt to be broken down and used for energy. To protect them it is necessary to give glucose and B vitamins, which enable the body to metabolize glucose.

Dr. Hugh S. Stannus said that the conditions in starvation for which protein hydrolysate therapy had been introduced made a complex picture of many unknowns. If the patient could swallow, digest and absorb the requisite protein, this might be supplied in some suitable form, such as reconstituted dried skim milk powder by mouth or, if he could not swallow, by nasal tube feeding. But if he was unable to digest, protein hydrolysate should be given by mouth or by gavage and if he could not swallow, digest or absorb, resort must be made to intravenous administration. But this conception had been shaken by the case of a repatriated prisoner in the last stages of starvation who had difficulty in taking his milk diet. The case seemed to demand intravenous hydrolysates, but none were available. He was therefore given glucose-saline intravenous therapy, a crude liver extract parenterally and teaspoon feeding with powdered liver extract. The response was dramatic, and the same result was obtained in another case.

Dr. Janet Vaughan, who was one of a small team sent out by the Medical Research Council to test the various methods of feeding in the Belsen camp, described the horrible conditions she found there. She first discussed intravenous therapy. Five patients were given amigen, which they took well, with no reaction. Four did well, but the fifth showed no improvement. The workers had no doubt that for intravenous therapy serum was preferable to hydrolysates. The explanation was that with it there was much more protein and relatively little fluid.

Mass Radiography in the Early Detection of Pulmonary Tuberculosis

The Medical Research Council has published a report on the results obtained by mass miniature radiography in the early detection of tuberculosis of the lungs. A survey of 23,000 persons from two factories, a large office group and a mental hospital, all in greater London, was conducted. Leaving out the mental hospital, because tuberculosis has long been known to show a higher incidence than the average in such institutions, interest centers on the early detection of disease among the general working population. The figures for the two factories and the office group were similar: between 1 and 1.5 per cent newly discovered tuberculous lesions. About a fourth of the persons affected were advised to leave work immediately for institutional treatment. The rest required outpatient observation while remaining at work. If the persons examined can be taken as a fair sample for the rest of the country, these figures mean an immediate temporary loss of 3 or 4 per thousand and some adjustment of work of 10 per thousand remaining under supervision. The final diagnosis was not made on a miniature film alone. About 6 per cent of persons were asked to return for a full size film and about 2.5 per cent for a medical interview.

Two Benefactors of Blinded Prisoners of War in Germany

Major Charteris, the Liverpool ophthalmic surgeon who twice declined repatriation in order to continue his treatment of men in German prison camps, was welcomed at a luncheon in London, which was presided over by Sir Ian Fraser, chairman of St. Dunstan's (the institute for blinded soldiers and sailors). Major Charteris was captured in Greece in 1940 and sent to Germany, where his captors soon recognized his skill in treating eye casualties. Twenty-five blind ex-prisoners of war, escorted by their wives or fiancées, were present at the luncheon. Another benefactor of the blinded prisoners, Lord Normanby, also was thanked. He was severely wounded, though not blinded, in the battle of France and while in a German hospital became interested in the blinded prisoners there. He taught himself braille from a book he found in a salvage dump and then instructed blinded soldiers how to read, thus establishing the camp instructional school, which developed with the help of materials sent by the British Red Cross.

BRAZIL

(From Our Regular Correspondent)

SÃO PAULO, May 28, 1945.

Campaign Against Trachoma

Besides the state of São Paulo, the third most important focus of trachoma in Brazil, where there is a special service of the state health department to combat the disease, two important areas of the highest prevalence of trachoma exist in Ceará, a northern state, and in Paraná, a southern state, where the efforts against that scourge have not yet been organized on a practical basis. In some districts of the state of Paraná a previous survey of a good sample of the population disclosed that an average of 10 per cent of the school children and 30 per cent of the adult rural population presented the disease. For this reason the National Department of Health has founded in the latter two states, in cooperation with the local authorities, several centers of treatment and control of the disease under the supervision of Dr. Herminio B. Conde, an able ophthalmologist with an extensive knowledge of the problem of trachoma. Some particular data are now available concerning the antitrachoma work during the first quarter of this year. Of 23,144 persons examined, 1,288 new cases have been discovered, for which 10,519 dressings and 20,866 instillations of collyria have been done, and 26,815 tablets of sulfonamide preparations have been distributed. Clinical cure was obtained in 221 cases. Among these trachomatous persons an average of 2 per cent were blind in both eyes, 6 per cent were blind in one eye, 29 per cent had lost 5/10 of the ocular acuity, 37 per cent had lost 3/10 of the acuity and 26 per cent had normal vision. This month a new survey is just beginning which will cover the great valley of the São Francisco river, which flows from the south to north through central Brazil and is the axis of large migrations of population that link the northern and the southern areas of high prevalence of trachoma.

Prolapses of the Uterus and Cancer

All medical publications agree in finding exceptional the association between prolapse and cancer of the cervix of the uterus. Recently Dr. Licinio Dutra published a paper including 3 well documented cases with another 5 cases taken from Brazilian gynecologists. After reviewing the different theories which have been formulated to explain the coincidence of these

two disorders Dr. Licinio Dutra draws the following conclusions: "The poor blood and lymph circulation associated with uterovaginal prolapse, the atrophy of the mucous membrane and of the endocervical and endometrial glands and the rarity of inflammatory manifestations of the irritative type might explain why uterine prolapse and cervical cancer so seldom coincide, together with the excessive cornification and the altered epithelium of the mucous membrane of the cervix and vagina, which reduce the possibility of cancer in uterine prolapse."

Brazilian Oranges

Much research is being aided by grants from the Fundos Universitários de Pesquisas para a Defesa Nacional. Experiments have been performed at the Department of Physiology of the Faculdade de Medicina de São Paulo by Prof. Franklin de Moura Campos to study the nutritive value of certain varieties of Brazilian oranges. It was found that Brazilian oranges are poor in calcium salts. Ascorbic acid and thiamine were found in large amounts. Ascorbic acid was determined by a photoelectric colorimeter (Klett-Sumerson) and vitamin B_1 by the rat growth method devised by Miller.

The following conclusions may be drawn from Professor Moura Campos's investigations:

1. Brazilian oranges are poor in calcium salts, 0.016 Gm. per hundred grams being found on the average.

2. Some Brazilian oranges (Lima, Pera) are rich in ascorbic acid. Lima oranges presented an average of 55.48 mg. per hundred grams, Pera oranges 31.22 mg. per hundred grams.

3. Seleta and Pera oranges are rich in vitamin B_1. Both are given as the only source of thiamine that either prevented or cured beriberi.

4. Daily doses of 1 cc. of Seleta orange juice showed preventive action; doses of 2 cc. cured vitamin B_1 deficient animals.

5. Pera orange juice also was active.

Death of Dr. Adolph Lindenberg

Dr. Adolph Lindenberg, a leading dermatologist of São Paulo and a great figure of Brazilian medicine, died recently at an advanced age. Dr. Lindenberg was the founder of modern dermatology in São Paulo. He was a true representative of the great period of parasitologic investigation in dermatology, in which he became famous in Brazil as well as in all South America. Beginning with the first parasitologic identification of leishmaniasis in Brazil in 1909, he made in 1911 extensive researches on the subject of sporotrichosis, then a new disease described for the first time by A. Lutz in Brazil. The careful study of a patient affected with a mycetoma of the knee led Lindenberg to discover a new species of Actinomyces—Discomyces brasiliensis. He was one of the pioneers of the idea of the extraordinary clinical polymorphism of neotropical blastomycosis. One of the last subjects that interested Dr. Lindenberg in his parasitologic investigations in dermatology was pemphigus foliaceus ("wild fire"), the cause of which is still an engima. Among the several distinguished disciples of the dermatologic school which Lindenberg created in São Paulo are Dr. A. Martins de Castro and Dr. N. Rossetti.

Brief Items

Dr. Eurico Rangel, director of the Statistical Division of the Serviço de Biometria Medica, died recently at the age of 59. Dr. Rangel studied medical biometry and statistics at the School of Hygiene and Public Health of the Johns Hopkins University in 1925-1926 and was director of the Vital Statistics Bureau of the National Department of Health at Rio de Janeiro from 1933 to 1940.

On June 18-21 the annual meeting of the Brazilian Heart Association will be held. The medicosocial care of cardiac patients, the functional recuperation of such patients and neurocirculatory asthenia are the principal topics to be discussed. The organization committee includes Drs. Genival Londres and Oscar Ferreira Jr. of Rio de Janeiro and Drs. Dante Pazzanese and L. Mendonça Barros of São Paulo.

Drs. Guilherme M. Hautz, Raymundo B. Menezes and Wilson G. Santiago have been appointed professors of the Brazilian Army Medical School.

A modern hospital has been inaugurated in the state of Minas Gerais at Rio Preto (population 18,000). The fund for the erection of the hospital and for its maintenance has been raised from the population of the small city and the neighboring country.

The annual meeting of the Brazilian Association of Dermatology and Syphilography will be held at Belo Horizonte, state of Minas Gerais, on September 24-26. The principal subjects to be discussed are blastomycosis and the modern treatment of syphilis.

Dr. Alvaro Bahia, director of the division of child hygiene of the department of health of the city of Salvador, state of Bahia, left a few days ago for the United States, where he will study some organizations devoted to child welfare.

Dr. J. P. Azevedo Sodré, surgeon of the Municipal Emergency Hospital of Rio de Janeiro, has been elected a member of the National Academy of Medicine.

Marriages

WILLIAM BOYKIN LYLES JR., Spartanburg, S. C., to Miss Barbara S. Spencer of Dursley, Gloucestershire, England, March 28.

DAVID A. CLEVELAND, Milwaukee, to Mrs. Mary Macklin Stephens of Beverly Hills, Calif., in Riverside, Calif., February 26.

CHARLES AUGUST RENTROP JR., Germantown, Tenn., to Miss Marion Henrietta Meyn of Wallkill, N. Y., in Newburgh, N. Y., June 2.

MORRIS RAPPAPORT, Ellenville, N. Y., to Miss Judith Helen Preminger of Perth Amboy, N. J., March 18.

HENRY RANDALL THOMAS, Montgomery, Ala., to Miss Patricia Jane Piper of Rochester, Minn., May 26.

ROSS SIMONTON MCELWEE JR., Statesville, N. C., to Miss Doris Edgar in Kingston, N. Y., June 2.

NEWELL JEROME GRIFFITH, Tuckahoe, N. Y., to Miss Florrie Margaret Collins of Perry, Fla., June 2.

LOGAN UNDERWOOD MEWHINNEY, Holland, Texas, to Dr. RUTH ISADORA ALLEN of Dallas in May.

ALBERT F. TATUM, Tuscaloosa, Ala., to Miss Mary Nell Routledge of Birmingham, May 18.

HERBERT WINSTON FROSTICK to Miss Jean Caroline Wall, both of Charlotte, N. C., recently.

ROBERT J. ATWELL, Chillicothe, Ohio, to Miss Paula Mozelle Mitchell in Dayton, April 28.

HOWARD J. OHL, Lordsburg, N. M., to Miss Mary C. Shores of Union Star, Mo., April 3.

DOUGLAS T. LINDSAY, Minneapolis, to Miss Nelda Kanne of Faribault, Minn., March 26.

MILTON SALASKY, Norfolk, Va., to Miss Shirley Greenberg of San Francisco, May 19.

MACK RAYBURN to Mrs. Virginia Wilson Elam, both of Owensboro, Ky., April 6.

LORIN L. FOWLER, Marion, Ill., to Mrs. Lulu Caplinger of Downey, Calif., May 4.

MICHAEL J. LARKIN to Miss Helen M. Carroll, both of Trenton, N. J., June 20.

MANSON MEADS to Dr. HELEN WHEELER BELDING, both of Boston, May 26.

MARTIN SCHWEITZER to Miss Dorothy R. Chess, both of New York, June 9.

IRVING M. GREENBERGER to Miss Letty London, both of New York, June 3.

Deaths

William Hans Henry August Vogt ⊕ St. Louis; Missouri Medical College, St. Louis, 1897; joined the faculty of St. Louis University School of Medicine as instructor in gynecology and obstetrics in 1919, holding that position until 1924; assistant professor from 1924 to 1929 and associate professor from 1929 to 1933, when he became professor of gynecology and obstetrics and director of the department; instructor in gynecology and obstetrics at the Washington University School of Medicine from 1910 to 1915; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Southern Medical Association and the Central Association of Obstetricians and Gynecologists; past president of St. Louis Medical Society; served at various times on the gynecologic and obstetric staffs of Lutheran Hospital, City Sanitarium, City Infirmary, St. Louis Maternity, St. Luke's, St. John's and St. Louis City hospitals, St. Mary's Group of Hospitals and Deaconess Hospital and Home; since 1933 member of the advisory staff of St. Mary's Infirmary; died in Atlantic City, N. J., June 17, aged 68, of coronary thrombosis.

Henry Joseph Frederick Wallhauser ⊕ Mount Bethel, Pa.; University of the City of New York Medical Department, 1888; specialist certified by the American Board of Dermatology and Syphilology; past president of the Essex County (N. J.) Medical Society; member of the New Jersey Dermatological and Manhattan Dermatological societies; formerly medical director of Newark City Dispensary; consulting dermatologist to the Mountainside Hospital, Montclair, N, J., Overlook Hospital, Summit, N. J., Essex County Hospital for Contagious Diseases, Belleville, N. J., St. Mary's Hospital, Orange, N. J., and Lutheran Memorial Hospital, Crippled Children's Hospital, Babies' Hospital, Presbyterian Hospital, Newark City Hospital and the Hospital of St. Barnabas and for Women and Children, Newark, N. J., where he died May 5, aged 80, of arteriosclerosis and myocardial degeneration.

Oscar Francis Cox, Brookline, Mass.; Tufts College Medical School, Boston, 1914; professor of clinical urology at his alma mater and associate professor of medicine at the Boston University School of Medicine; served overseas during World War I; member of the subcommittee on venereal diseases of the National Research Council; secretary of the American Neisserian Medical Society; member of the American Medical Association; a director of the Massachusetts Society for Social Hygiene; director of the division of genitourinary diseases at the Massachusetts Memorial Hospital, Boston; chief of the genitourinary clinic of the Boston Dispensary; chairman of the advisory committee on venereal disease control of the Massachusetts Department of Public Health; died June 3, aged 57, of primary carcinoma of the lung.

John Pascal Sawyer, Cleveland Heights, Ohio; Western Reserve University Medical Department, Cleveland, 1886; since 1932 professor emeritus of therapeutics and clinical medicine at his alma mater, where he had served on the faculty in various capacities for many years; specialist certified by the American Board of Internal Medicine; member of the American Medical Association, American Gastro-Enterological Association and the Cleveland Academy of Medicine; fellow of the American College of Physicians; a trustee of the Cleveland Medical Library Association; emeritus chief of staff at St. Vincent Charity Hospital, Cleveland, where he died June 17, aged 83, of perforated stomach ulcer and terminal pneumonia.

Harold Glen Stevenson, Utica, N. Y.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1920; on the staff of the Oneida County Tuberculosis Sanatorium (Broadacres); at one time superintendent of the Berks County Sanatorium in Reading, Pa.; formerly on the staffs of the Eagleville Sanatorium for Consumptives, Eagleville, Pa., Montgomery Sanatorium, Amsterdam, Pennsylvania State Sanatorium, South Mountain, Niagara Sanatorium in Lockport, Loomis Sanatorium, Loomis, and the Neversink Sanatorium, Reading, Pa.; died May 4, aged 49, of chronic arthritis and myocardial failure.

George Ollie Allen, Marietta, Ga.; Southern Medical College, Atlanta, 1893; member of the American Medical Association; past president of the Cobb County Medical Society; served during World War I; while a resident of Fargo served as physician and surgeon for the Southern Railway Company; on the staff of the Marietta Hospital; member of the Marietta Rotary Club; died May 26, aged 73, of coronary thrombosis.

John Andrews, Grant City, Mo.; Rush Medical College, Chicago, 1892; on the courtesy staff of the Missouri Methodist Hospital, St. Joseph, where he died May 16, aged 79, of hypertensive and arteriosclerotic heart disease.

Guy Frank Arnold, Washington, D. C.; Baltimore Medical College, 1900; died May 26, aged 68, of gastric hemorrhage and cerebral thrombosis.

Mary Lantz Austin, Gallipolis, Ohio; Ohio Medical University, Columbus, 1904; for many years on the staff of the Ohio Hospital for Epileptics; died in the Holzer Hospital May 21, aged 78, of cerebral and generalized arteriosclerosis and chronic arthritis.

Clarence H. Barber, Grand Rapids, Mich.; the Hahnemann Medical College and Hospital, Chicago, 1891; member of the American Medical Association; on the staff of the Michigan Veterans' Facility, where he died May 18, aged 75, of coronary thrombosis and pulmonary edema.

Arthur J. Behrendt, Chicago; College of Physicians and Surgeons of Chicago, 1891; emeritus member of the Illinois State Medical Society and member of the American Medical Association; also a pharmacist; on the staffs of the Grant and St. Elizabeth's hospitals and the City of Chicago Municipal Tuberculosis Sanitarium; died in Evanston (Ill.) Hospital June 10, aged 79, of primary bronchogenic carcinoma.

William Belitz, Cochrane, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; died April 17, aged 81, of carcinoma of the gastrointestinal tract.

Oscar Caraker, Olmsted, Ill.; St. Louis College of Physicians and Surgeons, 1908; member of the American Medical Association; served as president of the Pulaski County Medical Society; on the staff of St. Mary's Hospital in Cairo; died May 22, aged 64, of coronary thrombosis.

Joseph Wallace Chetwynd, East Liverpool, Ohio; Jefferson Medical College of Philadelphia, 1907; member of the American Medical Association; on the staff of the East Liverpool City Hospital; formerly on the staff of the Massillon (Ohio) State Hospital; died May 2, aged 63, of heart disease.

Harold Thompson Clapp, Cleveland; University of Wooster Medical Department, Cleveland, 1890; medical examiner and consultant for the Travelers Insurance Company; died in the Lakeside Hospital May 27, aged 76, of myocardial failure.

Milton Daily, Sioux City, Iowa; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1895; member of the American Medical Association; formerly police surgeon; served as a member and president of the city school board; at one time medical examiner for the Cudahy Packing Company and the Stock Yards Company; on the staff of St. Vincent's Hospital, where he died May 8, aged 74, of embolism of the lung, fracture of the femur and diabetes mellitus.

Richard Ensign Dickson ⊕ Holyoke, Mass.; Jefferson Medical College of Philadelphia, 1895; served as president of the Eastern Hampden Medical Association; on the staff of the Holyoke Hospital; died in the Wesson Memorial Hospital, Springfield, May 9, aged 78, of coronary thrombosis.

Ernest De Forest Hammond, Salt Lake City; John A. Creighton Medical College, Omaha, 1900; member of the American Medical Association; past president of the Salt Lake County Medical Society; president of the medical staff of the Holy Cross Hospital medical staff and served as chief surgeon for the Salt Lake and Utah Railroad Company; died in the Veterans Administration Facility May 1, aged 74, of coronary heart disease with decompensation.

Walter Childs Haviland ⊕ Mansfield Depot, Conn.; Baltimore Medical College, 1904; specialist certified by the American Board of Psychiatry and Neurology, Inc.; member of the American Psychiatric Association and the New England Society of Psychiatry; in 1939 joined the staff of the Mansfield State Training School and Hospital, where he recently retired as senior physician; served on the staffs of the Connecticut State Hospital in Middletown, Conn., and the Worcester Insane Hospital, Worcester, Mass.; died May 14, aged 63, of heart disease.

Claude Turner Keyes, San Angelo, Texas; Memphis (Tenn.) Hospital Medical College, 1897; member of the American Medical Association; died in a local hospital May 8, aged 74, of carcinoma of the liver.

Jesse B. Lampton ✠ Sapulpa, Okla.; Hospital College of Medicine, Louisville, Ky., 1907; died March 28, aged 66, of coronary heart disease.

Daniel Isaiah Leatherman ✠ Greensburg, Pa.; College of Physicians and Surgeons, Baltimore, 1886; died March 31, aged 84, of angina pectoris.

Francis X. McCormick, Milwaukee; Marquette University School of Medicine, Milwaukee, 1925; member of the American Medical Association; police surgeon and an examining physician for the state athletic commission; died in St. Mary's Hospital May 18, aged 47, of cerebral hemorrhage and arterial hypertension.

Arthur Willis McDonough, Denver; the Hahnemann Medical College and Hospital, Chicago, 1910; member of the American Medical Association; served as president and secretary of the Colorado *Homeopathic Society*; died April 11, aged 66, of cerebral tumor.

Edward Lee McIntyre, Springfield, Ky.; Kentucky School of Medicine, Louisville, 1889; died April 15, aged 81, of bronchopneumonia.

Ralph J. Melman ⊕ Philadelphia; Medico-Chirurgical College of Philadelphia, 1907; on the staffs of the Babies' and Northern Liberties hospitals; examining physician for the local draft board number 9; died April 10, aged 60, of coronary occlusion.

Francis A. Bernard Norton, Bakerstown, Pa.; University of Louisville (Ky.) Medical Department, 1902; died in the Schenley Nursing Home, Pittsburgh, March 14, aged 72, of arteriosclerotic heart disease and cerebral hemorrhage.

Gurdon Edgar Padget, Cuyler, N. Y.; Syracuse University College of Medicine, 1904; died May 4, aged 78, of coronary occlusion.

August Nob Pelusio, Paterson, N. J.; College of Physicians and Surgeons, Baltimore, 1913; died April 29, aged 64, of pulmonary edema and arteriosclerosis

Everett Clifton Perkins, Dover, N. H.; Medical School of Maine, Portland, 1897; died April 3, aged 74, of cerebral hemorrhage.

Allan Ramsey, Cincinnati; Medical College of Ohio, Cincinnati, 1896; formerly assistant professor of medicine at the University of Cincinnati College of Medicine; served on the staff of the Children's Hospital; died in the Christ Hospital April 10, aged 75, of a fractured skull caused by a fall on a street car.

William Ford Richardson, Beech Creek, Ky.; Louisville Medical College, 1904; member of the American Medical Association; on the staff of the Muhlenberg Community Hospital in Greenville, where he died May 10, aged 74, of heart disease.

Silas M. Rohr, Santa Rosa, Calif.; Baltimore Medical College, 1889; died April 16, aged 84, of chronic myocardial degeneration and herpes zoster.

Reed Alonzo Sauter ⊕ Schenectady, N. Y.; Albany Medical College, Albany, 1895; also a pharmacist; died March 7, aged 75, of coronary occlusion.

***John Gottleib* Schwarz,** Gallipolis, Ohio; Ohio-Miami Medical College of the University of Cincinnati, 1912; served as superintendent of the Ohio Hospital for Epileptics, where he had been assistant superintendent and for many years on the staff; died in the Holzer Hospital April 19, aged 70, of chronic nephritis.

William Dodds Scott Jr., Baltimore; University of Maryland School of Medicine, Baltimore, 1904; served overseas during World War I; formerly affiliated with the U. S. Public Health Service; died in the Union Memorial Hospital April 16, aged 66, of congestive heart disease and hypertensive cardiovascular disease.

Beryl Whittier Scully, Rome, N. Y.; Cornell University Medical College, New York, 1933; member of the American Medical Association; interned at the Bellevue Hospital in New York; died April 28, aged 39, of a fractured skull received when his automobile hit a tree.

George F. Seiberling ⊕ Allentown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; on the staff of the Sacred Heart Hospital; member of the chamber of commerce; elected vice president of the board of directors of the Lehigh County Agricultural Society; died May 6, aged 75, of coronary thrombosis.

Arthur C. Sidler, Cudahy, Wis.; Milwaukee Medical College, 1897; formerly mayor of Cudahy; before Cudahy became a city he served as president of the village school board and health commissioner; died in Nashville, Tenn., March 31, aged 71, of arteriosclerotic heart disease.

Raymond Robinson Simmons ⊕ Winston-Salem, N. C.; Medical College of Virginia, Richmond, 1917; on the courtesy staffs of the City Memorial and North Carolina Baptist hospitals; died May 5, aged 53, of aortic and myocardial insufficiency.

Henry Petway Spencer, Burns, Tenn.; University of Tennessee Medical Department, Nashville, 1907; died in White Bluff April 18, aged 67, of coronary thrombosis.

Richard Henry Stafford, Sumner, Iowa; Rush Medical College, Chicago, 1890; for many years city health officer; surgeon for the Chicago Great Western Railway; died April 8, aged 85, of cardiovascular disease and coronary thrombosis.

Nevin G. Stevenson, Sparta, Ill.; Chicago Homeopathic Medical College, 1895; member of the American Medical Association; superintendent and owner of the Sparta Community Hospital, where he died April 28, aged 74, of cerebral hemorrhage.

Charles C. Stockard, Lawrenceburg, Tenn. (licensed in Tennessee in 1909); member of the American Medical Association; past president of the Hardin-Lawrence-Lewis-Perry-Wayne Counties Medical Society; at one time company physician for the Napier Irons Works in Napier; commissioned a first lieutenant by Governor Prentice Cooper as examining physician for the National Guard; died May 6, aged 60, of pernicious anemia.

Robert Glenn Stone, Atlanta, Ga.; University of Georgia Medical Department, Augusta, 1906; member of the Medical Society of New Jersey, American Medical Association and the American Psychiatric Association; in 1919 joined the staff of the New Jersey State Hospital, Trenton, where he was for many years clinical director, and from 1930 until he retired on May 1, 1944 medical director; died April 27, aged 64, of cardiac decompensation and renal insufficiency.

Colletta Mayme Swaney, Detroit; Wayne University College of Medicine, Detroit, 1937; served an internship at the Eloise Hospital in Eloise, Mich., and a residency at the East Side General Hospital; found dead in her apartment April 18, aged 40, of heart disease, acute venous stasis, emphysema of the lungs and congestion of the kidneys.

John W. Swindell, Greenville, Texas; Memphis (Tenn.) Hospital Medical College, 1892; member of the American Medical Association; died April 20, aged 75.

Thomas F. Taylor, Dresden, Tenn.; University of Tennessee Medical Department, Nashville, 1898; member of the American Medical Association; died in Martin April 4, aged 75, of coronary thrombosis.

Guglielmo A. Tedesco, Union City, N. J.; Regia Università di Torino Facoltà di Medicina e Chirurgia, Italy, 1899; died in St. Mary's Hospital, Hoboken, April 28, aged 70, of coronary occlusion and hypertrophy of the prostate.

Marcus Thrane, Hood River, Ore.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1894; member of the American Medical Association; died April 10, aged 70, of coronary thrombosis.

Joel Adams Tilton Jr. [illegible] George Washington University School [illegible] 1916; associated with the Veterans [illegible] April 28, aged 50, of coronary occlusion.

John Joseph Zaun Sr., Milwaukee; Rush Medical College, Chicago, 1901; on the staff of St. Mary's Hospital, where he died May 19, aged 65, of embolism.

PUBLIC HEALTH SERVICE

Leon Glassman ⊕ Assistant Surgeon, U. S. Public Health Service Reserve, Philadelphia; Hahnemann Medical College and Hospital, Philadelphia, 1940; interned and served a residency in obstetrics and gynecology at the Hahnemann Hospital in Philadelphia; entered the public health service reserve as assistant surgeon and began active duty in October 1943; assigned to the outpatient department of the U. S. Marine Hospital, Baltimore; on May 5, 1944 transferred to the War Shipping Administration and assigned to the medical examination program; later in 1944 assigned to the U. S. Maritime Service Training Ship *American Engineer;* a short while later ordered to the Coast Guard, Captain of the Port, Baltimore; assigned to the District Coast Guard office, Sixth Naval District, Charleston, S. C., for the final tour of duty on Oct. 30, 1944, since which time he had been on sea duty with the Coast Guard as medical officer aboard a Coast Guard cutter; recommended for the Purple Heart; was buried in the Marine cemetery on Saipan; died May 4, aged 30, of injuries received when he slipped on the Jacob's ladder while helping load wounded marines aboard his ship.

Correspondence

METHYLENE BLUE TEST FOR BILIRUBIN IN THE URINE

To the Editor:—The editorial comment in THE JOURNAL, April 21, page 1059, discussed Myers' use of the methylene blue test for bilirubin in the urine. In Correspondence May 26, page 308, appeared a communication from Watson, Meads and Castle in which the value of the test as used by Myers was questioned because of its lack of specificity for bilirubin. For the past one and one-half years the methylene blue test has been under investigation in several laboratories engaged in the study of infectious hepatitis under the auspices of the Commission on Measles and Mumps, Army Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, U. S. Army. Our experience with a modified methylene blue test in several epidemics of infectious hepatitis and in hepatitis produced experimentally in human volunteers has indicated that the modified test is capable of providing valuable information concerning the presence of bilirubin in the urine. A brief discussion of the technic and interpretation of the methylene blue test, as used in our studies, may aid in reconciling the favorable experience of Myers with the unfavorable opinion expressed by Watson, Meads and Castle. The test was performed by Myers and by Watson and her associates by adding 2 drops of methylene blue to 10 cc. of urine. The occurrence of a green color apparently has been interpreted as a positive test for bilirubin in the urine. Unfortunately, experience has shown that the addition of 2 drops of methylene blue to certain urines which do not contain bilirubin is followed by the development of a green color. Our experience indicates that this objection to the test can be eliminated by modifying the technic and interpretation.

The cause of the green color produced by the addition of methylene blue to certain urine specimens has been subject to controversy since the beginning of the century. Experiments such as those described by Watson and her associates indicate that the blending of the yellow pigments of urine, regardless of their nature, with methylene blue (or other blue solutions) produces a green color. This is the explanation for the green color occurring after the addition of 1 to 4 drops of methylene blue to certain urines that do not contain bilirubin. However, tests of a large number of supposedly normal and pathologic urines have indicated that no commonly occurring urine pigments other than bilirubin produce sufficient yellow color to require more than 4 drops of methylene blue to extinguish the green color resulting from the blending of blue and yellow.

For this reason we have performed and interpreted the test as follows: An aqueous solution of methylene blue (0.2 per cent based on actual dye content) is added drop by drop to 5 cc. of urine and the total number of drops required to impart a blue color to the urine-methylene blue mixture is noted. If more than 8 drops are required a smaller measured amount of urine is diluted to 5 cc. and the test repeated in order that a clearer end point may be obtained. If diluted, the number of drops is multiplied by the dilution factor. The reading (in drops) is taken as one less than the number needed to change the color from green to blue. A reading greater than 4 drops has been regarded as a positive test for bilirubin in the urine. Although the sensitivity of the test was diminished by the use of this criterion, its specificity was increased greatly, as indicated by the infrequent occurrence of falsely positive tests. Readings of 2 to 4 drops inclusive have been regarded as suggestive and as an indication for additional studies. As already stated, our investigations of this modified methylene blue test have been confined almost entirely to the study of urines from patients with infectious hepatitis. In this condition the modified test has yielded information of considerable value both in respect to early diagnosis and as a simple means of following the course of the disease. Furthermore, positive tests have been obtained with the urines from many hepatitis patients before the appearance of overt jaundice. An additional contribution of the test has been the roughly quantitative information it provides concerning changes in the excretion of bilirubin in the urine.

The methylene blue test, in our experience, has been inferior in sensitivity and specificity to the Harrison and diazo "spot" tests for bilirubin in the urine. On the other hand, when positive, it provides better quantitative evidence concerning the output of urine bilirubin than is afforded by the "spot" tests and it can be performed under conditions which do not permit the use of the latter. For these reasons it is our opinion that the modified methylene blue test, properly used and interpreted, will prove to be a valuable procedure.

Conclusive evidence has been obtained (by J. G. Reinhold and others) that a chemical reaction occurs between methylene blue and bilirubin. Spectrophotometric studies have revealed alterations in the absorption spectrums of methylene blue and bilirubin when the two were combined in aqueous solution. Furthermore, a green precipitate was obtained by the addition of methylene blue to bilirubin in weakly alkaline solutions. A similar precipitate appeared on standing after adding methylene blue to neutral or weakly alkaline urines containing bilirubin (obtained from patients with hepatitis). However, it is believed that this chemical reaction is less important than the blending of blue and yellow colors in explaining the green color constituting the positive methylene blue test.

SYDNEY S. GELLIS, Captain, M. C., A. U. S.
JOHN R. NEEFE, Captain, M. C., A. U. S.
JOHN G. REINHOLD, PH.D.
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Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, July 7, page 762.

BOARDS OF MEDICAL EXAMINERS

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

CALIFORNIA: *Oral.* Los Angeles, Aug. 11. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT: * *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEVADA: *Reciprocity.* Carson City, Aug. 6. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW MEXICO: * Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

OHIO: *Endorsement.* Columbus, July. Sec. Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * Portland, July 25-27. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland 4.

SOUTH DAKOTA: * Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Houston, July 17-19. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

WASHINGTON: * Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

RHODE ISLAND: Providence, Aug. 15. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

29:419-554 (April) 1945

Management of Myxedematous Patient with Symptoms of Cardiovascular Disease. T. H. McGavack, K. Lange and D. Schwimmer.—p. 421.
Electrocardiographic Study of Deformity of Chest. A. R. Adorno and P. D White.—p. 440.
Auricular Premature Systole: I. Aberration of Ventricular Complex in Electrocardiogram. K. Berliner and L. P. Lewithin.—p. 449.
Wolff-Parkinson-White Syndrome with Unusual Features. M. H. Stein. —p. 479.
Comparison of Therapeutic Effectiveness of Serum and Sodium Chloride in Scald Shock. O. Hechter, H. C. Bergman and M. Prinzmetal. —p 484.
Role of Renal Pressor System in Burn Shock. O. Hechter, H. C. Bergman and M. Prinzmetal.—p. 493.
Further Studies on Liver Principle Which Is Effective Against Burn Shock. O Hechter, H. C. Bergman, L. Sapirstein, R. Fisk, G. Feigen and M. Prinzmetal.—p. 499.
Ineffectiveness of Adrenocortical Hormones, Thiamine, Ascorbic Acid, Nupercaine and Post-Traumatic Serum in Shock Due to Scalding Burns. H. C. Bergman, D. D. Rosenfeld, O. Hechter and M. Prinzmetal.—p. 506.
Effect of Short Term Nutritional Stress on Resistance to Scald Shock. H. C. Bergman, O. Hechter and M. Prinzmetal.—p. 513.
Urologic Disease as Cause of Hypertension. M. M. Rath and H. I. Russek.—p. 516.
Morphologic Study of Cardiac Conduction System: Part IV. Anatomy of Upper Part of Ventricular Septum in Man. D. J. Glomset and R. F. Birge.—p. 526.

American Journal of Clinical Pathology, Baltimore

15:87-122 (March) 1945

*Tumors of Thymus in Myasthenia Gravis. N. A. Murray and J. R. McDonald.—p. 87.
*Rh Antibodies. I. Davidsohn.—p. 95.
Rh Blood Types and Some of Their Applications. A. S. Wiener. —p. 106.

Tumors of Thymus in Myasthenia Gravis.—Murray and McDonald studied thymus glands removed from 10 fetuses and from 100 persons from the ages of 4 months to 86 years. They also studied thymomas associated with myasthenia gravis in 13 cases and 2 thymic tumors removed surgically from patients with myasthenia gravis. Several observations made by them suggested that these tumors are thymomas. Most primary tumors of the thymus associated with myasthenia gravis are of a single type. They are made up of lymphocytes and larger pale cells that have faintly acidophilic cytoplasm in varying proportions and indefinite cell boundaries. These tumors contain numerous small blood vessels and occasional Hassall's corpuscles. A "lining up" or palisading of the pale cells along connective tissue trabeculae and pseudorosette formation around blood vessels appear to be distinguishing features. If metastasis and direct extension are sufficient criteria for the diagnosis of malignancy, then these tumors are malignant. It is believed that "thymoma" is an adequate name for these tumors. Those which will metastasize cannot be distinguished from those which will not metastasize. The absence or presence of secondary germ centers (lymph follicles) does not point either to or away from malignancy. The absence of differentiation between cortex and medulla is not a reliable criterion for the diagnosis of malignancy. The incidence of myasthenia gravis among patients with thymoma is nearly 100 per cent. Eaton has stated that the incidence of thymomas among patients with myasthenia gravis is 14 per cent. According to Bell the incidence at necropsy of thymic dysplasia among patients who have died of myasthenia gravis is about 50 per cent.

Rh Antibodies.—Davidsohn says that the titer of anti-Rh agglutinins in the blood of mothers of children with erythroblastosis is highest from about eight to twenty days following delivery, and this is the best time for testing for anti-Rh agglutinins and for obtaining potent anti-Rh serum. The prozone phenomenon (failure of antigen-antibody reaction in undiluted serum, but manifest reaction in higher dilutions) is not infrequent in anti-Rh serum. Therefore, when testing for anti-Rh agglutinins, serum dilutions up to 1:20 should be examined. The presence of anti-Rh agglutinins during pregnancy does not necessarily spell erythroblastosis in the baby about to be born, particularly if the antibodies may be ascribed to a preceding pregnancy. Erythroblastosis may be due to Rh incompatibility even in case of Rh-positive mothers. Among factors of possible prognostic significance with regard to future pregnancies, the following two considerations may have to be included: (*a*) the homozygocity or heterozygocity of the husband if determinable; (*b*) the persistence of anti-Rh agglutinins following birth of a child with erythroblastosis.

American Journal of Physiology, Baltimore

143:463-634 (April) 1945. Partial Index

Dynamics of Isolated Heart and Heart-Lung Preparations of Dog. L. N. Katz, W. Wise and K. Jochim.—p. 463.
Proximodistal Fluid Convection in Endoneurial Spaces of Peripheral Nerves, Demonstrated by Colored and Radioactive (Isotope) Tracers. P. Weiss, Hsi Wang, A. C. Taylor and M. V. Edds Jr.—p. 521.
Efficiency of Glare Reduction by Eyelids. E. Simonson, S. S. Blankenstein and E. J. Carey.—p. 541.
Effect of Adrenocorticotropic Hormone on Survival of Normal Rats During Anoxia. Choh Hao Li and V. V. Herring.—p. 548.
Use of Cholinesterase in Shock. R. J. Schachter.—p. 552.
Effect of Adrenalectomy on Potassium of Stimulated Muscle. J. R. Jordan.—p. 558.
Contents of Stomach, Small Intestine, Cecum and Colon of Normal and Fasting Rabbits. E. B. Carmichael, J. T. Strickland and R. L. Driver.—p. 562.
Dehydrating Effect of Continuously Administered Water. A. V. Wolf. —p 567.
Effect of Hemorrhage on Lactate/Pyruvate Ratio and Arterial-Venous Differences in Glucose and Lactate. Clarissa H. Beatty.—p. 579.
Rate of Carbon Monoxide Uptake by Normal Men. W. H. Forbes, F. Sargent and F. J. W. Roughton.—p. 594.
Average Time Spent by Blood in Human Lung Capillary and Its Relation to Rates of CO Uptake and Elimination in Man. F. J. W. Roughton.—p. 621.

American Journal of Surgery, New York

130:139-278 (May) 1945

Treatment of Abdominal Injuries: Review of 88 Personal Cases. J. L. Dixon, G. Martin and A. Ochsner.—p. 143.
*Air Embolism: Fatal Air Embolism Due to Powder Insufflators Used in Gynecologic Treatments. H. S. Martland.—p. 164.
Refrigeration in General Surgery of Limbs. F. M. Allen.—p. 170.
*Positive Pressure Respiration in Treatment of Acute Pulmonary Edema. F. P Ansbro.—p. 185.
Skin Grafting by General Surgeon. J. C. Urkov.—p. 195.
New Technic for Reconstruction of Oviducts. D. Polowe.—p. 208.
Nonsplinting Treatment of Elbow Joint Injuries: Report of Its Use in 20 Cases. T. A. Boutrous, A. Blain and W. A. Chipman.—p. 212.
Acute Cholecystitis: Comparative Study of Mortality Rate After Immediate and Delayed Operations. W. J. McGuigan.—p. 219.
Cellophane in Bone and Joint Surgery. G. H. Harley and L. W. Breck. —p. 229
Sulfathiazole-Cod Liver Oil Ointment in Postoperative Care of Septic Hand. D. Brezin.—p. 232.

Fatal Air Embolism Due to Powder Insufflators.—Martland investigated two deaths occurring after vaginal insufflation of medicinal powders for the relief of pruritus vulvae. In the first case a virginal and cribriform hymen played an important role in the causation of the air embolism. The doctor, believing he was spraying powder over the external genitals, must have unknowingly held the glass tip of the insufflator directly over the largest opening in the hymen and have blown powder and air into the vagina. The air entrapped in the vagina was forced into the uterine cavity. The exact point of entry of air into the venous circulation cannot be demonstrated. The fact that the patient had just passed a menstrual period favors engorgement and distention of the uterine veins. The second woman was six months pregnant. In this case the metal end of the insufflator must have rested against the soft cervix of the pregnant uterus and considerable powder and large amounts of air were blown directly into the uterine cavity. The main purpose of the insufflators is to dilate and smooth out the folds

in the vagina so that the powder may be sprayed on the mucosa. It is obvious that the sudden blowing up of the vagina with air under excessive pressure is not without danger. The engorgement of the endometrium around the menstrual period, open veins after uterine curettage and the soft cervix of a pregnant uterus all might favor air embolism during such insufflations. It is reasonable to assume that few of these catastrophes are likely to be reported and that perhaps some such deaths have been attributed to heart disease or some other condition and never verified by necropsy.

Positive Pressure Respiration for Pulmonary Edema.—Ansbro reports 2 cases of acute pulmonary edema in which positive pressure respiration with oxygen was followed by a prompt clearing of the condition and recovery. The first patient took an overdose of sedative medication the night and morning before operation. Respiratory depression following the operative procedure was considered the initial cause of the widespread pulmonary edema that ensued. Inhalation of oxygen by catheter, mask and tent failed to relieve either the cyanosis or the edema. The application of positive pressure by the anesthesia mask resulted in a swift clearing of edema and cyanosis. The pulmonary edema in the second patient probably resulted from the primary tracheal obstruction (which necessitated the tracheotomy) and was aggravated by the ensuing ball valve action of the wet gauze at the tube opening, which resulted in an increased negative intrapulmonary pressure. The removal of the ball valve produced some improvement; the patient was literally "drowning in her own secretions" until positive pressure respiration dammed back the fluid. It is recommended that positive pressure respiration be adopted in combating what is frequently regarded as a terminal event.

American Review of Soviet Medicine, New York

22:291-384 (April) 1945

Treatment of Spinal Column and Spinal Cord Wounds. N. I. Propper-Grashchenkov.—p. 292.
Agonal States and Clinical Death: Problems in Revival of Organisms. V. A. Negovski.—p. 303.
Radiotherapy and Intracranial Pressure. Maria B. Tsuker.—p. 316.
Refrigeration Anesthesia in Surgery of Extremities. S. V. Lobachev.—p. 323.
Susceptibility of Macacus Rhesus to Virus of Tick Borne Encephalitis. L. A. Silber and A. K. Shubladze.—p. 332.
Louping Ill in U. S. S. R. L. A. Silber and A. K. Shubladze.—p. 339.
Cytology and Karyology of Colon-Typhoid Group. M. A. Peshkov.—p. 342.
Carbonic Acid in Formation of Amino Acids by Surviving Animal Tissues. M. G. Kritzmann.—p. 349.
Symptom of "Electrical Discharge" in Brain Injuries. A. V. Triumfov.—p. 350.
Stimulating Visual Function. S. V. Kravkov.—p. 353.
Therapeutic and Prophylactic Use of Grip Antivirus. D. M. Rossiski.—p. 356.

Archives of Internal Medicine, Chicago

75:215-278 (April) 1945

Arachnodactyly (Spider Fingers). H. Gray.—p. 215.
Primary Atypical Pneumonia of Unknown Cause. R. C. Schmitz.—p. 222.
*Effects of Cold Air on Air Passages and Lungs: Experimental Investigation. A. R. Moritz and J. R. Weisiger.—p. 233.
*Fatal Poisoning from Potassium Thiocyanate Used in Treatment of Hypertension: Report of Case and Review of Literature. A. del Solar, G. Dussaillant G., M. Brodsky B. and G. Rodriguez C.—p. 241.
Venesection for Plethoric Patient. L. E. Hines and D. L. Kessler.—p. 248.

Effects of Cold on Air Passages.—Moritz and Weisiger caused dogs to breathe extremely cold air for periods ranging between twenty and one hundred and thirty-three minutes. The rate at which air was warmed within the body was measured by means of appropriately placed thermocouples. The air was delivered to the larynx at temperatures which ranged between —50 and —28 C., and in no instance were temperature recordings lower than +18 C. observed at the bifurcation of the trachea. The explanation of the rapid warming of inhaled cold air and of the occurrence of relatively mild and localized injury following the inhalation of cold air lies in the fact that dry air has an extremely low heat capacity and that the number of calories required to produce a great rise in the temperature of dry air can be provided by the heat derived from the cooling of a small amount of tissue by a few degrees. Although the intermittent exposure to cold air that occurs during normal respiration does not cause significant injury to the pharynx or larynx, a continuous exposure of these structures to cold may result in the development of a rapidly obstructive edema. Experiments on dogs warrant the inference (1) that it is unlikely that significant injury to the air passages of man would result from the breathing of air at any degree of coldness likely to be encountered in nonexperimental conditions as long as it was inhaled through the nose or between partially closed lips and (2) even though extremely cold air was inhaled rapidly through a widely opened mouth, it would be warmed to a point well above freezing by the time it reached the bronchi.

Fatal Poisoning with Potassium Thiocyanate.—Del Solar and his associates gave potassium thiocyanate to 73 patients with hypertension. In the fatal case which they report a distinct fault in dosage on the part of the patient was responsible for the intoxication. The case emphasizes the danger of prescribing the drug in easily inaccurately measured forms, like the solution for drop administration. The thiocyanate concentration of the blood at the onset of toxic symptoms was only 7 mg. per hundred cubic centimeters. The concentrations of the drug in the tissues are the highest ones thus far reported in similar instances. A prominent feature of the postmortem examination was the finding of an acute necrotic nephrosis that had produced no symptoms or signs during life.

Archives of Ophthalmology, Chicago

33:265-340 (April) 1945

Choice of Operation for Primary Glaucoma Combined with Cataract. J. S. Guyton.—p. 265.
Resection of Levator Palpebrae Muscle for Ptosis, with Anatomic Studies. R. N. Berke.—p. 269.
Uveitis, with Poliosis, Vitiligo, Alopecia and Dysacousia (Vogt-Koyanagi Syndrome). E. Rosen.—p. 281.
Meridional Aniseikonia at Oblique Axes. H. M. Burian and K. N. Ogle.—p. 293.
Heterochromia Sympathica. P. H. Boshoff and J. J. Theron.—p. 311.
Plastic Corneal Bath for Application of Penicillin. H. A. G. Duncan.—p. 313.

Canadian Medical Association Journal, Montreal

52:327-444 (April) 1945

Penicillin Agar Pastilles. P. Greey and I. B. Macdonald.—p. 327.
Psychoneurotics Discharged from Canadian Army. J. D. Griffin, W. D. Ross, G. H. Josie and M. F. Henderson.—p. 330.
Penicillin Therapy in Skin Infections. N. M. Wrong.—p. 341.
Acute Fluoride Poisoning. I. M. Rabinowitch.—p. 345.
Mental Illness and Principles of Medicine. J. G. Dewan and T. Owen.—p. 349.
Further Observations on Experimental Bone Formation with Special Reference to Bone-Forming Properties of Epithelial Lining of Trigone in Dog. A. C. Abbott and E. Stephenson.—p. 358.
Thiouracil. E. M. Boyd and W. F. Connell.—p. 362.
*Agranulocytic Angina Effectively Treated with Intravenous Pyridoxine (Vitamin B_6). M. M. Cantor and J. W. Scott.—p. 368.
Critical Survey of Two Diagnostic Pregnancy Tests (Colostrum Intracutaneous Test and Histidine Test). J. F. Davey and D. E. Daley.—p. 371.
Rupture of Uterus: An Analysis of 53 Cases. E. Delfs and N. J. Eastman.—p. 376.
Acute Inversion of Uterus. T. E. Nugent and M. H. MacKinnon.—p. 381.
Intravenous Use of *Novocain* as Substitute for Morphine in Postoperative Care. J. A. McLachlin.—p. 383.
Ancillary Services in Industrial Hygiene. N. L. Burnett.—p. 386.
Curare: New Tool for Anesthetist. H. R. Griffith.—p. 391.
New Rocker Type of Cast-Walker: Preliminary Report. A. M. Vineberg and D. R. Murphy.—p. 394.
Hemorrhagic Disease of Newborn. P. E. Williams.—p. 397.
Vasomotor Rhinitis. W. P. E. Paterson.—p. 400.

Pyridoxine (Vitamin B_6) in Granulocytopenia.—Cantor and Scott point out that the list of drugs likely to cause granulocytopenia has been lengthened year by year and now includes a number of coal tar derivatives, the barbiturates, the sulfonamides, gold salts and thiouracil. They report 3 cases of granulocytopenia successfully treated with pyridoxine (vitamin B_6). The pyridoxine was given daily by intravenous injection in doses of 125 or 200 mg. The material used was a 10 per cent solution of pyridoxine hydrochloride in isotonic solution of sodium chloride. This was put up in 10 cc. rubber capped vials and autoclaved for thirty minutes at 15 pounds pressure. The rapid and uniform response observed in these cases leads the authors to suggest that pyridoxine is the factor in liver and liver extracts responsible for the granulocytopoietic effect noted when liver is administered in granulocytopenia. Pyridoxine

produces granulocytopoiesis by an effect of the myelocytic elements of the bone marrow. It seems probable that pyridoxine is the factor involved in the maturation and emigration of the polymorphonuclear leukocyte.

Cancer Research, Baltimore

5:257-320 (May) 1945

Sarcomatous Transformation of Stroma of Mammary Carcinomas That Stimulated Fibroblastic Growth in Vitro R. J. Ludford and Hilda Barlow.—p. 257.
9,10 Dimethyl 1,2 Benzanthracene as Highly Potent Carcinogen for Rabbit's Skin. I Berenblum—p. 265.
Heterologous Transplantation of Mouse and Rat Tumors H S N. Greene and E. D. Murphy.—p 269
Thymonucleic Acid in Tumors R E. Stowell—p. 283.
Relative Thymonucleic Acid Content of Human Normal Epidermis, Hyperplastic Epidermis and Epidermoid Carcinomas. R. E Stowell and Zola K Cooper.—p. 295
Respiratory Behavior of Bacteria-Free Crown Gall Tissues. P. R. White—p. 302.

Endocrinology, Springfield, Ill.

36:245-290 (April) 1945

Oxidation Reduction Potential of Thyroid Follicle in Normal and Experimental Conditions. E. De Robertis and J. Moura Gonçalves —*p. 245.*
Study of Effect of Prolactin on Broodiness and on Cock Testes A. V. Nalbandov, M. Hochhauser and Marie Dugas—p. 251
Metabolism of Rats After Thyroidectomy or During Thiouracil Treatment, and Effect of Thyroid Feeding A E. Meyer and G V. Ransom—p 259.
Variations in Water Content of Rat's Uterus During Continuous Estrogenic Treatment. W. R Carroll—p 266
Response to Thyroxine After Subtotal Hepatectomy. P E. Kellaway, H. E. Hoff and C. P. Leblond—p 272

Epidemiological Information Bull., Washington, D. C.

1:205-246 (March 15) 1945

Evolution of Tuberculosis in France During War.—p 207.
Memorandum on Chief Changes Made by International Sanitary Conventions, 1944. N. M. Goodman—p. 219
Current Reports on Prevalence of Certain Diseases: A Data on Plague, Cholera, Yellow Fever, Smallpox and Typhus Received During the Period March 1 to March 15, 1945—p 228
Id.: B Data on Other Diseases: Cerebrospinal Meningitis Cases, May-December 1944.—p. 238.
Trend of Certain Notifiable Diseases: Cases of Diphtheria Reported in Various Countries, 1943 1944—p 241

1:247-288 (March 31) 1945

International Sanitary Convention of June 1926 Modified by International Sanitary Convention of 1944: Preliminary Disposition—p 247.

Gastroenterology, Baltimore

4:205-288 (March) 1945

*Atabrine Dihydrochloride (Quinacrine Hydrochloride): Some Observations on Its Toxicity and on Its Use in Treatment of Malaria, with Particular Reference to Its Effects on the Liver. H R Butt, J E Hall, C. H. Watkins and R. W. Cragg—p 205.
Digestive Diseases in Station Hospital Overseas. Observations Over a Two Year Period. B. D. Rosenak and L M Foltz—p. 213.
Interdigestive Discharge of Duodenal Content: I Rate of Discharge. Four Rhythms. W. V. Berger and E. Oppenheim.—p. 228.
Osmotic Pressure of Fasting Jejunal Secretions in Man L. C McGee and A. B Hastings—p. 243.
Pepsin Secretion in Response to Caffeine. M. I. Grossman, J. A Roth and A. C. Ivy—p. 251
Some Observations of Changes in Renal Water Output of Albino Rat Under Influence of High Fat Diet. H Shay, R. Kolm and S S. Fels—p 257.

Effect on Liver of Atabrine Dihydrochloride (Quinacrine Hydrochloride).—Butt and his associates administered to 50 white men between the ages of 19 and 35 years 4 5 Gm of atabrine over a ten day period. All of these patients had had malaria with multiple relapses. Prior to the administration of atabrine and again at the completion of the ten day course of atabrine therapy the following laboratory procedures were carried out: (1) sulfobromophthalein test for hepatic function; (2) prothrombin time (Quick's method); (3) serum bilirubin; (4) van den Bergh reaction; (5) erythrocyte, leukocyte and differential count; hemoglobin estimation and a special blood smear for macrocytosis; (6) thick blood smear for malaria parasites. There was little evidence that atabrine exerted much, if any, hepatotoxic action. The toxic reactions reported in this and other studies have been few and of only moderate severity. To hesitate to use atabrine because of the possible untoward reactions does not seem justified.

Journal of Experimental Medicine, New York

81:405-538 (May) 1945

Hemoglobin and Plasma Protein: Their Relation to Internal Body Protein Metabolism L L. Miller, Frieda S. Robscheit Robbins and G. H. Whipple—p 405.
Synthesis, Storage and Excretion of Creatine, Creatinine and Glycocyamine in Progressive Muscular Dystrophy and Effects of Certain Hormones on These Processes C L Hoagland, Helena Gilder and R E. Shank—p 423.
Tolerance to Amino Acid Mixtures and Casein Digests Given Intravenously Glutamic Acid Responsible for Reactions S C. Madden, R. R Woods, F. W. Shull, J. H. Remington and G H. Whipple. —p 439
Comparison of Human and Guinea Pig Complements and Their Component Fractions. O. G. Bier, Graciela Leyton, M. M. Mayer and M. Heidelberger.—p. 449.
Regenerative Cycle of Motoneurons, with Special Reference to Phosphatase Activity. D. Bodian and R C Mellors—p. 469.
Cytochrome Oxidase in Normal and Regenerating Neurons. H. A. Howe and R. C. Mellors—p. 489.
Reversible Inactivation of Substance Inducing Transformation of Pneumococcal Types. M. McCarty—p 501.
Plasma Protein Metabolism—Electrophoretic Studies: Restoration of Circulating Proteins Following Acute Depletion of Plasmapheresis L. J. Zeldis and E. L Alling—p 515

Journal of Immunology, Baltimore

50:191-254 (April) 1945

Antigen Antibody Reactions in Salmonella Group: Introduction—Complement Fixation—Precipitation—Agglutinin Inhibition—Antigenicity—General Conclusions. E Seligmann—p 191
Use of Refined Serum Albumin as Nutrient for T. Pallidum. P. A. Little and Y. Subbarow.—p. 213
Serologic Relationship Amongst Salmonella and Other Enterobacteriaceae. I. Saphra and M Wassermann—p 221
Role of Pathogenicity Enhancing Substance in Mice Infected with Shigella Dysenteriae (Shiga) and Other Enterobacteriaceae. L Ohtzki and P. K Koch—p 229.
Studies on Listeria Monocytogenes II. Effect of Heat and Alcohol on Stable Somatic Antigens Mary L Robbins and A M. Griffin—p 237.
Id: III. Antibody Response to Individual Components of Antigen Mosaic During Immunization. Mary L. Robbins and A. M. Griffin. —p 247.

Journal of the Mount Sinai Hospital, New York

11:317-374 (March-April) 1945

Recent Advances in Histochemistry G Gomori—p. 317.
*Wound Infections in Diabetic Surgical Patients: Analysis of 34 Cases R. W. Watson—p 327.
Glioma of Optic Nerve. H. M Katzin—p 332
Acute Suppurative Labyrinthitis and Bacterial Meningitis, Labyrinthectomy, Recovery. Report of Case. J G Druss—p. 336.
Life's Later Years: Studies in Medical History of Old Age; Medicine of Islam. F. D. Zeman—p. 339.
Massive Pulmonary Embolism. V Based in Part on Study of 88 Fatal Cases H Neuhof and S H Klein.—p 345
Essays on Biology of Disease: Obesity E. Moschcowitz—p 357.

Wound Infections in Diabetic Surgical Patients.—Watson presents observations on 34 patients with a history of preceding diabetes mellitus who were operated on for some pathologic condition having no direct relation to their glycosuria. The diabetes was well controlled in these patients. With the exception of two thyroidectomies and one hernioplasty, every patient was subjected to laparotomy. Fifteen of the wounds healed by primary union; 19 of the wounds became infected. A comparative study of operative wounds of an equal number of nondiabetic surgical patients was made for control purposes. Wound infections developed in 3 of the 34 cases selected. Postoperative wound infections were almost six times more frequent in the diabetic group. This susceptibility is in large part due to the greatly lowered tissue resistance inherent in the diabetic patient.

Journal of National Cancer Inst., Washington, D. C.

5:311-382 (April) 1945

Gastric Physiology in Relation to Gastric Cancer A C. Ivy—p. 313
Genetic Analysis of Induction of Tumors by Methylcholanthrene: IX Induced and Spontaneous Adenocarcinomas of Stomach in Mice. L C Strong—p. 339.
Superficial Spreading Type of Carcinoma of Stomach. A. P. Stout —p 363
Radical Surgery for Gastric Cancer A Brunschwig—p 365.
Physiology of Mucus Secretion. I Hollander—p 367.
Excretion of Sulfa Drugs by Stomachs of Normal Persons and Patients with Gastritis, Peptic Ulcer and Gastric Cancer L Schiff—p. 369.
Disturbances of Sugar Metabolism in Gastric Cancer. H O. Singher. —p 371
Multiple Cancers of Human Gastrointestinal Tract. S Warren—p 375.
Observations of Chronic Gastritis and Cancer W A Meissner.—p 377.

Journal of Nervous and Mental Diseases, New York

101:401-514 (May) 1945

War Psychiatry and Its Influence on Postwar Psychiatry and on Civilization. E. A. Strecker.—p. 401.
Psychiatry Before World War II. S. W. Hamilton.—p. 416.
Present and Future Effects of War Neuroses. C. C. Burlingame.—p. 429.
Civilian Advances and Investigations in Neurosurgery During the War. C. Pilcher.—p. 434.
War Neuroses or Battle Fatigue? R. R. Grinker.—p. 442.
War and Its Psychiatric Problems. H. P. Rome.—p. 445.
Injuries to Central Nervous System. W. M. Craig.—p. 451.
*Injuries to Peripheral Nervous System: War Wounds and Organization for Their Care. H. C. Naffziger.—p. 453.
Two Important Postwar Problems in Neurologic Surgery. E. Sachs.—p. 460.
Compensation Laws and the Veterans Administration. D. J. Margolis.—p. 462.

Injuries to Peripheral Nervous System in War.—Naffziger thinks that under the best conditions the results of surgery of the peripheral nerves leave much to be desired. The functional result depends on the integrity of the entire neuromuscular mechanism. Much more is involved than merely regeneration of a nerve. Muscles destroyed or fibrosed cannot act even though nerve supply returns. Injuries to major vessels with ischemia, when associated with palsies of the nerves, constitute one of the most severe conditions. We have little to offer the victims of traction injuries in which, through stretching, the damage to fibers is spread over great lengths of the nerve. The affected nerve, though remaining in gross continuity, contains widely scattered areas of rupture and degeneration. Suture of nerves is time consuming and is not practicable in the rush of urgent war surgery. It is a sound surgical principle to allow considerable time after complete healing of a wound before repair of a nerve is attempted. As regards organization of our medicomilitary establishment, we have profited neither from our experiences in the last war nor from the example of our British allies. British military forces are cared for by 3.5 medical men per thousand, as compared to about 6.0 used by our army. More highly specialized care is being given by the English than is available to our forces, in spite of the fact that Great Britain has proportionately fewer medical men. They have accomplished this without waste of medical manpower by utilizing existing facilities. Of the five British peripheral nerve centers, four are associated with or are near medical schools. They are staffed principally by civilians. In addition to the surgeon, neurologists, neurophysiologists, neuropathologists, orthopedists and special technical help from the medical schools participate and form a team. Among the directing surgeons are some who had a vast experience in this type of surgery in the last war. In the United States, three years of war have resulted in the designation of certain general hospitals for peripheral nerve cases. The specialized staffs consist of young neurologic surgeons, mostly well trained in the fundamentals of the specialty but without previous opportunity to familiarize themselves with the diagnosis and therapy of injuries to peripheral nerves. If the hospitals were located near medical schools, the staffs of these schools would supplement the study and care of the patients and, in addition, the military hospitals would serve as training centers for the specialists of tomorrow. Such opportunities cannot be duplicated and should not be lost.

Missouri State Medical Assn. Journal, St. Louis

42:257-316 (May) 1945

*Penicillin in Treatment of Gonorrhea. D. R. Seabaugh.—p. 273.
*Diagnosis of Thromboangiitis Obliterans and Peripheral Arteriosclerosis. P. S. Lowenstein.—p. 277.

Penicillin in Treatment of Gonorrhea.—Seabaugh found that 100,000 units of penicillin is productive of cures in 74.3 per cent of cases of gonorrhea. This percentage of cures may be increased to 95 by the administration of additional penicillin. Five per cent of the cases treated did not respond to 400,000 units of the drug. The effectiveness of penicillin is not dependent on the age or chronicity of the lesion. After a clinical and bacteriologic cure, 6.1 per cent of the total cases treated will undergo a relapse within the first ten days. Another 11.9 per cent of the total cases treated will show a primary reduction of the discharge to only a morning tear with negative prostatic cultures and also undergo a relapse back to an active status. Penicillin exerts no demonstrable effect on acute epididymitis. When given intramuscularly, it produced no demonstrable improvement in 2 cases of gonorrheal rheumatism. Direct administration of 25,000 units of the drug quickly controlled the acute inflammatory manifestations in an acutely involved knee. Penicillin administered locally will cure some cases of anterior gonorrheal urethritis but is less effective than by the intramuscular route.

North Carolina Medical Journal, Winston-Salem

6:185-228 (April) 1945

Case Reports Broaden Tumor Clinic's Usefulness by Critical Analyses of Trends in Diagnosis and Treatment of Cancer. F. R. Lock and Martha D. Yow.—p. 185.
Principles Frequently Neglected in Treatment of Pollinosis. R. V. Ellis.—p. 190.
Significance of Pleurisy With and Without Effusion. A. L. Ormond.—p. 194.
Usefulness of Repeated Ophthalmoscopic Examinations During Treatment of Hypertension. F. W. Stocker.—p. 198.
Need for Widespread Whooping Cough Immunization. R. B. Lawson.—p. 201.

Public Health Reports, Washington, D. C.

60:429-456 (April 20)1945

Physical Impairments of Members of Low Income Farm Families—11,490 Persons in 2,477 Farm Security Administration Borrower Families, 1940: III. Impaired Hearing for Speech. Mary Gover and J. B. Yaukey.—p. 429.
Procedure for Handling of Field Samples of Dust and Fume. H. E. Seifert, R. G. Keenan and L. T. Fairhall.—p. 441.

60:457-484 (April 27) 1945

Over the Horizon in Public Health. T. Parran.—p. 457.
Extended Malaria Control Program. L. L. Williams Jr.—p. 464.

60:485-512 (May 4) 1945

Control of Rat Fleas (Xenopsylla Cheopis) by DDT. D. E. Davis.—p. 485.
Two-Cavity Dust Counting Cell. W. E. McCormick.—p. 489.

60:513-544 (May 11) 1945

Nontuberculous Pulmonary Calcification and Sensitivity to Histoplasmin. C. E. Palmer.—p. 513.
Studies of Acute Diarrheal Diseases: XIV. Clinical Observations. A. V. Hardy and J. Watt.—p. 521.

Review of Gastroenterology, New York

12:77-152 (March-April) 1945

*Study of Electrocardiogastrographic Test: Its Possibilities in Differentiating Benign or Malignant Gastric Changes. J. Menendez Feros.—p. 99.
Syphilis of Stomach: Case Report. F. H. Voss.—p. 111.
Peptic Ulcer: I. Etiology. R. Ehrmann.—p. 117.
Acute Bacillary Dysentery Due to Bacillus Alkalescens. W. Lieberman.—p. 123.

Electrocardiogastrographic Test.—According to Menendez Feros the electrocardiogastrogram is a clinical test by which one may measure the intragastric voltage obtained by an intragastric lead in connection with an electrocardiographic apparatus. He made 500 electrocardiogastrographic tests in the presence of normal and pathologic conditions. The test offers new aid in differentiating benign or malignant gastric changes and gives some idea regarding the metabolic changes of the gastric cells. These phenomena are considered to be related to the variations of the cellular permeability or surface tension which are connected with the electrical conductibility of the gastric cells. With the technic employed by the author, the ST segment and gastric T waves have a mean value of 0.3 cm. in healthy subjects. When the intragastric voltage of these waves is between 0.1 and 0 cm., severe gastric anatomic changes might be established. In cancer of the stomach the ST segment and T waves will frequently have a high voltage. These findings are more common in the malignant cases with a short period of evolution. When benign inflammatory changes are concomitant with the neoplasm, the intragastric voltage will be between these two opposite tendencies. In gastric cancer with a low intragastric voltage due to concomitant benign inflammatory changes an injection of epinephrine will increase the voltage. In normal cases or in pure benign inflammatory changes the epinephrine does not seem to have any electrical reaction; on the contrary, it has a tendency to decrease it. The same results have been obtained in gastric allergy.

United States Naval Med. Bulletin, Washington, D. C.

44:901-1124 (May) 1945. Partial Index

Casualty Handling Afloat: Practical Problems. G. R. Dunlop.—p. 901.
Casualties During Amphibious Combat Operation. N. H. Matros.—p. 909.
Medical Observations on Seabees in Jungle. N. L. Mistachkin.—p. 916.
Silk Technic in Appendectomy. P. Shambaugh.—p. 932.
Cotton Suture Material in Hernial Repair. N. E. Bear.—p. 939.
Surgical Treatment of Posttraumatic Painful Extremity. M. H. Brown. —p. 942.
*Pellegrini-Stieda Disease. E. J. Buckley.—p. 947.
Tyrothricin Therapy in Postoperative Pilonidal Cysts. H. Berger. —p. 952.
Pathologic Aspects of Appendix in Military Personnel. M. C. Wheelock. —p. 957.
Hyaluronic Acid: Tissue Polysaccharide: Some Effects on Erythrocytes. C. L. Spingarn and J. P. Jones.—p. 963.
Erythema Multiforme: Study of 10 Cases. W. W. Duemling and T. A. Lesney.—p. 968.
Pneumonia in U. S. Navy—1882-1942: Part I. As Cause of Admission to Sick List. D. F. Smiley and H. A. Raskin.—p. 973.
Streptococcic Pneumonia. E. B. Erskine.—p. 985.
Oxygen Concentration in Oxygen Tents. Margaret H. Wolff.—p. 988.
*Treatment of Malaria with Arsenicals. W. H. Stewart.—p. 991.
Peptic Ulcer in Naval Personnel. M. M. Baumgartner.—p. 995.
Intravenous Salicylates in Rheumatic Fever. K. E. Martin.—p. 1000.
Prostatitis and Seminal Vesiculitis as Common Causes of Backache. W. H. Mast and W. C. Hurly.—p. 1002.
Urinary Frequency Among Personnel at Sea. C. A. Macgregor.—p. 1007.

Pellegrini-Stieda Disease.—Buckley states that a history of injury to the knee joint followed by pain, swelling, tenderness in the medial aspect and restricted motion of the joint is an indication that the Pellegrini-Stieda syndrome is present. This pathologic condition should be considered in cases of sprains or contusions if the aforementioned symptoms are present beyond the usual period of recovery. Serial x-ray studies should be made in all such cases. Many months after the initial injury complaint may be made of limitation of motion and weakness and discomfort of the leg, causing a disturbed function. Secondary arthritic changes may also be present. Early cases show a swelling of the soft tissues at the inner aspect of the knee. Several weeks later a calcified mass will be noted on palpation. The calcification, if present, is firm and slightly movable but not adherent to the overlying skin. The x-ray shadow is usually directed vertically in a crescentic shape, lying adjacent to the medial femoral condyle, with a soft tissue gap between the calcification and the distal end of the femur. The lesion is best seen in the conventional anteroposterior view. The histories of the 2 patients are illustrated by roentgenograms showing the crescentic calcification in the region of the adductor tubercle.

Treatment of Malaria with Arsenicals.—Stewart treated 78 malarial survivors of a naval engagement who had tertian malaria. All had been exposed to the bite of malaria-carrying mosquitoes. They had no mosquito netting and no prophylactic medication for the fifteen days they were ashore. Immediately after being evacuated, all were given suppressive therapy consisting of 0.2 Gm. of atabrine on alternate days. The first case of malaria appeared five days later, and new ones continued to develop during the following fortnight. A routine method of treatment was adopted which consisted of bed rest and 0.65 Gm. of quinine sulfate three times daily. In a group of 10 patients who had been tried on quinine with unfavorable results, oxophenarsine hydrochloride 0.04 Gm. was given in addition to the quinine. The oxophenarsine hydrochloride was administered intravenously in a single dose to those men who had continued to have high temperatures after at least three or four days of quinine therapy. In all but 1 the temperature fell to normal within a few hours after the oxophenarsine hydrochloride injection and did not subsequently rise above 99 F. Seeing the excellent results obtained in these 10 cases, it was decided to try oxophenarsine hydrochloride on 3 unselected patients. In none of these 3 patients did fever appear subsequently, so that it became possible to put them on ambulatory treatment after only four days in the sickbay. The average hospital period of the 10 quinine resistant cases after treatment with oxophenarsine hydrochloride was three and one-half days. Reactions to oxophenarsine hydrochloride are rare. It is probably advisable to use at least four injections of 0.04 Gm. at weekly intervals following the initial treatment.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

14:147-216 (Jan.) 1945

Recent Investigations Concerning Biochemistry of the Thyroid Gland. V. M. Trikojus.—p. 147.
*Removal of Blood from Traumatic Hemothoraces. J. I. Hayward. —p. 157.
Review of Present Surgical Treatment of Peptic Ulcer and Carcinoma of Stomach. J. B. G. Muir.—p. 173.
Early Treatment and Results of Penetrating Wounds of Chest: Further Report. C. W. B. Littlejohn.—p. 194.

Removal of Blood from Traumatic Hemothoraces.—Extravasated blood in the pleural cavity acts as an irritant and causes an inflammatory response in the pleura. Inflammatory exudate seeps into the pleural cavity diluting the blood, and fibrous tissue commences to grow. Great fibrous thickening and even calcification of the pleura may result with prolonged or permanent respiratory disability. When the blood is efficiently removed many patients will have a dry and healed pleura within a month with no respiratory disability remaining, and those who become infected will have a small loculated empyema instead of one coextensive with the original hemothorax plus the added exudate. Treatment by repeated aspirations fits into the plan of dealing with hemothoraces in New Guinea. The needle must be of adequate bore and length. Aspiration is repeated every three days until the pleura is dry, but the interval is varied to suit each case and usually becomes longer as the effusion becomes smaller. It is a common fault to carry out aspiration at too low a level. The needle should rarely be inserted below the ninth intercostal space just medial to the angle of the scapula, the eighth just lateral to the angle of the scapula, the seventh in the posterior axillary line (usually the best to try first), the sixth in the midaxillary line, the fifth in the anterior axillary line and the fourth in the nipple line. Inexperienced men may fail because the needle enters the phrenicocostal sinus and pierces the diaphragm. It is advisable to aspirate all the fluid which can be obtained, but removing more than a pint is inadvisable because sudden and large changes in the degree of aeration or collapse in the lung should be avoided.

British Medical Journal, London

1:399-432 (March 24) 1945

Therapeutic Trial of Methionine in Infective Hepatitis. C. Wilson, M. R. Pollock and A. D. Harris.—p. 399.
*Treatment of Infective Hepatitis with Methionine. G. Higgins, J. R. P. O'Brien, R. A. Peters, Alice Stewart and L. J. Witts.—p. 401.
Antidiuretic Action of Nicotine and of Smoking. J. H. Burn, L. H. Truelove and Isabel Burn.—p. 403.
Enforced Leisure: Study of Activities of Officer Prisoners of War. A. R. Dearlove.—p. 406.
Substances Used in Treatment of Pediculosis Capitis: Their Relative Value. Elizabeth B. S. Scobbie.—p. 409.
Local Effects of Intramuscular Injection of Solvochin. F. Hawking. —p. 412.

1:433-470 (March 31) 1945

Imbalance of Vitamin B Factors: Pyridoxine Deficiency Caused by Additions of Aneurin and Chalk. M. B. Richards.—p. 433.
Duct Papillomata of Breast: Plea for Conservative Treatment. C. P. G. Wakeley.—p. 436.
"Neutral Proflavine Sulfate" (Monosulfate of 2: 8-Diaminoacridine): Its Local Action in Infected Wounds Involving Bone. J. F. Heggie, G. B. R. Warnock and R. W. Nevin.—p. 437.
Hereditary Hemorrhagic Telangiectasis. D. Cappon.—p. 440.
Newer Concepts of Breast Feeding. M. Witkin.—p. 441.
Unilateral Hypotony During Anesthesia. Ina Brittain and G. J. C. Brittain.—p. 442.
Psychologic Reactions in the Wounded. L. Minski.—p. 444.

Methionine in Infective Hepatitis.—Higgins and his associates administered methionine to alternate patients with infective hepatitis. The total number was 37, of ages between 17 and 45 years. Care was taken to exclude patients with liver disease from other causes; no patient who had received neoarsphenamine or who had been exposed to any toxic substance was included in the experimental group. The patients were kept in bed. To minimize the chance variation of the methionine content of the meals, all patients, treated and untreated, were put on a diet of low fat and high protein content, supple-

mented with vitamins. A record was kept of the amount eaten by every patient at each meal. It was estimated that the methionine content of the diet consumed daily was of the order of 2.5 Gm. Throughout the day five 1 Gm. doses were given either in milk or after flavoring with fruit juice. Including that in the diet, the treated patients received daily nearly 7.5 Gm. of methionine. Treatment with methionine did not significantly affect the clinical course of the illness, the anorexia or the average duration of biliuria or of bilirubinemia.

1:471-504 (April 7) 1945

*Control of Infection in Recent Wounds by Surgery and Local Chemotherapy. F. H. Bentley and S. Thomson.—p. 471.
Blast Injury to Lungs: Clinical and Radiologic Findings and Their Relation to Certain Symptoms. G. R. Fearnley.—p. 474.
Outbreak of Jaundice with Signs in Nervous System. E. A. J. Byrne and G. F. Taylor.—p. 477.
Social Study of Hospital Treatment. M. Brown and F. C. Carling.—p. 478.
Pulmonary Acariasis in Monkeys. L. J. Davis.—p. 482.
Fulminating Gas Gangrene: Fatal Case with Unusual Accompanying Features. C. J. Cellan-Jones and E. M. Griffin.—p. 482.

Control of Infection in Wounds.—Bentley and Thomson, members of the penicillin control team in the Central Mediterranean Force, investigated the value of sulfanilamide and penicillin when applied locally in the treatment of recent wounds. In an investigation of 1,000 wounds during the battle for the Gothic Line the organism of initial sepsis was found to be Staphylococcus pyogenes aureus. The incidence of infection in wounds before operation at the casualty clearing station was about 51 per cent. In wounds undisturbed during transit and treated at the casualty clearing station by operation alone, 49 per cent were infected and 23 per cent were septic; by operation and sulfanilamide powder, 43 per cent and 11 per cent; by operation and penicillin-sulfathiazole powder, 25 per cent and 7 per cent, when examined in the base hospital five to ten days later. Thus operation alone did not completely remove infection from a recent wound. Sulfanilamide applied locally had a bacteriostatic effect; for although the infecting bacteria persisted, their activity was depressed, so that the incidence of sepsis was reduced. Penicillin-sulfathiazole powder similarly applied was more effective; its use was followed by the destruction of the infecting cocci in about one half of the infected wounds with an equally low incidence of sepsis. Wounds operated on at the casualty clearing station in under twelve hours had a lower incidence of infection than those operated on between twelve and twenty-four hours in all the chemotherapy groups. Wounds that had been redressed between casualty clearing station and base hospital had a higher incidence of infection than had those that had not been disturbed. The importance of control of infection by operation and chemotherapy at the casualty clearing station is illustrated by the results of suture. Of wounds uninfected with pyogenic organisms 80 to 85 per cent obtained grade 1 union, whether appearing clean or dirty, whereas wounds that were infected, even if appearing clean, showed a lower rate of success.

1:505-544 (April 14) 1945

Recent Work on Pharmacology of Sulfonamides. F. Hawking.—p. 505.
Investigation and Results of Treatment of 1,000 Cases of Vaginal Discharge. O. Lloyd.—p. 509.
*Treatment of Epilepsy by Electrically Induced Convulsions: Preliminary Report. G. Caplan.—p. 511.
Fractures of Zygoma Bone. B. Elizabeth Nesbitt and C. R. D. Leeds.—p. 512.
Solitary Diverticulum of Cecum. G. C. Dorling.—p. 513.
Penicillin and Fibrinolysis. K. Dixon.—p. 514.

Electric Convulsions in Epilepsy.—Caplan regards epilepsy as a disturbance of the electrical equilibrium of the brain which leads to the occasional accumulation of an excessive quantity of energy. The epileptic fits can be regarded as a discharge mechanism whose function it is to disperse this energy whenever it exceeds a certain threshold value. An epileptic patient's chief disability lies in the fact that his fits are rarely predictable and may occur at any awkward moment or in situations involving considerable danger. The idea has therefore been developed of replacing these spontaneous fits by electrically induced convulsions which can be produced under controlled conditions of time and place. This therapy should not supersede the pharmacologic methods of combating the fits, but rather it should be an accessory treatment in those cases in which fits occur despite full dosage of anticonvulsant drugs. This paper is a preliminary report on 15 cases of epilepsy in which electrical convulsions were tried. In 11 cases the fits have been materially diminished. In 7 cases the symptoms of an associated psychosis have been ameliorated. The value of an induced convulsion as a means of terminating a dangerous psychic equivalent has been illustrated. No serious or alarming complications have been experienced.

Edinburgh Medical Journal

32:61-96 (Feb.) 1945

Meningococcal Endocarditis: Review. W. R. Logan.—p. 49.
Management of Multiple Injuries in Aircrews. I. L. Dick.—p. 61.
Investigations of Vitamin A Content of Human Body Fluids. W. Tomaszewski and L. Dziatoszyński.—p. 74.
Wilson's Disease. A. J. Glazebrook.—p. 83.

Journal of Pathology and Bacteriology, Edinburgh

57:1-156 (Jan.) 1945

Bacteriophage Action on Bact. Typhosum and B. Megatherium as Displayed by Dark Ground Cinemicrography. A. Pijper.—p. 1.
Tissue Changes in Experimental Mice Treated with Pentose Nucleotides. L. Dorothy Parsons.—p. 9.
Phagocytosis of Vaccinia Virus in Vitro. K. B. E. Merling.—p. 21.
Bacterial Flora of Wounds and Septic Lesions of Hand. R. E. O. Williams and A. A. Miles.—p. 27.
Study of Effects of Applying Pressure to Experimental Thermal Burns. G. R. Cameron, J. W. Allen, R. F. G. Coles and J. P. Rutland.—p. 37.
*Bacteriologic Aspects of Penicillin Therapy. F. R. Selbie, Rosemary D. Simon and J. McIntosh.—p. 47.
In Vitro Determination of Sulfonamide Sensitivity of Bacteria. G. J. Harper and W. C. Cawston.—p. 59.
Notes on Examination of Exudates for Pathogenic Anaerobes. W. J. Tulloch.—p. 67.
In Vitro Production of Alpha Toxin, Theta Hemolysin and Hyaluronidase by Strains of Cl. Welchi Type A, and Relationship of In Vitro Properties to Virulence for Guinea Pigs. D. G. Evans.—p. 75.
Lipids of Human Kidney Cortex and Medulla in Fatty Change. G. Popják.—p. 87.
Observations on Anti-Pernicious Anemia Factor, with Suggested Method for Testing Liver Extracts in Laboratory. W. Jacobson, H. Stewart and S. M. Williams.—p. 101.
Isoagglutinin Titers in Heterospecific Pregnancy. G. H. Smith.—p. 113.
Nonhemolytic Group K Streptococcus from a Case of Endocarditis. J. L. Penistan.—p. 123.
*Life Span of Red Cell in Man. S. T. Callender, E. O. Powell and L. J. Witts.—p. 129.

Bacteriologic Aspects of Penicillin Therapy.—Research on the clinical application of penicillin gave Selbie and his associates the opportunity of studying this subject from the bacteriologic point of view. They found that Staphylococcus aureus is in the great majority of cases sensitive to penicillin, but variation was shown in the degree of sensitivity: 15 of 157 strains were at least eight times less sensitive than the standard strain. Streptococcus pyogenes and pneumococci were usually sensitive and showed only minor variation in susceptibility. Some of the nonhemolytic streptococci showed considerable resistance. The 10 strains of Actinomyces were less sensitive than the Oxford staphylococcus, but the majority were within the therapeutic range of penicillin. Observations on penicillin blood levels indicate that a dose of 20,000 units given intramuscularly every three hours will maintain a bacteriostatic concentration sufficient to deal with all sensitive organisms likely to be encountered. The penetration of penicillin from the blood into cavities and in particular the subarachnoid spaces (cerebrospinal fluid) is at times insufficient and has to be supplemented by direct injection. A good indication of improvement in pyogenic infections is a diminution in the blood leukocyte count. The rate of disappearance of the micro-organisms depends largely on the nature of the lesion. In acute infections they disappear as a rule in a few days but persist longer in deep foci and in areas of devitalized or necrotic tissue. This persistence is especially characteristic of lung infections, where they appear to have a purely saprophytic existence. Secondary invasion by penicillin insensitive organisms is liable to occur, especially in wounds sustained in battle or in air raids. The development of resistance to the drug was observed in a small number of instances.

Life Span of Red Cell.—Callender studied the survival of transfused erythrocytes in 3 normal male subjects of group A from whom blood was removed and replaced by blood of group O. The curve of decay of the transfused cells was linear within the experimental error; their average life was sixty days. The relation between the decay of transfused cells and the law of survival of the individual erythrocyte has been deduced. It is concluded that red cells live for one hundred and twenty days in men, which is the true average life. The normal rate of replacement is 0.83 per cent daily.

Journal of Physiology, Cambridge

103:359-488 (March) 1945

Glycogen in Adipose Tissue. E. Wertheimer.—p. 359
Synthesis of Acetylcholine by Tissue of Central Nervous System. W. Feldberg.—p. 367.
Excitability Changes at Neuromuscular Junction During Tetany. S. W. Kuffler.—p. 403.
Effect of Initial Level of Blood Pressure on Response of Human Subject to Blood Pressure Raising Reflexes. M. B. Bruce, R. T. Martin and F. H. Smirk.—p. 412.
Respiration and Cardiac Output in Isolated Heart-Lung-Head Preparation in Rat. E. W. H. Cruickshank.—p. 417.
Facilitation, Inhibition and Depression at Artificial Synapse Formed by Cut End of a Mammalian Nerve. R. Granit and C. R. Skoglund. —p. 435.
Mechanism of Water Diuresis in Normal Rats and Rabbits as Analyzed by Inulin and Diodone Clearances. S. E. Dicker and H. Heller. —p. 449.
Observations on Thermal Burns: Influence of Moderate Temperature Burns on a Proteinase of Skin. A. Beloff and R. A. Peters.—p. 461.
Activity of Vagal Stretch Endings During Congestion in Perfused Lungs. E. Bülbring and D. Whitteridge.—p. 477.

Lancet, London

1:359-390 (March 24) 1945

Hunterian Museum: Yesterday and Tomorrow. G. G. Turner.—p. 359.
Psychiatric Casualties Among Officers and Men from Normandy: Distribution of Etiologic Factors. E. Miller.—p. 364.
Repair of Perforating Corneal Wounds. R. A. D. Crawford.—p. 366.
Penicillin Gonorrhea: Suggested Scheme of Treatment. T. R. L. Jones, F. G. Maitland, S. J. Allen, with a Postscript by S. Dudley. —p. 368.
Rehabilitation in Naval Hospital. H. J. Burrows.—p. 370.

1:391-422 (March 31) 1945

Resettlement of Disabled in Work. T. Ferguson.—p. 391.
Are Sulfonamides Merely Bacteriostatic Agents? L. Colebrook and W. C. Cawston.—p. 394.
*Penicillin in Clostridial Infections: G. H. Fisher, M. E. Florey, T. A. Grimson and P. M. De C. Williams.—p. 395.
Subcapital Fractures of the Femoral Neck Fixation by Pin and Graft. E. N. Wardle.—p. 399.
Multiple Attacks of Cerebrospinal Fever. W. F. Corfield.—p. 402.
Mikulicz Pack Used in Thoracic Wound. A. R. Clarke.—p. 403.

Penicillin in Clostridial Infections.—During the first weeks after D day Fisher and his associates made observations on the influence of penicillin on the incidence and course of gas gangrene and allied conditions. Penicillin should prevent the development of gas gangrene rather than treat the established condition. Inadequate "prophylactic" administration may lead to a serious clinical picture very different from that associated with either gas gangrene or anaerobic cellulitis. During the period June 8 to July 24, 3,907 battle casualties were admitted; 436 of these had been treated with injections of penicillin. These were those most liable to suffer from gas gangrene. The treatment prescribed was an initial injection of 100,000 units, followed in about six hours by 45,000 to 50,000 units at four or five hour intervals till definitive surgical treatment could be carried out. Had the selection been perfect, cases of gas gangrene and allied conditions should not have developed in those not prophylactically treated with penicillin, but such conditions developed in 28 out of a total of 3,471 cases; among these 28 were 5 cases of gas gangrene. Among the 436 prophylactically treated with penicillin 2 developed "gas" infection but none had gas gangrene. The authors discuss four groups of cases. The first group includes those first recognized as gas infection in the emergency hospital, the second group those recognized and treated before; in the two other groups gas infection was not diagnosed, but those of the third group had dirty lacerated wounds and were treated earlier with prophylactic penicillin; those of the fourth group had "clean" lacerated wounds. The diagnosis of gas infection was made on the basis of the following clinical criteria: swelling and color of muscles, thin brownish discharge, presence of gas, smell, discoloration of surrounding skin, and general condition of the patient. None of the cases of the first group had reached the stage of fulminating gas gangrene. They would be classified as "anaerobic cellulitis" or "local gas gangrene" of muscle. Bacteriologic diagnosis was made both on film and in culture. Both supported the diagnosis. The following therapeutic program was found most satisfactory: immediate injection of 20,000 units of penicillin, repeated at the beginning of operation and thereafter three hourly or by intramuscular drip, for from ten to fifteen days. Immediate injection of 50 to 100 thousand units of gas gangrene antiserum, repeated if considered necessary. Wide incision of the wound and excision of only definitely necrotic muscle. The lengthy penicillin treatment was thought necessary owing to the observation that the swelling of muscles, clostridial infection and evidences of toxemia persisted much longer than the unhealthy appearance of the muscle surfaces. As a precaution against secondary infection, penicillin paste, 250 units per gram, was applied locally as soon as systemic treatment was discontinued and till secondary suture or skin grafting could be carried out. Patients liable to develop gas gangrene should receive a penicillin injection as soon as possible after wounding, and treatment should be continued till granulations have formed on the wound surface. With a short or interrupted course of penicillin a profound or protracted toxemia may result in spite of the absence of typical local signs. In such cases the diagnosis may be missed and the patient fail to receive further penicillin or gas gangrene antiserum.

Medical Journal of Australia, Sydney

1:265-288 (March 17) 1945

Observations on Certain Bacteriologic and Serologic Examinations of Stored Blood. Marjorie Bick.—p. 265.
Aspiration Biopsy. T. E. Wilson.—p. 268.
*Experimental Transfusion with Malaria Infected Blood. R. Officer. —p. 271.
Experimental Observations on Limitations of Oil as Vehicle for Anesthetic Agents. M. Kelly.—p. 274.

Transfusion with Malaria Infected Blood.—Officer says that the use of potentially malaria infected individuals as donors for blood transfusion has been regarded as dangerous heretofore because the patient might develop malaria, but in an emergency it would be foolish to deny the benefit of transfusion to an exsanguinated patient if the malarial parasites so transmitted could be dealt with effectively by doses of quinine. Experimental transfusions of malarial blood containing large numbers of parasites have been carried out on 5 volunteer recipients. One volunteer had two such transfusions. The transfusions were immediately followed by routine antimalarial treatment. The author concludes that the development of malaria in a nonimmune recipient following blood transfusion from an infected donor can be prevented by the immediate institution of antimalarial therapy. In case of emergency a potentially malarial donor could be used for transfusion, with the knowledge that the benefit derived from the transfusion would far outweigh any ill effects resulting therefrom.

South African Medical Journal, Cape Town

9:33-48 (Feb. 10) 1945

A Physician's Visit to Central Africa. J. F. Brock.—p. 34.
Mortality from Cancer in England and Wales Viewed from New Angle. C. Pijper.—p. 39.
Successful Response to Penicillin in Case of Subacute Bacterial Endocarditis. B. G. Shapiro.—p. 40.
*Case of Ovalocytosis. J. Barnetson.—p. 42.
Actinomycosis Treated with Sulfonamides. C. A. H. Watts.—p. 43.

Case of Ovalocytosis.—Barnetson reports the history of a middle aged woman of European extraction who was hospitalized with symptoms suggesting chronic colitis. During a routine blood count it was discovered that 95 per cent of the erythrocytes were oval. The patient had no history of anemia, nor did the family history reveal anemia. Examination of the blood of a brother revealed that 45 per cent of the erythrocytes were oval. Ovalocytosis is an unusual and interesting abnormality of the blood. It is never associated with noteworthy anemia, and it is not related to sickle cell anemia in Negroes.

Archiv für klinische Chirurgie, Berlin

205:549-818 (May 18) 1944. Partial Index

*Causation of Adhesive Pericarditis and Results of Its Surgical Treatment. H. H. Westermann.—p. 549.
*Is There Such a Condition as Wartime Toxic Diffuse Goiter? W. Gattig. —p. 580.
Results of Hochenegg's Method of Surgical Treatment for Cancer of the Rectum During the Period of 1900 to 1942. E. Fenster and K. O. Herrmann.—p. 589.
Surgical Treatment of Paralysis of Facial Nerve. H. von Seemen. —p. 598.
Late Stage of Infected Cranial Impression Gunshot Injury, Its Clinical Aspect and Its Treatment. T. Riechert.—p. 603.
Roentgenologic Demonstration of Duodenal Papilla. H. Beulin.—p. 636.
Therapy of Idiopathic Dilatation of Common Bile Duct (Congenital Coledochus Cyst). H. Michel.—p. 644.
Clinical Aspect of Tuberculosis of Kidneys. H. J. Lauber and G. Röhrs. —p. 668.

Adhesive Pericarditis.—Westermann reports results of surgical treatment in 53 cases of adhesive pericarditis. Rheumatism rather than tuberculosis plays the most important part in the genesis of the condition. The etiology is determined by the history and the postoperative course rather than by microscopic findings. The incidence of adhesive pericarditis may be reduced and the surgical treatment made more effective by combating the rheumatic infection. Of the patients 37 were male and 16 female; 15 were between the ages of 11 and 20 years, 19 patients between 21 and 30 years. The second and third decades of life show the highest incidence. Conservative treatment proved ineffective. Pericardiectomy was performed in all of the cases except 1, in which Brauer's operation was first performed. A two stage pericardiectomy by combining the transthoracic and the anterior fenestration method was performed in 2 cases. A large anterior window-like opening with a lateral pedunculated flap after Kocher was used in the one stage pericardiectomy in all the other cases. Complete recovery took place in 19 cases and considerable improvement in 15. The mortality rate was 35.8 per cent. Recovery and improvement in two thirds of the cases is to be considered as a highly satisfactory result in spite of the still high mortality rate. New adhesions from regenerating ribs and the systolic drawing in of the thorax may be prevented by the complete removal of the posterior periosteum of the ribs and by covering the heart with a soft cutaneous muscle flap. Precardiac cardiolysis may be combined with radical excision of the pericardium. This specific combination is to be considered as the essential factor on which the permanent results depend. Cooperation of the surgeon with the internist is important, since even better results may be obtained from pericardiectomy when performed in an early stage of the disease.

Wartime Toxic Diffuse Goiter.—Wartime toxic diffuse goiter does not represent a specific form of toxic diffuse goiter as to origin, clinical aspect, treatment or prognosis. A single physical exertion or a single instance of mental excitement, as well as prolonged mental or physical strain continuing for weeks or months, may be the eliciting factor in soldiers and in civilians alike. Toxic diffuse goiter must have been latent in these persons, since a specific change in the thyroid depending on an individual predisposition is to be considered as the principal cause of the disease. The incidence of fully developed toxic diffuse goiter was low during the first world war and has proved the same during the present conflict. The incidence of mild forms has been high, and differential diagnosis from purely nervous heart disorders and disturbances of circulation may be difficult. As observed by Gattig, in 4 of 5 soldiers the toxic diffuse goiter presented a gradual development of medium severity within one year. In the fifth soldier the sudden onset of the disease could be traced to the fact that he was buried under the falling fragments of a shelter which had been hit by an artillery shell. In 3 civilian patients the night bombardment of their homes was the eliciting cause of the disease, which developed within a few days after the bombardment. A mortal fear reaction however was missing at least in 1 instance in which the patient immediately regained his self control by helping to save other persons from the wreckage. Treatment of wartime toxic diffuse goiter does not differ from the usual treatment, but the results of Plummer's treatment, as well as the recovery rate, are less satisfactory in secondary toxic diffuse goiter in wartime than in primary toxic diffuse goiter.

Acta Medica Scandinavica, Stockholm

117:417-590 (Aug. 16) 1944. Partial Index

*Intrasternal Administration of Heparin. S. Lindgren and L. Walldén. —p. 417.
*Paroxysmal Paralytic Hemoglobinuria. A. Louw and H. E. Nielsen. —p. 424.
Pain and Rectal Tenesmus After Injection of Epinephrine into Colon. G. C. Brun.—p. 448.
Combination of Diabetes Mellitus and Acute Hepatitis. K. A. Vannfält. —p. 462.
Circulation in Fallot's Tetralogy. P. Eskildsen.—p. 488.
Investigations on Ascorbic Acid Content in Serum from Patients Suffering from Peptic Ulcer. I. Ebbesen and M. Rasmussen.—p. 507.
Reexamination of Patients with Exophthalmic Goiter Treated Conservatively. K. Brøchner-Mortensen and H. Uhrbrand.—p. 513.
Sedimentation Rate and Room Temperature. T. Romanus.—p. 535.

Intrasternal Administration of Heparin.—Lindgren and Walldén administered 57 mg. of heparin regularly at six hour intervals by intrasternal injection and found that the effect on the coagulation time was the same as when it was given intravenously. In view of the need of repeated injections, the needle can remain in the sternum; this is much easier than to keep a needle fixed in the cubital vein. The intrasternal method is recommended as an improvement in technic.

Paroxysmal Paralytic Hemoglobinuria.—Louw and Nielsen differentiate between exogenous and endogenous forms of hemoglobinuria. With the endogenous forms they group cold hemoglobinuria, march hemoglobinuria, chronic hemolytic anemia (Marchiafava type) and paralytic hemoglobinuria or myoglobinuria. This last form is rare, only 4 cases having been reported previously. After reviewing these cases, the authors describe myoglobinuria in a boy aged 10 who had a history of repeated attacks of muscular pain and difficulty in walking since the age of 4 years. During an acute attack, when the boy was admitted to the hospital, the urine was dark reddish brown and gave a strong reaction for blood. Spectroscopic analysis showed that myoglobin was excreted in the urine during the attack, at which time there was also creatinuria. The boy was feeling well at his discharge. The appearance of 8 cases of progressive muscular dystrophy in the family of this boy suggested that progressive muscular dystrophy and paralytic myoglobinuria may be different forms of the same disease, the latter representing the acute manifestation of the lesion, while progressive muscular dystrophy is the chronic form.

Nordisk Medicin, Stockholm

21:189-244 (Feb. 4) 1944. Partial Index

Blood Donor Activity of Health Board. O. Nordlander.—p. 189.
Pemphigus Contagiosus of Newborn, Especially with Regard to Prophylaxis and Treatment. O. Kaalund-Jørgensen.—p. 196.

Hospitalstidende

New Instrument for Wire Extension. E. Madsen.—p. 199.

Hygiea

*Thrombophlebitis Saltans: Case. E. Feltström.—p. 217.
Osteosynthesis with Kirschner's Thread. J. Cedermark.—p. 219.

Thrombophlebitis Saltans.—In Feltström's case of venographically verified thrombosis in the right leg and thigh the course was normal for a few days after heparin treatment, but new disturbances atypical both for thrombosis and for the usual banal thrombophlebitis affected in turn different segments of the walls in the deep veins in the right and left leg, with secondary thrombus formation. Heparin treatment at once stopped the fresh thrombotic process but seemed powerless against further spread of the pathologic process. Recovery resulted after treatment with injections of estrogen.

Svenska läk.-sällsk. förhandl.

*Etiology of Prostatic Hypertrophy from Endocrine Points of View. N. Törnblom.—p. 229.
Genesis of Detachment of Retina and Operative Treatment. R. Rosengren.—p. 239.
Ocular Complications in Sulfonamide Therapy. S. Holm.—p. 240.

Etiology of Prostatic Hypertrophy.—Törnblom says that it is uncertain whether hypertrophy of the prostate is due to endocrine disturbances. Endocrine treatment therefore is a shot in the dark. The favorable effects attributed to treatment with testosterone propionate may depend on a generally stimulating action of this preparation

Book Notices

Handbook of Physical Medicine. Selections Authorized for Publication by the Council on Physical Medicine, American Medical Association. Previous editions of this work were published under the title of Handbook of Physical Therapy. First edition. Cloth. Price, $2. Pp. 392, with illustrations. Chicago: American Medical Association, 1945.

The first edition of the Handbook of Physical Medicine is actually the fourth edition of the Handbook of Physical Therapy. It was prepared under the auspices of the Council on Physical Medicine of the American Medical Association. Physical medicine includes the diagnosis and treatment of disease by various nonmedical means. It employs the physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise and mechanical devices for physical and occupational therapy in the diagnosis and treatment of disease.

The Handbook of Physical Medicine represents a summary of the efforts of the Council during a twenty year period to separate the beneficial from the useless in this form of therapy, to evaluate the various physical therapeutic agents and the methods of their employment and to protect the medical profession from the snares and pitfalls found in this field.

When Dr. Joseph F. Smith brought a resolution before the House of Delegates of the American Medical Association urging the Board of Trustees to establish a Council on Physical Therapy, the board chose nine men from the ranks of chemists, physicists, pathologists, physiologists, radiologists and clinicians to compose the Council. Later the membership was increased to twelve. In 1944 the Board of Trustees changed the name to the Council on Physical Medicine.

Many members of the medical profession, representing the various specialties, have acted as referees or consultants for the Council. These men have tested physical agents and apparatus submitted for acceptance, studying the therapeutic claims made for them, evaluating the merit of special articles submitted for publication and aiding in the educational work of the Council.

The Council's aims and purposes are threefold: 1. To protect the medical profession and thereby the public against inefficient and possibly dangerous apparatus and against misleading and deceptive advertising in connection with the manufacture and sale of devices for physical therapy. 2. To disseminate such reliable information as it possesses or may acquire and to stimulate instruction to aid the practicing physician in choosing true and sound physical therapeutic methods. 3. To act in an advisory capacity to the profession and to the public in all matters concerning this branch of medicine. The work of the Council has progressed along two distinct lines: 1. The evaluation of the efficacy of physical therapeutic apparatus, usually but not always submitted for Council consideration, through a study of the therapeutic claims made for such devices; the elimination of false, misleading or exaggerated statements in advertising matter concerning the equipment and the publication of the Council's acceptance or rejection of the given physical agent in THE JOURNAL. The booklet Apparatus Accepted can be obtained free of charge by writing to the Secretary of the Council. 2. The improvement of the type of physical therapy practiced by the profession.

Some of the subjects discussed are evaluation of methods used in physical therapy; physiologic effects of heat; heat in surgical and orthopedic conditions; fever therapy; physiology of massage; body mechanics and posture; therapeutic and remedial exercise; occupational therapy; hydrotherapy; colonic irrigation; electrical stimulation of muscle; medical diathermy; electrolysis; ultraviolet and infra-red radiation used in therapy; physical therapy in the treatment of fractures, in infantile paralysis, in psychiatric practice and in skin diseases.

Neuro-Ophthalmology. By Donald J. Lyle, B.S., M.D., F.A.C.S. Fabrikold. Price, $10.50. Pp. 395, with 234 illustrations and 7 charts for recording lesions affecting the visual system. Springfield, Ill.: Charles C Thomas, 1945.

This work deals with the relationship of the eye to the brain, showing the effect of certain diseases of the brain on the eyes. An attempt is made to obviate the necessity of referring to the many textbooks on neurology so as to glean from here and there, with much time consuming effort, information pertaining to neuro-ophthalmology. The plan is to bring together in brief but comprehensive and coordinated manner those many phases of neurology as far as they concern, directly or indirectly, neuro-ophthalmology. The first twelve chapters are devoted to embryology, anatomy, pathology, physiology and morphology. The remaining seven chapters include a thorough discussion of the various infections, diseases and tumors that affect the brain and eye. The chapter on intracranial and orbital neoplasms is especially comprehensive, although no attempt is made to include a classification of brain tumors.

There are 130 necropsy or operatively confirmed case histories, which have been outlined in connection with the text. There are many retinal photographs of ocular conditions, about half of which are stereoscopic and so placed that one can observe them through the stereoscope in order to obtain depth perception. Several charts for recording lesions affecting the visual system are included. The final chapter includes a discussion on eye manifestations of head injuries, which should be of vital interest to every ophthalmologist. This book should be welcomed by many ophthalmologists, neurologists and neurosurgeons because this vast subject matter is correlated into a working unit.

A Textbook of Pathology: Pathologic Anatomy in Its Relation to the Causes, Pathogenesis, and Clinical Manifestations of Disease. By Robert Allan Moore, Edward Mallinckrodt Professor of Pathology, Washington University School of Medicine, Saint Louis. Cloth. Price, $10. Pp. 1,338, with 513 illustrations. Philadelphia & London: W. B. Saunders Company, 1944.

In writing a textbook of pathology, an author must ask himself "Is this a book for students?" or "Is it for practicing physicians?" or "for specialists in pathology?" The approach to these various avenues would imply stressing fundamental problems of interest to different groups. However, in recent years writers in the various branches of the medical subjects have sought to include and correlate the fundamental sciences as part of their discussion for a better understanding of disease problems. Anatomy, physiology, chemistry, bacteriology and pathology are the pillars supporting the framework about which the better understanding of the cause and effect, the pathogenesis and epidemiology of disease and the effectiveness of the therapy is better understood. Physicians today do not have to "guess" what the nature of the patients' ailments are, they need only evaluate the objective and subjective findings in terms of the basic sciences. Therapy should not be empirical but placed on a scientific level of understanding the reasons for the drug which is prescribed for the patient.

Moore has achieved some of these objectives. As he has indicated, his textbook on pathologic anatomy is presented in its relation to the causes, pathogenesis and clinical manifestations of disease. This is an excellent approach, for, as Moore has demonstrated in his book, pathology can and should be made dynamic. Gone is the era of the pure morphologist, the dead house pathologist; and this important subject of pathologic anatomy must be presented in an interesting, understanding and vital manner. The clinical pathology conferences, the surgical, neurologic and various other branches of medicine in which the clinician and pathologist meet to discuss their medical problems throughout hospitals and teaching institutions in this country are indicative of the cooperative manner in which physicians work for the benefit of their patients and the community. But to interest the clinical branches in medicine along this line of thinking it was necessary for the pathologist to make his branch of medicine a vital and integral part of the whole. The clinician thinks in terms of pathology, the pathologist analyzes and interprets his subject in terms of clinical medicine.

Moore has presented his material in an interesting manner. As a teacher in pathology he understands the needs of the student. This is manifest in his book by his arrangement of the subject matter according to the causative agent or agents. In a simple, concise and lucid manner the subject is discussed. Long, uninteresting discussions are eliminated for the sake of brevity. There is too much material presented for detailed review; the literature (mostly in English) at the end of the chapter can be further studied by the interested reader. If a disease is designated by the discoverer's name, Moore tells the reader who this person is or was. Virchow, Rokitansky, Koch,

Cohnheim, Bright, Councilman, Welch, Wells are not mere names; they mean something to the student who reads about the disease which these men have described. A discussion on physiologic alterations, chemical changes, bacteriologic factors is interwoven in the discussion, so that the student now has an understanding of the alterations in form and disturbances of function that take place in disease to prepare him for his better understanding of clinical medicine.

Moore also discusses deficiency diseases, tropical medicine, diseases of unknown or obscure cause and the virus diseases. Thus the practicing physician and specialist in pathology may find in this book information which will benefit him in his specialty.

We do not wish to imply that this textbook is the answer to all the problems in pathology for the clinician and the pathologist. There are several examples that one can cite that the reader may take exception to. To cite just one example, the histogenesis of tuberculosis is not complete; the formation of caseation necrosis and the mechanism of bone formation could be discussed in more detail. But these are minor compared to the overall subject matter presented. Practically every phase of pathology has been discussed, and in a textbook of pathology of this size some detailed phases must be eliminated for the sake of the overall subject matter.

The text is clear and the illustrations have been well selected. There is a good index. The book can be highly recommended and should be in the library of students, physicians and hospitals.

Tropical Nursing: A Handbook for Nurses and Others Going Abroad. By A. L. Gregg, M.A., M.D., M.Ch., Member of Associate Staff of Hospital for Tropical Diseases, London. Second edition. Cloth. Price, $3. Pp. 185, with 13 illustrations. New York: Philosophical Library, 1944.

Some of the most important information in this handbook is included in the introduction and the chapter on personal hygiene in the tropics. The advice offered to one going to the tropics for the first time is sound and might well be heeded. The diseases are treated briefly and in an elementary fashion. The descriptions are hardly complete enough for the nurse to risk a differential diagnosis and start treatment in the absence of a doctor. The nursing procedures referred to are all ones employed in illnesses of temperate climates and in effect deny the existence of a field of "tropical nursing." However, the important part that insect vectors play in transmission of tropical diseases is aptly stressed with its relation to the nursing problems. A section on technic which outlines blood examination, blood transfusion, bowel lavage, the test meal, intramuscular injection and intravenous injection is a simple review for handy reference. The section on care of the eyes in the tropics includes injury from intense sunlight and that due to insects. The glossary of tropical terms contains few terms restricted to tropical medicine. A table of weights and measures is included for reference purposes.

Textbook of Anaesthetics. By R. J. Minnitt, M.D., D.A., Director of Anaesthetics, David Lewis Northern Hospital, Liverpool, and John Gillies, M.C., M.B., Ch.B., Consultant in Anaesthetics, Department of Health for Scotland. With a chapter on Local and Regional Analgesia by L. B. Wevill, M.B., F.R.C.S., Major R. A. M. C., which includes a section on Its Application to Dentistry by Dr. John Boyes, Dental Surgeon in charge, Facio-Maxillary Unit, Bangour E. M. S. Hospital, Scotland. Sixth edition. Cloth. Price, $7. Pp. 487, with 199 illustrations. Baltimore: William Wood & Company, 1944.

The former "Handbook of Anaesthetics" by Ross and Fairlie was revised in a fifth edition in 1940 by R. J. Minnitt. This, the sixth edition, has been rearranged and largely rewritten by R. J. Minnitt of Liverpool and John Gillies of Edinburgh. The scope of the book has been considerably extended to conform to the change in name to "Textbook of Anaesthetics." In general, the authors are to be congratulated on the changes and additions. It is now a book which probably is honestly and fairly representative of the thought and practice among a majority of British anesthetists. Certain points of disagreement with the opinions held in this country are present and to be expected. That the effort deserves to be called a textbook of anesthetics would be questioned by many. As a pleasant and profitable means of familiarizing oneself with modern British practice in anesthesiology, it should prove useful to the medical profession in this country.

The Foetal Circulation and Cardiovascular System, and the Changes That They Undergo at Birth. By Alfred E. Barclay, O.B.E., D.M., F.R.C.P., Kenneth J. Franklin, D.M., F.R.C.P., and Marjorie M. L. Prichard, M.A. Cloth. Price, 50s. Pp. 275, with 160 illustrations. Oxford: Blackwell Scientific Publications, Ltd., 1944.

Seven years ago Dr. A. E. Barclay, the dean of British roentgenologists, decided to tackle the problem of determining exactly what happens in the circulation when a placental animal is born; he wanted particularly to determine the time of functional closure of the ductus venosus. In order to facilitate this research, Dr. Barclay devised a cineradiographic apparatus and joined forces with Dr. Kenneth J. Franklin and Marjorie M. L. Prichard.

The book which describes their studies begins with a fine chapter on the history of the problem and what has been learned —mainly by the anatomists and embryologists. The next chapter is on the course of the blood flow in the fetal animal—mainly the lamb—as determined with the help of cineradiography and an opaque medium in the blood vessels. Chapter III reports a detailed study of the behavior of the many parts of the cardiovascular system in the mature fetal lamb. Chapter IV is on the circulation of the mature fetal lamb and the respiratory mechanisms which take over after birth. Chapter V is on lambing as it is observed by shepherds. Chapter VI is on the changes which occur during and shortly after the birth of the lamb. These changes are listed in approximate order on pages 126 and 127. The exact order has not yet been established for all the changes, but the authors have evidence for the view that there is a functional closure in the ductus venosus, then in the via sinistra and then in the ductus arteriosus. Functional closure precedes anatomic closure. There is a discussion of the factors which bring about respiration and the big changes in the circulation. Chapters VII and VIII are on comparative physiology, and chapters IX to XII are on the changes at birth in the human fetus and infant.

As Galen so truly said a thousand years ago, while describing the via sinistra and ductus arteriosus, the closure of these fetal channels at the birth of an animal is an even more wonderful phenomenon than was their original creation.

The book is beautifully illustrated and there is a fine bibliography. It doubtless will long stand as a classic in the literature on the physiology of the circulation. It should serve also as a beautiful example of what a man can accomplish in spare time when he is past 60 and working hard for his government—during years when his country is fighting a desperate battle for its life.

Myasthenia gravis. Por el Dr. Adalberto R. Goñi, jefe de clínica médica del Servicio sanitario de correos y telecomunicaciones. Paper. Pp. 135, with 10 illustrations. Buenos Aires: Librería y editorial "El Ateneo," 1944.

Mysthenia gravis is such a rare disease that there has been no monograph written on the subject for nearly forty years. Since 1934, when Walker discovered the striking effects of neostigmine (prostigmine) on the symptoms of myasthenia gravis, many cases have been reported and papers on research are now appearing at the rate of about twenty-five a year. Goni reports in detail 13 cases observed since 1937 in Buenos Aires and its vicinity and reviews in an adequate manner the history of our knowledge of this disease and its clinical as well as pathologic aspects. His chapter on the pathologic physiology of myasthenia gravis is published in collaboration with Alfredo Lanari, a physician who has done considerable investigative work both in this country and in Buenos Aires. This monograph is up to date, with an extensive list of references to the current literature and an adequate index. There are a few illustrations. The book, an extremly creditable volume, is, without question, the best treatise on the disease in print at the present time.

Diseases of the Nervous System in Infancy, Childhood and Adolescence. By Frank R. Ford, M.D., Associate Professor of Neurology, The Johns Hopkins University, Baltimore. Second edition. Cloth. Price, $12.50. Pp. 1,143, with illustrations. Springfield, Ill.: Charles C Thomas, 1944.

This excellent work continues to maintain its high standard. The author has eliminated the minor errors that creep into every text and has added new material. The index has been amplified extensively. This improved edition can be highly recommended for pediatricians and neurologists.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MIXED INSULINS

To the Editor:—What is the consensus as to the efficacy of the mixed insulins, i. e. regular and protamine insulin and of globin insulin? Are any mixed insulins on the market as yet? Captain, M. C., A. U. S.

[This question was referred to two qualified consultants, whose respective replies follow.—ED.]

ANSWER.—The combination of standard insulin with some type of delayed action insulin (protamine or globin) has been employed by all physicians experienced in the handling of severe diabetes for some years. It has been recognized that delayed action insulin, though it approached nearer the desideratum of supplying insulin for utilization at the physiologic rate than did multiple injections of standard insulin, still left something to be desired. The experience of many workers is reported in the literature of the past few years, with the consensus being that a combination of the two types of insulin works out best in those severe cases that do not regulate well on either of the insulins when used uncombined. The article by Colwell reviews the literature and sums up the present status admirably.

Globin insulin has now been given a thorough clinical trial. At first it was hoped that, because it was administered as an unprecipitated type of delayed action insulin, presumably precipitating in the tissues after injection, it would prove to be the ideal type, having a quick acting and delayed acting quotient. From clinical experience, however, it has seemed to act much like its precursor, protamine insulin.

Some of the pharmaceutical houses have been working on a mixed type of insulin, one that contains a quick action and a delayed action element. At the present time there are no mixed insulins on the market.

ANSWER.—Various attempts have been made to devise an insulin preparation having prolonged activity but also exerting a rapid effect. The ultimate aim is the maintenance of good control in the great majority of diabetic patients with a single injection daily. Protamine zinc insulin alone will control about half of all diabetic patients, the milder cases requiring 40 units or less per day. More severe cases require more rapid insulin action than is afforded by the slowly absorbed protamine zinc insulin. Good regulation may be established in many of these more severe cases by giving separate morning injections of protamine zinc insulin and of regular insulin such as protamine zinc insulin 45, regular insulin 15 or protamine zinc insulin 60, regular insulin 20, and so on. In such treatment the dose of protamine zinc insulin is usually about three times the dose of regular insulin. The results are usually satisfactory, but two injections are required, even though both are administered before breakfast.

If regular and protamine zinc insulins are mixed in the syringe or in a vial, the resultant preparation will give an intermediate type of effect (provided the regular insulin: protamine zinc insulin ratio is 1:1 or greater, since a large part of the regular insulin is precipitated by such admixture). Good clinical control may often be established by using mixtures containing 2, 2½ or 3 parts of regular or crystalline insulin to 1 part of protamine zinc insulin.

Globin zinc insulin has not yet, according to the comparative studies available, proved to offer any considerable advantages as an intermediate type of insulin. It frequently permits after breakfast hyperglycemia of excessive degree and often causes midafternoon hypoglycemia. It is completely absorbed in less than twenty-four hours, so that the advantageous overlapping effect of protamine zinc insulin is lost.

MacBryde and his co-workers have obtained results superior to those secured with extemporaneous insulin mixtures by using a single injection daily of modified protamine zinc insulin containing half or less than half as much protamine as market protamine zinc insulin (0.5 or 0.625 mg. per hundred units instead of 1.25 mg.). This market protamine zinc insulin has two components: (1) 75 per cent of any given dose is in precipitated form and is slowly absorbed throughout a period of twenty-four hours or longer; (2) 25 per cent is in solution and is rapidly absorbed, acting to control the blood sugar rise after food intake. This proportion of slow to rapid activity was selected after an analysis of 350 cases showed that it fitted the requirements of the great majority of diabetic patients. The St. Louis investigators feel that the use of variable extemporaneous mixtures has perhaps been a necessary step in developing information as to the most desirable time-activity pattern of an intermediate insulin. They believe that the use of mixtures should be discouraged because the results are irregular and the problems of mixing are confusing to patients and physicians. Since 90 per cent of a series of 110 patients were well regulated with modified protamine zinc insulin, there seems to be no necessity for the prescription of individual insulin mixtures. Other investigators have confirmed the good results obtained with market protamine zinc insulin by the Washington University group.

It seems likely that some form of modified protamine zinc insulin containing much less protamine than is present in market protamine zinc insulin will eventually completely displace the latter. There is as yet no modified protamine zinc insulin on the market. Until such a preparation becomes available it is probably best to give two separate injections, one of protamine zinc insulin and the other of regular insulin, before breakfast daily to patients not well regulated with protamine zinc insulin alone.

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RATE OF TRAVEL OF CLOT IN BLOOD STREAM

To the Editor:—What is the rate of travel of an embolus in the blood stream of the veins as to the time it takes to go through the right auricle and ventricle and reach the lung?

A. P. George, M.D., Haverhill, Mass.

ANSWER.—It is assumed that the inquiry relates to the passage of a blood clot and not to that of air or fat from the peripheral veins to the pulmonary artery. Naegeli and Janker in their studies on experimental embolism with the help of a moving picture film saw that an opaque embolus, injected into the femoral vein, passes up the abdominal vena cava, hesitates for a while at the diaphragm and then shoots along the thoracic vena cava to the right auricle; even from here the embolus may come back again to the diaphragm before negotiating the transit through the heart. Certainly there is evidence of retrograde flow in the vena cava of the experimental animal. The liver enlarges in right heart failure, and in cinematographic studies of animals it has been shown that such failure is associated with regurgitation of blood from the right side of the heart into the liver. A similar temporary backflow can occur at each expiration when the liver is compressed during inspiration.

In man the rate of travel of the embolus would depend on the actual circulation time as determined by ether or decholin, on the rate and depth of respiration and on the rise in pressure in the right heart and pulmonary artery. Judging from observations in man, a sudden attack of dyspnea, cyanosis or retrosternal pain follows a sharp, tearing feeling in one of the extremities within fractions of a minute. This rate of travel is not to be confused with a slowly ascending thrombosis, which may take several days from the plantar veins of the foot to the iliofemoral segment but may break loose at any time during its progress.

DRUGS HAVING CURARE-LIKE ACTION ON MOTOR NERVES

To the Editor:—What drugs may be employed to produce motor paresis of isolated muscles, the drug being injected into the muscle?

Lieutenant Commander, MC(S), U.S.N.R.

ANSWER.—Drugs having a curare-like action are magnesium, which acts on the peripheral muscles, and quinine, which in addition increases the refractory period and slightly inhibits cholinesterase. Curare itself interrupts the nervous impulse at the neuromuscular junction. Synthetic curare-like compounds such as quinine methochloride, quinine ethochloride and salts of erythroidine act in a similar manner. Onium salts in general possess a curariform action. Atropine antagonizes or prevents the action of acetylcholine, acting directly on the effector cell, plain muscle and gland cells and renders them insensitive. The local injection of 0.1 to 0.2 per cent solution of procaine or some other local anesthetic blocks the centripetal proprioceptive impulses and thereby relaxes muscular tonus, normal

and abnormal. Neuromuscular transmission is weakened so that the muscle responds better to direct than to nerve stimulation. Cold, fatigue, low potassium, excessive calcium and strong current (cathodal depression) are well known conditions unfavorable to conduction.

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RESTORATION OF BODY FIGURE AFTER PREGNANCY

To the Editor:—A prospective mother aged 22 is interested in regaining her figure after parturition. The main problem is her breasts, which before pregnancy were large but well formed and not pendulous. They have enlarged considerably by now, the seventh month of pregnancy. What measures taken both before and after delivery will insure a return of the breasts to as nearly as possible their original state? Will the wearing of a brassière while sleeping help? Does nursing the baby tend to make the breasts pendulous? What forms of exercise, if any, are of benefit to breast uplift? Are any exercises advisable ante partum? What measures do actresses generally take to preserve their figures?

Lieutenant (jg), (MC), U.S.N.R.

ANSWER.—There is little authentic information concerning the proper care of the breasts during pregnancy in order to retain their firm, normal appearance. The enlargement of the breasts is due partly to the development of the secretory acini and partly to the growth of the duct system. Proper support without compression throughout the pregnancy will prevent the excessive stretching of the tissues as a result of the increased weight and size of the breasts; it will also prevent an excessive pull on the pectoral muscles. Gentle but superficial massage of the skin with a bland cold cream may reduce the tendency toward striae.

Nursing does promote changes in the breasts, and they tend to become pendulous and flabby, rarely returning to their previous state. A properly fitting support should be worn for several months after delivery. The usual puerperal exercises are recommended, although they will not alter the tone of the breasts.

There are no special measures that actresses take to preserve their figures. The following suggestions will help: The weight gain during pregnancy should be restricted to no more than 16 to 18 pounds (7-8 Kg.). A balanced high protein diet will assure good nutrition. Daily exercises outdoors, particularly walking, will maintain good muscle tone. A properly fitting abdominal support after the fifth month of gestation will provide support for the pelvic girdle. Care at the time of delivery to prevent much separation of the abdominal muscles will assure a return of the normal appearance of the abdomen. Regulated exercises for at least eight weeks following delivery will go far to restore the figure to the normal.

DOSAGE OF TESTOSTERONE PROPIONATE

To the Editor:—I have been administering 25 mg. of testosterone propionate intragluteally three times weekly to a vigorous man in his middle seventies who complained of inadequate energy, impaired memory for recent events and general letdown. The patient believes that he has experienced some improvement from this treatment and is insistent on larger dosage. I am hesitant to administer a greater dosage, but my hesitancy is not based on any knowledge of possible harmful effects. Is prolonged administration of testosterone in amounts of 25 mg. or more three times weekly inadvisable?

M.D., Indiana.

ANSWER.—Symptoms such as those mentioned could be expected in a man of this age to be the result of the aging processes. It is also quite possible that these symptoms could be initiated to some extent by a definite decrease or loss of sex function. If the patient does not have pronounced hypertrophy of the prostate and if there is no evidence of a possible cancer of the prostate, one might be justified in increasing the dosage of testosterone propionate to 50 mg. three times weekly without fear of harm to the patient. However, it should not be administered to a man of this age for the purpose of increasing potency, which might result from doses of 50 mg.

The 25 mg. dose is usually adequate when the preparation is given for its tonic effect; this dosage is also effective in relieving the symptoms of the climacteric in younger men, in patients having hypogonadism or undeveloped testes and in castrates.

MAPHARSEN AND BISMUTH IN CEREBROSPINAL SYPHILIS—INJECTION TECHNIC

To the Editor:—I have been using iodobismitol or sobisminol with mapharsen in cerebrospinal syphilis, including tabes dorsalis and taboparesis, attaining serologic reversal. If serologic reversal can be attained in this way is there additional advantage to be gained by using tryparsamide or malaria fever therapy? I can persuade my patients to bear the pain of the injection, but the induration of the buttock becomes extremely severe—to the point where further injections are almost impossible. Do tryparsamide and malaria fever therapy have any advantages over bismuth subsalicylate in cerebrospinal syphilis? I have not read anything on the subject since the original work of Hanzlik.

M.D., Ohio.

ANSWER.—It has been the experience of the majority of syphilologists that mapharsen and bismuth do not reverse the reaction of the spinal fluid to negative in patients with tabes dorsalis or taboparesis. The blood serologic tests may become negative in tabes dorsalis without treatment of any sort, but rarely do mapharsen and bismuth cause a significant change in the blood or spinal fluid reaction of a patient with taboparesis. In other words, the experience of the inquirer is quite contrary to that reported in most of the literature during the past twenty years. In fact, mapharsen, as a rule, is less efficient in the treatment of cerebrospinal syphilis than is neoarsphenamine or arsphenamine, and the use of tryparsamide and fever therapy has become popular because their use for the patient with cerebrospinal syphilis has demonstrated their definite superiority over any of the preparations of arsenic or bismuth. Iodobismitol and sobisminol do not have any therapeutic advantage over bismuth subsalicylate.

It is probable that the local reactions to bismuth as mentioned are due to improper technic of injection. Consideration of the following factors may overcome some of the difficulty in technic: 1. The injection may be too superficial; a needle 2½ inches long should be employed. 2. Deposit of bismuth in the injection tract may occur at the time of withdrawing the needle. 3. Massage of the buttock should follow withdrawal of the needle. 4. The injection should be made with the patient lying on the table completely relaxed and not while the patient is standing or leaning over a table or chair. 5. Exercise and a sitz bath after the injection may be helpful.

INJECTION THERAPY FOR PAIN IN THROMBOPHLEBITIS

To the Editor:—I understand that injection of the lumbar sympathetic nerves is indicated for the relief of vasospasm caused by thrombophlebitis. What is the technic? What textbook or journal is recommended for additional information on the procedure?

Clauss B. Strauch, M.D., Hazel Green, Wis.

ANSWER.—Thrombophlebitis, by irritating directly or reflexly the sympathetic fibers which course along the blood vessels of the extremities, does produce vasospasm. This is manifested by a cool cyanotic extremity, with pulses diminished as compared with those on the other side; there is also a diffuse severe cramping sensation, a pain of vasoconstriction, which defies any known pattern of peripheral pathways. Under such conditions paravertebral infiltration of the regional sympathetic nerves relieves pain, decreases edema and increases peripheral blood flow. It must be emphasized, however, that not all cases of venous thrombosis exhibit these phenomena; those in the lower part of the leg are notoriously bland and are apt to give rise to embolism without much collateral vasospasm.

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CARRIERS OF HEMOLYTIC STREPTOCOCCUS

To the Editor:—A boy aged 4 years has hypertrophied tonsils and chronic cervical adenitis. Culture of material from his throat reveals hemolytic streptococci. Should there be any restrictions against his contacts with other children, such as those incidental to attending nursery school, playing with preschool children or eating in a dining room where other young children are present?

Daniel Haffron, M.D., Elgin, Ill.

ANSWER.—Group A hemolytic streptococci are pathogenic for man. A child carrying this organism in the throat is capable of spreading infection to other children, and restrictions are usually considered to be advisable although not specifically required under the department of health regulations for the state of Illinois.

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THE ANOXIA TEST IN THE DIAGNOSIS OF CORONARY INSUFFICIENCY

A STUDY OF 289 CASES

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The diagnosis of coronary sclerosis is usually dependent on the clinical history of pain in the chest or arm, invoked by effort and relieved by rest. In certain cases an apparent constant correlation exists between the occurrence of pain and the amount of increased demand on the heart for work, but in many other cases the occurrence of pain is not related consistently to increased effort or other cause. Because of the vagaries of the symptom complex of angina pectoris, the diagnosis may be difficult to establish. Consequently, any objective method for confirming or excluding a diagnosis of coronary sclerosis would be of immediate interest to the clinician, particularly if the test was applicable from the standpoint of time and material, was harmless to the patient and could be definitely interpreted.

A number of observers have noted the reaction of so-called normal persons and of persons who have coronary disease to low percentages of oxygen, particularly in regard to electrocardiographic changes. The medical profession is indebted, however, to Levy and his associates [1] for their efforts to introduce a standardized test which might aid in the diagnosis of coronary sclerosis in difficult cases. Their continued studies, together with the work of Barach and others [2] and of Greene and Gilbert [3] have clarified many of the puzzling observations that originally were made in use of this procedure.

In studies of the electrocardiographic effects of anoxia, Levy and his associates used a mixture containing oxygen 10 per cent and nitrogen 90 per cent. On the basis of their experience they defined certain criteria for the electrocardiographic changes associated with, and indicative of, coronary insufficiency. These they summarized as follows: [4] 1. The arithmetic sum of the RS-T deviations in all four leads (1, 2, 3 and 4F) is 3 mm. or more (fig. 1). 2. Partial or complete reversal of the direction of the T wave in lead 1 is accompanied by an RS-T deviation of 1 mm. or more. 3. Complete reversal of the direction of the T wave in lead 4F is present regardless of any associated RS-T deviation in this lead (figs. 2 and 3).

Moreover, they stated that "strong presumptive evidence of diminution in the coronary reserve is afforded by the occurrence of pain during a test which is electrocardiographically negative. The successful use of pain as an index will depend upon the observer's ability to differentiate it from the minor discomfort of an apprehensive subject, and his astuteness in detecting the occasional malingerer."

MATERIAL

At the Mayo Clinic during the last two and a half years the anoxia test has been performed in 300 cases. The present analysis is based on the results of the test in 289 of these cases. Evaluation of the patient's history and physical findings preceding the test disclosed symptoms or physical findings suggestive of coronary insufficiency in all but 7 cases. The clinical diagnosis was not established conclusively in any case prior to performance of the anoxia test.

The oldest patient was 67 years of age and the youngest was 24. Six patients were in the third decade of life, 57 in the fourth, 112 in the fifth, 94 in the sixth and 20 in the seventh.

The test never was performed in the presence of congestive heart failure or within four months after a suspected cardiac infarction or more than once in twenty-four hours in the same case.

METHOD

The method devised by Levy was used with only minor modifications. By means of a reservoir bag and a mask the patient breathed 10 per cent oxygen and 90 per cent nitrogen from a cylinder containing this mixture. A tank containing 100 per cent oxygen was included in the apparatus, and a flood valve permitted almost instantaneous replacement of the 10 per cent oxygen mixture by 100 per cent oxygen.

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1. Levy, R. L., Barach, A. L., and Bruenn, H. G.: Effects of Induced Oxygen Want in Patients with Cardiac Pain, Am. Heart J. **15**: 187-200 (Feb.) 1938. Levy, Bruenn and Russell:[5] Levy, Williams, Bruenn and Carr:[6] Levy, Patterson, Clark and Bruenn.[4]

2. Barach, A. L.; Steiner, Alfred; Eckman, Morris, and Molomut, Norman: The Physiologic Action of Oxygen and Carbon Dioxide on the Coronary Circulation, as Shown by Blood Gas and Electrocardiographic Studies, Am. Heart J. **22**: 33-34 (July) 1941.

3. Greene, C. W., and Gilbert, N. C.: Studies on the Responses of the Circulation to Low Oxygen Tension: V. Stages in the Loss of Function of the Rhythm Producing and the Conducting Tissue of the Human Heart During Anoxemia, Am. J. Physiol. **56**: 475-486 (July) 1921; Studies on the Responses of the Circulation to Low Oxygen Tension: III. Changes in the Pacemaker and in Conduction During Extreme Oxygen Want as Shown in the Human Electrocardiogram, Arch. Int. Med. **27**: 517-557 (May) 1921. Studies on the Responses of the Circulation to Low Oxygen Tension: VI. The Cause of the Changes Observed in the Heart During Extreme Anoxemia, Am. J. Physiol. **60**: 155-192 (March) 1922.

4. Patterson, J. E.; Clark, T. W., and Levy, R. L.: A Comparison of Electrocardiographic Changes Observed During the "Anoxemia Test" on Normal Persons and on Patients with Coronary Sclerosis, Am. Heart J. **23**: 837-846 (June) 1942.

The test was performed under basal conditions. The usual period of observation was twenty minutes. Electrocardiograms were made before the test and ten and twenty minutes after the patient began to breathe the mixture containing 10 per cent oxygen. If the patient experienced pain during the test, an effort was made to secure final tracings before changing from 10 to 100 per cent oxygen; however, if the distress seemed severe, 100 per cent oxygen was given at once. On completion of the test, 100 per cent oxygen was given routinely for from one to two minutes, a time adequate for the subsidence of cyanosis.

The electrocardiograms included the three standard leads and the precordial leads designated 4R and 4F (terminology of American Heart Association).[5]

RESULTS

On the basis of clinical evidence alone, the 289 persons subjected to the anoxia test were divided into four groups, as follows: group 1, controls; group 2, patients who had an essentially positive history for coronary insufficiency; group 3, patients who had an equivocal history, and group 4, patients who had an essentially negative history. In the following summary the expression "electrocardiographically positive test" indicates that during the anoxia test there were electrocardiographic changes of a type and degree satisfying one of the criteria of Levy.

Group 1 was composed of 7 healthy men who had experienced no symptoms suggestive of angina pectoris. None of these men experienced pain during the anoxia test and no significant electrocardiographic changes occurred.

Group 2 was composed of 92 cases in which a history highly suggestive of angina pectoris was obtained. This diagnosis probably would have been made, perhaps with some slight reservation, even if the anoxia test had not been performed. When the result of the test was positive, it was regarded as confirmatory evidence of coronary insufficiency. When the result of the test was negative, the tentative diagnosis based on clinical grounds, nevertheless, was maintained.

Of the 92 patients, 53.2 per cent had electrocardiographically positive tests, with or without pain; 19.6 per cent experienced pain but no significant electrocardiographic changes occurred, and 23.9 per cent had no pain and no significant electrocardiographic changes developed. In 3.3 per cent of cases the test was regarded as unsatisfactory.

Group 3 was composed of 108 cases in which there were certain features in the history suggestive of coronary insufficiency and also certain clinical manifestations of a doubtful or contradictory nature. In some cases angina of effort was present or absent under identical circumstances. In other cases the location of the pain in the chest had no relation to the sternum and had no typical extension. In some cases the psychoneurotic makeup of the patient together with the bizarre location of the pain in the chest and its unusual duration in a paroxysm aroused suspicion of its psychosomatic origin. In this group of patients the development of significant electrocardiographic changes during the period of deprivation of oxygen had the greatest value because of the doubtful diagnosis.

Of the 108 patients, 19.5 per cent had electrocardiographically positive tests, with or without pain; 18.5 per cent had pain but no significant electrocardiographic changes occurred, and 50 per cent had no pain and no significant electrocardiographic changes developed. In 12 per cent of patients the test was regarded as unsatisfactory.

Group 4 was composed of 82 patients who gave a history which had few if any features of a true anginal syndrome. The apprehensive individual who has a recent history of pain around the heart and is fearful of serious heart disease is representative of this group. In the opinion of the clinician there was little evidence to support the patient's suspicion.

Of the 82 patients, 1.2 per cent had an electrocardiographically positive test. Although the clinician recognized that the changes ordinarily would be regarded as indicative of coronary insufficiency, he maintained

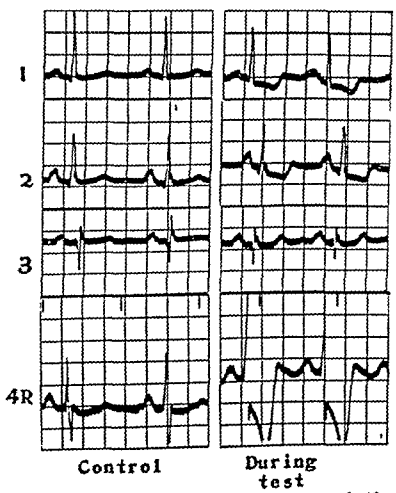


Fig 1.—The patient was a man aged 49 The history was compatible with the diagnosis of angina pectoris. Ten minutes after inhalation of the mixture of 10 per cent oxygen and 90 per cent nitrogen was begun he complained of mild pain in the chest The electrocardiogram designated "During test" was taken at this time The depression of the ST segment in lead 4R indicates coronary insufficiency (criterion 1, Levy).

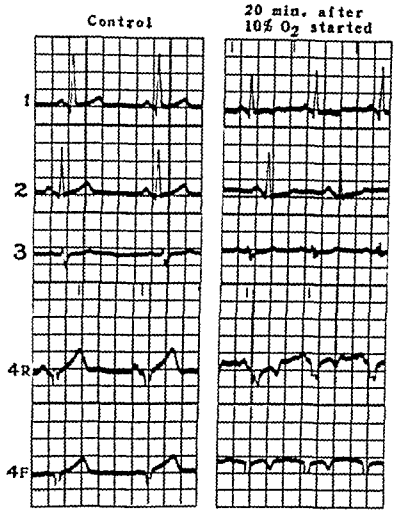


Fig. 2.—The patient was a man aged 50 The history was compatible with the diagnosis of angina pectoris Twelve minutes after inhalation of the mixture of 10 per cent oxygen and 90 per cent nitrogen was begun he complained of a sensation of mild pressure in the sternal area of the chest The complete reversal in the direction of the T wave in leads 4R and 4F indicates coronary insufficiency (criterion 3, Levy).

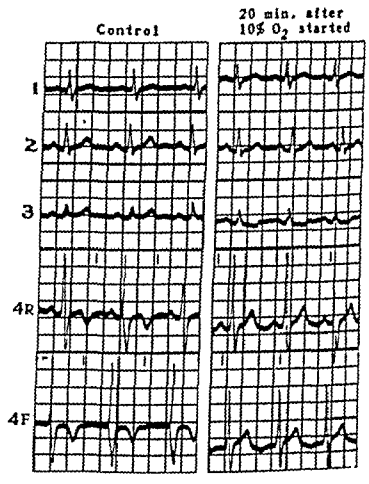


Fig 3 —The patient was a man aged 42 The history was compatible with the diagnosis of angina pectoris. No pain in the chest occurred during the period of oxygen deprivation The complete reversal in the direction of the T wave in leads 4R and 4F indicates coronary insufficiency (criterion 3, Levy).

5 Miss Bess Tews and her associates gave technical assistance in performing the anoxia tests.

his original diagnosis of myalgia of the chest wall. Eleven per cent of patients had pain but no significant electrocardiographic changes occurred, and 76.8 per cent had no pain and no significant electrocardiographic changes developed. In 11 per cent of cases the test was regarded as unsatisfactory (tables 1 and 2).

Unfavorable Reactions.—In general, the same type of unfavorable reactions were encountered in our patients as were reported by Levy and his associates [6] and by Burnett and his associates.[7] In 25 of the 39 cases in which an unfavorable reaction occurred, the test was regarded as unsatisfactory.

Nine patients had vasovagal reactions characterized by a fall in blood pressure associated with slowing of the pulse rate and, in some instances, with cold sweat, pasty color and the appearance commonly seen in shock. Three patients had nausea and, as a result, the test was discontinued. The test was discontinued when 4 additional patients complained of severe generalized discomfort or requested that the procedure be interrupted.

Within six minutes after the test was started, 1 patient became restless and complained of a "huge head" and nausea. The blood pressure dropped to 70 mm. of mercury systolic and 40 mm. diastolic. A questionable momentary loss of consciousness occurred and a few convulsive twitches were noted.

Loss of consciousness occurred in 3 cases. One of these patients fainted and another was "beginning to lose consciousness" when 100 per cent oxygen was introduced. In the third case the reaction was associated with development of arrhythmia and cardiac arrest for more than three seconds.

In 1939 Levy, Bruenn and Russell [8] reported that in their experience with the anoxia test arrhythmia had not occurred and that "ventricular premature contractions present in control records in several instances disappeared with the induction of oxygen want."

Our own results are at variance with these findings. One patient stated that with exercise his heart became irregular, and frequent ventricular premature contractions developed while he was breathing the mixture containing 10 per cent oxygen. This finding is interesting but not representative. In 5 other cases the number of premature contractions increased during the test, and in 8 more cases this type of arrhythmia persisted unchanged throughout the period of oxygen want. In cases in which the only cardiac irregularity was of the extrasystolic type the test was carried through to a satisfactory termination. Nodal premature contractions developed in 1 case. Nodal rhythm developed during the test in 2 cases. In 1 of these the altered rhythm started twelve minutes after the test was begun. The heart rate had increased from 62 to 98 beats per minute during the twelve minutes and dropped to 44 at the onset of nodal rhythm. The administration of 100 per cent oxygen was begun immediately and normal sinus rhythm was resumed. In the second case the onset of nodal rhythm was attended by the clinical picture of shock; that is, there was loss of consciousness momentarily and a blood pressure reading could not be obtained.

In 2 cases there was complete cardiac arrest, which in 1 case lasted for more than three seconds (fig. 4) and in the other for exactly four seconds. The first patient momentarily lost consciousness.

The 4 cases in which nodal rhythm or cardiac arrest developed during the test were reviewed. No characteristic which was peculiar to these from the standpoint either of the histories or of the physical status could be defined. The clinical evidence of angina pectoris was equivocal and the element of anxiety was large, perhaps unusually so. One of the 2 patients who had cardiac arrest had had a conduction disturbance (wide S wave pattern, bundle branch block) for at least three years. We know of no means of predicting when such a reaction might develop.

TABLE 1.—*Results in 289 Anoxia Tests*

Clinical Classification as to History of Angina Pectoris	Total Cases	No Pain or Significant Electrocardiographic Changes		Pain Without Significant Electrocardiographic Changes		Significant Electrocardiographic Changes Without Pain		Significant Electrocardiographic Changes With Pain		Unsatisfactory	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Group 1, controls	7	7	100								
Group 2, essentially positive	92	22	23.9	18	19.6	13	14.1	36	39.1	3	3.3
Group 3, equivocal	108	54	50.0	20	18.5	6	5.6	15	13.9	13	12.0
Group 4, essentially negative	82	63	76.8	9	11.0	1	1.2	..	....	9	11.0

TABLE 2.—*Types of Electrocardiographic Changes in Seventy-One Tests* *

Criteria of Levy	Cases	Per Cent of 71 Tests
1. Sum of deviations of RS-T segment in four leads is 5 mm or more	47	66.2
2. Partial or complete T₁ inversion plus deviation of RS-T segment of 1 mm or more.	2	2.8
3. Complete reversal of direction of T wave in lead 4 F	12	16.9
1 and 3	9	12.7
1, 2 and 3	1	1.4

* No changes occurred in the following combinations of criteria: 1 and 2, and 2 and 3

THE SIGNIFICANCE OF CHANGES IN THE T WAVE IN THE PRECORDIAL LEADS

In publications concerning the anoxia test prior to June 1942, Levy and his associates [6] had maintained four criteria for electrocardiographic changes constituting a positive test. The first three are expressed in the introductory section of this paper. In 1942, however, they [4] discarded the fourth criterion, with the following statement: "The combination of partial T wave reversal and RS-T deviation of 1 mm. or more in lead 4F as the sole criterion of a positive test was observed in less than 2 per cent of the cases of coronary sclerosis and was found with equal frequency in normal persons. Its use as a sign of a positive reaction has therefore been discontinued."

6 Levy, R. L., Williams, N. E., Bruenn, H. G., and Carr, H. A.: The "Anoxemia Test" in the Diagnosis of Coronary Insufficiency, Am. Heart J. 21: 634-656 (May) 1941. Levy, R. L., Patterson, J. E., Clark, T. W., and Bruenn, H. G.: The "Anoxemia Test" as an Index of the Coronary Reserve: Serial Observations on 137 Patients with Their Application to the Detection and Clinical Course of Coronary Insufficiency, J. A. M. A. 117: 2113-2118 (Dec. 26) 1941.

7. Burnett, C. T.; Nims, M. G., and Josephson, C. J.: The Induced Anoxemia Test, Am. Heart J. 23: 306-333 (March) 1942.

8 Levy, R. L., Bruenn, H. G., and Russell, N. G., Jr.: The Use of the Electrocardiographic Changes Caused by Induced Anoxemia as a Test for Coronary Insufficiency, Am. J. M. Sc. 197: 241-247 (Feb.) 1939.

Our experience confirms the wisdom of this revision of criteria, since the fourth one alone was satisfied in only 4 of our cases. In 2 of these cases the clinical evidence was essentially positive for angina pectoris, in 1 equivocal and in 1 essentially negative.

The significance of partial inversion of the T wave in lead 4F with slight segmental deviation is related closely to the more general problem of the significance

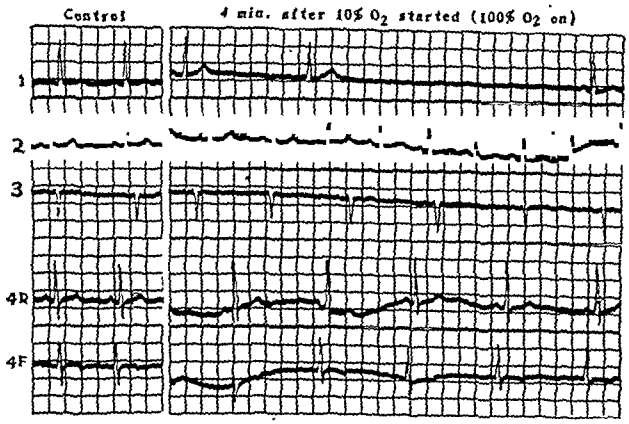


Fig. 4.—The patient was a man aged 41. The history afforded only highly equivocal evidence of angina pectoris. One of the types of cardiac arrhythmia that sometimes develops during periods of oxygen deprivation is shown in lead 1 of the electrocardiogram taken four minutes after inhalation of the mixture of 10 per cent oxygen and 90 per cent nitrogen was begun. The period of asystole lasted 3.4 seconds. Momentary loss of consciousness occurred. The diagnosis remained uncertain.

of alteration of the T wave in the precordial leads. As a positive finding Levy has retained among his criteria complete reversal of the T wave in lead 4F regardless of associated RS-T segment deviation in this lead. For this reason data concerning changes in this wave are important. Certain findings in the present series of tests are interesting, but their significance is mitigated by the diagnostically indeterminate nature of the related clinical material.

Diminution in the height of the T wave in lead 4F as a result of the anoxia test is recognized as a frequent occurrence in individuals who have a normal cardiac reserve. This same observation may be made relative to lead 4R. It seems probable that when the initial height of the T wave in the precordial lead is only 2 to 4 mm., the decrease in voltage that normally occurs during periods of oxygen deficiency might be sufficient to reduce the T wave to, or slightly below, the isoelectric line.

The 8 cases in our series in which the major change in the electrocardiogram during the test was of this type are grouped in column 1, table 3. Seven cases in which the T wave changes in the precordial leads were of comparable degree but were opposite in direction are grouped in column 2 of the same table. In these cases a slightly negative T wave in lead 4R or 4F became almost isoelectric or an upright T wave in these same leads increased in voltage without attendant segmental deviation. The 12 cases in which there was complete reversal of the direction of the T wave in lead 4F without other significant electrocardiographic change are grouped in columns 3 and 4.

The results of the tests listed in columns 1 and 2 were considered to be negative electrocardiographically, according to the criteria of Levy, whereas the results of those in columns 3 and 4 were considered to be positive.

This analysis suggests that a slight increase in height or decrease in negativity of the T wave in leads 4R and 4F more frequently is associated with a history compatible with the presence of coronary insufficiency than is a reduction in the height of this wave to the isoelectric level. We are not concerned with explanations of this observation and record it only because it may be significant if confirmed by further experience.

THE COMPARATIVE VALUES OF PRECORDIAL LEADS

Throughout this series of tests, as mentioned previously, we used both lead 4R and lead 4F. Since Levy and his associates [9] reported only their findings with lead 4F, however, changes in lead 4R were disregarded in determining whether the results of a test were positive or negative. As a matter of fact the results, regardless of which lead is used, are fundamentally the same, as illustrated by the fact that only four of our tests showed significant changes in lead 4R and not in lead 4F and only two tests showed the reverse situation.

INSTANCES OF STRIKING SEGMENTAL ELEVATION

While depression of the RS-T segment, especially in leads 4R and 4F, was the commonest type of change in the positive test, striking elevation of this segment occurred in 4 cases. In 3 of these, elevation of the RS-T segment was most pronounced in lead 3 and was accompanied by segmental depression in lead 1 (fig. 5).

THE EFFECT OF ALTITUDE AND OTHER VARIABLES

In connection with inspiration of oxygen-nitrogen mixtures, two questions pertaining to the physiologic state of the body arise. The first question, which is of practical interest, concerns the effect of geographic increase in altitude. The second question, which is more theoretical in nature, concerns determination of the pressure altitude for a person breathing air which is equivalent to the pressure altitude for a person breathing an oxygen-nitrogen mixture at a constant altitude.

In spite of various prediction formulas for averages, there are no absolute rules for determination of an individual's average alveolar partial pressure of oxygen in an anoxia test of short duration. There is considerable individual variability both in the initial alveolar

TABLE 3.—*Changes in T Wave in Precordial Leads*

Clinical Classification as to History of Angina Pectoris	Column 1 Low Amplitude; T 4R or T 4F Decreased in Height	Column 2 T 4R or T 4F Increased in Height Without Change in Direction	Column 3 Complete Reversal of Upright T 4F	Column 4 Complete Reversal of Inverted T 4F
Group 2, essentially positive	2	4	2	5
Group 3, equivocal	6	3	2	2
Group 4, essentially negative	6	..	1	..

partial pressure of carbon dioxide and in the rate and extent of lowering of this pressure. It must be emphasized that the test is individualized and of such short duration that respiratory equilibrium is not present.

The alveolar situation always must conform to the law of partial pressures. When applied to the alveoli, this law reads as follows: $B = p\,O_2 + p\,CO_2 + p\,H_2O + p\,N_2$, in which B designates barometric pressure, and $p\,O_2$, $p\,CO_2$, $p\,H_2O$ and $p\,N_2$ designate partial

9. Levy, Williams, Bruenn and Carr.[6] Levy, Patterson, Clark and Bruenn.[8] Patterson, Clark and Levy.[4]

pressures of oxygen, carbon dioxide, water vapor and nitrogen respectively. The partial pressure of water is assumed to be constant at 47 mm. of mercury. If the ratio of carbon dioxide lost to oxygen absorbed in the alveoli is assumed to be 1 and the person is assumed to be in nitrogen equilibrium, the preceding equation can be written as follows: $B = p\,O_2 + p\,CO_2 + 47$

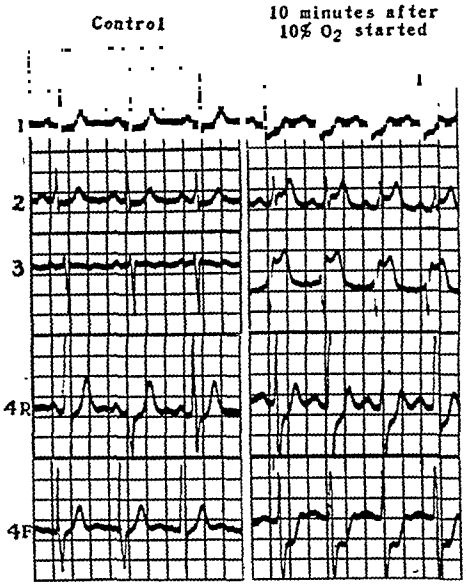


Fig. 5.—The patient was a man aged 38. Six days prior to examination recurring episodes of pain in the chest suggestive of severe coronary insufficiency had occurred. The routine electrocardiogram did not afford satisfactory evidence of recent infarction. Seven minutes after inhalation of the mixture of 10 per cent oxygen and 90 per cent nitrogen was begun the patient complained of slight pain in the left elbow. The electrocardiogram taken ten minutes after the test was begun is of particular interest because the changes recorded simulate those associated with acute infarction of the posterior portion of the left ventricle.

$+ f\,N_2\,(B - 47)$, in which $f\,N_2$ designates the volumetric fraction of nitrogen in the dry mixture.

Unfortunately the alveolar respiratory quotient cannot be predicted during the early respiratory response to anoxia, and as the partial pressure of nitrogen in the lungs is changed exact nitrogen equilibrium will not be present. It may be noted that when the alveolar respiratory quotient is below 1 the partial pressure of nitrogen is higher than $f\,N_2\,(B - 47)$ but that in the early anoxic response the alveolar quotient is likely to be unity or higher.

We think that the preceding alveolar equation is workable in its simple form and that it does not commit one to accurate predictions. It is apparent that, if the percentages of oxygen and nitrogen are fixed in the inspired dry mixture, the main determinants of the partial pressure of oxygen in the lungs are the barometric pressure and the partial pressure of carbon dioxide in the alveoli. With increases in ground elevation or higher altitudes, the barometric pressure would be decreased, and even though the pressure of carbon dioxide of individuals living at higher altitudes normally would be lower at first, the reaction to the test theoretically and practically would be more severe. When low alveolar partial pressures of oxygen, which are encountered when a dry mixture of 10 per cent oxygen and 90 per cent nitrogen is inspired, are related to the oxygen dissociation curve, they fall on the very steep part of the curve.

In addition to the fact that the alveolar partial pressures of oxygen that are encountered are in a critical range, there is also a possible increase in p_H of the blood coincident with increased ventilation of the lungs. This additional variable increases the difficulty of predicting the saturation of hemoglobin with oxygen from the dissociation curves of oxyhemoglobin and alveolar oxygen tension.

When these factors are considered, the deduction can be made that the extent of anoxemia among individuals inspiring the same mixture at the same barometric pressure would differ considerably. This deduction has been confirmed experimentally by Barach and others.[2] We believe that this variation in anoxemia, which cannot be controlled in the test, is one of the factors which determines whether the result will be positive or negative.

The second problem, that is, determination of the exact pressure altitude for a person breathing air which is equivalent to the pressure altitude for a person breathing a mixture of 10 per cent oxygen and 90 per cent nitrogen at a constant altitude, is somewhat conjectural if it concerns an individual rather than a group. This problem is not an integral part of this paper but rather it is of general interest. Excellent observations on the alveolar partial pressures of oxygen and carbon dioxide at various lowered barometric pressures have been made. The alveolar partial pressures of oxygen obtained when individuals have been taken rapidly from ground level to pressure altitudes of from 18,000 to 22,000 feet closely approximate those obtained when individuals at ground level have breathed a mixture of 10 per cent oxygen and 90 per cent nitrogen for a short period of time.

COMMENT

The clinical material analyzed in this report included many cases in which the existence of coronary insufficiency was not established or excluded. Hence any attempt to derive evidence for the definition of criteria for an electrocardiographically positive test is unwarranted. Evidence favoring the accuracy of Levy's criteria may be found, however, in the fact that electrocardiographic changes that satisfied one or more of his criteria developed in a high percentage of cases in which the clinical data favored the diagnosis of angina pectoris. Positive electrocardiographic changes occurred in only 1 case, in which the clinical evidence offered practically no support for the diagnosis of angina pectoris.

Our experience with pain as the sole expression of a positive test contrasted with our experience with electrocardiographic changes. In 11 per cent of 82 cases in which the histories were essentially negative for angina pectoris there was pain without significant electrocardiographic changes during the period of oxygen deprivation; in 19.5 per cent of 92 cases in which the histories were essentially positive there was pain without significant electrocardiographic changes. The [illegible] of cases in which the history was [illegible] and in which pain developed affords minimal grounds for relying on pain as an indication of coronary insufficiency. Levy and his associates suggested that the time of appearance of pain was considerably earlier in cases in which the test was positive electrocardiographically than in those in which it was negative. We have not confirmed this observation (table 4).

We agree with Levy and his associates[4] that "the successful use of pain as an index will depend upon the observer's ability to differentiate it from the minor discomfort of an apprehensive subject." Although pain as an index of diminished coronary reserve may be

helpful if used discreetly, this is not the type of evidence which primarily is being sought in oxygen deprivation studies. A full account of the subjective reactions of the patient is available before the anoxia test is undertaken. The subjective reactions of the patient to the test always must be evaluated in the light of knowledge concerning his temperament. If an individual of stable temperament complains of pain during the test, the ascription of his pain to coronary insufficiency is usually justifiable. If a patient who has a psychoneurotic temperament complains of distress, it may be justifiable to attribute his discomfort to extracardiac factors. The validity of these conclusions depends on the discriminating judgment of the clinician. When the positive or negative result of an anoxia test, however, is determined by the clinician's evaluation of the subjective reactions of his patient, then the test ceases to supply a novel type of information. Accuracy in the diagnosis of angina pectoris always has been dependent on the discriminating judgment of the clinician.

Consideration of this series of cases in which the diagnosis of angina pectoris was not established before the anoxia test was performed provided information concerning its usefulness as a diagnostic adjunct. One assumption must be made; that is, a positive test affords conclusive evidence of coronary insufficiency. The majority of the tests in which significant electrocardiographic changes occurred were performed in cases in which the histories were regarded as highly suggestive of angina pectoris. However, if the test had not been done, the clinician would have retained in most cases some reservation concerning the accuracy of the diagnosis. Any physician who has imposed on an otherwise healthy person a restricted program of activities and then has been harassed by a lingering doubt concerning the accuracy of his diagnosis of coronary sclerosis would value the confirmatory evidence of a positive anoxia test.

TABLE 4.—*Average Time of Appearance of Pain*

Clinical Classification as to History of Angina Pectoris	Significant Electrocardiographic Changes Absent		Significant Electrocardiographic Changes Present	
	Time, Min.	Cases	Time, Min.	Cases
Group 2, essentially positive.....	8	17	9	33
Group 3, equivocal.....	8	18	9	15
Group 4, essentially negative....	6½	9		

What is the value of the test in which the results are negative? Burnett and his associates [7] stated that "since the anoxemia test is designed to furnish objective evidence of coronary insufficiency, a negative or 'normal' response in a patient who presents equivocal evidence of coronary disease adds little to the diagnosis and may further cloud the clinical picture." Levy and his associates repeatedly have warned against the acceptance of negative results as evidence of adequate coronary circulation. Failure to recognize this well established principle will lead to confusion and to incorrect diagnosis. Even with this knowledge it is difficult on certain occasions to resist the temptation to reassure the patient and ourselves that coronary insufficiency does not exist because the anoxia test was negative.

SUMMARY AND CONCLUSIONS

The anoxia test was performed in 289 cases, according to the method established by Levy. In 282 instances the test was performed in cases in which some clinical evidence of angina pectoris existed, although in most of these cases this diagnosis could not have been made on the basis of clinical evidence alone. The results were electrocardiographically positive in 71 of the 282 cases (25 per cent).

Of the 92 cases in which the history was suggestive of angina pectoris, the test was electrocardiographically positive in 53.2 per cent. In 19.6 per cent of cases pain was experienced but there were no significant electrocardiographic changes. In 23.9 per cent of cases the results of the test were completely negative. In 3.3 per cent of cases the test was unsatisfactory.

Of the 108 cases in which an equivocal history of angina pectoris was obtained, the test was electrocardiographically positive in 19.5 per cent. In 18.5 per cent of cases there was pain but there were no significant electrocardiographic changes. In 50 per cent of cases the results of the test were completely negative. In 12 per cent the test was unsatisfactory.

Of the 82 cases in which the histories contained few if any suggestions of a true anginal syndrome, the test was electrocardiographically positive in 1.2 per cent. In 11 per cent of cases there was pain but there were no significant electrocardiographic changes. In 76.8 per cent of cases the results of the test were completely negative. In 11 per cent the test was unsatisfactory.

The occurrence of pain unattended by significant electrocardiographic changes during a test does not impress us as an event likely to contribute significantly to the solution of a diagnostic problem.

Twenty-five of 289 tests were regarded as unsatisfactory because one or several unfavorable reactions occurred. In 2 cases in which a brief period of cardiac arrest occurred, the reaction was regarded as dangerous.

In the majority of instances (66.2 per cent) in which the test was electrocardiographically positive, the only significant change consisted of a deviation, usually a depression, of the RS-T segment, totaling 3 mm. or more, in leads 1, 2, 3 and 4F. We think slight increase in height or decrease in negativity of the T wave in lead 4F or 4R more frequently is associated with a history suggestive of angina pectoris than is a depression to the isoelectric or diphasic level of a positive T wave in these same leads. Significant changes occurred in lead 4R and not in lead 4F in only four tests, and in lead 4F and not in 4R in only two tests.

Finally, the following observations concerning the choice of patients to be subjected to the anoxia test are presented in full recognition of the fact that further work in this field may necessitate a revision of opinion.

The anoxia test is not a laboratory short cut to the diagnosis of coronary sclerosis but is a means of substantiating a diagnosis of angina pectoris based on fairly convincing clinical evidence. In support of this conclusion (1) 53.2 per cent of 92 patients who had a history highly suggestive of angina pectoris had an electrocardiographically positive test and (2) of 82 patients who had minimal evidence of coronary disease only 1 had significant electrocardiographic changes during the period of oxygen want.

Use of the anoxia test should be restricted even among acceptable cases to instances in which (1) serious disagreement regarding diagnosis has occurred and (2) the establishment of a definite diagnosis is of such importance that acquisition of all helpful evidence is imperative. In some cases the presence of disease of the coronary arteries is of greater significance than in others. For a comparatively young person whose occupation entails much physical exertion or

nervous tension a restricted program of activities is a greater hardship than for an elderly person.

When use of the anoxia test is restricted to individuals selected in compliance with the foregoing standards, the possible danger to the life of the patient and the expenditure of time, effort and materials by the clinician are justifiable in view of the value of the information that can be obtained.

PROLONGED BLOOD CONCENTRATIONS AFTER ORAL ADMINISTRATION OF MODIFIED PENICILLIN

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It appears from the investigations made to date that successful oral administration of penicillin may hinge on complete neutralization of the acidity of the stomach plus a relatively slow release of this drug from some chemical which adsorbs it readily. In 1929 one of us,[1] following the studies of Gross,[2] utilized magnesium hydroxide in the purification of diphtheria toxin. It was noted at that time that this metallic hydroxide selectively adsorbed diphtheria toxin quite firmly in the presence of proteins. After adsorption vigorous treatment was required for the release of the exotoxin from the magnesium. Other metallic hydroxides acted similarly but appeared to be less effective in their binding power. However, in all cases selective adsorption occurred rapidly, resulting in a relatively pure diphtheria toxin.

On the basis that possibly penicillin, a biologic excretory product of a mold, might behave similarly, several manufacturers' products were treated with aluminum hydroxide gel U. S. P. and with magnesia magma U. S. P. by adding 30 cc. of the former and 20 cc. of the latter dropwise with constant agitation to 100,000 units dissolved in water. The penicillin and metallic hydroxides were then centrifuged at high speed and the penicillin concentration in the supernatant liquid determined.

In the case of the aluminum hydroxide, approximately 50 per cent of the penicillin added to it remained adsorbed on the sediment, while approximately 25 per cent of the penicillin remained adsorbed on the sedimented magnesium hydroxide. Both the aluminum and the magnesium hydroxide sediments were washed five times with distilled water. After three washings 27 per cent of the penicillin remained adsorbed on the aluminum hydroxide. Less than 0.5 per cent of the remaining penicillin was removed with the next two washings. However, all penicillin was released from the aluminum hydroxide on washing with buffer at p_H 6.0. It is of interest that after release from the aluminum hydroxide into buffer the penicillin solutions, originally yellow, were water clear and colorless. A similar result is obtained in the purification of diphtheria toxin by adsorption on magnesium hydroxide.

In the case of the magnesium hydroxide, which originally adsorbed approximately 25 per cent of the penicillin added to it, 16 per cent remained after the first washing. Four more washings with distilled water were not successful in removing this adsorbed penicillin. When penicillin was similarly treated with mixtures of aluminum and magnesium hydroxides, approximately 42 per cent of the penicillin was adsorbed. The first two washings with distilled water reduced this to 28 per cent. Practically none of the penicillin remaining was removed by three more washings. The penicillin adsorbed on mixtures of aluminum and magnesium hydroxides was removed from these chemicals on treatment with phosphate buffer, indicating that when penicillin is adsorbed on such mixtures it is preferentially adsorbed by the aluminum hydroxide. From these studies it appeared that penicillin is adsorbed more readily by aluminum hydroxide than by magnesium hydroxide but that magnesium hydroxide is more retentive.

ORAL ADMINISTRATION OF PENICILLIN ADSORBED ON ALUMINUM HYDROXIDE

In preliminary feedings, penicillin treated with aluminum hydroxide was used. Eleven volunteers (laboratory personnel) ingested in one dose 100,000 units of penicillin sodium in 20 cc. of water to which had been added dropwise, with constant agitation, 30 cc. of U. S. P. aluminum hydroxide. In all cases the preparation was given at 10 a. m., two to three hours after breakfast. As far as possible, bloods were taken one-half, one, two, four, seven and twenty-four hours after the penicillin was ingested. All blood samples were held in the refrigerator for twenty-four hours, following which the serums were removed by centrifugation and tested for penicillin activity by a series dilution technic[3] using Bacillus subtilis as the test organism. The standard used was the Food and Drug Administration calcium salt reference standard.[4] One unit of this standard invariably causes inhibition of the B. subtilis strain used in a dilution of 1:128. In chart 1 the results are presented in a composite curve. The number of determinations made at each point on the curve are shown. The individual curves followed the same general pattern. It will be noted that within thirty minutes the average concentration of penicillin in the blood was 0.29 unit per cubic centimeter. The average number of units in the serum after one hour was 0.125 per cubic centimeter, but this increased to 0.146 per cubic centimeter in one and one-half hours. This increase was due to the high level of 1 person who showed 0.375 unit per cubic centimeter of serum after one and one-half hours, while the other 3 persons on whom determinations were made at this time interval were 0.06, 0.06 and 0.09 unit per cubic centimeter respectively. At the end of the second hour the average amount of penicillin in the blood serum was 0.05 unit per cubic centimeter. This diminished to an average of 0.02 unit after four hours and to 0.015 unit after seven hours. On an average, the latter concentration was maintained through the twenty-fourth hour. Of the eleven tests made on the twenty-four hour blood samples in this series, 5 persons had concentrations of penicillin equivalent to from 0.03 to 0.045 unit per cubic centimeter of serum. The serum

From the Food and Drug Administration.

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2. Gross, P.: Preparation of Diphtheria and Other Bacterial Toxins by Adsorption, Proc. Soc. Exper. Biol. & Med. 26: 696, 1929.
3. Randall, W. A.; Price, C. W., and Welch, H.: The Estimation of Penicillin in Body Fluids, Science 101: 365, 1945.
4. Methods Used by the Food and Drug Administration for the Assay of Penicillin, Revised January 1945.

of the remaining 6 persons showed no activity by the test used, which was set up to measure a minimum of 0.03 unit per cubic centimeter of serum.

As a control, 6 persons were given orally in one dose 100,000 units of untreated penicillin sodium. The results are shown also in chart 1. It will be noted that with untreated penicillin the serum concentrations are considerably lower one-half and one hour after

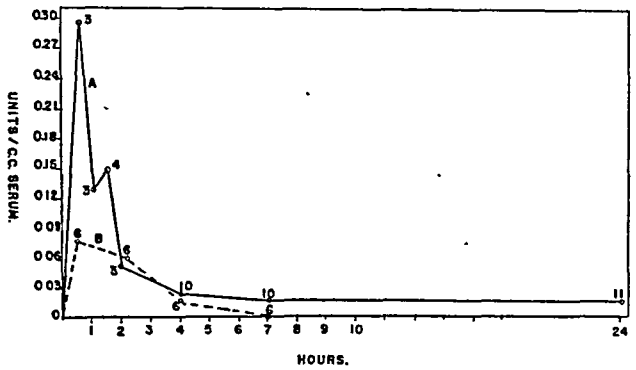


Chart 1.—Composite curves of blood levels following single oral dose of 100,000 units of (*A*) penicillin-aluminum hydroxide and (*B*) penicillin only. Numbers indicate the determination made at each point on curve.

ingestion. No penicillin could be demonstrated in the blood samples collected at the seventh and the twenty-fourth hour. Actually, of the 6 persons tested at the fourth hour 4 failed to show penicillin in their serums. By comparison, in the group given penicillin modified with aluminum hydroxide 5 of the 10 tested showed concentrations of 0.03 unit per cubic centimeter at the seventh hour, and they maintained this concentration through the twenty-fourth hour.

Since serum concentrations of penicillin reached nearly 0.30 unit per cubic centimeter within thirty minutes after ingestion of 100,000 units of penicillin modified with aluminum hydroxide but fell rapidly thereafter (chart 1), it seemed advisable to determine the effect of ingesting the same amount of penicillin at two hour intervals in four equal doses of 25,000 units each. Three million units of penicillin-aluminum hydroxide were prepared as described by adding to each 100,000 units 20 cc. of distilled water and 30 cc. of U. S. P. aluminum hydroxide. The penicillin represented the products of several manufacturers, but all were pooled in the preparation of the modified penicillin. Twenty-one persons were given 25,000 units (12.5 cc.) of the modified penicillin at 10 a. m., 12 noon, 2 p. m. and 4 p. m. Blood samples were obtained from all 21 test subjects one-half hour and twenty-four hours after ingestion. In addition, on 10 to 12 test subjects blood samples were taken two, two and one-half, four, four and one-half, six and six and one-half hours after ingestion and on 5 test subjects eight, twelve, fifteen, eighteen and twenty-eight hours after ingestion. The serum concentration levels of penicillin obtained are presented in a composite curve in chart 2, which shows that within one-half hour after each dose there is a definite increase of penicillin in the blood. After the first dose and subsequent increase in blood concentration of penicillin there is a fall in the concentration to 0.08 unit per cubic centimeter by the second hour, at which time a second dose of penicillin was given. The second dose was followed by an increase in the blood concentration of penicillin, as were the third and fourth doses. In the composite curve the average blood concentration level of penicillin one-half hour after the fourth dose is definitely increased over that obtained one-half hour after the first dose. It should be noted that after the first half hour the concentration of penicillin in the blood did not drop below approximately 0.08 unit per cubic centimeter until after the eighth hour (no penicillin was given after the sixth hour). From the eighth hour until the twelfth hour a concentration of 0.06 unit or more per cubic centimeter of blood was maintained. Between the twelfth and fifteenth hours the concentration dropped to 0.036 unit per cubic centimeter and this level was maintained through the twenty-eighth hour. By contrast, 6 persons given 100,000 units of untreated penicillin sodium, 25,000 units every two hours, had an assayable level for from seven to eleven hours.

Five persons were given, orally, penicillin modified with magnesium hydroxide prepared by adding dropwise, with constant agitation to each 100,000 units of penicillin sodium in 28 cc. of water, 22 cc. of U. S. P. magnesium hydroxide. Each person in this group was given 25,000 units (12.5 cc.) every two hours until a total of 100,000 units had been used. Blood samples were taken one-half hour and two, four, six and twenty-four hours after the first 25,000 unit dose was ingested. The curves obtained by plotting serum concentrations of penicillin against time were similar to those obtained with penicillin modified with aluminum hydroxide. Four of the 5 persons showed 0.06 unit per cubic centimeter in their serums twenty-four hours after the first dose had been administered. The amount of magnesium hydroxide used caused some laxative effect in 3 of the 5 persons in this series. However, magnesium hydroxide was as effective as aluminum hydroxide in the maintainance of penicillin in the blood after oral administration.

EXCRETION OF PENICILLIN IN THE URINE FOLLOWING MODIFIED PENICILLIN ORALLY

Eleven persons were given in a volume of 50 cc. a single oral dose of 100,000 units of penicillin modified with aluminum hydroxide. All urine was collected for a period of twenty-four hours. On an average, 13.6 per cent of the penicillin ingested was recovered in the urine. Twelve per cent of that recovered was obtained in the first two and one-half hours. The largest amount excreted was 27.3 per cent and the least 5.5 per cent. Penicillin was demonstrated in the urine as late as the nineteenth hour but in low concentrations. Two of the 11 persons under study failed to show penicillin in the urine at the nineteenth

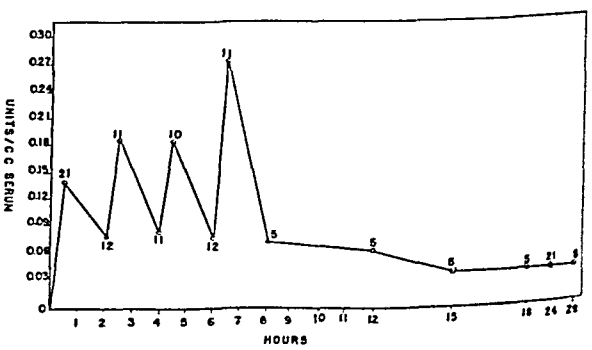


Chart 2.—Composite curve of blood levels following 100,000 units of penicillin aluminum hydroxide given orally in four doses of 25,000 units each at zero, two, four and six hours. Numbers indicate the determinations made at each point on curve.

hour, while the other 9 individuals showed at this time an average total excretion of 47 units. For comparison, the urine excreted after the ingestion of 100,000 units of untreated penicillin sodium was determined in 10 persons. The average total recovery was 6.7 per cent of that ingested, and 6 per cent of this was recovered in the first two and one-half hours. None was recovered after the seventh hour.

The average total excretion over a twenty-four hour period following four oral doses of 25,000 units of penicillin modified with aluminum hydroxide was determined on 11 persons. The average total recovery was 7,245 units (7.2 per cent); the greatest recovery was 15 per cent, and the least 1.2 per cent. The doses of penicillin-aluminum hydroxide were given at zero, two, four and six hours, and urines were collected one hour after each dose and then at irregular periods thereafter. The average amount of penicillin excreted by the 11 persons in this group one hour after the first dose was 2,165 units, one hour after the second dose 1,385 units, one hour after the third dose 1,759 units and one hour after the fourth dose 1,187 units.

Since the penicillin-aluminum or penicillin-magnesium hydroxide mixtures may be prepared just before they are administered orally, there is no stability problem involved. After the aluminum hydroxide-penicillin and the magnesium hydroxide-penicillin are prepared, their stability seems to be similar to that of penicillin sodium in distilled water, since at refrigerator temperature (10 C.) both mixtures have been found to be stable for at least thirty days.

COMMENT

The mechanism by which relatively high concentrations of penicillin are maintained in the blood following oral administration of penicillin modified with aluminum hydroxide cannot be explained on the basis of the experimental work done to date Certain facts, such as the strong neutralizing effect of aluminum hydroxide on the acid of the stomach, are established. The rapidity with which relatively high concentrations of penicillin may be demonstrated in the blood following a single oral administration of penicillin, modified with aluminum hydroxide, indicates that perhaps there is some absorption of penicillin directly from the stomach into the blood stream. This rapid increase in blood concentration of penicillin is demonstrable following each oral dose of penicillin-aluminum hydroxide. There is some indication at least of an accumulative effect since, as will be noted in chart 2, the concentration levels of penicillin reached after the second and fourth doses are considerably higher than that level reached following the first dose. Furthermore, following the first dose of penicillin-aluminum hydroxide (chart 2) in no instance did the serum concentrations of penicillin fall below what may be considered to be an effective therapeutic level until some time after the twenty-fourth hour, in spite of the fact that penicillin-aluminum hydroxide was not given after the sixth hour. It is suggested that the initial increase in blood concentration of penicillin following each dose of penicillin-aluminum hydroxide is the result of absorption through the walls of the stomach of penicillin which is either unadsorbed or loosely adsorbed on the aluminum hydroxide. Following this the penicillin-aluminum hydroxide passes into the upper intestine, where penicillin is released slowly from the aluminum hydroxide and adsorbed through the walls of this organ, thus reaching the blood stream via the portal system and the liver.

There is some difference of opinion concerning the concentration of penicillin in the blood necessary to exert efficient antibacterial action. It has been pointed out by Fleming,[5] after his studies on penicillin content of blood serum following various doses of this drug parenterally, that "we do not yet know whether it is better to maintain a constant low level of penicillin in the blood or to have a very high level for a short time after injection. . . . Clinically both systems have worked excellently." The oral administration of four doses of 25,000 units each two hours apart of penicillin modified by either aluminum hydroxide or magnesium hydroxide will result in a prolonged level of penicillin in the blood stream. It may be that the level of penicillin maintained by this dosage form will be effective in some diseases, but it can be postulated that in all likelihood it will not be effective in others. Actually, it probably will be necessary to maintain higher penicillin levels in the blood for the same disease in different individuals. However, if it becomes necessary to maintain high levels in the blood for longer periods of time, this may be accomplished by more frequent and larger doses. In preliminary studies with 150,000 units of penicillin-aluminum hydroxide given in six equal doses of 25,000 units each, serum levels of 1.0 to 1.5 units per cubic centimeter have been demonstrated.

SUMMARY AND CONCLUSIONS

A method of oral administration of penicillin modified with either aluminum hydroxide or magnesium hydroxide results in prolonged blood concentrations of this drug.

Blood levels of from 0.03 to 0.19 unit per cubic centimeter may be obtained for as long as twenty-four hours after the administration of 100,000 units in four doses of 25,000 units each. In some persons, serum concentrations of 0.06 unit were obtained thirty hours after the administration of 100,000 units in four doses of 25,000 units each.

Following each dose there is a pronounced increase in the blood concentration level of penicillin, and this blood level may be increased with subsequent doses. Relatively high levels of penicillin may be maintained in blood by increasing the frequency of the doses of penicillin-aluminum hydroxide.

Since the modified penicillin may be prepared at the time of use, no stability problem is involved.

After oral administration of the modified penicillin, relatively small amounts are excreted in the urine. The penicillin is apparently largely inactivated within the body. It appears that some absorption through the stomach wall is obtained followed by further slow absorption from the small intestine.

Because of prolonged penicillin concentrations in the blood following this method of oral administration, this dosage form may have some prophylactic value.

5. *Fleming, A.; Young, M. Y.; Suchet, J., and Rowe, A. J. E.:* Penicillin Content of Blood Serum After Various Doses of Penicillin by Various Routes, Lancet **2**: 621, 1944.

Good Traits.—In human nature good traits go together. To him that hath a superior intellect is given also on the average a superior character; the quick boy is also in the long run more accurate; the able boy is also more industrious. There is no principle of compensation whereby a weak intellect is offset by a strong will, a poor memory by good judgment or a lack of ambition by an attractive personality. Every pair of such supposed compensatory qualities that has been investigated has been found to show correspondence.—Thorndike, E. L.: *Harper Hosp. Bull.* **111**:227, 1920.

THE USE AND ABUSE OF GOLD THERAPY IN RHEUMATOID ARTHRITIS

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Unfortunately, some physicians employ gold salts in any type of arthritis; a few begin gold therapy at the first complaint of joint pain. Workers experienced in the care of rheumatic patients agree that gold is of no value in any type of joint disease except rheumatoid arthritis; some have not observed pronounced improvement even in the latter disease. Because of this indiscriminate, frequent abuse of gold salts in many forms of joint disease, the known facts concerning gold therapy in rheumatoid arthritis are discussed here briefly.

There are several important facts concerning gold therapy in arthritis:

1. Gold is of no value in any form of joint disease except rheumatoid arthritis.
2. Gold does not benefit all patients with rheumatoid arthritis.
3. Gold is not the final answer to the treatment of rheumatoid arthritis.
4. Toxic symptoms may appear at any time during this form of therapy.
5. From 10 to 20 per cent or more of patients who have received gold therapy relapse after stopping the drug.
6. Extreme care must be used during gold therapy and the physician must be familiar with the details of such treatment before undertaking this.
7. Injections of certain gold salts in proper dosage may be followed by subjective and objective evidence of improvement in the majority of selected patients with rheumatoid arthritis.

Gold salts are not advisable routinely at the onset of every case of rheumatoid arthritis. Conservative therapy results in some improvement in many patients with this disease when these individuals are followed carefully over a period of five to ten years. If the patient with rheumatoid arthritis obtains no benefit from conservative measures over a period of several months or if he grows steadily worse, gold therapy may be given if the physician is well acquainted with this form of therapy. Gold is still too dangerous for common use by the physician unless he has had special experience in this field.

Most specialists in rheumatic disease no longer believe that there is any specific virtue in the treatment of arthritis by bee venom, chaulmoogra oil, vaccines or sulfur except perhaps as a form of psychogenic therapy. The significance of focal infection in most cases of rheumatoid arthritis is still open to question. It is generally agreed that removal of focal infection by itself will not produce any great amelioration in the symptoms in most cases of rheumatoid arthritis. Fever therapy helps only a small percentage of these patients and the resulting improvement is usually only temporary. This does not apply to short periods of mild physical fever with temperatures up to 100 or 101 F., which may be definitely beneficial to some of these patients. The use of massive doses of vitamin D is still under investigation, but most rheumatologists agree that although some patients with rheumatoid arthritis may be benefited by this form of therapy the improvement is usually only temporary and in many cases disappears when the drug is stopped.

From the Arthritis Clinic of the Hospital of the University of Pennsylvania.

One should always emphasize the necessity of individualizing the program for the care of patients with rheumatoid arthritis. The program generally employed for this disease includes adequate mental and physical rest (with avoidance of emotional upsets if possible); local rest to the involved joints by means of splints when these are indicated; a nourishing, high vitamin, high caloric, anticonstipation diet unless the patient is decidedly overweight; proper physical and occupational therapy; orthopedic care as indicated; removal or treatment of definite focal infection as a general health measure to lessen the load of infection which the individual is carrying, and blood transfusions in some cases and symptomatic care as indicated including analgesics, sedatives and so forth.

Gold has been used as a therapeutic agent for many centuries. It was recommended as a panacea in the eighth century and was advocated in 1500 by Paracelsus together with mercury as an elixir of life. Although inorganic preparations of gold were in use until 1916, many organic compounds have been developed since that time. In 1913 Feldt [1] showed that certain preparations of gold possessed antibacterial properties. In 1927 he also showed that gold compounds were effective against experimentally produced streptococcic and spirochetal infections in mice. Lande [2] and Pick [3] reported on the use of gold preparations in human chronic polyarthritis in that same year. Forestier [4] popularized this form of therapy after he had treated large numbers of arthritic patients with gold preparations.

The Council on Pharmacy and Chemistry [5] has recognized the use of gold preparations only in the treatment of lupus erythematosus. Gold salts have been advocated for pulmonary tuberculosis, epidemic encephalitis, bronchopneumonia, asthma, influenza, migraine, malnutrition, alcoholism, typhoid, septicemia and many other diseases. Gold salts have been suggested as an analgesic, antispasmodic, sedative, hematinic, cardiac stimulant and even for the treatment of neurosis, debility and acute and chronic arthritis. There is no evidence substantiating the great majority of these claims.

Until recently the widespread use of gold was limited by its untoward reactions, the crudeness of the available preparations and the uncertainty of the dose. Because of the supposed beneficial action of gold salts in tuberculosis, Forestier believed that this metal should also be of value for patients with rheumatoid arthritis (which appeared to him to be a chronic wasting disease similar in some respects to tuberculosis).

Experimental animal and human clinical work now suggests that gold may be an important addition to our therapeutic armamentarium. Sabin,[6] Freyberg [7] and others have shown that gold preparations are definitely beneficial in the arthritis produced experimentally in

1. Feldt, A.: Deutsche med. Wchnschr. **39**: 549, 1913.
2. Lande, K.: Die günstige Beeinflussung schleichender Dauerinfekte durch Solganal, München. med. Wchnschr. **74**: 1132 (July 8) 1927.
3. Pick, E.: Versuche einer Goldbehandlung des Rheumatismus, Wien. klin. Wchnschr. **40**: 1175 (Sept. 15) 1927.
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5. Council on Pharmacy and Chemistry: Collodaurum Not Acceptable for N. N. R., J. A. M. A. **111**: 531 (Aug. 6) 1938.
6. Sabin, A. B., and Warren, J.: The Curative Effect of Gold Salts in Experimental Chronic Arthritis in Mice, with Special Reference to the Properties [illegible] M. A. **117**: 1561 (Nov. 1) 1941. [illegible] in Mice Produced by Filtrable [illegible] Science **89**: 228 (March 10) 19[illegible] opneumonia Group, Bact. Rev. **5**: [illegible] (March) 1941.
7. Preston, W. S.; Block, W. B., and Freyberg, R. S.: Chemotherapy of Chronic Progressive Arthritis of Mice: Role of Sulfur in Gold Containing Compounds, Proc. Soc. Exper. Biol. & Med. **50**: 253 (June) 1942.

mice by means of pleuropneumonia-like organisms. Dawson,[8] Freyberg,[9] Boots,[8] Hartung,[10] Cecil,[11] Snyder [12] and others have reported that rheumatoid arthritis in human beings has been definitely benefited by injections of gold. Others are not impressed by the results of gold therapy. Several years ago Bauer [13] observed definite subjective and objective improvement in only 4 of 30 patients treated with gold salts. In his experience these results were no better than the usual treatment with rest, a high caloric, high vitamin diet, analgesics and simple physical therapy. It was his opinion at that time that within ten years gold therapy would go the way of many previous rheumatic remedies and would not be considered the meritorious, antirheumatic remedy that it is hailed today. Other rheumatologists have used gold salts in rheumatoid arthritis "with hopes but with not very high hopes."

In most of the published reports on the use of gold in rheumatoid arthritis the results are very encouraging. Gold therapy at present seems to be the only drug which shows promise of checking the activity of rheumatoid arthritis; it is still imperfect and must be used with care.

Gold seems in some manner to arrest or lessen the inflammatory process in many cases of rheumatoid arthritis. It will not repair damaged cartilage or bone, will not reconstruct joints and will not rehabilitate the arthritic derelict who has crippling deformities and whose arthritis has been burned out after years of activity of the process. The patient who derives the greatest benefit from proper chrysotherapy is the one with active rheumatoid arthritis, preferably in the early stage of his disease. Although gold therapy is most effective in the early stages of rheumatoid arthritis, it frequently relieves pain and stiffness even in advanced cases and is worthy of a trial for such patients if there is still evidence of an active process at that time.

The physician should not use gold salts in any form of rheumatic disease other than rheumatoid arthritis. There is no indication for gold therapy in degenerative joint disease, as our present concept is that this is a process of aging and wear and tear and that there is no inflammatory process within the joints in these individuals. Likewise, gold therapy is of no value in gout, fibrositis, subdeltoid bursitis or specific infectious forms of arthritis.

MODE OF ACTION OF GOLD SALTS IN RHEUMATOID ARTHRITIS

The mode of action of gold salts in rheumatoid arthritis is unknown. Dawson and Hobby [14] have shown that gold salts have active chemotherapeutic properties against hemolytic streptococcic infection in mice comparable to that obtained with the sulfonamides. Hartung found that subcutaneous injections of gold salts were followed by a manifest increase in the bacteriostatic power of the patient's serum against the hemolytic streptococcus. Others have believed that gold acts by stimulating the reticuloendothelial system, but there is no good evidence in favor of this. Leichentritt and his co-workers [15] thought that gold might produce a diuretic effect with loss of tissue fluid and improvement in the joint symptoms. Other workers previously noted improvement in joint symptoms following the loss of fluid from periarticular tissues which accompanied the diuresis from ammonium chloride and mercupurin. Still others have suggested that gold therapy may be a prolonged acting mild shock therapy.

FATE OF GOLD IN THE HUMAN BODY

Although a small amount of gold is excreted through the intestine and the bronchial mucosa, most of it is excreted through the kidneys. Gold enters practically every cell of the body shortly after it is injected, and the greatest concentrations are found in the liver, spleen, kidneys and skin. Gold has been detected spectrographically in aspirated synovial effusions from the knee joints of patients with rheumatoid arthritis who have been treated with gold salts.

Freyberg and his associates [16] found that gold salts are transported in the blood plasma following intramuscular administration. Although the gold values of plasma and urine may vary with the size of the weekly dose injected, these are not directly proportional to this. The blood level of gold usually increases as the amount of gold injected increases. Although daily plasma values for gold may fluctuate somewhat from day to day, these are usually increased after each injection and remain at this higher level or decrease but slightly until the next injection is given.

The physician should bear in mind this large retention of gold. If large doses of gold salts are given (such as 100 mg. at a dose) approximately 20 per cent is excreted per week. During a course of gold therapy 80 per cent of the injected gold apparently remains in the body. This increasing retention of gold is extremely important clinically, as gold may be found in the urine or plasma for many months in diminishing amounts after the last injection of gold. If the weekly injections of gold are continued at a smaller dose, gold disappears from the urine more rapidly. Although gold has been found in the urine for ten months or more following the last weekly injection of 100 mg. of gold salts, when the weekly injections are limited to 50 mg. of the gold salt the urine may show no gold within a period of three months following the last injection. If still smaller doses are used (such as 25 mg. of the gold salt—which is the maximum dose we employ in most instances at present) the urine may show no gold four weeks following the last injecion. Block and Buchanan [17] have devised an extremely accurate and specific photoelectric colorimetric microchemical method for determining gold in biologic tissues and fluids.

There has been much confusion concerning the value of colloidal gold salts. The urine and plasma gold values vary greatly in different patients following the intramuscular or oral administration of colloidal gold

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15 Jacobson, S D, Leichentritt, B, and Lyons, R H Effect of Acid and Alkaline Salts on Some Patients with Rheumatoid Arthritis, Am J M Sc **104**: 540 (Oct) 1942

16 Freyberg, R H; Block, W D, and Levey, S: Metabolism, Toxicity and Manner of Action of Gold Compounds Used in Treatment of Arthritis, J Clin Investigation **20**: 401 (July) 1941

17 Block, W D, and Buchanan, O H Microdetermination of Gold in Biological Fluids, J Biol Chem **136**: 379 (Nov) 1940

salts. In some instances no gold is found in the plasma or urine after large amounts of colloidal sulfides are given. Others may absorb gold and have urinary plasma values comparable to those seen with the soluble salts of gold. In most persons, however, very low plasma gold concentrations are found following the administration of colloidal gold sulfide; these patients usually excrete very little gold in the urine.

Colloidal gold preparations are not expected to be as effective therapeutically as other gold salts, mainly because of the rapid phagocytosis of the particles of gold by the reticuloendothelial system with insignificant plasma gold concentrations. Although colloidal gold preparations may produce only few and mild toxic reactions, the gold particles are usually removed from the circulation so rapidly that both toxic reactions and favorable therapeutic effects are prevented.

DOSE OF GOLD SALTS IN RHEUMATOID ARTHRITIS

The dose of gold salts used in the treatment of rheumatoid arthritis is still in the experimental stage. The therapeutic effectiveness of gold probably depends on its absorption and its remaining in the circulation until it arrives at the site of action. Gold preparations which my associates and I have found to be of particular value in the treatment of rheumatoid arthritis include sodium aurothiomalate,[18] aurothioglucose,[19] sodium aurothiosulfate and calcium aurothiomalate.

In an attempt to find the optimal dose of gold salts for patients with rheumatoid arthritis, we progressively decreased the amount of gold given each week until we arrived at the following schedule. Although the doses are small, the therapeutic results seem, in the long run, to be approximately as good as with larger individual doses, and relapses of the disease occur much less frequently. With this smaller dose given intramuscularly we have not seen any serious toxic effects in the last hundred patients so treated. It must be remembered, however, that any schedule of dosage for gold salts is still subject to change, as the optimal dose is not yet known and patients vary widely in their tolerance to gold salts.

We give all injections intramuscularly. The following dosage schedule applies to either sodium aurothiomalate or aurothioglucose. The doses are in milligrams of the gold salts. The first four injections are given at intervals of three or four days and consist of 5 mg. each. All subsequent injections are given at weekly intervals. Ten mg. is given for the fifth and the sixth doses and subsequent injections are of 25 mg. The seventh to the fourteenth injections inclusive are of 25 mg. each. If the patient is definitely improving, as evidenced by lessening of his joint pain, swelling and stiffness and reduction in the sedimentation rate, the 25 mg. weekly injections are continued for an additional twenty-four weeks unless any signs of toxicity appear. If the patient has not definitely improved following the first fourteen injections, the weekly dose is increased to 50 mg. and this dose is continued for a total of twelve weekly injections. If improvement is not noted at the end of this time, one should be pessimistic concerning the use of further gold therapy for that particular patient. It is usually futile to repeat the course of gold therapy of those individuals who have had no improvement at all by such a first course of treatment.

If improvement is definitely noted after the first course of gold, a rest period of from six to eight weeks is permitted, during which time no gold is given. If a relapse in the arthritis occurs, gold therapy is begun after a six week period; in other cases the full eight weeks is allowed to elapse before the second course is given, and the entire first course of therapy is repeated.

Such a course of therapy permits the injection of a total of 850 mg. of the gold salt (or 425 mg. of metallic gold). In some cases, when the gold is well tolerated, if improvement continues but the sedimentation rate has not yet become normal a third course of gold is given after an interval of eight weeks following the termination of the second course.

Some workers have advocated that one should give approximately 50 per cent more aurothioglucose than sodium aurothiomalate in order to obtain biologically equivalent effects, as plasma gold concentrations following the administration of aurothioglucose average only 65 per cent of those following a similar dose of sodium aurothiomalate. Clinically we have obtained results from the smaller doses of aurothioglucose which seemed comparable, in the long run, to equal doses of sodium aurothiomalate.

If one uses gold sodium thiosulfate, it is advisable to increase the dosage schedule by one third, as gold sodium thiosulfate contains only 37 per cent of metallic gold as compared with 50 per cent of metallic gold in both sodium aurothiomalate and aurothioglucose. Although many other preparations of gold are available, insufficient work has been published concerning these to permit a final evaluation of their toxicity and clinical effects.

In the treatment of children with rheumatoid arthritis, proportionately smaller doses of gold salts should be given.

PRECAUTIONS DURING GOLD THERAPY

Either the patient or his family should be advised of the possibility of toxic reactions from gold. Any physician wishing to administer gold salts in rheumatoid arthritis must familiarize himself with the early signs of intolerance to this metal. The patient should be questioned and examined before each injection for any signs of toxicity (particularly rash, itching, sore mouth, metallic taste, jaundice, loss of appetite or persisting indigestion). We perform a complete blood count and urinalysis before each injection. Although this may prove unnecessary, a blood count and urinalysis should be performed at least every two or three weeks during the course of gold therapy.

If any evidence of toxicity appears, gold should be stopped at least temporarily. Some of these patients can tolerate injections of gold later.

Absolute contraindications to gold therapy include any history of purpura or agranulocytic angina; moderate or pronounced renal or hepatic disease; pregnancy; hemophilia; severe diabetes mellitus; colitis; severe anemia or any hemorrhagic tendency; severe eczema or chronic dermatitis; severe bronchial asthma, or any serious systemic illness other than the rheumatoid arthritis itself. Psoriasis is not a contraindication to gold therapy, although individuals with rheumatoid arthritis and psoriasis have responded less well than individuals without psoriatic skin lesions.

TOXIC REACTIONS FOLLOWING GOLD THERAPY

The most serious reactions which occur following gold therapy and which fortunately are very infrequent with small doses of gold and proper care are purpura hemorrhagica, severe exfoliative dermatitis, ulcerative enteritis, acute yellow atrophy of the liver, agranulo-

18. Myochrysine is the proprietary name for sodium aurothiomalate.
19. Solganal-B-Oleosum is the proprietary name for aurothioglucose.

cytic angina and aplastic anemia. Although the mortality following the administration of gold salts some years ago reached as much as 3 per cent or more, this has now been lowered to less than 0.5 per cent. Fortunately, we have had no fatalities following the administration of gold salts.

If small doses of gold salts are employed, severe general reactions are usually avoided, but pruritus and urticaria may occur. Less than 10 per cent of patients with rheumatoid arthritis must discontinue the injections of gold permanently because of intolerance to the drug.

The most common cutaneous reactions following gold therapy are erythema, generalized pruritus and urticaria. Almost any type of rash has been reported as a complication following gold therapy, including herpes, exfoliative dermatitis, leukoplakia, lichen planus, papular eruptions, desquamation, morbilliform rash, erythema nodosum and folliculitis.

Pruritus occurs commonly following gold therapy; it may be generalized or localized to one or more parts of the body. Local or general erythema is a frequent complication. Fortunately, exfoliative dermatitis occurs very infrequently. When gold compounds are stopped temporarily, erythema, pruritus and other mild skin lesions usually clear within a few weeks and the gold can in most instances be begun again.

Oral reactions include a metallic taste in the mouth and a sore tongue and gums. Some patients may experience dysphagia, loss of taste, anesthesia of the tongue or even an ulcerative stomatitis or hemorrhagic gingivitis.

Gastrointestinal symptoms are not uncommon following gold therapy and consist mainly of nausea and epigastric distress. Some patients may experience vomiting, colicky abdominal pains and diarrhea. Ulcerative enteritis has been reported occasionally.

Albumin or red blood cells may appear in the urine following gold therapy. Anemia may follow prolonged administration of gold, and occasionally one notes the development of hepatitis or acute yellow atrophy of the liver. Various respiratory, nervous and ocular complications have been observed following gold therapy, but these are usually rather mild. Rarely one sees an iritis or a retinitis following gold therapy. In these cases it is difficult to determine whether the iritis is a part of the general picture of rheumatoid arthritis or whether it has resulted from the gold.

A few patients may complain of additional pains in the joints and a temporary increase in joint swelling and stiffness for twenty-four hours following an injection.

Toxic reactions may appear at any time following the first injection up until several months after the complete cessation of therapy. When toxic complications occur, the most frequent are pruritus, dermatitis, stomatitis and gastrointestinal symptoms, including some change in taste.

PREDICTION AND PREVENTION OF TOXIC REACTIONS

There is no reliable method of predicting which patients will develop signs of toxicity from gold. The factors on which such reactions depend are not known. Patch tests with gold do not adequately reveal sensitivity to this metal. There is no certain method of preventing untoward reactions from gold salts. Various workers have suggested the concomitant use of vitamin B, large amounts of fruit juices, liver extract or niacin, but in most instances such measures have not eliminated the toxic reactions. Once a toxic reaction has developed, this must be treated symptomatically. There is no specific treatment for these.

One should never neglect any symptom which the patient mentions during the course of chrysotherapy, as this may be the early evidence of a toxic reaction. Patients vary greatly in their tolerance to gold salts.

Gold therapy should be stopped when even a mild reaction occurs. Gold should not be administered again until at least several weeks after the complete disappearance of the reaction. When gold therapy is begun again, minimal doses should be given—such as 10 mg. of the gold salt—this being increased cautiously at weekly intervals until 25 mg. has been given as a maximum for any one injection. Gold therapy should not be resumed for any patient who develops agranulocytic angina, purpura hemorrhagica, exfoliative dermatitis, pronounced albuminuria, aplastic anemia or severe jaundice.

RESULTS FOLLOWING THE ADMINISTRATION OF GOLD SALTS

When small doses of gold salts are used, the patient does not usually notice definite improvement until from one to three months of therapy have passed. The first symptom which is relieved is pain in the joints. Following this, the joint swellings become softer and gradually disappear. The patient's general status also improves and his appetite and strength return while his fever slowly subsides.

In patients whose rheumatoid arthritis is still in the early stage with the inflammatory process limited chiefly to the soft tissues, the improvement following cautious administration of gold salts may be amazing. The results following gold therapy are not so spectacular in the more advanced cases when there is pronounced muscular atrophy, cartilaginous erosion and contractions. Even in these patients, however, the inflammatory process may be checked and the swelling and pain may be reduced. Gold therapy does not form the sole treatment of these patients; the whole individual must be treated as well as his joints.

RELAPSES FOLLOWING GOLD THERAPY

Although the incidence of relapses following gold therapy may be as high as 35 per cent or more in some series, a much smaller incidence is noted when gold is given for a prolonged period in smaller individual doses. Although relapses following gold therapy appear most often within six to twelve weeks following the discontinuance of the drug, in some instances these may occur a year or two later.

SUMMARY

Conservative therapy should be used for at least several months for patients with rheumatoid arthritis before employing gold salts, except those individuals with a rapidly progressing form of the disease. Some workers employ gold salts at the onset of rheumatoid arthritis because results are better in the early cases. Gold salts should not be used in any form of joint disease except rheumatoid arthritis.

One should never insist that any patient with rheumatoid arthritis receive gold therapy because of the possibility of toxic reactions and because gold therapy is not effective in all patients with rheumatoid arthritis; relapses occur in some of these patients when gold is stopped.

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THE IMPORTANCE OF DETECTING TUBERCULOSIS IN CHILDREN

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Children infected with tubercle bacilli under the age of 12 years occasionally develop the acute reinfection type of tuberculosis, such as miliary disease, pneumonia, meningitis, pericarditis, pleuritis, peritonitis and synovitis. During this age period the chronic reinfection type of disease occasionally develops in the extrathoracic organs such as the bones and joints, but the lungs are involved with great rarity. The reinfection type of chronic pulmonary tuberculosis begins to make its appearance among tuberculin reactors in the early teen ages and increases in frequency with the decades. Since this fact was established the previous enthusiasm for examination of school children has waned; indeed, in some places such work has been abandoned. This is an extremely unfortunate situation and is without practical or scientific foundation.

Every child who reacts to tuberculin has primary tuberculosis (tuberculous infection). This disease begins with the first focalization of tubercle bacilli by neutrophils. From this stage it is a matter of reinfections and the like which determine whether the disease will incapacitate or kill. Illness and death from tuberculosis always begin with the simple and apparently harmless infection, just as "a journey of a thousand miles begins with a single step." To refuse or neglect to find the infected child and conduct the necessary procedure in his behalf in any community is to ignore or overlook an important phase of tuberculosis work.

The finding of primary tuberculosis (tuberculous infection) in a child invariably establishes two important facts: 1. Usually a contagious case has been in the child's environment. (Obviously the infected person should be sought, if still alive, and be prevented from spreading tubercle bacilli.)

2. The child has at least lesions of primary tuberculosis containing living tubercle bacilli. Moreover, his tissues have become so sensitized to tuberculoprotein that this substance is now a deadly poison to them. The sensitivity makes reinfections from exogenous or endogenous sources far more dangerous to him than was the first infection; therefore physicians, public health workers and parents must be constantly on guard for the destructive type of lesions in any one of many parts of his body.

The toll of primary tuberculosis is far greater than is generally realized. Bogen [1] made a painstaking analysis and concluded that approximately 50 per cent of infected persons at some time have clinical lesions. Not all who develop such lesions die from them—many are not even incapacitated. Nevertheless, the toll in morbidity and mortality is significant. Indeed, in parts of the world where all adults are infected, 25 to 30 per cent of the total number of deaths have been reported as due to tuberculosis.

Since infection with tubercle bacilli ultimately carries such a high toll it is fortunate that a simple, harmless, inexpensive but highly specific and accurate test is available to determine its presence. There is no phase of the examination for tuberculosis which provides as much specific and accurate information for so many people as the tuberculin test. We are able to inform every reactor that primary lesions containing living tubercle bacilli are present. The only exception is that when all bacilli die sensitivity of the tissues lingers for a time before it completely disappears. Every nonreactor can be told that he does not harbor living tubercle bacilli. The two exceptions are (1) during the preallergic stage and (2) for a short time before death in both acute and chronic forms of the disease. The tuberculin test is the only phase of the examination that is valuable in both a positive and a negative way. All other phases such as auscultation and microscopic and x-ray inspections are helpful when positive findings are revealed, but negative results do not rule out tuberculosis.

We have previously stated [2] that by the tuberculin reaction one obtains the best criterion of the tuberculosis situation in a community with a stable population. It promptly and accurately detects persons in all ages of life who have lesions containing living tubercle bacilli in their bodies. As all tuberculin reactors have been exposed directly or indirectly to contagious cases of tuberculosis, the test provides much information as to the number of such cases which have been allowed to exist in a community. Moreover, when properly administered periodically it is our best criterion as to the effectiveness of tuberculosis control in any community. Obviously an increase in infection attack rate indicates that the control measures have not been satisfactory, whereas a significant decrease is excellent evidence that effective work has been done. Wherever large numbers of contagious cases of tuberculosis are permitted to exist among people or animals without adequate isolation or control, a high percentage of children develop primary tuberculosis. Moreover, testing children gives one an idea of the potential clinical tuberculosis load of the future. If children are not being infected in large numbers, in all probability not many adults are being infected and reinfected from exogenous sources—obviously, the lower the incidence of infection and reinfection, the lower the morbidity and mortality from clinical tuberculosis.

In 1926 the tuberculin test was administered to children in Minneapolis grade schools, which were selected on the basis of their distribution throughout the city.[3] The percentage of reactors ranged from approximately 15 at the age of 6 to 70 at the age of 14 years (chart 1) with an average of 47.33 (chart 2). Thus, the infection attack rate had been so high that nearly one half of the grade school children had primary tuberculosis (tuberculous infection). The explanation for this unfavorable situation was evident. For example, in 1921, when the population of the city was 384,571, the tuberculosis mortality rate was 115 per hundred thousand (443 deaths). The municipal and county sanatoriums had a combined bed capacity of 250. In 1924 the municipal sanatorium, with 130 beds occupied by advanced cases, was abandoned because the county sanatorium had increased its capacity and was thought

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1. Bogen, Emil: The Toll of Tuberculous Infection, Am. Rev. Tuberc. 42:253, 1940.

2. Myers, J. A.: The Detection of Tuberculous Infection, J. A. M. A. 112:1904 (May 13) 1939.

3. Harrington, F. E., and Myers, J. A.: Studies on Tuberculous Infancy and Childhood: X. Tuberculous Infection Among Minneapolis School Children as Revealed by the Intracutaneous Test, Am. Rev. Tuberc. 14:454, 1926.

sufficient to care for all contagious cases. Nevertheless in 1925, when the total bed capacity in the county sanatorium was 417, when a small private hospital was operating to capacity and when a number of city patients were being housed in the state sanatorium and the veterans' hospital, there still remained an average of 120 patients on the county sanatorium waiting list. There was also a large number of tuberculous patients who refused to apply for institutional care and who remained in their homes until death. Treatment in the homes was not conducted according to modern methods; that is, there was little or no attempt to isolate patients and protect their associates against bacilli. Moreover, most patients had such advanced disease when detected that it was impossible to convert them from the contagious to the noncontagious stage.

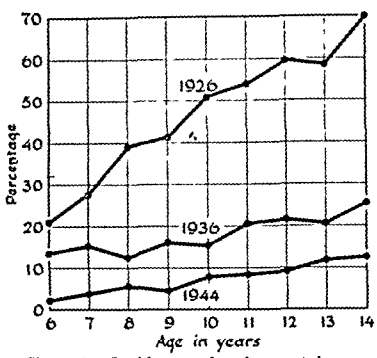


Chart 1.—Incidence of primary tuberculosis (tuberculous infection) among children in the same schools at intervals of approximately one decade.

While a pasteurization ordinance was in effect, there were numerous dairy products consumed by the citizens which had not been pasteurized. At that time only a few counties in the state had been accredited with reference to tuberculosis in cattle. Thus, tubercle bacilli were rife, as was reflected in the incidence of primary tuberculosis (tuberculous infection) among children.

With the continuance of this situation satisfactory control of tuberculosis could not be anticipated; therefore the program was intensified and methods were improved. Between 1925 and 1936 the total bed capacity at the county sanatorium reached 750 (60 of these beds were for children with primary tuberculosis and therefore did not assist in controlling contagion). Thus many more contagious cases could be isolated than in the previous decade. The Lymanhurst School and Health Center abandoned its treatment division for children with primary tuberculosis and concentrated its efforts on epidemiology. Large numbers of school children were tested with tuberculin, and the sources of the reactors' infections were sought among their adult associates. Many contacts of contagious cases were examined periodically. During this period all of the eighty-seven counties were accredited, so that by 1935 the state was designated a modified accredited area with reference to tuberculosis in cattle. By 1936 the tuberculosis mortality had dropped to 34 per hundred thousand (170 deaths). Thus, during this decade the number of tubercle bacilli which might be ingested or inhaled by children presumably was much decreased.

In 1936 we were desirous of obtaining tangible evidence [4] of the success of the methods employed during the past decade. Therefore we administered the tuberculin test to the children in the same schools as in 1926. The incidence of the first infection type of tuberculosis, as manifested by the intracutaneous test (Mantoux), ranged from approximately 14 per cent at the age of 6 to 26 per cent at the age of 14 years (chart 1) with an average of 18.9 (chart 2).

4. Harrington, F. E.; Myers, J. A., and Levine, N. M.: Significance of the Tuberculin Test, J. A. M. A. **108**: 1309 (April 17) 1937.

While approximately 1 of each 2 children had primary tuberculosis in 1926, it was present in only 1 in each 5 in 1936; thus, the potentialities of clinical tuberculosis during adulthood were definitely decreased.

Although the result of testing in 1936 denoted good progress in tuberculosis control, the situation was still far from satisfactory. Therefore the program was again intensified. Between 1936 and 1944 many patients with contagious and precontagious pulmonary tuberculosis were admitted to the sanatorium. The public had become so tuberculosis conscious that large numbers of apparently healthy persons were examined. Collapse therapy was employed extensively; in fact, one general hospital had set aside a division for chest surgery, and many patients with minimal and early moderately advanced tuberculosis were treated with ambulatory artificial pneumothorax, which prevented a sizable number from becoming contagious and converted others from the contagious to the noncontagious stage. The Minneapolis General Hospital had established a special chest disease service which was used as a clearing house for persons with pulmonary lesions suspected of being tuberculous. Those found to be in need of treatment for this disease were advised to transfer to the sanatorium. An advance step taken during this period consisted in quarantining incorrigible contagious cases. They were apprehended by the police department when necessary and committed to the sanatorium for as long as was deemed necessary by the commissioner of health and the sanatorium staff.

The testing of cattle throughout the state continued and the reactors, the total number of which was small, were killed. This was true also in adjacent states which might transport dairy products to the city; therefore it became extremely rare for a child or an adult to be infected with the bovine type of tubercle bacillus. In 1942, when the population of the city was 492,370, the tuberculosis mortality had dropped to 23 per hundred thousand (116 deaths).

In 1944 we were again desirous of obtaining tangible evidence of the results of the work. Therefore we tested the children in the same grade schools as in 1926 and 1936, with the result that among the 6,668 so tested the incidence of infection ranged from 2.1 per cent at 6 years to 12.5 per cent at 14 years (chart 1), with an average of 7.7 (chart 2). Thus, only one in each thirteen children was found to be a potential case of clinical tuberculosis in adult life. While this is a worth while accomplishment, we still have a significant tuberculosis problem among school children. Indeed, there will be a problem as long as a single child reacts to tuberculin; therefore the control measures must be increased and further intensified.

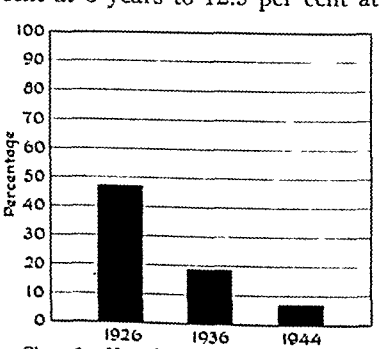


Chart 2.—Note decrease in primary tuberculosis (tuberculous infection) among children in the same grade schools between 1926 and 1944.

As the work progressed we deviated in several respects from the conventional method of administration of the tuberculin test. For example, in 1926 and 1936 the platinum needles were flamed after each test was administered. In 1944 the needles were not flamed

except when they came in contact with something other than the cleansed skin of the children. In no case was skin infection observed. This method doubles one's capacity for work, as it requires as long to flame the needle as it does to administer the tuberculin.

In 1926 and 1936 we used 0.1 mg. of tuberculin for the initial test. Those who did not react were given 1.0 mg. However, we are convinced that in areas where the incidence of tuberculous infection is low a milligram of tuberculin is a safe initial dose. We have employed this dosage in other work for a number of years. Therefore in 1944 the children in this study received a single test dose, consisting of 1.0 mg. No child reacted to a 4 plus degree, and we saw no more 3 plus reactions than had previously occurred when the 0.1 mg. dose was employed. The omission of the conventional first dose reduced the time consumption by about one half, as the second dose would have been necessary in approximately 95 per cent of our children.

All testing was done by one physician in order to insure uniformity of administration. From four hundred to five hundred tests were administered per hour. The same physician made the interpretation at the end of seventy-two hours, a procedure strongly recommended by the Committee on Tuberculosis of the Minnesota State Medical Association. This is far better than the usual forty-eight hour interval, because such conditions as mild hyperemia resulting from trauma have usually disappeared within seventy-two hours, whereas characteristic tuberculin reactions (induration or edema of 5 mm. or more in diameter) are still present and can be read as well even at ninety-six hours.

As tuberculosis is a contagious disease, obviously every child who reacts to tuberculin has been in contact directly or indirectly with a person or an animal that is disseminating tubercle bacilli. The source of the infection is often unknown to the reactor because many persons with clinical tuberculosis are contagious long before they are aware of the presence of their disease. Even among persons ill from tuberculosis rarely do more than 50 per cent know of the source of their original infection. Among the 512 children in our 1944 study who reacted to tuberculin the families of 385 had no knowledge of there having been contact with contagious cases of tuberculosis. Three families refused information, and eleven were not available for history of exposure. Twenty-seven had been exposed to tuberculous mothers or fathers, and 72 to other persons with contagious disease. For the remaining 14 children no direct contact was known, although relatives, such as grandparents, aunts and uncles, had suffered from clinical tuberculosis. Obviously, if we had examined only the children with known history of contact the majority of those with primary tuberculosis would not have been discovered.

Seeking the source of infection among school children who react to tuberculin is a potent case finding method wherever the incidence of tuberculosis is low. We have practiced this procedure a great deal and have found it fruitful; therefore it was strongly recommended that the adult members of the families of the 385 children who had no knowledge of contact with contagious cases be examined, as well as other close adult associates. This phase of the work has only begun, but its effectiveness is illustrated by the following: A girl in the third grade reacted to tuberculin but the x-ray films of her chest were clear. There was no known exposure. Examination of the parents revealed moderately advanced bilateral pulmonary tuberculosis in the father. His throat clearings contained numerous tubercle bacilli. At this time he was a university instructor with no knowledge of the presence of tuberculosis.

Chronic reinfection type of pulmonary tuberculosis is a disease of adulthood, both among human beings and among domestic animals. For example, Chadwick [5] reported that in the examination of large numbers of grade school children he found only 1 child in each 3,300 examined to have the reinfection type of pulmonary tuberculosis. In our studies at Lymanhurst we found only 1 such child in each 2,016 examined.[6] Many years ago, because of the rarity of this condition we discontinued making periodic x-ray films of the chests of the tuberculin reactors until they attained early adulthood. However, all children when first found to react to tuberculin should have one x-ray film inspection of the chest, as this may lead to detection of nontuberculous disease of the lungs and pleura as well as abnormalities of the cardiac outline. For this reason we recommended such inspection of the chests of the reactors. This was done also because among those of 12 years or older there is the possibility of finding an occasional chronic reinfection type of lesion which has attained sufficient size and consistency to cast a shadow visible to the unaided eye. It also provided an opportunity to emphasize that those who are already young adults and all others, as soon as they reach this period, should have annual examination, always including x-ray film inspection of the chest.

The families were advised to consult their private physicians for x-ray films of the reactors. In the event of inability to afford such service they were referred to a chest clinic. Among the 512 reactors there were 5 refusals, and 6 had moved and were not located. Two consulted physicans who advised against use of the x-rays, and 4 had fluoroscopies, as recommended by their physicians. Of the remaining 495 children the films were clear in 421. There was evidence of calcium deposits in 68, pleural adhesions in 4, bronchiectasis in 1 and pneumonia in 1. As was anticipated, no child presented evidence of lesions which might represent the reinfection type of chronic pulmonary tuberculosis. However, each of the 512 reactors is a potential case of this type of disease.

The finding of evidence of calcium deposits by x-ray has no significant meaning. The enthusiasm often manifested concerning evidence of calcium in the parenchyma, hilus or both, including some of our own previous writings, is, in our present opinion, "much ado about nothing." Postmortem findings by pathologists compared with x-ray evidence, both ante mortem and post mortem, even with the lungs removed and inflated, have shown that in only a relatively small number of persons in whom calcium deposits are actually present is there any evidence of its existence by x-ray inspection. Miller [7] found that "calcification of tuberculous first infection in the thorax is demonstrable roentgenographically in only about one fourth of the existing cases." Sweany [8] has shown that only about 20 per cent of the primary tuberculous infections in the chest

5. Chadwick, H. D.: The Massachusetts School Tuberculosis Clinic Program in Retrospect and in Prospect, School Physicians Bull., June 1935.

6. Myers, J. A.: The Latent or Smoldering Stages in Tuberculosis, Am. Rev. Tuberc. **36**: 355, 1937.

7. Miller, G. R.: The Recognition of Thoracic Calcification, Am. J. Roentgenol. **26**: 191, 1931.

8. Sweany, H. C.: Studies on the Pathogenesis of Primary Tuberculous Infection: I. The Regressive Lesions, Am. Rev. Tuberc. **27**: 559, 1933.

are detected by x-ray. Therefore, if one was to require x-ray evidence of calcification before making a diagnosis of primary tuberculosis, even if all calcification were due to this disease, one would miss 75 to 80 per cent of the cases.

The presence of x-ray evidence of calcium does not necessarily denote a healed lesion. Calcium is deposited in dead material, and at the same time disease may be present in adjacent living tissue which is not demonstrable by x-ray. The deposition of calcium does not indicate specificity for any disease; indeed, there are many nontuberculous conditions in which it is deposited. As many as 5 to 25 per cent of lesions which by x-ray were thought to represent primary tuberculous lesions have been found at postmortem to be nontuberculous. Therefore, if instead of testing the entire 6,668 children with tuberculin in 1944 we had just made x-ray film inspections of their chests, in only 68 of the 495 with primary tuberculosis would there have been sufficient evidence to suspect its presence. Thus, the remaining 427 children and their families would have been given a false sense of security with reference to the future potentialities pertaining to clinical tuberculosis, as they would have been told that they were free from tuberculosis. By the method employed we detected 512 actual cases of tuberculosis (we do not use "tuberculosis" synonymously with consumption) in some phase of its development. It is certain that some of the lesions already present, together with the accompanying allergy, will be responsible for the development of clinical tuberculosis at a later time. In what percentage this will occur we do not know, but our experience[9] in dealing with tuberculosis among children and adults for approximately twenty-five years, together with Bogen's careful analysis of the toll of tuberculous infection, has taught us that enough of the reactors develop clinical tuberculosis in later life so that it is extremely important to examine every adult periodically who reacts to tuberculin.

In 1939 Stewart[10] determined the infection attack rate to be approximately 1 per cent annually among Minneapolis children. Apparently this has decreased considerably; in fact, among the children of 6 years tested in 1944 the rate was one third of 1 per cent. The local health department,[11] the tuberculosis association and the medical society tested 7,518 junior and senior high school students in 1942 and 1943, and 941 (12.5 per cent) reacted.

The opposite extreme has been reported from Cincinnati,[12] where 3,622 high school students voluntarily had x-ray film inspections of their chests, and "from the x-ray findings 82.5 per cent showed primary phase tuberculosis: 70.1 grade 1, 10.2 grade 2 and 2.26 grade 3." This report, if the interpretations are correct, indicates an extremely serious situation among the children of Cincinnati. Indeed, the figures would indicate that this city is in a predicament no less serious than that of Vienna reported by Pirquet[13] in 1907. However, the situation may not be as bad as it appears, since the diagnoses were made entirely from x-ray shadows, which are never specific. Of all the phases of an examination there are only two which are specific —the tuberculin reaction and recovery of tubercle bacilli. Without at least one, diagnosis of tuberculosis in any phase is never justified.

Among 8,993 Minneapolis high school students who had 35 by 35 millimeter photofluorograms of the chest, approximately 1 in 1,500 had shadows which were thought to be due to the reinfection type of pulmonary tuberculosis. Among 3,622 Cincinnati high school students who had 4 by 10 inch photofluorograms, only 2 had such shadows. Concerning both of these studies the following statement was made: "It would seem that the high school is not the place to find tuberculosis." Evidently the word "tuberculosis" is used synonymously with consumption or gross lesions and if one is satisfied to postpone finding tuberculosis until it has reached such proportions the statement is correct. This seems paradoxical, however, at a time when so much is being said about finding the disease early and when the tuberculin test reveals its presence within three to seven weeks after focalization of bacilli. In reality, among 7,518 Minneapolis students tested 941 had tuberculosis in the strict sense of the word.

The invention of the stethoscope and the discovery of the tubercle bacillus were hailed with much enthusiasm, but both proved to be helpful in diagnosis usually after the disease is extensive. The x-ray film inspection of the chest is now in the limelight because it often detects shadows of lesions before they cause symptoms. However, enthusiasm for the x-ray is beginning to wane with the stark realization that it too is a method for locating areas of gross disease and therefore is not the earliest possible diagnostic procedure. However, it is the best we have to detect the location of reinfection type of lesions after they become macroscopic and are located in parts of the lung which are visualized on the film.

Among adult tuberculin reactors are those destined to develop chronic reinfection type lesions, and the most important step is to find these lesions while they are early and before they have caused illness or have become contagious. For almost a quarter of a century in the Tuberculosis Service of the Minneapolis Division of Health (formerly Lymanhurst) we have studied the various methods of detecting early lesions.[9] At first stereoscopic x-ray films were made of the chests of all persons examined, regardless of reaction to tuberculin or symptoms. These inspections were made annually for sizable groups of individuals. In some whose chests were originally clear on x-ray inspection there later appeared one or more areas with changes so slight that one could not determine whether lesions were actually present. Frequent periodic inspections in some of these cases, however, left no question as to the presence of lesions which slowly produced larger and larger shadows, and ultimately by other methods the majority of them were found to be tuberculous. Not all early demonstrable lesions are minimal. Occasionally the person whose film is clear may within three to six months have evidence of advanced disease.

On analysis we discovered that all persons who developed chronic tuberculous lesions under our eyes came from the group of tuberculin reactors. Moreover, these lesions usually did not become visible except in adulthood. Therefore we discontinued making films of the chests of nonreactors to tuberculin in all age periods because it seemed futile to be looking for something that could not possibly exist by reason of absence of tubercle bacilli. Of all the methods used we came

9. Harrington, T. E., in The Evolution of Tuberculosis as Observed During Twenty Years at Lymanhurst, Minneapolis, 1921-1941, Minneapolis, Journal Lancet, 1944.

10. Stewart, C. A.; Harrington, F. E.; Myers, J. A.; Boynton, R. E.; Chiu, P. T. Y., and Streukens, T. L.: Primary Tuberculous Infection Attack Rates, J. A. M. A. **113**: 2204 (Dec 16) 1939.

11. Report on High School Tuberculosis Survey, Hennepin County Tuberculosis Association, 1944.

12. Wilzbach, C. A.: Physical Fitness Program: A Report of Medical and Dental Examinations of 5,620 Senior and Junior High School Students, J. A. M. A. **125**: 828 (July 22) 1944.

13. Pirquet, Clemens. Demonstration zur Tuberkulindiagnose durch Hautimpfung, Berl. klin. Wchnschr **44**: 699, 1907; Frequency of Tuberculosis in Childhood, J. A. M. A. **52**: 675 (Feb 27) 1909.

to the conclusion that the only one which is scientific, accurate and wholly satisfactory for discovering the early chronic tuberculous lesion is that which makes annual x-ray inspections of the chests of adult tuberculin reactors, with complete examination of those with lesions which cast shadows.

The medical profession is seriously in need of a criterion by which one can determine whether a given tuberculin reactor will ever develop clinical tuberculosis. However, its realization seems most remote, since the evolution of clinical disease depends on several factors: 1. An infection that is definitely present today may completely disappear over a period of months or years; that is, all the tubercle bacilli in the lesions die. 2. Reinfections from exogenous sources may or may not occur. 3. The walls which nature establishes around the tubercle bacilli in the lesions of primary complexes may serve as permanent prisons for the organisms. On the other hand, they may be resorbed or trauma may rupture them so that the tubercle bacilli are liberated, to find lodgment on allergic tissue (endogenous reinfection). Since such a criterion probably is not possible, it would be helpful if one was available to determine when an individual begins to develop the reinfection type of tuberculosis; that is, when the disease is in the preclinical stage and before it has attained such gross proportion as to cast x-ray shadows. Caulfeild,[14] Ogden[15] and others believe such a diagnostic agent is now available in the Caulfeild inhibitive reaction and the tuberculin complement fixation test.

In most parts of the world at present the children constitute the only group over which one can exercise complete tuberculosis control. The child is born free from tubercle bacilli, and if his environment is adequately guarded his body will remain uncontaminated with these organisms. This necessitates complete examination of all who are to be his adult associates to find (1) those who already have clinical tuberculosis and (2) those who react to tuberculin and are potential cases of such disease. Those who on first or subsequent examination are found to have clinical tuberculosis must be kept from the child's environment unless it can be proved continuously that their disease is not contagious. The child himself should be tested periodically to make sure that no unsuspected contagious case among transients and the like has come into his environment and infected him. This procedure should not be limited to childhood but should be continued when adulthood is attained. This is not a theoretical consideration of idealists. It is actually in practice with a high degree of success and must be the ultimate goal in every home and community.

14 Caulfeild, A. H. W.: The Tuberculo Complement Fixation and Inhibitive Tests, Am Rev. Tuberc. **11**: 508, 1925

15. Ogden, W.: The Abolition of Clinical Tuberculosis by Anticipation and Control, Canad. M. A. J. **40**: 253, 1939.

Science and War.—But science is our consolation and refuge; today every nation respects it: in the midst of the tumult of war the descendants of Archimedes among us have nothing to fear from an enlightened soldiery, to whom their names and their work are known and who are happy to become for the moment their disciples. Perhaps it is actually in the most terrible times that, taking refuge in the cloisters of meditation, shunning in the exaltation of their spirit the horrors that surround them, they sometimes attain the most fortunate conclusions, the most fruitful discoveries We shall see that the list of accomplishments for this year yields nothing to those of our most peaceful years.—Olmsted, J. M. D.: François Magendie, New York, Schuman's, 1944.

PENICILLIN AND SULFONAMIDES IN THE THERAPY OF ACTINOMYCOSIS

REPORT OF SIXTEEN ADDITIONAL CASES AND IN VITRO TESTS OF SUSCEPTIBILITY OF ACTINOMYCES TO PENICILLIN AND SULFADIAZINE

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In 1941 we [1] reported 3 cases of actinomycosis successfully treated with sulfanilamide. Since then we have collected 16 additional cases treated in the Stanford medical, pediatric and surgical services at Stanford-Lane Hospitals, at the San Francisco Hospital and as private patients. These cases of actinomycosis include 3 of the pulmonary, 2 of the abdominal and 11 of the cervicofacial types.

In the last three years a number of articles have reported the use of sulfonamides in the treatment of actinomycosis.[2] The opinions expressed in general have been that the sulfonamides are of great value. Not only the cervicofacial types but also extensive abdominal and pulmonary types have been cured, or at least arrested, for long periods of time after the use of sulfonamides.

Penicillin has been used for too short a time to draw final conclusions as to its efficacy in treating actinomycosis. Herrell, Nichols and Heilman [3] reported the use of penicillin in 12 cases of actimomycosis. There was failure in 2 cases, a satisfactory result in 2 and a doubtful result in 8. These authors plan to give a detailed report at a later date. Other reports on the use of penicillin in the treatment of actinomycosis [4] deal with small numbers of cases, most of which have been followed for short periods of time. The general impression gained is that penicillin is an effective agent in treating actinomycosis. Several failures, however, have been reported.

Our purpose in the present paper is to compare the effectiveness of penicillin and the sulfonamides in the

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Part of the penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutics and Other Agents of the National Research Council

1. Dobson, L.; Holman, L., and Cutting, W.: Sulfanilamide in the Therapy of Actinomycosis, J. A. M. A. **116**: 272-275 (Jan 25) 1941

2. Wilkinson, E. E.: Actinomycosis Treated with Sulfanilamide, J. Pediat **18**: 805 810 (June) 1941. Lyons, C.; Owen, C. R., and Ayers, W. B.: Sulfonamide Therapy in Actinomycotic Infections, Surgery **14**: 99 104 (July) 1943 Ladd, W. E., and Bill, A. H., Jr.: Actinomycosis of the Chest with Spread to the Abdomen: Report of a Case Cured with Sulfadiazine, New England J. Med. **229**: 748 750 (Nov. 11) 1943 Hollenbeck, W. F., and Turnoff, D.: Actinomycosis Treated with Sulfadiazine, J. A. M. A. **123**: 1115 1117 (Dec. 25) 1943 Pillsbury, N. R., and Wassersug, J. D.: Pulmonary Actinomycosis. Treatment with Sulfonamides, New England J. Med. **230**: 72-74 (Jan. 20) 1944 Benbow, E. P., Jr.; Smith, D. T., and Grimson, K. S.: Sulfonamide Therapy in Actinomycosis, Am. Rev. Tuberc. **49**: 395-407 (May) 1944.

3 Herrell, W. E.; Nichols, D. R., and Heilman, D. H.: Penicillin: Its Usefulness, Limitations, Diffusion and Detection, with Analysis of 150 Cases in Which It Was Employed, J. A. M. A. **125**: 1003 1011 (Aug. 12) 1944.

4. These include:
Herrell, W. E., and Nichols, D. R.: The Calcium Salt of Penicillin, Proc. Staff Meet., Mayo Clin. **18**: 313 (Sept. 8) 1943
Lyons, C.: Penicillin Therapy of Surgical Infections in the United States Army, J. A. M. A. **123**: 1007-1019 (Dec. 18) 1943
Herrell, W. E.: The Clinical Use of Penicillin, ibid **124**: 622 627 (March 4) 1944.
Christie, R. V., and Garrod, L. P.: A Review of the Work of the Penicillin Research Institute, Brit. M. J. **1**: 513 515 (April 15) 1944
Wollgast, C. F.: The Clinical Use of Penicillin: A Report of 115 Cases Treated in an Army Hospital, Texas State J. Med. **40**: 229 231 (Aug.) 1944.
Altemeier, W. A.: Penicillin in Surgery, South. M. J. **37**: 494 497 (Sept.) 1944.
Herrell, Nichols and Heilman [3]

treatment of actinomycosis. Like Herrell and his associates, we feel that no final conclusions should be drawn with less than an eighteen month follow-up period. However, the sulfonamides and penicillin proved so effectual in most of our cases that we are reporting them to encourage others to use these drugs in order that a larger series of cases may be accumulated from which definite conclusions may be drawn. In addition to the study of the 16 cases of actinomycosis, various concentrations of penicillin and sulfadiazine were observed for their effects on different strains of Actinomyces in vitro.

REPORT OF CASES

Table 1 summarizes the case reports, listing the type of case, the drug or drugs used and the end result. Three cases were treated with penicillin alone, 3 with penicillin and sulfadiazine, 6 with sulfadiazine, 1 with sulfadiazine and sulfathiazole, 1 with sulfathiazole and 2 with sulfanilamide.

CASE 1.—G. R. F., a man aged 37, noticed a swelling on the left side of his neck three months before entry. This was compressed and then lanced and Actinomyces organisms were demonstrated in the pus. He was then treated by roentgen irradiation, ten doses of 200 roentgens, after which the swelling became nodular. Potassium iodide also was given for two weeks.

On admission to the penicillin ward in Stanford Hospital on March 15, 1944, examination was not remarkable except for an indurated swelling at the angle of the left jaw, from which yellow pus could be expressed in several places (*fig. 1*).

During the first six days after hospitalization he was treated with penicillin by continuous intravenous drip, the total dosage being 1,030,000 units. During the next thirty-two days he was given 120,000 units daily by three hourly intramuscular injections, so that the total by all routes was 4,655,000 units. He improved steadily, and only a few minimal nodules, without secretion, remained when he was dismissed. During the following month a mild discharge occurred on two occasions from the flattened nodules, but, in general, these decreased in size. Eight months after leaving the hospital he remained entirely well with no induration or swelling of the originally involved area (*fig. 2*).

This patient had an extensive cervicofacial type of actinomycosis. During a three months period the infection continued to spread in spite of iodide and roentgen therapy. A rapid and apparently complete healing occurred after the administration of 4,655,000 units of penicillin.

CASE 2.—M. M., a man aged 38, had had swellings over the left cheek and beneath the left ear for five months when he was first seen at Stanford Hospital. Occasionally the swellings broke down and discharged pus. He had had several teeth extracted and was given a one week course of sulfonamide therapy, all without any lasting benefit.

On admission to the penicillin ward on May 22, 1944 he was afebrile, with a crusted lesion on the left cheek near the ear and a tender swelling 6 cm. in diameter over the left malar bone. There was pus draining into the left auditory canal through a fistula in the upper wall. Examination was not otherwise remarkable except for expression of pus from the lesion, which contained the organisms of actinomycosis.

He was treated by intramuscular injections of penicillin at three hour intervals. During the first three days the daily dosage was 200,000 units, the next five days it was 120,000 units and the remaining nine days of treatment it was 40,000 units. The total dose during the seventeen days was 1,560,000 units. Healing was remarkably rapid, and no evidence of the lesion was apparent at the conclusion of treatment.

Rapid healing occurred in this case of cervicofacial actinomycosis of five months' duration by the administration of 1,560,000 units of penicillin over a seventeen day period.

CASE 3.—J. G., a man aged 56, a shipyard worker, entered the medical service of Lane Hospital on Aug. 21, 1944 complaining of fever and a severe cough. Four months previously he had started to lose weight. A chronic cough became much worse and he was hospitalized as a private patient and was given sulfadiazine for one month and penicillin for eight days. He improved and returned home feeling better. A week later, however, he developed a tender swelling in the right flank, and his local physician drained an abscess in the right lumbar region.

On entry he had a fever of 39.5 C. (103.1 F.) and there were numerous rales over both sides of his chest. X-ray examination showed scattered densities in both lung fields with encapsulated fluid in the right lower chest. The right psoas muscle shadow was obscured and the entire retroperitoneal area appeared cloudy. Thin yellow fluid drained from the right flank incision. On September 1 typical sulfur granules of actinomycosis were identified in the drainage. All cultures were heavily overgrown with Staphylococcus aureus, but the fungi were not isolated.

TABLE 1.—*Summary of Case Reports*

Case	Type	End Results
Penicillin		
1. Mr. G. R. F.	Cervicofacial	Cured
2. Mr. M. M.	Cervicofacial	Arrested
3. Mr. J. G.	Pulmonary	Arrested
Penicillin and Sulfadiazine		
4. Mr. A. D.	Cervicofacial	Arrested (alternate course)
5. Mr. J. McB.	Cervicofacial	Arrested (combined)
6. Mr. G. W.	Pulmonary	Arrested (alternate courses)
Sulfadiazine		
7. Mr D. P.	Cervicofacial	Cured
8. Mr. A. L.	Cervicofacial	Cured
9. Mrs. C. R.	Cervicofacial	Cured
10. Mrs. J. P.	Cervicofacial	Arrested
11. Mrs. I. B.	Abdominal	Arrested, 14 months
12. Mr. F. B.	Pulmonary	(Short course) (died)
Sulfadiazine and Sulfathiazole		
13. Miss M. M.	Cervicofacial	Cured
Sulfathiazole		
14. Mrs. M. W.	Abdominal	(Died)
Sulfanilamide		
15. Miss H. M.	Cervicofacial	Cured
16. Mr. D. M.	Cervicofacial	Cured

Cured: Followed for 6 months to 4 years after all therapy was stopped.
Arrested: No evidence of active disease, but there was too short a follow-up period to claim a cure.

He was started on penicillin on September 4, receiving 200,000 units daily intramuscularly. On September 21 the daily dose was reduced to 120,000 units. By October 11 he had received 4,300,000 units. The sinus was healed by September 26. The temperature became normal and remained so after the first week of treatment. On September 28 roentgenograms showed improvement in both lungs. On October 9 both lungs were practically clear on physical examination.

He was dismissed on October 13, and examinations in the outpatient clinic have shown that he was gaining weight and was without cough or fever, and that the chest remained clear.

Penicillin produced a prompt and decided improvement in this patient's pulmonary and retroperitoneal actinomycosis. He cannot be considered cured and will be closely followed. This case also illustrates the usual difficulty in establishing the diagnosis of actinomycosis until sulfur granules are found in the pus.

CASE 4.—A. D., a man aged 46, Spanish, a cleaning establishment operator, entered the San Francisco Hospital on April 9, 1944 complaining of a painful swelling on the right side of his neck. Three weeks previously he had had an upper respiratory infection complicated by a sore throat. An abscess formed, which broke spontaneously into his throat. The day before

admission a painful swelling developed in the upper right side of his neck. Examination showed a hard swelling of the right neck from the angle of the jaw to 4 cm. above the clavicle. The right tonsil was pushed forward and the uvula was displaced to the left. He was considered to have a peritonsillar abscess with cellulitis of the neck. He was treated with sulfadiazine, 1 Gm. every four hours. The fever subsided but the swelling persisted. On the twelfth day an incision was made below his right jaw and only indurated tissue encountered. Microscopic examination did not show Actinomyces. On May 5 dental roentgenograms showed extensive bony destruction around the roots of the right lower third molar. On May 9 the lower three molars were extracted. On May 25 a fluctuant abscess at the right angle of the jaw yielded thick yellow pus containing granules typical of Actinomyces bovis. These were identified on repeated examinations, although the organisms failed to grow on culture. On May 26 the sulfadiazine was stopped after administration of a total of 294 Gm. and the patient was started on penicillin 15,000 units intramuscularly every three hours (120,000 units daily). Within two days after starting the penicillin his condition showed much improvement. The swelling rapidly subsided and the drainage decreased until by June 22 it had ceased. He was discharged on June 28 with only a slight soft swelling below the angle of his jaw. He received a total of 4 million units of penicillin.



Fig. 1 (case 1).—Extent of involvement before treatment with penicillin.

This case illustrates the difficulties of establishing an early diagnosis of actinomycosis, even when it is suspected and repeated examinations are made to find the organism. The patient improved on sulfadiazine but the infection became stationary. The infection rapidly subsided with the administration of 4,000,000 units of penicillin. The bony involvement made necessary the intensive and more protracted course of therapy.

CASE 5.—J. McB., a man aged 41, a cook, developed a painless swelling in the right temple on Dec. 15, 1943. On December 26 he had two lower right molar teeth extracted, but the swelling continued to increase. He was brought to Stanford Hospital on Jan. 7, 1944, at which time he had a large fluctuant swelling in the right temple and an indurated swelling of the right side of his face extending down to the angle of the jaw. The abscess was drained of 50 cc. of thick yellow-gray pus. Actinomyces organisms were obtained on smear and subsequently identified on culture. Treatment with 1 Gm. of sulfadiazine every four hours led to rapid improvement. He was dismissed on January 12 and kept on full dosage of sulfadiazine at home. By March 3 the incisions had healed and the swelling had disappeared. The sulfadiazine was discontinued on March 3, but three weeks later the swelling in the right temple recurred and he was again given full dosage of sulfadiazine. On April 3 roentgen therapy and potassium iodide were started. In spite of the combined therapy of sulfadiazine, x-rays and iodide, the firm swelling in the right temple persisted and he began to have more difficulty in opening his mouth. A roentgenogram of the facial bones showed an area of bony destruction in the maxillary process of the right malar bone and an obscure right maxillary sinus.

On readmission May 19 to the penicillin ward he was started on 15,000 units of penicillin intramuscularly every three hours, a total of 120,000 units daily. By June 12 a total of 3,000,000 units had been administered. The swelling diminished and became softer and he could open his jaw better. He left the hospital on June 13, but by June 21 the swelling had started to increase again. Roentgenograms, however, showed healing of the malar bone. He was readmitted to the penicillin ward and started on June 29 again with 120,000 units of penicillin daily, continuing to July 23 to a total of another 3,000,000 units. As the penicillin therapy produced no definite improvement, treatment with sulfadiazine, 1 Gm. every four hours, was started on July 15. Under the combined therapy of penicillin and sulfadiazine the patient slowly improved, but there was still some swelling in the right temple on dismissal from the hospital on July 24. He was continued on 1 Gm. of sulfadiazine every four hours for one month and then given 1 Gm. every six hours for four months. The swelling disappeared and he has been free from symptoms for the past three months and working the past four months.

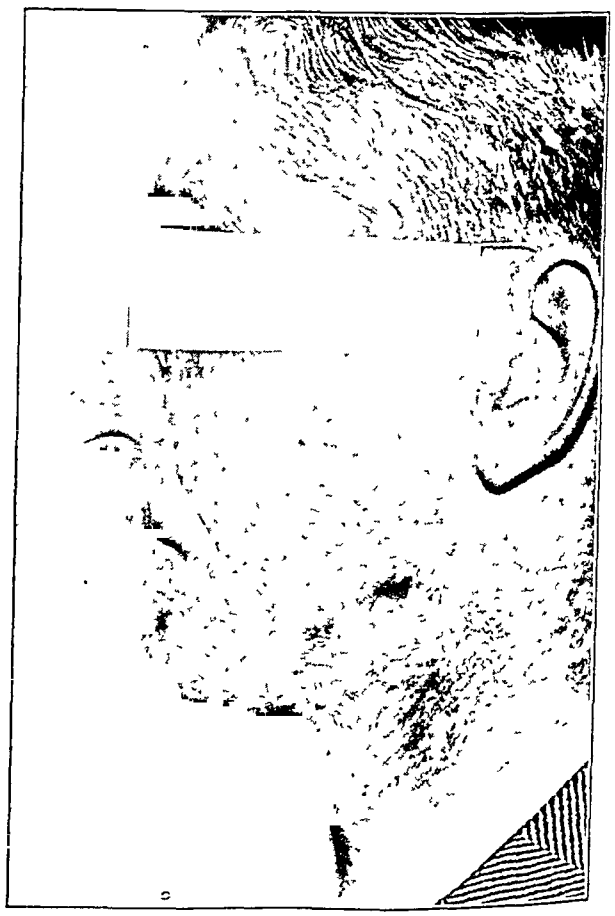


Fig. 2 (case 1).—Seven months after treatment with penicillin.

As in case 4, this illustrates the greater difficulty in obtaining a cure when there is extensive bony involvement. This proved the most difficult to control of the 11 cases of cervicofacial actinomycosis in this series. The patient was treated with sulfadiazine for seven months and received 6,000,000 units of penicillin in addition to surgical drainage, potassium iodide and roentgen therapy. A longer period of observation is necessary before he can be considered cured.



Fig. 3 (case 6).—Appearance of chest on July 31, 1943, showing the massive pleural empyema

CASE 6.—G. W., a man aged 39, a railroad switchman, entered the San Francisco Hospital on July 29, 1943 complaining of pain in the left side of his chest. He was an alcoholic addict For fourteen months he had had a chronic cough which produced a cupful of sputum daily. Three weeks prior to entry he suddenly developed a pleuritic pain in the left side of the chest, which gradually became a steady, dull ache under the left scapula and along the left costal border and his dyspnea increased.

A massive pleural effusion (fig. 3) was found on admission On July 31 750 cc. of purulent fluid was withdrawn from his left chest. Culture showed Actinomyces, but the exact strain was never identified. On August 6 an Eloesser flap was made in the left chest and 5,000 cc. of pus evacuated (figure 4 gives the appearance of the chest after drainage). Sulfadiazine was started on August 19, 1 Gm. every six hours. Lugol's solution was given also and the dosage gradually increased until he was receiving 33 drops three times daily by September 2. He also received ten roentgen radiation treatments of 100 roentgen units each to the left chest.

He improved rapidly and gained weight. The drainage from the left chest rapidly diminished. A roentgenogram of the chest on November 24 showed definite clearing of the density in the left lung field. He was discharged from the hospital on Nov 26, 1943.

Shortly after leaving the hospital he developed a severe upper respiratory infection, with a cough and an increase in drainage from the chest flap. He was readmitted on December 28, and on Feb. 9, 1944 again started on sulfadiazine, 1 Gm. five times daily to July 20 There was a slow general improvement but his sputum continued to contain Actinomyces granules. On August 11 he was started on a daily dose of 100,000 units of penicillin intramuscularly, which was decreased to 50,000 units daily on September 1. The penicillin was continued to October 28, a total of 5,000,000 units being given over the ten week period. At the time of his dismissal he was in excellent condition, without evidence of any pulmonary activity (figure 5 shows one of the latest chest films).

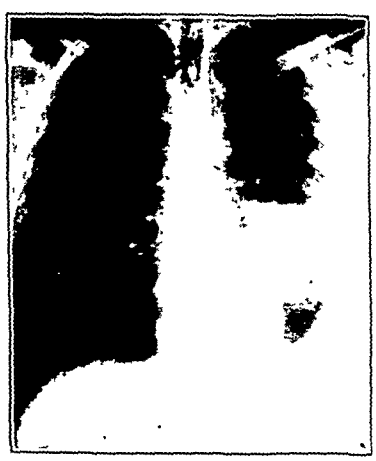


Fig. 4 (case 6).—Chest on Sept 14, 1943 showing extent of involvement of left lung after pleural drainage.

This patient had a chronic lung infection for fourteen months before he was brought to the hospital with a massive empyema. Organisms of the Actinomyces group were cultured from the empyema pus and repeatedly seen in granules in the sputum, but the exact species could not be identified. Surgical drainage and a nine week course of sulfadiazine produced definite improvement. A month after he left the hospital his cough and the drainage increased and he was readmitted. He was given sulfadiazine therapy for five months more and then 5 million units of penicillin. His case is considered arrested and he will be followed for an additional eighteen months before he can be considered cured.

CASE 7.—D. P.,[5] a man aged 30, a shipyard worker, developed a mass in the left submaxillary region in July 1943, six weeks after the extraction of a left lower molar tooth. During the next five weeks the mass increased in size, became fluctuant and finally ruptured through multiple sinuses The pus contained Actinomyces bovis.

The fluctuant area was drained surgically and a 50 per cent suspension of sulfadiazine in isotonic solution of sodium chloride instilled three times a day. Sulfadiazine also was administered intravenously, and then orally, to maintain a concentration of 12 to 15 mg. per hundred cubic centimeters in the blood. Iodide and thymol also were administered. Within two weeks the lesions had literally disappeared. One week later the urine became grossly bloody and the sulfadiazine was stopped, but the iodide and thymol were continued and the lesion was given 1,200 roentgens in divided doses.



Fig. 5 (case 6).—Chest on May 1, 1944, showing pronounced clearing of the left lung base.

In spite of this adjunct therapy, the mass and sinuses recurred a month after sulfadiazine was stopped, involving a more extensive region than originally. Sulfadiazine was resumed intravenously and then orally in doses adequate to produce a blood concentration of 15 to 25 mg. per hundred cubic centimeters. This required 4 Gm. every four to six hours. Local treatment was carried out, as when first seen. Fluids were given in large amounts and 15 Gm. of sodium bicarbonate was administered, in divided doses, each day. No toxic symptoms developed despite the high dosage of sulfadiazine, and the lesions again disappeared rapidly. Within one month the lesions and incisions had been replaced with firm scar tissue, but the therapy with sulfadiazine was continued for three more months. By this time the scars and deep seated induration had become quite soft and pliable. At present the patient is at work, apparently completely cured

It is obvious that treatment on the first occasion (three weeks) was inadequate and that the longer period (four months) was necessary to achieve complete cure. The recurrence and progression of the disease under iodide, thymol and roentgen irradiation are indicative of the low efficacy of these agents. The dose of sulfadiazine 4 Gm. every four to six hours is phenomenal but shows that these high doses and correspondingly high blood concentrations may be safe if the fluid intake is large and the urine is maintained on the alkaline side of neutrality.

5. The patient was seen through the courtesy of Dr Irving Wiesen *teld of the Permanente Hospital, Oakland, Calif.*

CASE 8.—A. L., a man aged 42, a farmer and welder, was admitted to the San Francisco Hospital on April 1, 1944 for treatment of an abscess on the right side of his jaw. Two weeks previously he had first noticed that he could not open his mouth widely, and a small, painless swelling had appeared at the right angle of the mandible. The swelling increased in size and became painful. Within a week an abscess formed, which was drained at the Stanford Clinic. The pus contained typical granules of Actinomyces bovis.

Examination on admission showed a swelling of the right jaw extending from the zygoma to about an inch below the body of the mandible. The swelling was firm and not tender except over the angle of the jaw. The incision along the inferior surface of the mandible was draining thick creamy pus. A roentgenogram of the mandible showed a large abscess around the root of the right second molar. On the third day the patient's temperature rose to 104.4 F. Hot compresses were started and continued for three weeks. Treatment with sulfadiazine 1 Gm. every four hours was continued for nineteen days to the time of his discharge from the hospital. On April 15 the affected molar was extracted. Cultures from the tooth socket isolated organisms of the Actinomyces group, hemolytic Staphylococcus albus, and anaerobic, gas producing bacilli.

He improved rapidly, the swelling subsided and the drainage decreased. A 2 cm. area of induration at the angle of the jaw was still present when he was dismissed to outpatient care. Seven months later he still showed no evidence of recurrence.

Adequate surgical drainage and nineteen days of sulfadiazine therapy produced a rapid cure. A diagnosis made early in the disease was no doubt an important factor in obtaining a cure.

CASE 9.—Mrs. C. R.,[6] aged 58, a housewife, developed a swelling below the left jaw in the middle of November 1943. A week later the lower left canine tooth was extracted, but the swelling increased and spread down into the left submaxillary region. A week later a small submaxillary abscess drained and typical sulfur granules were found in the pus and Actinomyces bovis was identified on culture. The patient was started on sulfadiazine therapy 1 Gm. every four hours, and this was continued for two weeks. At the end of that time the incision had healed and at the end of one month all induration was gone. One year later there is no evidence of a recurrence.

A prompt complete healing of the cervicofacial actinomycosis occurred after drainage and two weeks of sulfadiazine therapy. There has been no recurrence in one year.

CASE 10.—Mrs. J. P., aged 25, developed a swelling along the border of the mandible seven weeks after the removal of a carious third lower molar tooth. Two weeks later (Nov. 19, 1943) the lesion was opened surgically and the organisms of actinomycosis were demonstrated in the pus. No osteomyelitis was demonstrated by roentgenograms.

Treatment was intermittent during the first month and consisted of about fourteen days of active therapy with sulfathiazole or sulfadiazine in doses of about 1 Gm. every four hours. Iodide was also taken irregularly during this time. After this she had continuous treatment with sulfadiazine 1 Gm. every four to six hours, together with adequate fluids and sodium bicarbonate to keep the urine dilute and alkaline. She was also given Strong Solution of Iodine, U. S. P., 10 to 20 drops three times a day. No x-ray therapy was administered. At the end of two months she stopped treatment entirely because she felt perfectly well. Two months later she reported by letter that she considered herself well and that the army medical officers where her husband was stationed considered her cured.

Drainage and sulfadiazine produced a rapid improvement and possible cure in this case. Inadequate follow-up prevents the case being listed as a cure.

6. Seen through the courtesy of Dr. Robert S. Irvine, Department of Ophthalmology, Stanford Medical School

CASE 11.—Mrs. I. B., aged 41, a clerk, entered the surgical ward of Lane Hospital on Aug. 20, 1943 for treatment of a recurrent abscess on the right lower abdomen. In 1936 exploration for a ruptured appendix had been done. For the following six years she repeatedly developed abscesses in the right lower abdomen which were either drained by incision or ruptured spontaneously. Five days prior to admission the painful swelling recurred in the right lower quadrant. Examination showed a 10 cm. tender area of induration at McBurney's point.

On the day of admission a McBurney incision was made and an abscess drained, the pus containing typical sulfur granules. Sulfadiazine therapy was started, 1 Gm. every four hours. The patient was dismissed on the seventh day and continued on sulfadiazine at home, receiving a total of 125 Gm. of sulfadiazine in a three week period. The abdominal wound healed in three weeks. Examination on Dec. 6, 1944, fourteen months after drainage of the abscess, showed the abdomen to be soft and nontender.

Although more than fourteen months have passed since the last recurrence of the abdominal actinomycosis, the patient must be followed for another year before being pronounced cured. Without medication she has gone as long as ten months previously between recurrences. The relatively short course of sulfadiazine has arrested the infection for a long period and perhaps cured it.

CASE 12.—F. B.,[7] a man aged 63, a retired banker with severe diabetes, developed a productive cough in February 1943. He then began to have night sweats and soon lost weight and strength. From the sputum and from subcutaneous nodules a fungus was isolated, first called Streptothrix and later identified as Nocardia (Actinomyces) asteroides.

On four occasions he was given a week's course of sulfadiazine (1 Gm. every four hours), and during each of these periods he improved and his fever remitted. This therapy was not persisted in, however, and he slowly became weaker. He was transferred from the care of his private physician to the Stanford Medical Service on May 8, 1943.

Examination on admission showed that he was extremely ill and in great respiratory distress. There were multiple, firm, fluctuant nodules in the skin and subcutaneous tissues of the arm, chest and abdomen. Chest examination showed extensive bilateral pulmonary involvement. He failed to respond to sulfadiazine therapy and died on May 11.

Autopsy revealed numerous subcutaneous abscesses containing the fungus. Similar abscesses were found in the lungs, heart, kidneys, thyroid and psoas muscles.

In comparison with the successfully treated cases, the brief periods of treatment with sulfadiazine in this case seem highly inadequate. The immediate benefit from each course of sulfadiazine probably indicates that more prolonged therapy might have been curative.

CASE 13.—M. M., an Indian girl aged 9 years, was admitted to the pediatric service of Stanford-Lane Hospitals on Feb. 7, 1942 for treatment of a swelling of the right side of the face. The swelling was first noticed two months previously over the right angle of the jaw. On entry, physical examination revealed a swelling at the angle of the right mandible with a small superficial abscess over it and some purulent drainage at the base of the second right molar. Roentgenograms on Feb. 7, 1942 showed bony destruction and new bone formation involving about half of the right mandible. On February 9 pus from a sinus below the angle of the jaw contained sulfur granules typical of Actinomyces bovis. Sulfadiazine therapy was started, 4.1 Gm. daily for seventeen days and slightly smaller doses for five more days being given. She rapidly improved. The sinus was healed within two weeks and the swelling gradually receded. She was dismissed on March 4 after receiving a total of 84 Gm. of sulfadiazine.

7. To be reported in detail by Drs. James McNaught and William M. M. Kirby, Stanford Medical School

After two weeks at home the swelling of the jaw recurred and she was readmitted to the hospital on April 8, 1942. Although roentgenograms showed continued healing of the mandible, sulfur granules were again present in the pus. She had developed a slight leukopenia while on sulfadiazine, so she was given sulfathiazole, starting with 0.7 Gm. every four hours and then 0.3 Gm. every four hours, from April 15 to May 2, 1942. Again she rapidly improved and was dismissed May 2, 1942. She was followed in the outpatient department and had no evidence of infection when last seen on Nov. 5, 1943, a year and a half later. A roentgenogram on Nov. 5, 1943 showed a normal mandible.

This girl has apparently been cured of a cervicofacial type of actinomycosis in which there was extensive involvement of the mandible. She was much improved by three weeks of sulfadiazine therapy, but an additional three weeks of sulfathiazole was necessary to cure her. This course emphasizes the necessity for a longer period of treatment when there is bony involvement.

CASE 14.—Mrs. M. W., aged 27, a housewife, Chinese, entered the San Francisco Hospital on May 21, 1943 complaining of upper abdominal pain of two days' duration. She died ten days later.

One year prior to entry she began to have attacks of right upper abdominal pain and fever, never accompanied by jaundice. She entered another hospital in December 1942, where a liver abscess was drained posteriorly and Actinomyces was cultured from the pus. A right pleural effusion developed, following the operation, but no organisms were cultured from the fluid. Her weight fell from 101 to 75 pounds (46 to 34 Kg.). She was given sulfathiazole 9 Gm. daily for three weeks followed by 4 Gm. for several more weeks. She was then allowed to return to her home, but within ten days she had a recurrence of fever and right upper abdominal pain.

Examination on admission to the San Francisco Hospital revealed that she was slightly jaundiced. Her temperature was 101 F. A smooth, tender liver extended nearly down to the iliac crest, and the spleen to the level of the umbilicus.

Blood cultures were positive for Actinomyces, type undetermined. Tuberculin and coccidioidin tests were negative. Roentgenograms showed an elevation of the right leaf of the diaphragm and enlargement of the liver and spleen.

Sulfathiazole was started, 1 Gm. every four hours for forty-eight hours. The temperature fluctuated between 101 and 104 F. She became progressively more jaundiced and was comatose before death on May 31. At autopsy the essential findings were multiple abscesses in the liver and between the liver and the abdominal wall. There was a 1 cm. abscess in the submucosa of the stomach on the lesser curvature in the prepyloric area. Numerous sulfur granules were found in the abscesses in the liver and stomach. The lungs showed extensive bronchopneumonia. Dr. Alvin J. Cox of the Stanford department of pathology concluded "There is little doubt that the port of entry for Actinomyces in this case was the stomach, and there is no definite evidence of a previous lesion in this organ. Chronic suppurative lesions were extensive in the liver, accounting for most of the clinical features of the case."

This woman developed actinomycosis of the stomach and liver one year prior to her death. On sulfathiazole therapy she improved rapidly and was considered cured. The infection recurred and was rapidly fatal. Perhaps a longer course of sulfonamide therapy might have cured her. The autopsy findings indicated that the port of entry of Actinomyces was through the stomach.

CASE 15.—A woman aged 47, a school teacher, entered Stanford Hospital on Nov. 18, 1940 complaining of a swollen left jaw. On August 15 she had had two lower left molar teeth extracted. The gums healed, and she had no trouble for six weeks. About November 1 she began to have difficulty in opening her mouth, and a hard, nontender swelling appeared on the left side of her jaw.

Examination on admission showed a lemon sized swelling on the left mandible anterior to the angle. On November 19 the mass was aspirated but no pus was obtained. On November 26 she was started on sulfathiazole, being given 1 Gm. every four hours. On December 1 pus was obtained which contained the typical sulfur granules of actinomycosis. On December 6, after eleven days of sulfathiazole, she developed a generalized rash and a fever, and the drug was discontinued. On December 10 sulfanilamide was started, 1 Gm. every four hours. After two weeks the dose was reduced to 0.5 Gm. every four hours and at the end of one month to 0.5 Gm. four times daily. Under the treatement with sulfanilamide the drainage ceased and the indurated mass gradually diminished in size. She was dismissed seven weeks after starting the sulfanilamide with a 2 cm. area of induration anterior to the angle of the jaw. She was kept on a dosage of 0.5 Gm. of sulfanilamide four times daily for six more months. Now, four years after the onset of her infection, there is no evidence of any recurrence.

This is a four year cure of cervicofacial actinomycosis after use of iodide, x-ray therapy and a long course of sulfanilamide.

CASE 16.—D. M., a man aged 29, a pipefitter's helper, entered the San Francisco Hospital on May 22, 1942 for a swelling of the left side of his face. One month previously a swelling developed over the left mandible below the left parotid. The left eyelids became swollen and he had difficulty in opening his jaw. An abscess, localized in front of the left ear, was drained by his private physician. Actinomyces granules were identified, and he was sent to the San Francisco Hospital. Examination on admission showed a swelling on the left side of his face, involving the preauricular region, the left eyelids and the parotid, submaxillary and upper cervical areas. Roentgenograms showed osteomyelitis involving the left descending ramus of the mandible. On May 29 the incision made originally was enlarged and he was started on sulfanilamide, hot compresses and roentgen irradiation. He was given sulfanilamide 1 Gm. every four hours for four days and then put on sulfathiazole 1 Gm. every four hours for four days. On June 7 he was also given potassium iodide in increasing dosage and his jaws were wired. He received no sulfonamides from June 11 to June 30. On the latter date he was again started on sulfanilamide 1 Gm. every four hours. This was decreased to 0.6 Gm. three times daily, and this small dose was continued to July 19, when it was further reduced to 0.3 Gm. three times daily. He continued to improve. Drainage ceased, the induration diminished and roentgenograms showed healing of the osteomyelitis of the jaw. He was discharged to the outpatient department on Aug. 4, 1942. The jaw was kept wired for two more months. He had returned to work in a shipyard by July 10, 1943 and on Oct. 6, 1943 had no evidence of recurrence.

This case of extensive involvement of actinomycosis of the cervicofacial type was cured by surgical drainage, wiring of the jaws and the administration of iodide and sulfanilamide. We believe that a more intensive course of sulfonamide therapy, preferably sulfadiazine, might have produced a more rapid cure. Also we do not feel that it is necessary to wire the jaws during treatment.

CASE 17 (follow-up note on case 2 in our report in 1941 [1]).—E. Z., a man, now 28 years old, was treated for actinomycosis of the chest wall in 1939. At that time the organisms were demonstrated in smears after the termination of a rather brief course (seventeen days) of sulfanilamide, but he went on to apparent clinical recovery. However, the roentgen appearance of the chest never became entirely normal.

Two years later, in September 1941, he again began to have pain in the right chest. This forced him to reenter the hospital in May 1942. He was febrile and had a moderate secondary anemia. The pleura and chest wall over the right

lower lobe of the lung were involved in an inflammatory process. In spite of repeated attempts, no significant organisms were ever recovered from the sputum or by aspiration of the local lesion.

On the assumption that this was a recurrence of the actinomycosis, he was placed on sulfadiazine 6 Gm. daily. This was reduced in four days to 3 Gm. owing to nausea and crystalluria, and the therapy was continued for seven weeks. The dose was then reduced to 1 Gm. daily and finally discontinued entirely after four more weeks. The total course of treatment was therefore nearly three months. The fever remitted after the first week, and he rapidly gained strength. A few months later he felt well enough to apply for service in the Army but was refused. He then obtained work as a timekeeper, which he has been able to do satisfactorily. However, from time to time he still complains of soreness in the right chest. The most recent roentgenogram, made in April 1943, showed some residual opacities in the right chest.

Conclusions in this case must be circumspect, since it was not proved definitely that the recurrent disease was actinomycosis and there is no certainty that there may not be further recurrences.

IN VITRO TESTS OF SUSCEPTIBILITY OF ACTINOMYCES TO SULFADIAZINE AND PENICILLIN

In an attempt to determine the relative chemotherapeutic potency of sulfadiazine and penicillin against actinomycosis, the direct in vitro effect of these agents was studied. Three strains of Actinomyces [8] were grown for five to seven days in thioglycolate medium to which varying concentrations of the therapeutic agent were added, as shown in table 2. The results obtained with penicillin were somewhat more encouraging than those recently reported by Keeney and his co-workers.[9]

It is apparent that the different strains of Actinomyces vary considerably in their susceptibility to sulfadiazine and penicillin (table 2). If 10 mg. per hundred cubic centimeters in the blood is considered an average good therapeutic level for sulfadiazine, and 0.5 unit per cubic centimeter a high therapeutic level for penicillin, it is clear that sulfadiazine is more potent. With three times this content of penicillin, a level which is seldom maintained under present clinical conditions, penicillin may surpass sulfadiazine in efficacy. In no case does the combination of the two drugs significantly exceed the effect of the separate drugs, especially sulfadiazine, and in some trials the combination appeared to be less effective than sulfadiazine alone.

The inhibitory effect of either drug was usually apparent after one day of incubation, and in certain trials penicillin appeared to be slightly more effective during the first two or three days than at the end of the experiment. This may be due partly to destruction of penicillin in the culture tubes.

The general conclusions may be drawn that, unless exceptionally high concentrations of penicillin are used, this drug appears to be slightly inferior to sulfadiazine against various strains of Actinomyces in vitro and that the combination of the two drugs in usual dosage does not improve the results.

TABLE 2.—*Growth of Three Strains of Actinomyces in Vitro in the Presence of Sulfadiazine and Penicillin*

Series	Control	Sulfadiazine, 10 Mg. per 100 Cc.	Penicillin 0.5 Unit per Cc.	Penicillin 1 Unit per Cc.	Penicillin 1.5 Units per Cc.	Sulfadiazine, 10 Mg. per 100 Cc. + Penicillin 0.5 Unit per Cc.	Sulfadiazine, 10 Mg. per 100 Cc. + Penicillin 1 Unit per Cc.	Sulfadiazine, 10 Mg. per 100 Cc. + Penicillin 1.5 Units per Cc.
1. B2: Actinomyces Hominis (Derivation Unknown)								
0	3+, 3+	2+, 2+	3+, 3+	.....	.....	3+, 3+, 3+	.....	.....
1	3+	2+	1+	.....	.....	1+	.....	.....
2	3+, 3+	1+, 1+, 1+	.....	2+, 2+, 2+	.....	.....	3+, 3+, 3+	.....
3	3+, 3+	2+, 2+, 2+	3+, 3+, 3+	.....	.....	1+, 1+, 1+	.....	.....
4	2+, 3+, 3+	2+, 2+, 2+	.....	3+, 3+, 3+	.....	.....	2+, 1+, 1+	.....
5	3+, 3+, 3+	2+, 2+, 2+	.....	.....	1+, 1+, 1+	.....	.....	2+, 2+, 1+
2. B3: Actinomyces Isolated from Air, March 2, 1936								
0	3+, 3+	2+, 2+	3+, 3+	.....	.....	3+, 3+	.....	.....
1	2+	1+	.....	3+	.....	.....	2+	.....
2	3+, 3+, 2+	2+, 2+, 2+	.....	3+, 3+, 3+	.....	.....	3+, 3+, 3+	.....
3	3+, 3+, 3+	1+, 1+, 1+	2+, 2+, 2+	.....	.....	1+, 1+	.....	.....
4	3+, 3+, 3+	1+, 1+, 1+	2+, 2+, 2+	.....	.....	.....	1+, 1+, 1+	.....
5	3+, 3+, 3+	1+, 1+, 1+	.....	.....	2+, 2,+ 1+	.....	.....	1+, 1+, 1+
3. B4: Actinomyces Bovis A. T. C. C., 3007								
0	3+, 3+	2+, 2+	3+, 3+	.....	.....	3+, 3+	.....	.....
1	3+	2+	.....	2+	.....	.....	2+	.....
2	2+, 2+, 2+	1+, 1+, 1+	.....	2+, 2+, 1+	.....	.....	1+, 1+, 1+	.....
3	1+, 1+, 0	1+, 1+, 0	1+, 1+, 1+	.....	0, 1+, 1+	.....	.....	.....
4	1+, 1+, 0	1+, 1+, 1+	.....	1+, 1+, 1+	.....	.....	0, 1+, 1+	.....
5	1+, 1+, 0	1+, 1+, 1+	.....	.....	1+, 1+, 1+	.....	.....	0, 1+, 1+

* 0 means no growth; 1+, light growth; 2+, moderate growth; 3+, heavy growth.

COMMENT

An analysis of the end results summarized in table 1 shows that both the sulfonamides and penicillin are highly effective drugs in the treatment of actinomycosis. Every case showed prompt improvement when the dosage was adequate. All patients, except the 2 who died, have remained either cured or with the process arrested for considerable periods, and the 2 patients who died (12 and 14) had at one time been improved on sulfonamide. Patient 12, with extensive pulmonary involvement, was improved on each short course of sulfadiazine, but it was not continued long enough on any occasion to be effective. Patient 14, with extensive liver and peritoneal abscesses, was improved by sulfathiazole and the process was arrested for several months after the drug was stopped, but the short course given in the terminal stage was ineffective.

Actinomyces bovis was found to be the infective organism in 12 of the 16 cases described; one was identified as Actinomyces asteroides. In 3 cases the exact species was not identified.

Of the 11 cervicofacial cases, there had been dental extractions in 9. In 6 there had been extractions before the infection became evident, and in 3 there had been extractions after the infection started. In the other 2 cases pus was draining from around one or more

8. Obtained from the Department of Bacteriology of the Stanford Medical School.

9. Keeney, E. L.; Ajello, Libero, and Lankford, Elsie: Studies on Common Pathogenic Fungi and on Actinomyces Bovis: III. In Vitro Effect of Penicillin, Bull. Johns Hopkins Hosp. 75:410 (Dec.) 1944.

teeth. These cases support the "endogenous" theory of infection, which suggests that the pathogenic organisms are more or less constantly present in the mouth and alimentary canal, rather than the "exogenous" theory, which suggests that the infective organisms are taken into the mouth accidentally and at once penetrate into the tissues. Also the occupations and mode of living of the patients were not such that frequent contact with infected cattle, straws and so on was possible, except for the 9 year old Indian girl.

The in vitro effects of penicillin and sulfadiazine corroborate the clinical impression that different strains of actinomycosis vary considerably in susceptibility to these drugs. These results suggest that, in adequate doses, sulfadiazine may be more effective clinically than penicillin but that both drugs are potent agents against actinomycosis.

CONCLUSIONS

1. Sixteen cases of actinomycosis were treated with sulfonamides or penicillin. These cases include 3 pulmonary, 2 abdominal and 11 of the cervicofacial types.

2. Of the 16 cases treated, 7 may be considered cured and 7 arrested, while 2 ended fatally.

3. In vitro tests corroborate the clinical impression of varying susceptibility of Actinomyces to sulfadiazine and penicillin and of the slightly greater efficacy of sulfadiazine in certain instances.

4. The results in these cases indicate that both penicillin and the sulfonamides are highly effective drugs in the treatment of actinomycosis.

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REACTIONS TO 10,000 POOLED LIQUID HUMAN PLASMA TRANSFUSIONS

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The use of human blood plasma has become so prevalent that it is now firmly entrenched as an important part of our medical armamentarium. Since little has been reported concerning the reactions which may follow the administration of plasma,[1] it was felt that a detailed analysis of the extensive data collected at the Plasma Station of Fitzsimons General Hospital would add to the knowledge of this subject.

Each bottle of liquid plasma that is shipped from the Plasma Station is accompanied by a questionnaire which requests the pertinent information needed for a study of both beneficial results and reactions. The form is filled out by the attending physician and forwarded to our laboratory. Our report is based on an analysis of 10,000 such questionnaires returned from the 353 military hospitals within the continental United States provided with plasma by this station. The thousands of other plasma transfusions which have been given, using plasma supplied by this laboratory, and for which no questionnaires have been returned, have not been incorporated in this report.

From the Plasma Station, Fitzsimons General Hospital, Denver.

1. Erf, L. A., and Jones, H. W.: Experiences Associated with a Transfusion Unit in 700 Bed Hospital; Survey of Over 3,500 Administrations of Blood and Plasma, Ann. Int. Med. **19**: 1 (July) 1943. Muirhead, E. E., and Hill, J. M.: The Advantages and Clinical Uses of Dessicated Plasma *Prepared by* the Adtevac Process, ibid. **16**: 286 (Feb.) 1942. Weinstein, J. J.: Reactions from Transfusions of Unpooled Liquid Human Plasma: Analysis of 1,500 Transfusions, M. Ann. District of Columbia **11**: 226 (June) 1942. Lozner, E. L., and Newhouser, L. R.: Preservation of Normal Human Plasma in the Liquid State: I. A Statistical Study of 1,751 Administrations, J. Clin. Investigation **23**: 343 (May) 1944.

THEORETICAL TYPES OF REACTIONS

From a theoretical point of view there are several classes of reactions that may occur following plasma transfusions. These may be enumerated as follows:

1. Thermal or pyrogenic reactions.
2. Allergic reactions.
3. Hemolytic reactions.
4. Toxic reactions due to use of sodium citrate and merthiolate.
5. Transmission of infectious diseases from the donor.
6. Reactions due to bacterial contamination.
7. Pulmonary embolism.
8. Cardiac failure due to overloading of the circulation.
9. Miscellaneous reactions.

It is at once obvious that, in general, these classes of reactions are similar to those which may follow whole blood transfusions. However, because of the essential differences between whole blood and plasma, certain of these theoretical reactions have no practical bearing.

Thermal or Pyrogenic Reactions.—These reactions are characterized by chill and/or fever of a relatively transient nature. Such reactions are usually considered to be caused by either foreign substances or toxic products of bacterial growth called pyrogens.[2] Pyrogens are heat stable up to three hours of autoclaving and also water soluble. Hence their peculiar ability to produce reactions when present in a solution administered parenterally is in no way affected by the sterility of the solution, since they are not bacteria but the result of bacterial growth. Since mildly incompatible whole blood transfusions may result in uncomplicated chill and fever clinically indistinguishable from a pyrogenic reaction, we believe that the term thermal reaction is preferable despite the fact that the usual offending agent is pyrogenic. From the very method of the preparation of plasma it is evident that thermal reactions due to pyrogens can and do follow plasma transfusions.

Allergic Reactions.—The occurrence of allergic reactions following whole blood transfusions have been thoroughly detailed by Kilduffe and DeBakey.[3] According to them, these reactions fall into three types: the mild form characterized by urticaria of a more or less generalized nature, the moderately severe form evidenced by difficulty in breathing and loss of sphincteric control, and the severe type resembling anaphylactic shock. In our own experience only the mild and moderately severe forms of allergic reactions have been noted following plasma transfusions. Nevertheless the possibility of an anaphylactic reaction cannot be excluded, since the same factor responsible for such an occurrence following whole blood transfusion is probably also present in plasma.

The mechanism of allergic reactions following whole blood or plasma transfusions is not at all clear. In some cases the underlying cause is possibly due to the introduction of substances derived from ingested food by the donor to which the patient may be sensitive. In others, passive transfer of sensitivity to the patient may be the explanation. This will be taken up later under the analysis of allergic reactions.

2. Nelson, C. M.: The Cause of C[illegible] mous Therapy, J. A. M. A. **112**: 1,303 (April [illegible] L.: Cause and Elimination of Reactions After [illegible], Ann. Surg. **92**: 195 (Aug.) 1930.

3. Kilduffe, R. A., and DeBakey, M.: The Blood Bank and the Technic and Therapeutics of Transfusions, St. Louis, C. V. Mosby Company, 942, p. 500.

of the signs and symptoms described occurring in this type of reaction.

As previously stated, we believe that the vast majority of these reactions are due to the presence of pyrogens introduced during either the procurement of the blood, the processing of plasma or the actual transfusion itself. The technic of procuring blood and of processing it into plasma is performed in a closed vacuum system in which the 4 per cent sodium citrate used as an anticoagulant and the 50 per cent dextrose in the pooling bottle have been found to be pyrogen free. The distilled water used in making the 1 per cent merthiolate solution is fresh and pyrogen free, as determined by the permanganate test. Obviously, then, if the solutions added to plasma are free of pyrogenic contamination, subsequent pyrogens must be introduced by means of the apparatus (tubing, needles and valves) used in the preparation and administration of plasma. Scrupulous care of all such apparatus is of the utmost importance. While other workers have emphasized this, we feel that the subject will bear repetition.

A definite routine has been established for the care of this apparatus. All needles, tubing and valves are cleaned immediately after use. No more than a few minutes are allowed to elapse between the time of use and the washing of these parts This is essential to prevent clotting and adherence of blood or plasma to the

TABLE 3.—*Analysis of Thermal Reactions by Pools of Plasma*

Number of Reactions in Same Pool	Number of Pools Involved	Number of Negative Reports of Bottles in Same Pool	Number of Reports Not Received in Same Pool	Total Number of Reactions
2	14	2	0	28
2	4	0	2	8
1	69	3	0	69
1	47	2	1	47
1	43	1	2	43
1	5	0	3	5
Total	182			200

apparatus. The parts are completely disassembled and washed twice with freshly distilled pyrogen free water under pressure. A third washing is performed with sterile pyrogen free saline solution freshly prepared. The needles are carefully styletted and the tubing is minutely scrutinized for any adherent blood or plasma. The valve parts are glycerinated and reassembled The entire set is put together and wrapped. The sets are then autoclaved, always within three hours from the time the apparatus was washed. This minimizes bacterial growth and therefore diminishes the occurrence of pyrogens. This method, while seemingly simple, has proved to be eminently satisfactory.

The foregoing procedure is strongly recommended for the proper care of the apparatus in the actual administration of plasma. Since the Plasma Station supplies plasma to more than 350 hospitals, it is difficult to exert control over this factor. Unquestionably many pyrogenic reactions occur because of this. To illustrate: Hospital A had 1 thermal reaction in 750 plasma transfusions, hospital B had 4 in 600, while hospital C had 6 in 150. It seems logical to assume, since all three hospitals are supplied with plasma made under standard conditions, that the difference in thermal reaction rate (hospital C having a rate thirty times greater than hospital A) could be attributed to local causes

In order to emphasize further the point that thermal reactions may be the result of factors not present in the actual processing of plasma, an analysis of this type of reaction by the pools involved was made as presented in table 3. Each 2,000 cc. pool is dispensed in four 500 cc. bottles.

It will be noted that there were 2 reactions in each of 18 pools. These 36 reactions may be ascribed to the plasma per se, even though in 14 of the pools two other

TABLE 4.—*Allergic Reactions*

Onset extremes *	Immediate to 72 hours
Average for 79 cases	56 minutes
Types	
	10
	3
	0
Urticarial reactions	
Distribution	
Localized	43
Generalized	59
Severity	
Mild	63
Moderate	17
Severe	2

* One case had an onset of five days and is not included in these figures

bottles from the same pool gave no reaction On the other hand, there was only 1 reaction in 116 pools of which either two or three bottles were administered without reaction. It would seem probable that these 116 reactions were not the result of pyrogens present at the time of processing the plasma but more likely were introduced during the administration by improperly cleaned intravenous sets. In addition there were single reactions in each of 48 pools in which one or no other reports were received. No decision can be made concerning this last group owing to lack of data Assuming the foregoing interpretation to be correct, the thermal reaction rate ascribable to plasma itself would be 0.84 per cent, which would include the group of 48 reactions with either one or no other reports Another explanation for the discrepancy in reactions to plasma derived from the same pools is that the sensitivity of different individuals to pyrogens may be quite variable. No information is available on this point, although the data may indicate such a possibility.

Allergic Reactions.—There were 105 reactions of the allergic type, of which all but 3 were urticarial in nature The usual urticarial reaction appeared during or soon after the infusion. The skin rash was either gener-

TABLE 5.—*Analysis of Allergic Reactions by Pools of Plasma*

Number of Reactions in Same Pool	Number of Pools Involved	Number of Negative Reports of Bottles in Same Pool	Number of Reports Not Received in Same Pool	Total Number of Reactions
3	2	1	1	6
2	6	2	0	12
2	1	0	2	2
1	34	3	0	34
1	22	2	1	22
1	18	1	2	18
1	11	0	0	11
Total	94			105

alized or localized When the latter type was present, the face was usually involved. Accompanying signs and symptoms, aside from itching of the skin, were rarely encountered. The other 3 cases of this group were ones of asthmatic breathing. These allergic reactions responded well to small doses of epinephrine

There are three possible mechanisms underlying allergic reactions: the transfer of substances derived from ingested food by the donor to which the recipient

is sensitive; passive transfer of sensitivity from donor to recipient; the sensitivity to common normal substances in plasma.

In an attempt to avoid the presence of possibly offending food derivatives in plasma, donors are placed on a semifasting diet consisting mainly of fluids and carbohydrates for the six hour period preceding the blood donation. The transfer of sensitivity is more difficult to control. Prospective donors with active allergic states are rejected. In a series of this type it is not possible to ascertain whether this selection of donors had any effect on the allergic reaction rate.

The data presented in table 5 consist of an analysis of allergic reactions from the same pools. As every allergic reaction must be ascribed to the plasma itself, it is of interest to note the sensitivity of the patients involved in these reactions to various pools. Nine pools were responsible for 20 reactions. Yet 12 pints of plasma from these same pools were given without any untoward result.

In table 6 the data of multiple allergic reactions in the same individuals are presented. The 105 allergic reactions were experienced by 81 different patients. Six of these patients suffered 24 reactions. One patient had as many as 7 allergic reactions to plasma from 5 different pools. Unfortunately it has been impossible to determine the allergic background of these patients.

TABLE 6.—*Multiple Allergic Reactions of Patients to Plasma from Two or More Pools*

Number of Recipients	Number of Allergic Reactions	Number of Pools Involved
1	7	5
1	5	3
1	4	3
1	3	3
1	3	2
1	2	2
Total 6	24	18

It is on the basis of the foregoing data that we believe that many of the allergic reactions are due to the presence of a normal substance common to the plasma of many donors. An individual sensitivity to such substances by certain recipients can be postulated. Otherwise it is difficult to explain the case of 1 individual reacting to 7 bottles of plasma derived from 5 different pools. A probable factor in a certain small percentage is an idiosyncrasy to the citrate, glucose or merthiolate solution present in the plasma.

SUMMARY

In this series of 10,000 pooled liquid plasma transfusions, 296 reactions were reported, a reaction rate of 2.96 per cent. Of these, 200 were thermal reactions and 105 were allergic reactions. Eleven patients experienced combined reactions. There were 2 reactions of a miscellaneous nature. Eighty-nine (a total rate of 0.89 per cent) of the thermal reactions were believed to be ascribable to the plasma itself. Few of the reactions were severe in nature, and no fatalities or near fatalities attributable to the plasma transfusions were noted. There were no hemolytic reactions reported.

It is felt that thermal reactions, in the main, can be prevented. At one hospital where the transfusion apparatus was properly cleaned, one thermal reaction occurred in 750 plasma administrations.

While allergic reactions may be reduced in incidence by careful selection of donors, it is probable that they cannot be entirely eliminated, as there is considerable evidence to show that many of the reactions are due to a substance normally present in plasma to which certain individuals are sensitive. Certain chemical idiosyncrasies are also a factor.

We believe the closed vacuum technic used in obtaining whole blood and in the processing of plasma is the safest method in use from the standpoint of sterility. A contamination rate of approximately 1 per cent in the preparation of more than 70,000 pints of plasma supports this view.

Certain precautions must be observed in the use of plasma. The condition of the patient, indication for use, amount to be given and speed of administration are matters for the judgment of the attending physician. An adequate filter must always be used to prevent precipitated fibrin from entering the circulation and causing embolic phenomena. In the presence of a severe reaction of any type, the plasma transfusion should be discontinued. Subsequent plasma administrations to the same patient should be given from another pool. This is particularly important in the cases of allergic reactions.

CONCLUSIONS

1. Reactions following the administration of pooled liquid human plasma are chiefly of the thermal and allergic types.

2. Hemolytic reactions do not occur as the result of such plasma transfusions.

3. Reactions of the thermal type are largely preventable. Scrupulous and detailed attention to the proper cleansing of all apparatus used is essential in the prevention of pyrogen contamination.

4. Allergic reactions, because of the protein nature of allergies, cannot be prevented in the main.

5. The closed vacuum technic of procuring blood and of processing plasma is the ideal method.

6. The use of pooled liquid human plasma is eminently safe and attended with fairly infrequent reactions of relatively mild nature.

2 East Thirty-Seventh Street.

The First Mercury Thermometer.—The appealingly modest personal story of how he (Daniel Fahrenheit, 1686-1736) came in 1714 to invent the mercury thermometer and the scale of temperature by which his name is daily remembered in English speaking countries is told by a German instrument maker, Daniel Fahrenheit, native of Danzig and long resident in Holland. His was one of the early eighteenth century contributions to the study of the fascinating but complicated physical problem of heat, which will lead us through the work of Joseph Black, Lavoisier, Rumford, Joule, Helmholtz, Kelvin and Gibbs. Besides Fahrenheit, others who developed scales of temperature were R. A F de Reaumur, French naturalist (1683-1757) whose "Reaumur scale" (1730) is still used in many countries; Anders Celsius (1701-1744), Swedish astronomer at Uppsala, who first calibrated the centigrade thermometer (1742), divided into 100 degrees between the freezing and boiling points of water and universally employed in scientific work; and William Thomson, Lord Kelvin, who premised an "absolute scale" of temperature on which water boils at 373.7 degrees, freezes at 273.7 degrees and would—theoretically—cease to exist as water if it could ever be got down to absolute zero.—The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co, Inc, 1945.

Clinical Notes, Suggestions and New Instruments

MENINGITIS DUE TO SALMONELLA PANAMA

MAJOR WILLIAM H WOOD JR, MAJOR FRANK H MAYFIELD AND CAPTAIN ARTHUR W FRISCH
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Two cases of meningitis due to Salmonella panama comprise the material on which this paper is based Invasion of the human meninges by this organism is not common These cases are of especial interest, as the source of infection was traced to an attendant in the milk laboratory of the hospital in which the babies were born, and because 1 survived with sulfadiazine therapy

LITERATURE

Salmonella panama is a subgroup of the typhoid-paratyphoid group of bacteria (Topley and Wilson[1]) and is named for D E Salmon, the discoverer E O Jordan identified this particular strain (Salmonella panama) in 1934 as the cause of food poisoning among American soldiers in Panama In 1938 Schiff[2] described S panama as a cause of infectious diarrhea among infants in New York City A more complete account of infantile diarrhea by Abramson, Frant and Oldenbush[3] lists the Salmonella organisms as a prominent cause of this malady Harvey[4] in 1937 reviewed the literature of Salmonella suipestifer infections and added 21 new cases of his own which had occurred in and around Baltimore

Hormaeche and his associates[5] believe that Salmonella diarrhea occurs all over the world Infections due to this group of organisms are more frequent in children, though they do not always localize in the intestinal tract The state of the Salmonella problem has recently (1943) been reviewed most comprehensively by Bornstein[6] He proposes the terms Salmonella gastroenteritis (food poisoning), Salmonella fever (typhoidal type) and Salmonella septicemia for the three varieties of cases in human beings

The genus Salmonella comprises a group of more than one hundred strains of organisms which are pathogenic for animals and man The sources of infection are protean and include human carriers as well as a wide variety of animals Spread of infection occurs through handling poultry, eggs, meat, milk and other foods contaminated from animal sources, as well as certain rodents, flies and other insect vectors It is believed that most cases of Salmonella meningitis follow the septicemic form of the disease, salmonellosis, and the literature contains reports of cases of meningitis due to many different strains of this bacterium

Neter[7] quotes a review of the literature by Guerra, Peluffo and Aleppo published in 1940 in which he found that they had collected 56 case reports of purulent meningitis due to salmonellosis up to that time and adds 22 other cases collected since then, making a total of 78 cases He presents another of his own, a hydrocephalic child who died of meningitis due to Salmonella cholerae suis Bray and Meredith[8] also reported a case in a hydrocephalic child of 4½ months who died of Salmonella sandiego meningitis

It is the impression of most investigators that Salmonella infection is apt to prove fatal to the very young, to debilitated patients or to those having a mixed infection Yet Ravitch and Washington's[9] patient, a 4½ year old Negro girl, developed Salmonella suipestifer (also called cholerae suis) septicemia and meningitis complicating meningococcic septicemia and meningitis She survived, and her survival was attributed by the authors to the preceding meningeal reaction produced by the meningococcus and its antiserum A 7 year old girl observed by Neter[10] was cured of meningococcic meningitis and Salmonella cholerae suis bacteremia by sulfathiazole Another patient studied by Neter[11] suffered from S cholerae suis bacteremia complicating scarlet fever This patient recovered on sulfanilamide and sulfadiazine medication

Katsampes and Bradford[12] reported the recovery of a month old infant suffering from Salmonella panama meningitis with sulfapyridine Wilsdon and Gibson[13] also recorded the case of a man aged 61 who had meningitis due to Salmonella london His cerebrospinal fluid was sterilized by sulfapyridine though he subsequently died of hypostatic pneumonia Patterson's[14] 2 patients with paratyphoid B (Salmonella paratyphi B) meningitis recovered after sulfapyridine and sulfathiazole medication He concluded that neither drug appeared to be specific but that sulfathiazole was probably to be preferred until some better drug was discovered Hollis and Barron[15] had a fatality in a child with meningitis of the Salmonella oranienburg type They stated that sulfonamide medication is effective in certain types of Salmonella meningitis Of 9 patients who recovered from this condition, out of a group of 53, sulfonamides were used in 5 In the other 44 sulfonamides were used in only 2

In trying the effect of sulfaguanidine on the various strains of dysentery and Salmonella organisms, Bornstein and Strauss[16] concluded that this drug was effective against bacillary dysentery and against S paratyphi A and S cholerae suis though ineffective against other organisms of the Salmonella group Sulfathiazole and sulfadiazine have been reported to be effective against other cases of septicemia[17] and a urinary tract infection[18] due to Salmonella organisms When confronted with a case of purulent meningitis one is still justified in beginning therapy with one of the sulfonamides, preferably sulfadiazine or sulfathiazole Penicillin has little if any effect on the salmonella group

REPORT OF CASES

CASE 1.—T a white male infant, was brought to the hospital on the twenty third day of life After a normal full term pregnancy he was delivered with the aid of midforceps on Jan 24, 1944 He seemed to be vigorous and healthy, weighing 8 pounds 7½ ounces (3,840 Gm) His course during the ensuing thirteen days was not remarkable As his mother had a breast infection, he was given the usual formula of evaporated milk, boiled water and dextrimaltose He nursed well and gained weight normally and was allowed to go home with his mother on February 6

During the succeeding ten days all went well, but on February 16 he exhibited unusual twitchings and slight generalized convulsive movements, and it was thought that he had an elevation of temperature, consequently he was brought t

From the Percy Jones General Hospital Battle Creek, Mich

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see us. The family history and past history were irrelevant. The examination was negative save for a generalized convulsion and temperature of 102 F. He was put in a local hospital and observed for the rest of that day. The next day his temperature was 104 F., and as convulsions had continued at intervals a lumbar puncture was performed even though the fontanel was soft and level and the neurologic examination otherwise negative. Purulent spinal fluid was released under

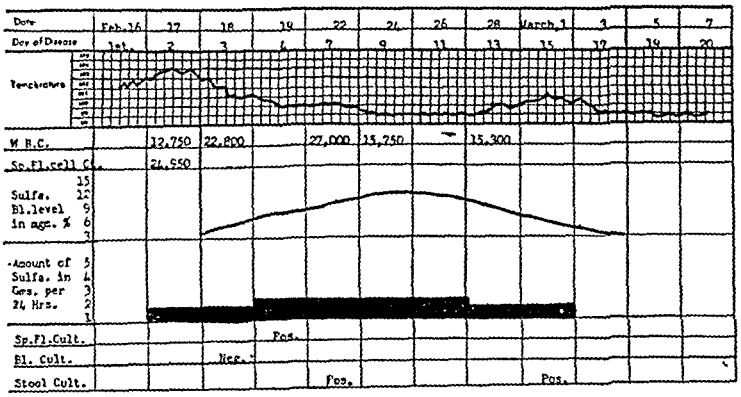


Chart 1.—Course in case 1.

normal pressure. There were 24,950 white blood cells present (95 per cent polymorphonuclears).

Sulfadiazine therapy was instituted immediately. The drug was given by mouth, as the patient was not vomiting. The daily dose varied between 1 and 1.5 Gm. to maintain a blood level of 6 to 10 mg. per hundred cubic centimeters. His clinical response was good. The elevation of temperature subsided gradually during the succeeding several days, and white blood cells, which varied between 22,000 and 27,000 early in the disease, subsided to 15,000 (chart 1).

By February 19 a gram negative motile rod had grown from the spinal fluid culture, later identified as Salmonella panama. The same organism grew from the stool culture but not from the blood. Sulfadiazine was continued till March 1. On that day the patient had begun to vomit, slight puffiness of the eyelids appeared, and the temperature rose to 101 F. Fearing renal damage, the drug was stopped immediately. Subsequent urine examinations were normal, the edema and vomiting quickly disappeared and the temperature subsided. Attempts to obtain cerebrospinal fluid for follow-up examinations were unsuccessful from the lumbar route. As the clinical condition of the patient was so good, it seemed wise not to attempt cisternal or ventricular taps at this time.

He left the hospital March 7 and since that time has continued to do well at home.[19]

CASE 2.—H., a white female infant, was first seen on the twenty-first day of life. She was born in the same hospital, spontaneously at term, Jan. 28, 1944. Her birth weight was 8 pounds 8½ ounces (3,860 Gm.) and she seemed to be normal in every way. She was put to the breast but required additional feedings consisting of evaporated milk, boiled water and dextrimaltose. As the maternity ward was crowded, and as she and her mother were so well, they went home in an ambulance on the fifth day of the puerperium.

On February 14 she did not seem as well as usual. She cried much of the time and refused to eat. A doctor said she had a cold and treated her symptomatically. On February 16 she twitched occasionally. Gradually the hyperirritability increased and she was brought to us on February 18, four days after the onset of the present illness.

The family history and past history were irrelevant. The history as given was elicited. On examination it was apparent that her temperature was moderately elevated and that she was hyperirritable, as evidenced by clonic convulsive movements. The fontanel was full, though not bulging. A lumbar puncture was attempted but no fluid could be obtained. The next day one of us (F. H. M.) obtained a few drops of purulent cerebrospinal fluid from the cistern. From this, the same organism was ultimately isolated (Salmonella panama). As in the first patient, S. panama was also recovered from stool, but not from blood cultures.

This child also was placed on sulfadiazine medication, an average daily intake of 1.5 Gm. producing an average blood level of 8 mg. per hundred cubic centimeters. During the first week her temperature subsided from 103 to 100 F., though the white blood cells remained up around 18,000 to 20,000 per cubic millimeter till March 1. During this period she required small doses of phenobarbital to control her convulsive tendency.

On March 3 a ventricular tap showed the cerebrospinal fluid to be slightly cloudy. It contained 1,120 white blood cells (42 per cent polymorphonuclears and 58 per cent lymphocytes), 18 mg. of sugar per hundred cubic centimeters, 1,013 mg. of protein per hundred cubic centimeters and 11.6 mg. of sulfadiazine per hundred cubic centimeters. By March 20 her temperature averaged 99 F. and the white blood cells 8,500 per cubic millimeter. Though she did not seem toxic (in fact, her weight gain had been satisfactory throughout) the fontanel was bulging, and 45 cc. of clear cerebrospinal fluid was withdrawn from the ventricles. This fluid contained 150 white blood cells per cubic millimeter, 9 mg. of sugar, 1,025 mg. of protein and 4 mg. of sulfadiazine per hundred cubic centimeters. The culture remained sterile (chart 2).

Feeling that she was over the infectious or septic phase of her disease, though fearing hydrocephaly, we discontinued medication and allowed the patient to go home. She was brought in every three or four days. On these visits the head always was tense, and 50 to 100 cc. of clear sterile ventricular fluid containing about 100 lymphocytes was withdrawn. The circumference of her head gradually increased to 17⅞ inches.

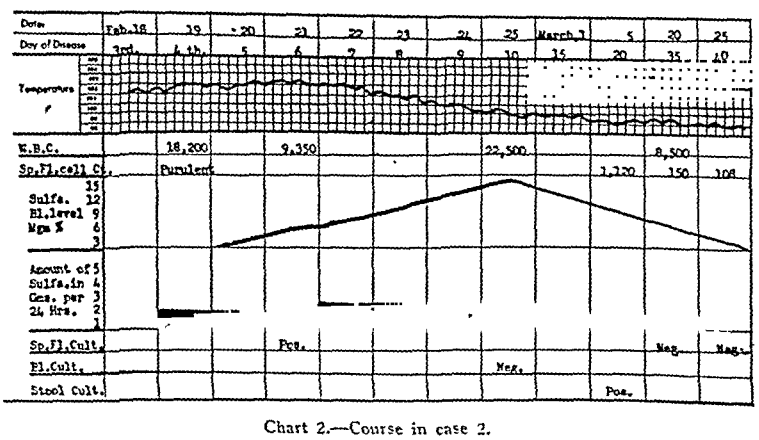


Chart 2.—Course in case 2.

Owing to lack of proper surgical facilities she was referred to Dr. A. Earl Walker of the University of Chicago on April 18 for some possible palliative surgical procedure. Intervention was deemed unwise, and shortly thereafter the baby died.

Postmortem examination revealed "chronic hyperplastic arachnoiditis and ependymitis with severe internal hydrocephalus due to occlusion of the foramen of Munro on the right and stenosis of the foramen of Munro on the left, with bilateral occlusion of the foramens of Luschka and Magendie. The picture is compatible with the end result of Salmonella meningitis."

19. Since this article was written we have heard indirectly that the patient remained well until July 26, on which date he is said to have received a third injection of pertussis vaccine. A stormy illness followed and he died two days later, four months and three weeks after leaving the hospital. The attending physician failed to obtain cultures of blood or of cerebrospinal fluid, but such a clinical course would not suggest that salmonellosis played a part in this last illness.

COMMENT

The 2 cases here reported are of unusual interest as the 2 infants were born at the same hospital within four days of each other. Both were healthy full term babies, cared for in the same nursery and given the same formula. They remained well till the twenty-third and seventeenth days of life, respectively, suggesting a two to three week incubation period.

The same infecting organism, Salmonella panama, was recovered from the spinal fluid and stool cultures of the 2 patients. Though blood cultures remained sterile, and though neither child suffered gastroenteritis, the port of entry was most likely the enteron, with subsequent infection of the meninges via the blood.

So many points of similarity suggested a common source of infection for these 2 patients. The state public health department of Michigan later isolated the identical organism from the stools of an attendant in the milk laboratory of the hospital. It seems reasonable to presume that this person was the carrier from whom these infants received their infection.

Routine stool cultures done on all babies who had been in the nursery around this time revealed the presence of a rather widespread epidemic due to Salmonella panama. A large number had mild infectious diarrhea of short duration. Approximately an equal number showed no symptoms. Three such carriers had positive stool cultures for several months after the initial infection.

When roughly tested on ordinary culture mediums, both cultures were found to be resistant to concentrations as high as 20 mg. of sulfathiazole and of sulfadiazine per hundred cubic centimeters. In view of the favorable clinical result obtained, one of us (A. W. F.) again studied the cultures by a quantitative method, as follows: Approximately 500 organisms per cubic centimeter were inoculated into a medium composed of 10 per cent rabbit serum and Tyrode's solution (p_H 7.4) containing 5 mg. of sulfadiazine per hundred cubic centimeters. Appropriate samples were plated out at various intervals and the number of colonies compared with the control tubes to which no drug had been added. Both strains of S. panama were relatively little affected during the early logarithmic growth phase, but by the end of sixteen hours a 50 per cent reduction in the population of one culture (case 1) and an 80 per cent decrease in the second (case 2) was observed in the presence of 5 mg. of sulfadiazine per hundred cubic centimeters. These data suggested that under favorable conditions the organisms were also susceptible to the in vitro action of sulfonamide drugs.

Sulfonamide medication was employed as is recommended by all authorities, at least until the causative organism of purulent meningitis is established. When the etiologic factor was found to be a Salmonella bacterium a review of the literature failed to offer a better mode of therapy. Penicillin seems to have no effect on this group of organisms, and our particular strain grew in the presence of 5 and 10 units of penicillin.

We add these 2 cases of S. panama meningitis to the growing list of Salmonella infections, as we feel that the first patient was definitely cured by the treatment employed and that the second patient was cured of the septic process only to succumb to an internal hydrocephalus, an aseptic pathologic process.

SUMMARY

Two cases of meningitis due to Salmonella panama were observed in infants 3 weeks of age who were born within four days of each other at the same hospital. The source of infection is believed to have been a carrier of this organism who worked in the hospital milk laboratory. The period of exposure ranged from five to thirteen days. The onset of symptoms occurred in seventeen to twenty-three days.

Sulfadiazine was used for periods ranging from fifteen to thirty-four days. One patient survived with this treatment, but the second died of an internal hydrocephalus due to an inflammatory obstruction, though the cerebrospinal fluid remained sterile.

We recommend routine stool cultures on all hospital attendants who come in contact with infants and debilitated patients.

Special Article

This article has been read by the majority of the members of the Council on Medical Service and Public Relations and is published with the approval of the Council for the information that it contains relating to the factors underlying the demand for federal sickness insurance.

E. J. McCormick, M.D., *Chairman.*

HEALTH INSURANCE

AN INQUIRY INTO SOME OF THE FACTORS AND FORCES UNDERLYING THE DEMAND FOR A COMPULSORY SYSTEM

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AND
GERHARD HIRSCHFELD, Director
Research Council for Economic Security
CHICAGO

During the legislative sessions of 1945, more than thirty measures proposing cash sickness benefit plans or compulsory health insurance systems were introduced in twelve state legislatures. Other bills called for studies of health insurance. In Congress a number of bills were introduced providing for some sort of medical care or sickness benefits. No other year has seen such a demand for compulsory health insurance.

Compulsory health insurance, briefly, is a system by which medical and hospital care would be available to all who desire it, the cost being paid by employers, employees and, possibly, government. Compulsion would stem from the fact that everybody would be required to pay taxes regardless of whether or not he sought medical care. Cash sickness benefits refers to a system by which those covered would be entitled to weekly benefit payments in case of illness. The purpose is to make up partly for loss in wages or salaries during such time. A comprehensive system may offer both medical and hospital care as well as cash benefits, and there have been a few such proposals.

Behind the demand for compulsory systems of medical and hospital care or cash benefits, or both, is the belief that present medical treatment is inadequate; that this results in large losses that could be prevented; that an economic barrier exists between the needs of the average patient and the medical services available.[1]

However, more careful inquiry will reveal that the demand for compulsory health insurance has been more consistent and more pronounced in some states than in others. New York, for instance, has had no fewer than twenty-seven health insurance bills introduced in the legislature between 1935 and 1945. Yet New York has far better medical and hospital facilities, as well as provision for social services, than the average state. On the other hand, such states as Mississippi, Georgia, Alabama, Arkansas and the Carolinas, where the need for medical care is most acute, have practically no organized demand for compulsory health insurance.

Who then is responsible for the demand? Is it the sick and the poor who want it because they need it? Is it the government, trying to gain political benefit? Is it organized groups, such as industrial labor? Is it enterprise? What is behind the demand—social pressure, economic conditions, political interests? What is

1. The Debaters' Digest, May 1940.

the need for medical care and what its estimated cost? Is prevalent disease the only problem, or shall attention be given to potential illness? What are some of the basic factors that should be considered in a constructive health program?

How much is known about the actual conditions underlying our national health problem? Should a decision be made now or should more time be given to research and study? While this article cannot give the answers, it attempts to shed some light on the various problems in order that a better view may be obtained on the subject of compulsory health insurance.

HISTORY

The social reform movement early in the century played an important part in proposing state health insurance. It was supported by such "social reformers" as Louis D. Brandeis, associate justice of the Supreme Court of the United States; Lillian D. Wald, head of Henry Street Settlement, New York City; Charles R. Henderson, head of the Department of Practical Sociology, University of Chicago; Edward T. Devine, professor of social economy, Columbia University, and John B. Andrews, secretary of the American Association for Labor Legislation. Another group included economists such as John R. Commons, professor of economics, University of Wisconsin; Henry R. Seager, professor of political economy, Columbia University, and Joseph P. Chamberlain, professor of public law, Columbia University

In 1910 the Russell Sage Foundation sent Frankel and Dawson to study European systems of social insurance. Their report did much to stimulate the movement in this country. In 1911 Brandeis advanced the idea of compulsory social insurance against sickness before the annual meeting of the National Conference on Charities and Corrections. The next year the American Association for Labor Legislation set up a Committee on Social Insurance. This committee, together with one from the American Medical Association, drafted a Model Sickness Insurance Bill in 1915, called the "Standard Bill." It was introduced in the Massachusetts, New Jersey and New York state legislatures.

During the 1915-1921 period, eleven legislative commissions were appointed to study and report on the proposal for state health insurance. Six of these—two from California and one each from Massachusetts, New Jersey, Ohio and Pennsylvania—submitted recommendations in favor of the proposed plan while five—from Illinois, Connecticut, Massachusetts, Pennsylvania and Wisconsin—reported unfavorably. Bills providing for state health insurance were introduced into the legislatures of fifteen states but were defeated in all cases. The "Standard Bill" passed the New York state senate but was defeated in the house. By 1921 the movement had practically ceased and little more was heard of it for over a decade.

In more recent years the first major event stimulating discussion of and proposals for compulsory health insurance was a publication in 1932 of the final reports of the Committee on the Costs of Medical Care. Composed of physicians, social scientists and laymen, this committee had begun its investigations in 1927 with funds provided by the Rockefeller Foundation, the Russell Sage Foundation and other organizations.

In 1934 the American Association for Labor Legislation sent circular letters to individuals over the country asking them to send telegrams to the Secretary of Labor and the President of the United States urging on them the need for state compulsory health insurance. The American Association for Social Security has been the chief sponsor of health insurance in the states. In 1935 it formulated the Model Bill, largely under the leadership of Abraham Epstein.

Since 1935 and including 1945, 102 bills have been introduced into the legislatures of twenty states, with success only in Rhode Island, in 1942. The passage of the National Social Security Act in 1935 was largely responsible for the increased activity. From then on the social insurance movement accelerated, with the subject of health insurance coming in for special consideration. The largest number of bills, previous to 1945, appeared in 1939, when the Wagner Bill was introduced in Congress.

HEALTH SURVEYS

The Committee on the Costs of Medical Care found that for an average day 2 per cent of the working population of the United States were disabled by sickness, with an annual wage loss of $1,000,000,000 in 1928-1929. The people of this country suffer from one to two disabling illnesses per person each year; female workers lose from eight to twelve days per year; male workers seven to nine days each year; school children average seven or more days of illness each year.

TABLE 1.—*Compulsory Health Insurance Bills Introduced in State Legislatures**

State	1935-1944 (10 Years)	1945 (1 Year)	Total	Cultural Ranking (According to H. Odum)
New York	22	5	27	4
California	7	11	18	1
Massachusetts	6	7	13	2
Rhode Island	9		9	12
Connecticut	5	2	7	3
Washington	3	2	5	8
Pennsylvania	4		4	17
Wisconsin	3	1	4	15
New Hampshire	2		2	23
Colorado		1	1	19
Illinois	1		1	6
Michigan	1	2	3	7
Minnesota		1	1	14
Montana		1	1	29
Nebraska	1		1	11
New Jersey		1	1	10
New Mexico		1	1	35
Nevada		1	1	9
Ohio	1		1	20
Oregon	1		1	5
Total	66	36	102	

* As of April 22, 1945
Source Research Council for Economic Security, Chicago 3

This table illustrates the rising trend in the number of compulsory health insurance bills introduced in state legislatures While in the ten year period from 1935 to 1944 the total number of such bills amounted to sixty six, the current year has seen no fewer than thirty six bills introduced in state legislatures An interesting sidelight is provided by the fact that the states ranking highest in cultural traits, that is, in economic and social development, boast the largest number of health insurance bills.

Distribution of services was unequal. Lacking in rural areas, towns and small cities, it was also unevenly distributed among individuals and classes. The 10.3 per cent of the population suffering the largest amount of sickness paid 41.2 per cent of total costs of medical services. The committee concluded that under existing methods of payment it is impossible for 99 per cent of families to set aside a reasonable reserve for medical expense.

Another survey was conducted by the United States Public Health Service in 1935-1936 It aroused much discussion and was partly responsible for the National Health Conference in 1938, composed of 170 delegates

from labor, farming, industry, civic clubs, social work, public welfare, medicine, nursing and hospitals.

The comparison summarized in table 2 shows some of the difficulties encountered in the investigation of the need for and cost of medical care. There is wide differentiation between the income groups, the number

TABLE 2.—*Comparative Summary of Health Surveys in the United States on Sickness and Medical Care*

	California Medical Economic Survey 1933-34	Committee on Costs of Medical Care 1928-31	National Health Survey 1935-36	U. S. Public Health Survey 1928-31
Illnesses per thousand of population	928 Income $1,200-$1,999	910 Income $1,200-$1,999	Not given	823
Disabling illnesses per thousand	492 Income $1,200-$1,999	488	172 7 days and over	492
Hospitalized illnesses per thousand	85 Income $600-$1,199	62 Income $1,200 less	46.7	59
Average days of disabling illness per person	16.30 Males	6.40 Income $1,200-$1,999	9.83	7.70
Cost of medical care per person	$24.33	$22.58	$16.00	Not given
Cost of medical care per family	$79.25	$89.53	$64.00	Not given
Per cent of illnesses receiving medical care	73.9 Income $1,200-$1,999	71.4 Income $1,200-$1,999	81.0	Not given

of hospitalized illnesses, the average days of disabling illness and the cost of medical care. Although four careful surveys have been made, they have not yielded conclusive evidence of the size or definite knowledge of the nature of our national health problem.

PRIVATE PROTECTION

Moreover, these surveys hardly take into consideration two major causes for the increasing demand for compulsory health insurance: first the progress of medical science, second the development of private insurance.

The American medical miracle increased the life span by about fifteen years between 1900 and 1944. New remedies and public health measures have reduced substantially the death rate from typhoid, scarlet fever, whooping cough, tuberculosis, dysentery and malaria, diarrhea and many other diseases. "Without such advances, these nine diseases alone would have taken ten times more American lives during the past forty years than were lost by all the United States armies during our entire history, until 1941." [2] These achievements have been publicized widely and have no doubt been appropriated by the thinking of every individual. From the knowledge of it the demand for modern medical services has been but a small step.

Social insurance probably would not have appeared so conspicuously on the field of social reform had the general concept of insurance not been developed greatly and become known more widely during the last twenty years. The introduction of group insurance, the supplementing of old age and survivors' insurance, the idea of social budgeting have contributed substantially to a greater appreciation of the principle of insurance. Accompanying charts show the amazing growth of such services as health and accident insurance (chart 1) and Blue Cross plans (chart 2) during the last decade. According to the Health and Accident Underwriters Conference, at the end of 1944 more than 40,000,000 persons were covered under some form of health and accident insurance, a fivefold increase over 1934, when about 8,000,000 people were insured. The increase in premium value has kept pace with the increase in coverage. From $69,000,000 in 1919, premium value increased to $525,000,000 in 1944, when benefit payments to policyholders increased in proportion.

Operating in forty-two states with a population of over 110 million, eighty-two Blue Cross plans have 17,500,000 members enrolled under 7,500,000 contracts. This is over 12 per cent of the total population, or nearly 16 per cent of the population in the states covered. It is estimated that hospitals with more than 90 per cent of all nongovernment beds are now enrolled in Blue Cross plans.

Another form of private protection is prepaid medical care, which covers at present between 4,000,000 and 5,000,000 people. Although much remains to be done in developing and perfecting this service, such states as Washington, Oregon, California and Michigan have between 9 and 16 per cent of their populations thus covered. A widely organized system of prepaid medical care would go far toward solving the medical part of our national health program.

Benefit payments on account of sickness and disability by national and international labor unions totaled about $50,000,000 between 1933 and 1944.[3] Fraternal societies have sickness benefit schemes in operation covering more than 4,000,000 members.

These are some of the forms of voluntary protection. Of course, there are many others, such as life insurance, soldiers' insurance, industrial pensions, community chests, homes for the aged, retirement funds, private savings including war bonds and workmen's compensation.

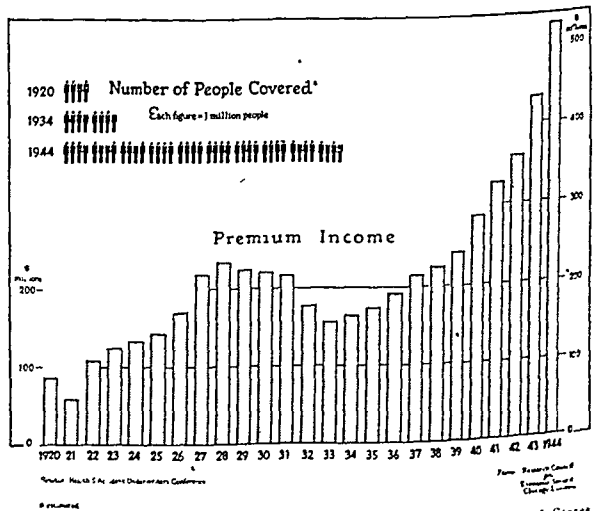


Chart 1.—Growth of health and accident business in the United States 1920-1944.

It is probably no exaggeration to estimate the face value of all private protection close to the aggregate of our national wealth, i. e. in excess of $350,000,000,000. Although this estimate is bolstered by the favorable conditions of the present period of prosperity, it is still

2. Medical Care for Everybody? American Association of University Women, published in 1945.

3. Proceedings of American Federation of Labor Convention

likely that even under less favorable conditions the total amount of private protection would not be less than $250,000,000,000.

Perhaps it would be natural to expect the demand for compulsory health insurance to go down as the amount of private insurance protection goes up. But this expectation is not fulfilled. Present trends do not

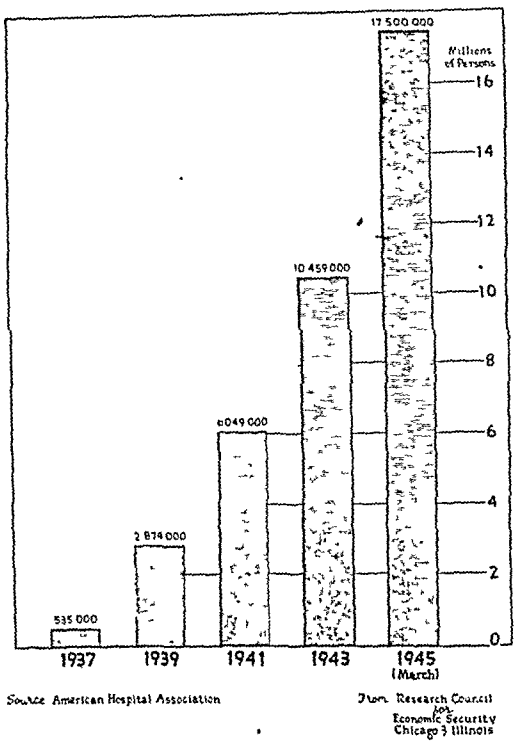


Chart 2.—Enrolment in Blue Cross plans, 1937-1945.

seem to support this contention. The demand for compulsory health insurance has never been louder or more insistent. Yet the amount of private protection has never been greater. The implication is that the demand is not guided primarily by the medical needs and that even a perfect system of private coverage would not still the demand for a compulsory system.

PUBLIC OPINION

While in the end the public will decide what form of health insurance the country shall have, in the actual debate the public has remained in the background. From the standpoint of organized expression it may be said that the line-up of groups favoring or opposing compulsory health insurance has changed little during the last thirty years. Generally in favor are organized labor, the reform groups, philanthropic organizations, the Social Security Board and other groups. Opponents to a comprehensive compulsory system of health insurance under federal administration are found among insurance companies, manufacturers, commercial organizations, the medical profession and those responsible for the entrepreneurial system and, beyond that, dependent in their operations on the principles of free and individual enterprise.

It is difficult to form an exact conclusion on what the public thinks of the problem of health insurance. Public opinion polls would indicate that the public favors health insurance. However, this depends on the form in which the question is submitted. If it emphasizes benefits, public opinion favors health insurance. But when the question emphasizes the financial cost, the necessary tax burden and the economic consequence in general, the public seems to be less sure about the desirability of a compulsory system.

That public thinking on the matter is closely allied with economic conditions is shown in the accompanying chart. The number of articles taken from the "Reader's Guide to Periodical Literature" from 1932 to 1944 shows that the interest in health insurance rises considerably in a period of depression and leads up to legislative action. This is clearly expressed in the line from 1933 to 1934, the peak of which is followed by enactment of the Social Security Act in 1935. Again, from 1937 to 1938 the line rises and leads up to the extension of the Social Security Act in 1939. Since we have had the Beveridge plan, the Delano Report, the Wagner-Murray-Dingell Bill, and other recommendations for social security legislation, the line is rising without a break.

NEED FOR MEDICAL CARE

Notwithstanding the large amount of voluntary protection against illness, there is no disagreement among the advocates of compulsory health insurance, as well as the opponents, as to the need for better medical care. The disagreement is about the form, the administration, coverage, benefits and many other details. Moreover, the term "need for medical care" is by no means understood alike by all concerned. For one thing, complete statistics on the extent of disease, prevalent and potential, are lacking in practically every one of the forty-eight states. For another, the need for medical care is relative, changing with economic circumstances, physical

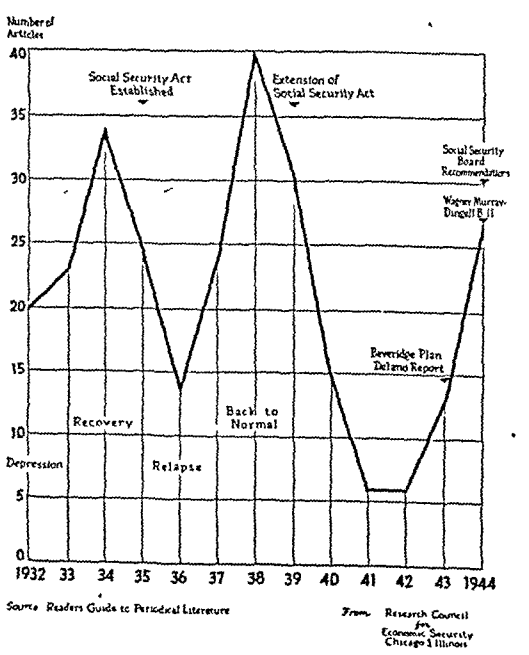


Chart 3.—Number of articles in periodicals on economic and political aspects of medical care, 1932-1944

conditions and personal attitudes. A man working on a farm may think nothing of a cold that bothers him for a few days. He may keep right on working. In contrast, a woman living in the city may be bothered so much by a cold that she feels obliged to consult a physician or even go to a hospital. What is the absolute

need for medical care in the one case and in the other? Two persons suffering from the same kind of disease but possessing different degrees of intelligence may go about their treatment in different ways. The well informed man may seek medical consultation early and find relief quickly. Another may postpone action until his case not only requires a long period of hospitalization but invites complications calling for more elaborate and expensive treatment than was justified originally.

In addition to this problem which concerns the individual there are other problems which go beyond the personal aspects. The health problem differs in virtually every state. In California, communicable diseases account for a major share of reported illnesses. In 1940 chickenpox, whooping cough, mumps, measles and other contagious diseases accounted for about two thirds of all cases reported. In Mississippi influenza, syphilis, malaria, gonorrhea and dysentery are high on the list of reported illnesses. Mississippi's health problem is largely a Negro problem, with illness rates higher among Negroes than among white persons, and death rates from all diseases except cancer, heart disease and suicide between 20 and 50 per cent higher than those for white persons. In New York cancer, syphilis, tuberculosis and pneumonia are the important health problems. In Wisconsin, again, epidemic illness, chickenpox, measles and mumps claim the largest share of reported illnesses.

SANITATION AND HYGIENE

This contrast in leading causes of illness makes it difficult to analyze the health problem of our nation and makes it dangerous to generalize on the requirements for better medical care. But there is still another problem that should be given serious consideration. It is the lack of sanitation and hygiene as a major contributing factor to disease.

Taking the country as a whole, nearly 50 per cent of the population is in need of sewerage systems.[4] In a state like Mississippi, 78 per cent of the population are without benefit of sewerage, followed by Arkansas and Idaho with 74 per cent, South Carolina with 72 per cent and Utah with 71 per cent. In the matter of water supply, 12.5 per cent of all rural dwellings lacked water supply within 50 feet of the house.[5] North Dakota with 39 per cent, New Mexico with 30 per cent, Arizona with 27 per cent, South Dakota with 26 per cent and Montana with 25 per cent headed the list.

An equally unfavorable picture is found in the field of housing. Before the war 18.3 per cent of all dwelling units throughout the country were substandard buildings, i. e. in need of major repairs. Arkansas (39.1 per cent), Alabama (37.0 per cent), Oklahoma (34.5 per cent), North Dakota (33.7 per cent) and Mississippi (33.6 per cent) were the five leading states in this respect.[6] It is widely agreed that lack of sewerage, water supply, sanitary housing facilities and equipment breed disease and probably account for a major share of the large amount of potential disease, little of which is reported or dealt with. Nevertheless here is a very real and vital part of our national health problem which must be taken into consideration if a satisfactory and lasting solution of that problem is to be found.

4. National Inventory of Needs for Sanitation Facilities: III. Sewerage and Water Pollution Abatement. Pub. Health Rep. 59: 857 (July 7) 1944.
5. Atkins, C. H.: National Inventory of Needs for Sanitation Facilities: Rural Sanitation, Pub. Health Rep. 59: 969 (July 28) 1944.
6. U. S. Census, Housing, 1940, vol. 2, p. 73.

COST

Even if the exact nature and extent of the need for medical care were known, it still would not be enough to set up a definite health insurance program. The next step would be to ascertain the cost of a program developed from this information. Obviously, since the exact need is not known, neither can be the cost. In spite of this lack of knowledge, the advocates of compulsory health insurance have not hesitated to make definite recommendations.

According to the Insurance Economics Society of America fourteen compulsory health insurance measures were introduced in the legislatures of six states in 1945. Of these, four were compulsory health insurance measures providing medical care, hospitalization and other services to the employed and their dependents, as well as cash benefits to the employed during disability. Tax rates proposed varied from 2 per cent to 4 per cent of the payroll up to $3,000. The other ten proposals provided medical care, hospitalization and other services only. Tax rates varied from 2 per cent of the payroll up to $3,000 to 3 per cent of the payroll up to $5,000.

In other words, it is apparently assumed that a payroll tax of 3 per cent or less would be adequate. But it is a question whether this rate would be sufficient to cover the cost of a comprehensive system of medical care, hospitalization and cash sickness plans.

In explaining his "Model Bill," Abraham Epstein, one of the best authorities on social insurance in the United States, wrote as follows:

> Available data indicate that an amount equal to about 6 per cent of the wages of all insured persons is necessary for a sound health insurance program. Of the total, 4.5 per cent is needed for the health services with adequate remuneration to the medical professions, and 1.5 per cent for the cash benefits.

In connection with the proposed system of medical and hospital insurance in California, the California State Chamber of Commerce estimated "that the cost of care which would be made available under the governor's bill would require an average expenditure of 4.5 per cent of income."[7]

The Heller Committee of the University of California, which made detailed studies of incomes and expenditures of families in the Bay Region, estimated that a minimum of 5 per cent of income is needed for medical service even if such service is purchased at minimum cost through a group prepayment plan.

In Mississippi the cost of compulsory health insurance as of 1940 has been estimated by the Research Council for Economic Security at about $29,000,000 a year. This would require a tax of more than 6 per cent of all income payments received by the people in the state. If administrative costs were added, a tax of 7 per cent would probably be necessary.

In New York State, which has a comparatively high per capita income, it is estimated that a 5 per cent payroll tax would come close to financing a system of compulsory health insurance. However, if the cost of medical services should be higher than when the individual bears the cost himself, a 6 per cent tax would probably be necessary.[8]

Legislative bills in Wisconsin proposed a 4 per cent tax with which to finance a compulsory health insurance system. Before the war this rate would have yielded $28,000,000. If 10 per cent should be allowed for administrative costs and 5 per cent for reserve, the net

7. Health Insurance for California? February 1945, p. 26.
8. Research Council for Economic Security.

amount available for benefit payments would be about $23,000,000. In contrast, the amount needed for benefits in 1940, on the basis of a $20 annual medical cost per person, would have been over $32,000,000. Apparently a tax rate of between 5.5 and 6 per cent would be required to finance a comprehensive health insurance plan.[8]

From this brief survey of the cost of proposed health insurance plans it is evident that in most cases a 3 per cent payroll tax is inadequate. A more realistic appraisal would point to a tax rate of between 5 and 7 per cent of payrolls, and even this rate would only be sufficient to finance a system of medical and hospital care. Additional appropriations would be required for the financing of a cash sickness plan such as is in operation in the state of Rhode Island and as has been proposed in other states. There is good reason to believe that the payroll tax rate required for the financing of a system of compulsory hospital and medical care plus a cash sickness plan would be close to 7 per cent. It is against such a rate of taxation that the true cost of a compulsory system of health insurance should be determined and the effects of that cost on the state economy, on wages and enterprise, on investment, on buying power and on other factors should be evaluated.

Moreover, cost factors are elastic. Expenditures under a compulsory health insurance system are probably higher in periods of depression than of prosperity. When employment is abundant and the wage level high, people do not take time out to be sick unless they have to; it loses them substantial income. But when people, through lack of employment and low wages, risk little or no loss of income by staying home and claiming health or sickness insurance, the claim rate rises substantially.

Experience both at home and abroad shows that the claim rate goes up as prosperity goes down. This is not to imply that people submit claims under false pretenses. However, it is a statistical record, viz. the recent history of the Cash Sickness Plan in Rhode Island as well as the much longer experience of compulsory health insurance in Germany, Great Britain and other countries; also in the public works experience in our own country during the thirties that people take advantage of benefits offered under a compulsory system. If the records do not necessarily indicate that people claim benefits to which they are not entitled, nevertheless they show that "opinionated sickness" makes for a tremendous cost of compulsory health insurance. No doubt this trend is, at least in part, responsible for the fact that in Germany expenditures of the compulsory sickness insurance system rose from 12.16 reichsmarks per member in 1885 to 93.64 reichsmarks in 1939, while in Great Britain they rose from £0/17/10 in 1912 to £2/6/– in 1927. There is little reason to assume that a compulsory system of health insurance in our own country or in any state would not follow a similar pattern.

It is a dangerous practice to rely too much on a fixed rate of taxation. While a rate can be fixed, the amount of revenue cannot. A 3 per cent payroll tax levied under conditions of full employment and high wages yields a return substantially larger than the same tax would yield in a period of widespread unemployment and low wages. In determining revenue one must bear close watch on the wide fluctuations of economic activity in general and of unemployment and wages in particular.

THE PART OF LABOR

Our national health problem, then, is not a simple one. However, the various difficulties have not deterred the interested parties from advancing their compulsory health insurance proposals at every opportunity, in the belief that this will go a long way toward solving that problem. In doing so perhaps they have not been guided primarily by the need for medical care or the cost or the fact that there exists a good deal of voluntary protection. Apparently other considerations have played a decisive part in the demand for compulsory health insurance. Where does that demand originate? And what are the times and conditions most conducive to it?

Periods of depression which influence the demand for compulsory health insurance also contribute greatly to the growth of organized labor. Within ten years, membership in the two leading unions, the American Federation of Labor and the Congress of Industrial Organizations, has risen from less than 3,000,000 to more than 13,000,000 (chart 4). Does a connection

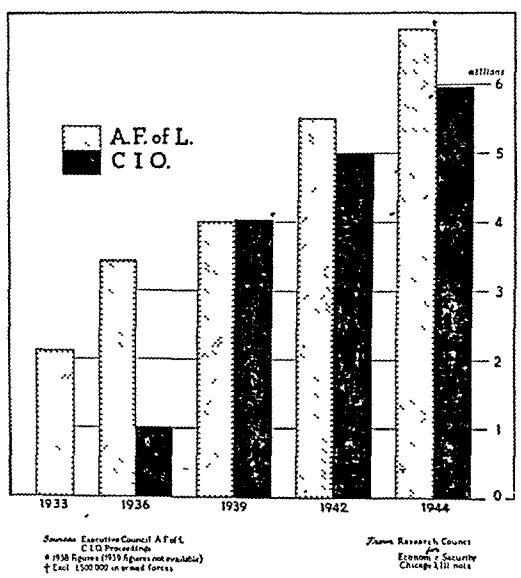


Chart 4.—Membership of labor unions in the United States, 1933 1944.

exist between the growth of organized labor and the increasing demand for compulsory health insurance? If the idea seems farfetched, look at the development of the demand in several states.

In California the period of 1912 to 1920 was marked by economic instability. Soon after the turn of the century, labor interests became increasingly active. From 1901 to 1907, and again from 1909 to 1911, the Union Labor Party elected the mayor of San Francisco. Socialists and Communists began to enter the labor unions in force, and the leadership inclined to be radical. The Industrial Workers of the World gained in power and influence. Labor union membership amounted to 45,000 in 1910 and rose to 69,000 in 1915 and to 104,200 in 1920. Beginning with the Initiative and Referendum Act in 1911, social legislation continued to increase, with four major social welfare acts adopted in 1913.

The depression, beginning in 1929, struck California severely. The index of employment declined from 100 in 1929 to 75 in 1931 and to 62 in 1934. A considerable burden was added to the state economy by the large migration of victims of the depression from other

states. Between 1932 and 1936, it is estimated, no fewer than 300,000 migrants entered the state.

Labor union membership, which at the beginning of the depression had difficulty holding its own, increased rapidly from 1935 on. In that year it amounted to 102,000 but by 1940 had climbed to 650,000. The period of depression was characterized by the severity of organized strikes. The Cannery and Industrial Workers Union struck in 1933, and the following year the International Longshoremen's Union called a strike in San Francisco with 25,000 workers involved. Socialist and Communist influence was strongly felt, especially in the Democratic party, which, under the leadership of Governor Olson, sponsored the compulsory health insurance proposals of 1939. Between 1929 and 1936 four important social welfare acts were passed by the state legislature. One group of which all political leaders must take account in California is that of the aged, who during the last twenty years or more have proved a most powerful source of political activity.

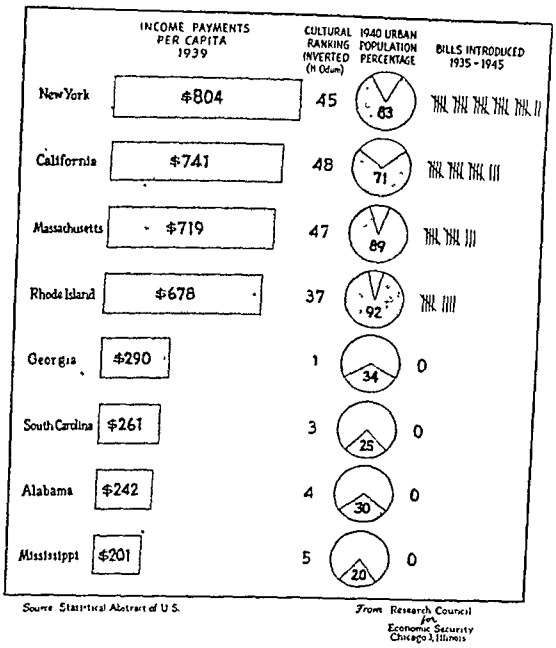


Chart 5.—Economic and social progress versus the demand for health insurance.

All these groups, the unions, the aged, the Socialists, the Communists, combined to create, between 1933 and 1938, some of the most flamboyant and utopian proposals that have ever appeared on the American scene. In 1933 the Utopian Society advocated a perfect society to the slogan of "A New Economy of Abundance." In 1933-1934 cooperative groups and societies expanded considerably, culminating in the barter scheme of "Tradex." Technocracy in 1934 came out with a highly artificial scheme of technology and finance. Between 1934 and 1936 the E. P. I. C. scheme advocating state socialism flourished, nominating a candidate for governor. Launched in 1934, the Townsend movement proposed a monthly payment to the aged. The "Ham-and-Eggs" movement proposed a weekly bonus, polling 1,000,000 votes in the 1938 election.

New York State has seen perhaps more attempts to introduce compulsory health insurance than any other state. During the last decade twenty-seven bills have been presented in the state legislature. The location of the national headquarters of many reform organizations in New York City has been probably responsible for this activity. But the strongest proponent has been the New York State Federation of Labor. In 1935 it had 850,000 members—exclusive of the four railway brotherhoods—organized in eight hundred unions, city labor bodies and district trade councils. About 55 per cent of the membership is in New York City. The State Federation maintains a permanent legislative committee, which works with about twenty labor newspapers throughout the state. In recent years the C. I. O. has entered the scene with equally vigorous activity.

In contrast to California and New York, Mississippi has seen little demand for compulsory health insurance in spite of the obvious need for better medical care. No bills calling for state health insurance have appeared in the legislature, nor has any organized group advocated such action. Standard social legislation such as has appeared in other states has not been enacted in Mississippi. If there had been any organized groups or labor unions in the state there probably would have been more legislative activity favoring compulsory health insurance. The absence of labor or group action is due to the weakness of organized labor. There are only a few local unions. The American Federation of Labor has no state branch.

As may be seen from comparison between the highly vocal demand for compulsory health insurance in California and New York, on the one side, and the absence of any organized demand in Mississippi, on the other (chart 5), certain conditions help or hinder the development of such a demand. These conditions make themselves felt regardless of prosperity or depression, being a result of the state's economic and social development. In Mississippi, for instance, a predominantly rural state with a large Negro population, conditions do not favor the organization of groups or unions, even with the stimulus that comes from a period of depression. In California and New York, however, conditions always favor collective action, even in times of prosperity.

FACTORS CONDUCIVE TO DEMAND

California's population is 71 per cent urban, the state having seven cities with a prewar population of 100,000 or over. This makes for congregation and collective action. With its nearly 300,000 wage earners in manufacturing industries (1939) it ranks among the ten leading states. This facilitates labor organization. In addition, since 1940 about 1,300,000 newcomers have settled in California, working mostly in shipyards, aircraft factories and other industries.

With a per capita income of $741 in 1939, against a national average of $539, California is one of the wealthiest states in the Union. This makes for extensive development of modern medical service and equipment and spurs the appetite for even better facilities. Finally, California's population is marked by a high degree of mobility caused by five principal factors: extensive foreign trade, large tourist movement, influx of migratory workers, the climate attracting many older people and the lure of Hollywood. This mobility makes for novel, sometimes startling, economic ideas and social experimentation.

New York has likewise an abundance of factors conducive to the demand for compulsory health insurance. In view of the fact that New York has by far the largest number of manufacturing establishments and of wage

earners, as well as the highest amount of wages and products, it is no surprise that labor organization is perhaps more highly developed in this than in any other state. In urban development New York ranks high, having twelve cities with over 100,000 population (1940). New York City, especially, probably yields more instances of collective action and pressure than any other city.

In per capita wealth New York outranks every other state with the exception of New Jersey. Accordingly, medical services and facilities have been developed to the highest degree and in turn have provoked the desire for still further improvements. Finally, the state has the most cosmopolitan population of any state. Before the war less than 80 per cent of its population was native born against more than 90 per cent for the country as a whole. The substantial share of foreign population, apart from the large proportion of first generation Americans, is undoubtedly responsible for the introduction of many social ideas partly copied from foreign countries. *Mississippi is the antithesis for both California and New York.* In industrial development it ranks among the lowest of all the states. There are virtually no large cities; hence there is little opportunity for mass action. In per capita income it stands at the very bottom. Therefore the development of medical facilities compares unfavorably with that of other states and is largely dependent on out of state help. Owing to the absence of industrial wealth and opportunity and with a population half white, half Negro, few foreign ideas enter the state, and those that do are instantly discouraged.

CONCLUSIONS

The demand for compulsory health insurance, it may be concluded, is promoted most powerfully by organized collective action, especially by organized labor. However, the opportunity for such action is not always present. It is easier to organize in depression than in prosperity, easier in industrial than in agricultural states, easier in large cities than in small towns, easier in areas where medical service and facilities are well organized.

We are then in a position to summarize as follows:

The most powerful single force responsible for the origin of the demand for compulsory health insurance is organized labor.

The time most conducive for this demand is a period of depression.

The place most conducive for formulation and pressing of such demand is the large city.

Apparently, the opportunity to organize the demand is more important than the prevalence of the need for medical care. The evidence points to the probability that, contrary to popular belief, the legislative proposals for compulsory health insurance are based not so much on social needs as on political interests, and that the ability on the part of labor to organize and press the demand, rather than the concern about the state of health, is the primary consideration.

Organized labor is strongest in the most highly industrialized and urbanized sections of the country. It is only natural that labor-promoted plans for compulsory health insurance are designed chiefly in the interests of industrial labor and are modeled to fit the conditions prevailing in highly developed areas. But these conditions are not typical of the country at large, nor are they the major part of our national health problem. Therefore it may be said that such plans hardly promise an adequate solution of that problem, which is made up of many different factors apart from those that characterize conditions in the large cities.

Illness apparently is not chiefly responsible for the demand for compulsory health insurance. If it were, recommendations would start in the medically least progressive states. However, they originate at the opposite end of the scale, where medical care and social services are most highly developed. The proposed recommendations do not and apparently are not designed primarily to solve the health problems in rural areas, economically underdeveloped regions and among underprivileged groups.

There are three principal aspects of our national health problem:

(*a*) The need for medical care and hospital facilities where none now exist. This is largely a problem of constructing hospitals and of organizing medical services, both of which could probably be realized more effectively on a state or local than on a federal scale.

(*b*) *The need for better sanitation and hygiene.* This is chiefly a public health project and one for state and local government to put into operation, probably with the help of federal subsidies.

(*c*) The need for economic development which would enable more remunerative employment for the people. This applies especially to predominantly agricultural states such as Mississippi, Alabama, Arkansas, Georgia and the Carolinas. It would mean crop rotation, improved irrigation, more industrialization, better education, vocational training and the development of foreign trade.

How, then, can the federal government cooperate in improving, directly or indirectly, the health of the people? The health problems of Mississippi are similar to those of Arkansas, Missouri, Kentucky, Tennessee, Georgia and Alabama. They constitute a regional rather than a national problem. Therefore, participation on the part of the federal government may well be confined to financial subsidies, of which Mississippi has been a recipient in the past, and to the construction of hospitals, clinics and other medical facilities. The important difference between such an arrangement and a federal system of compulsory medical care and hospitalization lies in the fact that the all important administration of these services would not be monopolized in the hands of the federal government but could be assumed by private enterprise and, if needed, by local government units. A voluntary setup, while making full use of federal resources, would neither interfere with the health and medical conditions in other states nor attempt to impose on a state like Mississippi provisions and benefits adapted to urbanized and industrialized regions and not designed for the special conditions of the agricultural South.

State and local authorities can give full consideration to local requirements, whereas the federal government cannot. Moreover, the authority of the state would be limited as against the practically unlimited power of government authority if administration of social services was concentrated in federal hands. Finally, a compulsory system of health insurance would be kept within the limited resources of the state, with regard both to cost and to political exploitation, whereas it would be virtually without limitation on a federal basis. If necessary, the restricted financial resources of the state could be supplemented by federal aid.

Previous pages have indicated the growth in volume and extent of protection provided by private

enterprise. No doubt this could be further promoted by common and concerted action among the various carriers—insurance companies, medical organizations, nonprofit hospital plans, industrial societies and mutual benefit associations. There is little reason to doubt that an agreement on collective action would go far in making possible extended protection against sickness at substantially lower cost than is possible under separate plans.

All these considerations emphasize the need for careful deliberation with regard to current or contemplated proposals for compulsory health insurance. Another important factor is the lack of factual comprehensive information. In view of the absence of specific data as to the exact need for medical care, any legislative proposal could hardly be based on anything more substantial than general ideas obtained from overall estimates. As a result, benefits are not determined on local requirements. The exact cost is not known. The rate of taxation cannot be fixed with any degree of accuracy. A reliable and complete survey of the health problem of the states and of the nation has never been made. Until it is made, and until more information is available, not only as to the cost of compulsory systems but of the effect on such widely divergent factors as government, taxes, enterprise and human nature, care should be taken by the citizen and his legal representatives to weigh carefully the pros and cons before they decide what they want in the way of health insurance for themselves, for their children, for their state and for their nation.

176 West Adams Street.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following reports. HOWARD A. CARTER, *Secretary.*

"AN APPRECIATION"

The Council on Physical Medicine desires to take this opportunity to express its feelings of gratitude and appreciation for the services of the following consultants, whose assistance in carrying out the work of the Council has been given so freely during the past year: Drs. Milton B. Cohen, Clement J. De Bere, Hart Fisher, K. G. Hansson, John S. Hibben, Alexander Hollaender, Arno B. Luckhardt, S. L. Osborne, Perry Pepper, Scott M. Reger, Bernard D. Ross, Henry Schwerma, Ralph Waters and W. F. Wells.

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Educational Work.—Drs. Frances Baker, Robert L. Bennett, Benjamin Boynton, Earl C. Elkins, F. H. Ewerhardt, Richard Kovacs, Fred B. Moor, W. H. Northway, William Schmidt and Walter M. Solomon (in service).

Ophthalmic Devices.—Drs. Thomas D. Allen, Charles A. Bahn, S. Judd Beach, Conrad Berens, Frederick Carl Cordes, Alfred Cowan, L. T. Post and Avery C. Prangen.

Artificial Limbs.—Drs. Harry E. Mock, S. Perry Rogers, Paul Steele and Philip Wilson; Messrs. McCarthy Hanger Sr., W. E. Isle, J. B. Korrady, Joseph Spievak and David E. Stolpe.

Respirators.—Drs. Walter B. Cannon, Edward L. Compere, Charles McKhann and James Wilson.

Electrocardiographs.—Drs. A. R. Barnes, George Fahr, Harold E. B. Pardee, William D. Stroud, Carl J. Wiggers and Frank H. Wilson.

Roentgen Therapy.—Drs. William Edward Chamberlain, Arthur Carlisle Christie, Edwin Charles Ernst, Gioacchino Failla, Fred Murchison Hodges, John Thomas Murphy, deceased, Robert Reid Newell, Eugene Percival Pendergrass, Ursus Victor Portmann, Lauriston S. Taylor and J. L. Weatherwax.

Contraceptive Devices.—Drs. Nicholson J. Eastman, William W. Greulich, Lieut. Comdr. Joseph Hughes, Dr. A. C. Ivy, Prof. Walter J. Meek and Dr. Ephraim Shorr.

Occupational Therapy.—Drs. Raymond Allen, Winfred Overholser, Col. Howard A. Rusk, Drs. William Stroud and Francis Trudeau.

YOUNG RECTAL DILATORS NOT ACCEPTABLE

Manufacturer: F. E. Young & Company, Chicago.

The Young Rectal Dilators consist of plugs of graded sizes designed to stretch the external sphincter muscle of the anus. They are made of a plastic material.

The Dilators are intended to be used by the patient following the instruction of a physician. The firm claims the Dilators are useful in the treatment of chronic constipation and that they are sold only on a physician's prescription.

The firm submitted a list of physicians who have had experience with the Dilators and also eighteen letters from physicians who have prescribed the device. The evidence presented in these letters is merely a description of the writer's experience and is devoid of scientifically controlled data.

The Council's investigator reported that the Young Rectal Dilators were dangerous and that they are likely to cause harmful effects when used by the patient. Examination of the information which the firm submitted does not reveal acceptable scientific evidence to substantiate their value. The Council voted, therefore, not to accept the Young Rectal Dilators, because of the lack of adequate evidence of their therapeutic efficacy.

PARAVOX MODEL VV2 RADIO TUBE HEARING AID ACCEPTABLE

Manufacturer: Paraphone Hearing Aid Company, Inc., 2056 East Fourth Street, Cleveland 15.

The Paravox Model VV2 is a two tube instrument with transmitter, amplifier and batteries in one case. A single cord attaches to the case, connected to which is a crystal receiver.

Physical dimensions:

Case: 5 1/16 by 2 5/16 by 1 1/8 inches.

Receiver: Either 1 inch diameter or 3/4 inch diameter crystal.

Weight: Case (containing batteries, transmitter and amplifier) 11 ounces.

Current consumption:

A battery (1½ volts) 68 milliamperes.

B battery (30 volts) 0.5 milliampere.

Battery drain is independent of volume control setting.

Acoustical gain for speech: With 1 inch diameter crystal receiver and full volume, 31 decibels. This gain represents the average gain for 3 persons, each of whom had losses of from 40 to 50 decibels for air conduction from 256 to 2,048 cycles. These persons perceived speech through a high quality sound system at an average level of 31 decibels less intensity with the hearing aid than without it.

Acoustical gain for pure tones:

Frequency	250	500	1,000	2,000	3,000	4,000	5,0
Full gain in decibels (large receiver)	16	30	42	43	34	26	3

These measurements were obtained with an artificial ear. The hearing aid was mounted on a body baffle. The foregoing values do not indicate absolute sound pressure values but indicate the amplification efficiency of the instrument at the frequency levels shown.

Physical and mechanical features: The amplifier and batteries are contained in a single case of black enameled metal. The combined volume and "on-off" switch consists of a knurled disk at the top of the case. The case is slightly larger and heavier than the conventional tube hearing aid transmitter case, since it also contains the batteries. The total weight is less than that of the conventional instrument, which has separate cases for the transmitter and batteries.

Performance: This instrument operates in an entirely satisfactory manner. There is a minimum of inherent amplifier, case and cord noise.

Recommendation: The Council on Physical Medicine voted to include the Paravox Model VV2 Radio Tube Hearing Aid in its list of accepted devices.

PARAVOX MODEL VV3 RADIO TUBE HEARING AID ACCEPTABLE

Manufacturer: Paraphone Hearing Aid Company, Inc., 2056 East Fourth Street, Cleveland 15.

The Paravox Model VV3 is a three tube instrument with transmitter, amplifier and batteries in one case. A single cord attaches to the case, connecting to a crystal receiver.

Physical dimensions:

Case: 5 1/16 by 2 5/16 by 1 1/8 inches.
Receiver: Either 1 inch diameter or 3/4 inch diameter crystal.
Weight: Case (containing batteries, transmitter and amplifier) 11 ounces.

Current consumption:

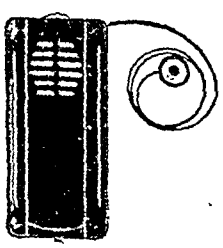
A battery (1½ volts) 65 milliamperes.
B battery (30 volts) 0.6 milliampere.
Battery drain is independent of volume control setting.

Acoustical gain for speech: With 1 inch diameter crystal receiver and full volume, 44 decibels. This gain represents the average gain for 3 persons, each of whom had losses of from 40 to 50 decibels for air conduction from 256 to 2,048 cycles. These persons perceived speech through a high quality sound system at an average level of 44 decibels less intensity with hearing aid than without it.

Acoustical gain for pure tones:

Frequency.....	250	500	1,000	2,000	3.000	4,000	5,000	6,000
Full gain in decibels (large receiver)....	29	46	51	55	46	45	29	11

These measurements were obtained with an artificial ear. The instrument was mounted on a body baffle. The foregoing values do not indicate absolute sound pressure values but indicate the amplification efficacy of the instrument at the frequency levels shown.



Paravox Model VV3 Hearing Aid

Physical and mechanical features: The amplifier and batteries are contained in a single metal case, finished with smooth black enamel. The combined volume control and "on-off" switch consists of a knurled disk at the top of the case. The case is slightly larger and heavier than the conventional tube hearing aid transmitter case, since it also contains the batteries. The total weight is less than that of the conventional instrument, which has separate cases for the transmitter and batteries. The 1½ volt A battery (small or size C flashlight battery) and the 30 volt B battery (special small size hearing aid battery) cannot give as many hours of service as can be anticipated from the larger size batteries usually used with three tube instruments.

Performance: The Paravox Model VV3 operates in an entirely satisfactory manner. There is a minimum of inherent amplifier, case and cord noise.

Recommendation: The Council on Physical Medicine voted to include the Paravox Model VV3 Radio Tube Hearing Aid in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES-1945 OUT IN AUGUST

Considerable delay has been experienced in preparing the bound volume of New and Nonofficial Remedies-1945. The printing of the final forms is now in progress, and, when the binders have finished, the book will be available, it is hoped, some time in August. Difficulty in procuring paper, scarcity of personnel and other causes have contributed to this unavoidable delay. It is especially regretted that these circumstances have postponed the distribution of the paper bound copies which are given each year to one class of each accredited medical school.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its actions will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

SCARLET FEVER STREPTOCOCCUS TOXIN, TANNIC ACID PRECIPITATED.—A sterile buffered solution containing in suspension a tannic acid precipitate of scarlet fever toxin and 0.4 per cent phenol as a preservative.

Actions and Uses.—This tannic acid precipitated toxin is claimed to permit slower absorption and a prolonged antigenic stimulus which permits a reduction in the amount of toxin and size of dose as compared with former methods of immunization.

Dosage.—Children receive three intracutaneous injections of 0.1 cc. (dose 1, 750 STD/0.1 cc.; dose 2, 3,000 STD/0.1 cc.; dose 3, 10,000 STD/0.1 cc.) at two week intervals. Some may need a supplemental dose after a four week interval.

Adults may receive 500, 2,000, 6,000 and 10,000 STD at two week intervals. Each vial should be well shaken before use. The toxin should not be used beyond expiration date on label or if it does not resuspend completely on shaking.

Preparation.—Scarlet fever toxin is prepared from cultures of hemolytic streptococcus, N Y-5 (Dochez) strain, and treated with ammonium sulfate. The ammonium sulfate precipitate is dissolved in sterile saline solution, buffered at p_H 6.6 and preserved with phenol. Samples of the toxin which meet the requirements of the National Institute of Health are further treated by the addition of sterile diluent and 0.5 per cent solution of tannic acid.

The tannic acid precipitated toxin is washed free of tannic acid and suspended in buffered saline solution containing 1 per cent acacia. The suspension is assayed for skin test dose potency and diluted suitably for market packaging. The finished product is preserved with 0.4 per cent phenol and complies with the requirements of the National Institute of Health of the United States Public Health Service.

WYETH INC., PHILADELPHIA

Scarlet Fever Streptococcus Toxin for Immunization, Tannic Acid Precipitated: 0.5 cc. single immunization vials and 2 cc. 10 immunization vials packaged in units of three vials (children) contains respectively in each 0.1 cc. 750, 3,000 and 10,000 skin test doses; and in units of four vials (adult) containing in each 0.1 cc. 500, 2,000, 6,000 and 10,000 skin test doses. Also 0.5 cc. single and 2 cc. ten dose vials containing a supplementary dose for children and adults, representing in each 0.1 cc. 10,000 skin test doses. Preserved with phenol 0.4 per cent.

COD LIVER OIL WITH VIOSTEROL (See New and Nonofficial Remedies, 1944, p. 630).

The following additional dosage form has been accepted:

MEAD JOHNSON & COMPANY, EVANSVILLE, IND.

Cod Liver Oil with Viosterol: 473 cc. Each 1 Gm. has a potency of not less than 1,800 U. S. P. units of vitamin A and of not less than 400 U. S. P. units of vitamin D.

PERCOMORPH LIVER OIL (See New and Nonofficial Remedies, 1944, p. 636).

The following additional dosage form has been accepted:

MEAD JOHNSON & COMPANY, EVANSVILLE, IND.

Capsules Oleum Percomorphum with Other Fish Liver Oils and Viosterol: 83 mg.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - Chicago 10, Ill.

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SATURDAY, JULY 21, 1945

THE CONSTRUCTIVE PROGRAM FOR MEDICAL CARE

On June 22 the Council on Medical Service and Public Relations of the American Medical Association, meeting with the Board of Trustees, developed a program for the extension of health and medical care in the United States, published elsewhere in this issue. This program is so direct in its statements of objectives to be achieved that it requires little interpretation. By it the Association supports improvement in nutrition, housing and living conditions that are fundamental to good health. Again it places the American Medical Association behind the extension of qualified public health and preventive medical service. The program recognizes that plans for insurance against the costs of hospitalization on a voluntary basis have now been sufficiently developed to warrant support, although some controversial questions have not yet been satisfactorily settled. The care of the indigent, for which there are no suitable provisions under existing or proposed national or other compulsory sickness insurance plans, may by new technics be incorporated into voluntary sickness insurance plans.

Fundamental to a scientific plan for meeting needs for medical care is the scientific survey which determines the existence and scope of such needs. This fact is recognized in the proposals that surveys be made to determine these needs and that federal aid be given where needs are demonstrated, with the understanding that administration and control will be under local auspices. Scientific also is the proposal for continuous surveys of all plans leading toward their extension and improvement as new needs are shown.

The final measures in this program relate to problems associated with the war and the situations created by military service. More than 60,000 physicians have been involved in military and other government services, while less than 90,000 physicians have tried to meet the needs of the civilian population. On these civilian physicians has rested a great burden. Every one now agrees that discharge of physicians from the armed services as rapidly as possible is necessary for the maintenance of medical care of the quality that has prevailed in this country. Associated with such discharge must come relocation and redistribution of physicians, since the needs of various communities have been modified by conditions related to the war. Certainly the desires of the men who have given so greatly of themselves both to the men in the armed services and to the civilian population during the war years merit consideration. It would be unfair to force revolutionary changes in medical practice on these physicians while they are away from their homes and have not had opportunity to voice their opinions. This applies equally to the 12,000,000 men and women who have fought to preserve the American form of government.

The needs of medical education have been told repeatedly and are again emphasized in this constructive program. Unless plans provide for a sufficient number of young men and women in the premedical curriculum, the nation will face a desperate shortage of physicians in coming years, a shortage made more acute by increased demands of the armed forces and of various government agencies for trained physicians. The needs of the Veterans Administration for physicians will far exceed any demands ever made previously by that agency.

THE RELEASE OF MEDICAL OFFICERS FROM THE ARMED FORCES

Almost simultaneously with the coming of V-E day, physicians, as well as most other members of the armed forces, began to look forward to the day of their release from military service. The unrest inevitably associated with uncertainty as to the future was, of course, heightened by the sudden cessation of routine medical activities, so that many a physician chafed over being held in service without work to do. The dissatisfaction was further heightened when announcement of a system of release of men on a point system was made, yet without any statement as to the technic by which officers would be discharged from the service. More recently announcement has been made from the Office of the Surgeon General that from 2,000 to 3,000 physicians might be released by January 1946 or indeed that as many as 7,000 might be released by May 1946.

On July 11 Senator Johnson of Colorado accused the Army of taking a "leisurely attitude" toward release of physicians who are urgently needed for the civilian population. Other members of the Military Affairs Subcommittee also urged the Army to speed the release of physicians. Some dissatisfaction arises, as was indicated in a letter from five military medical officers published in The Journal last week, over the concept that the Army is not taking in any new young men but apparently will hold on as long as possible to those it already has. To these claims and charges the Army Medical Department replies that the European war

may be ended but there still remain the problems associated with the armies of occupation, the intensified war with Japan in the Pacific, the requirement that the sick and disabled be kept in the Army until they have reached maximum recovery, and medical routines associated with the discharge of men from the armed forces.

In a consideration of the questions associated with the discharge of British medical officers, the London *Lancet* points out that it was possible to invade France with a cover of less than 5 hospital beds for each hundred men but that it is necessary in the Far East, with "its long lines of communication, its abominable climates and its special risks from endemic and epidemic disease" to furnish 10 beds for every hundred troops and physicians and medical personnel to staff them.

The suggestion that young men who have recently completed internships and residencies be taken into the military service to replace older physicians now in the service is not wholly sound. This would not provide the Army with the highly specialized services that can be provided only by older men. The necessary peripheral nerve surgery, vascular surgery, plastic surgery and highly specialized diagnostic and therapeutic skills of internal medicine, psychiatry, dermatology and ophthalmology, for example, will not be made available by taking new young men into the service.

The physicians of the armed forces may be assured that every agency of the American Medical Association that can possibly be helpful is seriously engaged in this problem. The Committee on Postwar Medical Service, the Board of Trustees and all of the facilities of the headquarters office are doing their utmost to aid officers in the Office of the Surgeons General in solving problems related to the discharge of medical officers. Years were required for mobilizing the armies and medical services of our nation; release cannot be accomplished overnight.

OLEOMARGARINE

With the advent of war there has been a considerable decrease in edible fats available for civilian consumption. As a means for increasing the supply of solid edible fat to replace the decreasing amount of butter available for nonmilitary populations, margarine has been increasingly emphasized. Aside from the fact that this food has been fortified to the extent of 9,000 international units of vitamin A per pound to compensate for its lack of this vitamin, much discussion has concerned the nutritional value of fortified margarine as compared with butter fat. Various economic interests have been injected into this discussion, but only recently has objective evidence on the nutritional value of this fat been available.

Deuel and his associates [1] found that growing rats could use either butter fat, various vegetable fats or margarine with equal ease. The animals grew equally well, as shown by increase in weight and increase in bone length, whether their dietary fat consisted of butter fat or of margarine. In addition, Deuel [2] made careful analyses of the rats maintained on diets containing the various fats and found that there was no difference in the protein, lipid, ash or water content of the tissues of the animals. Then Elvehjem and his associates [3] showed that margarines permitted satisfactory growth in rats when the carbohydrate of the diet was glucose, sucrose, starch, dextrin or a mixture of them, whereas, when lactose was the sole carbohydrate of the diet, the rats grew better when butter or lard rather than oleomargarine was the fat used.

Deuel and his associates [4] studied the effect of different fats on fertility and lactation, since under these circumstances the dietary requirements constitute a more stringent test of nutritional adequacy than does growth. Difference was not found in the fertility of male or female rats on diets which contained various fats, irrespective of whether the fat was butter, margarine, corn, olive, peanut or soybean oils, provided the diets were supplemented with the proper fat soluble vitamins. All the diets produced young of equal weight at weaning, showing that they were equally efficacious in promoting lactation. These results would indicate that butter per se is not required for the growth or lactation of the rat. Perhaps then nutritional deficiency might occur in subsequent generations of animals whose diet was deficient in butter fat; a study [5] was carried out in which ten generations of rats were maintained on a diet containing margarine fortified with vitamin A in place of butter fat. Vegetable fats such as those used in margarine, the evidence proved, can serve adequately in place of butter fat in regard to growth, reproduction and lactation on a diet which would be otherwise nutritionally satisfactory.

The experimentalists in nutrition have shown that margarine may be substituted for butter fat with impunity in regard to growth, reproduction and lactation, provided the diet is nutritionally adequate. Of all the fat soluble vitamins, margarine is deficient in vitamin A, but this deficiency is made up by the fortification of the product with added vitamin A. This is a common procedure and most products on the market today are fortified in this way. The possibility of using margarine as a low cost fat may be of considerable importance in the feeding of the war seared population of Europe; it may also be used with safety in this country when a less costly edible fat is needed.

1. Deuel, Harry J., Jr.; Movitt, Eli; Hallman, Lois F., and Mattson, Fred: J. Nutrition **27**: 107 (Jan.) 1944.

2. Deuel, H. J.; Movitt, Eli; Hallman, Lois F., and Wu, E.: J. Nutrition **27**: 335 (April) 1944.

3. Boutwell, R. K.; Geyer, R. P., Elvehjem, C. A., and Hart, E. B.: J. Nutrition **26**: 601 (Dec.) 1943.

4. Deuel, H. J.; Movitt, Eli, and Hallman, Lois F.: J. Nutrition **27**: 509 (June) 1944.

5. Deuel, H. J.; Hallman, Lois F., and Movitt, Eli: J. Nutrition **29**: 309 (May) 1945.

Current Comment

INFORMATION BULLETIN FOR MEDICAL OFFICERS READY

Information of special value to medical officers about to reenter civilian life has been published at frequent intervals in THE JOURNAL. Various agencies of the American Medical Association, including the Committee on Postwar Medical Service, the Bureau of Information, the Council on Medical Education and Hospitals and the Bureau of Legal Medicine and Legislation, have taken part in gathering this information. In order to make this material more readily available, the Bureau of Information has prepared a pamphlet entitled "Information Bulletin for Medical Officers," which contains a digest of the G. I. Bill of Rights, educational facilities in civilian institutions, aids in establishing a practice, licensure and reciprocity data and certification by specialty boards. This pamphlet is now ready for medical officers and through the courtesy of the Surgeons General of the Army, Navy and Public Health Service will be sent to all physicians in those services. A brief digest of this material cannot answer all the questions which may arise. It is indicated in the pamphlet, however, how additional information on specific problems may be obtained.

THE FACTORS UNDERLYING THE DEMAND FOR COMPULSORY SICKNESS INSURANCE

The article by Strow and Hirschfeld in this issue of THE JOURNAL is offered as a report of a scientific investigation into the forces now promoting the mechanism for medical service incorporated in the Wagner-Murray-Dingell bill. The analysis reveals that legislative proposals for compulsory health insurance are not based on actual investigation of needs; neither are they apparently founded on anything resembling exact measurement of the extent of illness and failure to receive medical care. Strow and Hirschfeld offer proof that the demand for compulsory sickness insurance arises in those sections of the country where medical care and social services are most highly developed and that the demand is associated with the activities of highly organized labor groups. The demand is urban rather than rural. This investigation shows further that the chief problems in providing adequate distribution of medical service and facilities for health is the construction of new hospitals, the improvement of sanitation and hygiene, the improvement of economic conditions and the organization of medical services around medical institutions. This scientific report coordinates well with the program for extension of medical services developed through the Council on Medical Service and Public Relations and the Board of Trustees of the American Medical Association, also published in this issue of THE JOURNAL. The report by Strow and Hirschfeld is not opposed to organized labor; rather it is offered specifically to organized labor for study so that cooperation may be secured in extending to the worker, to the farmer and to people generally the most that American medicine can give under a democratic system of government. Compulsory sickness insurance leads to regimentation and totalitarianism. The continued evolution of plans for medical care with the acceleration that has been evident in recent years will yield technics for providing medical service adapted to the American way of life.

PUBLICITY FROM THE COMMITTEE OF PHYSICIANS

The so-called Committee of Physicians for the Improvement of Medical Care, Inc., has been sending out bulletins again. Apparently little, if any, attention is given to them, since they receive little if any comment in either medical or lay periodicals. Many, if not most, of the members of this committee are full time teachers in our medical schools. The chief concern of Statement No. 15 seems to be the effect of proposed legislation on such teachers. One absolute falsehood demands correction. The statement says "Since the American Medical Association is uncompromising in its insistence upon fee-for-service payment, this system would undoubtedly be elected by 'the majority of the general medical practitioners.'" Even casual observation or reading would reveal that this statement is not true. The statement expresses great fear that the so-called teaching hospitals associated with medical schools might be forced under one clause of the Wagner-Murray-Dingell bill to become open hospitals. This, they say, "would destroy the present organization of clinical faculties and the possibility of controlling the quality of medical care." The final demand in their statement is "special provisions for the protection of educational institutions." The narrowness of the point of view of this group can now be clearly understood by the medical profession. The names of the committee are here repeated as published in Statement No. 15:

Channing Frothingham, chairman
Milton C. Winternitz and Carl Binger, vice chairmen
Russell L. Cecil, honorary chairman
John P. Peters, secretary and treasurer

Alf S. Alving	Harry S. Mackler
Bertram Bernheim	Irvine McQuarrie
Ernst P. Boas	J. H. Means
Samuel Bradbury	T. Grier Miller
Allan M. Butler	George R. Minot
Alexander M. Burgess	Fred D. Mott
Hugh Cabot	Robert B. Osgood
Louis Casamajor	Walter L. Palmer
Thomas B. Cooley	H. B. Richardson
Robert L. DeNormandie	G. Canby Robinson
Nathaniel Faxon	David Seegal
Charles A. Flood	Clement A. Smith
Maurice Fremont-Smith	Richard M. Smith
Harry Goldblatt	Joseph Stokes Jr.
F. T. H'Doubler	Borden S. Veeder
William J. Kerr	Allen O. Whipple
H. Clifford Loos	James L. Wilson
F. D. W. Lukens	W. Barry Wood Jr.
George M. Mackenzie	Edward L. Young

One wonders how many of them read or understood the purport of Dr. John Peters' latest revelation.

CONSTRUCTIVE PROGRAM FOR MEDICAL CARE

AMERICAN MEDICAL ASSOCIATION

This platform was adopted by the Council on Medical Service and Public Relations and the Board of Trustees of the American Medical Association on June 22, 1945.

Preamble

The physicians of the United States are interested in extending to all people in all communities the best possible medical care. The Constitution of the United States, the Bill of Rights and the "American Way of Life" are diametrically opposed to regimentation or any form of totalitarianism. According to available evidence in surveys, most of the American people are not interested in testing in the United States experiments in medical care which have already failed in regimented countries.

The physicians of the United States, through the American Medical Association, have stressed repeatedly the necessity for extending to all corners of this great country the availability of aids for diagnosis and treatment, so that dependency will be minimized and independence will be stimulated. American private enterprise has won and is winning the greatest war in the world's history. Private enterprise and initiative manifested through research may conquer cancer, arthritis and other as yet unconquered scourges of humankind. Science, as history well demonstrates, prospers best when free and unshackled.

Program

The physicians represented by the American Medical Association propose the following constructive program for the extension of improved health and medical care to all the people:

1. Sustained production leading to better living conditions with improved housing, nutrition and sanitation which are fundamental to good health; we support progressive action toward achieving these objectives.

2. An extended program of disease prevention with the development or extension of organizations for public health service so that every part of our country will have such service, as rapidly as adequate personnel can be trained.

3. Increased hospitalization insurance on a voluntary basis.

4. The development in or extension to all localities of voluntary sickness insurance plans and provision for the extension of these plans to the needy under the principles already established by the American Medical Association.

5. The provision of hospitalization and medical care to the indigent by local authorities under voluntary hospital and sickness insurance plans.

6. A survey of each state by qualified individuals and agencies to establish the need for additional medical care.

7. Federal aid to states where definite need is demonstrated, to be administered by the proper local agencies of the states involved with the help and advice of the medical profession.

8. Extension of information on these plans to all the people with recognition that such voluntary programs need not involve increased taxation.

9. A continuous survey of all voluntary plans for hospitalization and illness to determine their adequacy in meeting needs and maintaining continuous improvement in quality of medical service.

10. Discharge of physicians from the armed services as rapidly as is consistent with the war effort in order to facilitate redistribution and relocation of physicians in areas needing physicians.

11. Increased availability of medical education to young men and women to provide a greater number of physicians for rural areas.

12. Postponement of consideration of revolutionary changes while 60,000 medical men are in the service voluntarily and while 12,000,000 men and women are in uniform to preserve the American democratic system of government.

13. Adoption of federal legislation to provide for adjustments in draft regulation which will permit students to prepare for and continue the study of medicine.

14. Study of postwar medical personnel requirements with special reference to the needs of the veterans' hospitals, the regular army, navy and United States Public Health Service.

MEDICINE AND THE WAR

THE SUPPLY OF MEDICAL STUDENTS AND PHYSICIANS

Memorandum presented on June 4, 1945 to President Harry S. Truman by a special committee of the Committee on Postwar Medical Service consisting of Evarts Graham, M.D., St. Louis; Victor Johnson, M.D., Chicago; Harvey Stone, M.D., Baltimore, and Fred C. Zapffe, M.D., Chicago.

Whatever measures may be taken in the near future for the improvement of the health of this nation, including the construction of additional hospital facilities and the extension of various plans of prepayment insurance against sickness, it would seem to be axiomatic that physicians must be provided in adequate numbers if these measures are to succeed. Yet we are now failing to provide for the training of enough physicians to meet the demands for doctors which we know will increase after the war.

At that time we shall need about 30,000 more physicians than before the war, primarily because of the requirements of the Veterans Administration (about 15,000) but also because of the needs of the peacetime Navy (about 5,000) and the Army plus possibly a compulsory universal military training program (about 10,000). This estimate disregards extra physicians required to provide replacements for casualties among medical officers, medical assistance to liberated countries and the more complete and extensive medical care demanded in this country.

Even if admissions, enrolments and graduations from our medical schools should continue at the present wartime levels, only about half of this need would be met, since 40,000 students will receive the M.D. degree in the period 1942 to 1948 and 24,000 physicians will have died during that time. Thus, under the most favorable conditions only about 16,000 additional physicians will be available after the war to do the work of 30,000.

In spite of this, freshmen enrolments in the medical schools of this country will be drastically reduced within the next year. In the past year virtually no able bodied males have been permitted to commence the two year course of college premedical studies because the Army and Navy have ceased assigning men to such studies and the Selective Service System has discontinued deferments of premedical students. In the past few years each freshman class of about 6,000 students included 4,000 to 5,000 able bodied men. These are no longer available under existing regulations.

From now until some time after the war, medical schools must enroll their freshmen from the following limited groups: women, physically disqualified males, men under or over the draft age and veterans. Relatively small numbers are available in these categories: medical schools annually receive applications from only 800 to 900 women and even fewer physically disqualified males; men under 18 or over the draft age can be disregarded, since there is only a handful of such students enrolled in medical studies. These three categories would scarcely supply 1,200 to 1,500 entering freshmen for the medical school classes of early 1946, even if all who applied to medical schools were admitted, with complete disregard for the qualifications of the applicants for the study and practice of medicine.

Major Gen. Lewis B. Hershey, the director of the Selective Service System, has stated that several hundred, or even a few thousand, acceptable medical applicants should surely be forthcoming from the hundreds of thousands of veterans being discharged from the armed forces. Checking on this statement indicates that it is a belief without foundation in fact. Eight large universities (California, Chicago, Illinois, Iowa, Michigan, Minnesota, Northwestern and Wisconsin), which normally supply 800 to 900 of the entering freshmen in our medical schools, now have enrolled just 42 veterans in premedical studies who will complete their preparation for entrance into medical school before 1947. Only 28 of these were considered probably acceptable as medical students and physicians. Generalizing from these data, it would seem that veterans may be expected to provide less than 4 per cent of the freshman class before 1947, totaling perhaps 200 to 300 students as compared with the total of 6,000 normally admitted.

Within the next year medical school freshmen admissions will be reduced by about 5,000 because of the existing policies and there will be an equal reduction in M.D. graduates three years hence. To write off 5,000 physicians is equivalent to depriving medical care from 100,000 hospitalized veterans, 1,000,000 soldiers or sailors or 4,000,000 civilians. Passage of even the best of the scores of medical care and hospitalization bills now pending in Congress and state legislatures would be ineffective and meaningless if we simultaneously prohibit the training of sufficient doctors.

This deficiency can be corrected under the present Selective Service Act as follows: Defer qualified men now in college premedical studies when they reach 18 and defer 8,000 selected high school graduates of this year to commence college studies in premedicine. From these, 4,500 should be earmarked for admission to specific medical schools a year later. Repetition of this procedure each year the war lasts would effect the training of enough doctors to care for the health of the people. Consideration might also be given to the assignment of a limited number of men now under arms back to premedical studies, provided they pursue such studies satisfactorily before induction, as far as this may be consistent with military necessity.

It is of basic importance to note that the restrictive regulations now in effect were promulgated a year ago. Since that time the war situation has radically changed. Even though we still have a tremendous task ahead, requiring the mobilization of all necessary resources, it remains true that the Selective Service System has recently announced a reduction in the rate of induction of men into the armed forces by 30,000 per month starting in July. It is not apparent that the deferment of a small percentage of this number of premedical students would in any way affect the military situation. On the other hand, it would help to insure adequate medical care of civilians, including veterans, after the war.

The acute need for an appropriate adjustment is underscored by the realization that the present policies will result in the same drastic reduction in medical school enrolments for each year that the Asiatic war lasts. It will even continue for a period after the peace, since premedical studies require two years before a student is ready to enter a medical school. The necessity for a continuous flow of students into and through our medical schools has been urged by the Surgeons General of the three armed services, by Mr. Paul McNutt of the War Manpower Commission, by Dr. Frank Lahey, chairman of the Directing Board of the Procurement and Assignment Service for Physicians, by every medical school in the country with a single exception and by virtually all medical educators and leaders in the medical profession. This conviction does not represent a special interest or problem of the medical profession or the medical schools. Actually, most medical schools would welcome an enforced period of relaxation from their arduous wartime program involving increased enrolments and acceleration of the training. The proposed adjustments are dictated only by the necessity for preserving the health of the nation.

ARMY

MEDICAL EQUIPMENT FOR SHIPMENT TO PACIFIC

Medical equipment being shipped to the Pacific is prepared at U. S. Army Medical Depot M-424, Honeybourne, England, the largest depot of its kind in England. Everything from delicate surgical instruments to x-ray machines is processed at this depot. Some 2,500 items are included in a so-called medical unit, which is sent as freight and does not accompany the hospital personnel. Certain surgical instruments require considerable time to prepare for shipment. A forceps, for example, gets a brisk cleaning in water, is dipped into carbon tetrachloride solution and is dried again. Then a technician, wearing rubber gloves, dips it again into a menthol solution to remove finger prints. After the forceps is dried it is covered with an oil preservative, then wrapped in an aluminum foil and finally hermetically sealed in cellophane. Thousands of individual surgical instruments require this treatment.

Major Charles A. Bohan, who is in charge of receiving and checking equipment at this depot, stated that bulky machines are torn down to save shipping space. If an item is damaged or rusted it is thrown into the salvage pile or "cannibalized" for good parts. Pacific bound hospitals will use only American equipment. British items turned in at the depot are declared surplus, with future disposition to be made by the Army's general purchasing agent.

57th STATION HOSPITAL

The 57th Station Hospital, located in Tunis, was recently awarded the Meritorious Service Unit Plaque for superior performance of duty during the period Jan. 1, 1944 to Nov. 1, 1944. The presentation of the plaque was the highlight of the army day celebration in Tunis, at which the American, English and French armies were well represented as well as members of the guard of the Bey of Tunisia.

The following medical corps officers are assigned to the 57th Station Hospital: Major Paul M. Fuller, commanding officer, Kalamazoo, Mich.; Capt. Alex E. Fairshter, ward officer, Philadelphia; Capt. George A. Greenberg, in charge of medical service, Somerville, N. J.; Capt. Joseph B. Johnston Jr., ward officer, Barium Springs, N. C.; Capt. Emory L. Mauritz, in charge of surgical service, Des Moines, Iowa, and Capt. Julius L. Samuels, eye, ear, nose and throat officer, Hollywood, Calif.

U. S. ARMY MEDICAL CORPS CONVALESCENT CAMP IN CHINA

A complete remedial therapy gymnasium has been constructed at the U. S. Army Medical Corps convalescent camp near Kunming, China, to hasten the recovery of American troops in the China theater following hospitalization for battle injuries, major operations, fractures and other casualties. Capt. Julius R. Pearson, Miami Beach, Fla., is the medical officer in charge. All the equipment at the camp has been built from salvaged materials. Parts of wrecked airplanes and jeeps, scrap metal and lumber, old steering wheels from trucks, tin cans, pipe and concrete are used in the construction of machines.

MERITORIOUS SERVICE UNIT PLAQUE

The Meritorious Service Unit Plaque was recently awarded to the 1798th Service Command Unit, Station Complement, Headquarters Detachment, Veterinary Section, Fort Des Moines, Iowa, for superior performance of duty in connection with food inspection activities throughout the state of Iowa during the last four years.

MEDICAL NUTRITION LABORATORY

The formal opening and dedication of the Army Service Forces Medical Nutrition Laboratory, Surgeon General's Office, U. S. Army, took place June 9 at the Chicago Quartermaster Depot. Major George H. Berryman, commanding officer of the Medical Nutrition Laboratory, presided.

DR. WILLARD O. THOMPSON AWARDED CERTIFICATE OF DISTINGUISHED SERVICE

Dr. Willard O. Thompson, chairman of Regional Committee No. 14 of the Committee for Wartime Graduate Medical Meetings, was recently awarded a Certificate of Distinguished Service by Major Gen. Russell B. Reynolds, commanding general, Sixth Service Command. According to the citation accompanying the award, "In 1942 the American Medical Association, in conjunction with the American College of Surgeons and the American College of Physicians, established a fund to provide postgraduate medical instruction for medical officers stationed throughout the Army. Dr. Willard O. Thompson, chairman of the Committee for Wartime Graduate Medical Meetings for Region No. 14, which includes Illinois and Wisconsin, obtained the services of prominent teachers and practitioners of medicine to lecture and conduct clinical exercises in the hospitals of the Sixth Service Command. He himself has actively participated in the teaching and by boundless energy and enthusiasm has maintained the continuity and high quality of the program. The medical officers of this service command as well as hundreds of civilian physicians who have attended the courses at army hospitals have universally expressed their appreciation for this unusual opportunity for postgraduate instruction, which has definitely raised the standard of medical practice in the Sixth Service Command. Dr. Thompson, as chairman of the committee, by his untiring efforts and devotion to this important program, has rendered distinguished service to the Sixth Service Command, and in recognition thereof the commanding general is pleased to present this citation."

BLINDED VETERANS ORGANIZE ASSOCIATION

One hundred soldiers who have lost their sight in the war recently organized a Blinded Veterans Association, the first of its kind in this country, to help blinded service men establish themselves as independent members of their home communities. The association will act as a clearing house for jobs for blinded veterans of this and World War I. The constitution of the Blinded Veterans Association forbids the acceptance of contributions and will be maintained only from fees and dues of members. The organization was set up at the Army's Old Farms Convalescent Hospital, Farmington, Conn. Mr. Raymond Frey, a former army lieutenant, who is now an instructor of the blind at Valley Forge General Hospital, Phoenixville, Pa., is chairman of the association.

MERITORIOUS SERVICE UNIT PLAQUE

Military personnel assigned to Dibble General Hospital, Menlo Park, Calif., Service Command Unit 1985, have been cited for "superior performance of duty" between Dec. 1, 1944 and Jan. 31, 1945 and authorized to wear the Meritorious Service unit insigne. Presentation of a Meritorious Service unit plaque to the Menlo Park army installation also was authorized by Major Gen. William E. Shedd, commanding general of the Ninth Service Command.

NEW DERMATOSES SLIDES TO AID INSTRUCTION

The Office of the Surgeon General reported recently that six sets of lantern slides on cutaneous disease have been completed by the Army Medical Museum and are ready for distribution. They will be lent to army teaching centers and are available for deployment teaching programs. These slides emphasize dermatoses which have been seen in tropical overseas theaters. All but three are in color.

COLONEL BLADES NAMED CONSULTANT

Lieut. Col. Brian B. Blades, M. C., who is chief of the thoracic surgical section of Walter Reed General Hospital, Washington, D. C., has been appointed consultant to the Surgeon General in thoracic surgery, in addition to his other duties.

ARMY AWARDS AND COMMENDATIONS

Lieutenant Colonel Robert D. Bickel

Lieut. Col. Robert D. Bickel, formerly of Gallup, N. M., and now assigned to the Liaison Office at the American Medical Association, was recently presented with the Legion of Merit award "for exceptionally meritorious service in the performance of duty as commanding officer, —— Station Hospital during the period Jan. 1, 1943 to Oct. 13, 1944. Lieutenant Colonel Bickel (then Major) despite inadequacies of personnel and difficulty of supply while in India, has enlarged and expanded this hospital of a 50 bed capacity to meet rapidly increasing needs. He moved it from India to China, where the supply problem was even more acute, and continued its expansion. Because of his untiring efforts, efficient administration, devotion to duty and outstanding leadership, this hospital was able to perform its mission and also to meet extraordinary demands caused by the sudden unanticipated evacuation of patients from the hospital in East China and the Air Force dispensaries. This service reflects great credit both to Lieutenant Colonel Bickel and to the armed forces of the United States." Dr. Bickel graduated from Johns Hopkins University School of Medicine, Baltimore, in 1937 and entered the service March 10, 1941.

Captain Albert H. Meinke Jr.

Capt. Albert H. Meinke Jr., formerly of Detroit, was recently cited "for meritorious service in combat during the period Feb. 20 to Feb. 26, 1945 in the Apennine Mountains, Italy. During an attack, when mounting casualties crowded his aid station, and the enemy subjected his position to a terrific artillery barrage, Captain Meinke performed his duties as battalion surgeon with cool courage and skill. Laboring for more than forty-eight hours without rest, he gave the best medical assistance to each of the wounded and directed the disposition and evacuation of all casualties with commendable efficiency and promptness. By his tireless devotion to duty under the most distressing conditions, Captain Meinke saved many lives and prevented much pain and suffering. He has well earned the commendation and praise of all for his inspirational accomplishments, which are truly in keeping with the finest traditions of the Medical Corps." Dr. Meinke graduated from the University of Michigan Medical School, Ann Arbor, in 1943 and entered the service Aug. 4, 1944.

Captain Harlan Alfred Alexander

A Bronze Oak Leaf Cluster was recently awarded to Capt. Harlan Alfred Alexander, formerly of Minneapolis, for "heroic achievement in connection with military operations against the enemy on Oct. 24, 1944 during the Leyte Island operation. During a time when an infantry battalion was attacking north on the Buri airstrip, the launching of a severe enemy counterattack inflicted many casualties among the friendly forces and prompted an immediate withdrawal of the battalion. Captain Alexander, realizing the necessity for evacuating the wounded, and with the knowledge that front line protection had been withdrawn, maintained his aid station in the exposed area until all the wounded were evacuated to a place of safety. This action, with utter disregard for his own personal safety, was an impressive demonstration of courage on the part of Captain Alexander." Dr. Alexander graduated from the University of Minnesota Medical School, Minneapolis, in 1930 and entered the service Sept. 8, 1942.

Colonel Jarrett M. Huddleston

An Oak Leaf Cluster to the Silver Star was awarded posthumously recently to Col. Jarrett M. Huddleston, formerly of Washington, D. C. The citation accompanying the award read "for gallantry in action at ——, Italy, on Feb. 7, 1944. At about 08:15 Feb. 7, 1944 an enemy dive bombing attack caused considerable damage to buidings and vehicles, one of the latter being loaded with ammunition. Colonel Huddleston, who at the time was engaged on a tour of inspection of hospitals, came upon the scene at the time of the attack. With complete disregard for his own life and safety, he entered one of the buildings, then burning, to rescue a badly wounded soldier who was buried in the wreckage. Working with coolness and efficiency he evacuated the soldier, commandeered a vehicle and dispatched him quickly to a hospital. During all this time exploding projectiles and bursting shrapnel from a burning truck covered the area. Colonel Huddleston's calm and courageous action undoubtedly saved the life of the wounded soldier, prevented widespread confusion and was an inspiration to all present, reflecting the highest credit upon himself and is in keeping with the finest traditions of the Army of the United States." Dr. Huddleston graduated from George Washington University School of Medicine, Washington, in 1916 and entered the service the following year.

Captain Leon M. Swift

The Bronze Star was recently awarded to Capt. Leon M. Swift, formerly of Marysville, Calif., "for meritorious service in connection with military operations against an armed enemy. During the period of Dec. 29, 1944 to Jan. 13, 1945 Captain Swift, as platoon leader of the clearing platoon, worked tirelessly and very efficiently in treatment of battle casualties which passed through his station in great numbers. Although in poor health at the time, Captain Swift refused to be evacuated and worked for excessively long periods of time without regard for his health and personal comfort, and his timely and superior treatment of the great number of battle casualties resulted in the saving of many lives. His leadership and devotion to duty was an inspiration for the excellent functioning and operation of the clearing platoon. Captain Swift's outstanding professional ability, devotion to duty and disregard for personal welfare are in keeping with the highest tradition of the United States Army." Dr. Swift graduated from the College of Medical Evangelists, Los Angeles, in 1933 and entered the service May 2, 1942.

Captain Robert H. Draddy

The Bronze Star was recently awarded to Capt. Robert H. Draddy, formerly of New York, for "meritorious achievement in action" from Nov. 11, 1944 to April 23, 1945 in France and Germany. "As commanding officer of a collecting company," said the citation, "Captain Draddy discharged his duties in an exemplary manner throughout the period in which the division fought its way through the mountainous terrain of the Vosges into Germany and across the Rhine. During the bitterly contested crossing of the Neckar River at Heilbronn, Germany, he so well organized and directed the evacuation of casualties that despite long litter hauls and enemy action many wounded men arrived at the clearing station in less than two hours after their recovery. Captain Draddy's excellent utilization of personnel and equipment thus resulted in the saving of many lives in this and countless other actions." Dr. Draddy graduated from Cornell University Medical College, New York, in 1943 and entered the service Dec. 31, 1942.

Captain Hime Poliner

Capt. Hime Poliner, formerly of Easton, Pa., was recently cited for performing an appendectomy under difficult conditions on an LCI (L). According to the citation signed by Lieut. George Linton Jr., U.S.N.R., commanding the ship, the patient complained of sharp abdominal pains while the ship was off Mindoro Island, Philippine Islands, on April 11 last. "Capt. Hime Poliner, M. C., . . . being the only physician on board the ship, examined the patient and diagnosed the complaint as acute gangrenous appendicitis, necessitating an immediate appendectomy." The concluding paragraph of the citation read "It is the desire of this command to commend Dr. Poliner to his superior officers for the prompt and skilful action taken by him under these somewhat unique circumstances, as the appendectomy performed by Dr. Poliner is, to the best knowledge of this command, the first operation of its kind performed aboard an LCI (L)." Dr. Poliner graduated from Temple University School of Medicine, Philadelphia, in 1936 and entered the service in December 1942.

Major George M. Brother

George M. Brother, formerly of Indianapolis, was recently awarded the Bronze Star for developing an extremely effective malaria control program. He has been assistant surgeon at headquarters of the 15th AAF for some time. Dr. Brother graduated from the Indiana University School of Medicine, Indianapolis, in 1934 and entered the service Dec. 8, 1942.

NAVY

NAVY AWARDS AND COMMENDATIONS

Captain Howard K. Gray

The Navy Commendation Ribbon was recently awarded to Capt. Howard K. Gray, formerly of Rochester, Minn. Captain Gray, who was chief of the surgical service at the Navy Hospital, Aiea Heights, Hawaii, between August 1944 and May 1945, was commended for "devotion to duty, able leadership in coordinating the surgical service of the hospital and superior skill in his profession." He is now serving as chief of surgery at the U. S. Naval Hospital at San Diego. Dr. Gray graduated from Harvard Medical School, Boston, in 1927 and entered the service Dec. 26, 1941.

Lieutenant Commander Ralph C. Parker Jr.

Lieut. Comdr. Ralph C. Parker Jr., formerly of Boston, was recently awarded the Bronze Star "for meritorious service as senior medical officer attached to the U. S. S. *Arkansas* prior to and during the invasion of the coast of France on June 6, 1944. Skilled and tireless in the performance of duty, Lieutenant Commander Parker achieved exceptional success in training the personnel of the medical department for the prompt and expert care and treatment of casualties brought aboard during assault operations. His outstanding professional integrity and devoted efforts were responsible for the saving of many lives and in keeping with the highest traditions of the United States Naval service." Dr. Parker graduated from Harvard Medical School, Boston, in 1937 and entered the service July 2, 1938.

Lieutenant Joseph Rogers

Lieut. Joseph Rogers, formerly of Brooklyn, was recently commended, the citation reading "For distinguishing himself by heroism after his ship had suffered a damaging underwater explosion during the occupation of Kiska Island on Aug. 18, 1943. He worked heroically for a period of thirty-six hours administering expert medical treatment to men injured in the explosion. Medical treatment to these men was so ably administered that all injured men recovered. His conduct was at all times in keeping with the highest traditions of the naval service." Dr. Rogers graduated from Harvard Medical School, Boston, in 1941 and entered the service Oct. 5, 1942.

MISCELLANEOUS

CONTROL OF TYPHUS IN YUGOSLAVIA

The United Nations Relief and Rehabilitation Administration recently assumed leadership in the program for the control of typhus in Yugoslavia as part of its duties under the International Sanitary Conventions of 1944.

The United States of America Typhus Commission formerly led the control program in Yugoslavia, with UNRRA personnel assisting. The commission signed an agreement with Marshal Tito in January 1945 setting up the necessary arrangements for the work. Mass inoculation of the entire population of Bosnia and Herzegovina is well under way, and half a million people have been inoculated to halt the spread of endemic typhus in that area. DDT powder and vaccine were shipped to the area by plane so as to expedite the program. Twenty UNRRA doctors, nurses, sanitary engineers and other technicians are now at work as members of the health staff of the UNRRA Yugoslav mission. The takeover of the control program by UNRRA was completed July 1.

The first typhus epidemic of World War II in Yugoslavia was reported from the Partisan side in the winter of 1941-1942. The disease reached a peak in the section then known as "Independent Croatia" the following winter, when there were over 30,000 cases with more than 5,000 deaths among the civilian population in western Bosnia and Dalmatia. In central and eastern Bosnia typhus reached epidemic proportions in 1944.

Typhus broke out in 1941 in a large concentration camp in Serbia, where a number of gipsies were interned. It gradually spread over the country and in the winter of 1943-1944 there was a severe epidemic. With the arrival of the United States of America Typhus Commission last winter, modern methods of epidemic control were introduced. DDT insecticide powder is applied with hand or electric blow guns. Hundreds of people can be disinfested in a short time. No undressing, bathing and subsequent disinfection of wearing apparel is necessary.

Dr. W. A. Sawyer, director of the health division, expressed a hope that UNRRA, in carrying forward the work so well begun by the United States of America Typhus Commission, in cooperation with the health officers of the Yugoslav government, would be able to rid Yugoslavia of louse borne typhus and so preclude the possibility of future outbreaks.

CUBAN DOCTORS VOLUNTEER FOR WORK IN OCCUPIED EUROPE

Four Cuban doctors who have volunteered for duty in occupied Europe recently arrived in the United States for special studies at the University of Maryland before going to Europe for the United Nations Relief and Rehabilitation Administration. They are Drs. Amary Escalona, Oscar Ferrer, Rene Vallejo and Enrique Roig.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL June 30, p. 671)

CALIFORNIA

St. Luke's Hospital, San Francisco. Capacity, 225; admissions, 6,156. Dr. Howard H. Johnson, Medical Director (assistant resident—mixed service, disqualified for medical service).

DISTRICT OF COLUMBIA

St. Elizabeths Hospital, Washington. Capacity, 7,576 beds; admissions, 2,599. Dr. Winfred Overholser, Medical Director (intern).

ILLINOIS

Illinois Masonic Hospital, Chicago. Capacity, 186; admissions, 5,322. Mr. William H. Tenney, Superintendent (2 interns, October 1).

Oak Park Hospital, Oak Park. Capacity, 182; admissions, 5,479. Sister St. Colette, Superintendent (intern).

MASSACHUSETTS

Massachusetts General Hospital, Boston. Capacity, 480; admissions, 7,677. Dr. N. W. Faxon, Medical Director (interns and residents—anesthesia).

NEW JERSEY

Hackensack Hospital, Hackensack. Capacity, 300; admissions, 7,293. Mrs. Mary Stone Conklin, R.N., Superintendent (3 interns).

Passaic General Hospital, Passaic. Capacity, 275; admissions, 5,399. Miss Margaret A. Wallace, R.N., Superintendent (intern).

NEW YORK

St. Joseph Hospital, Far Rockaway. Capacity, 163; admissions, 2,671. Sister M. Bertrand, Superintendent (resident—mixed service).

Gouverneur Hospital, New York City. Capacity, 220; admissions, 3,221. Dr. O. I. Bloom, Medical Superintendent (intern).

New York State Reconstruction Home, West Haverstraw. Capacity, 310; admissions, 142. Dr. Kenneth S. Landauer, Acting Superintendent (residents—orthopedic surgery).

OHIO

Glenville Hospital, Glenville. Capacity, 135; admissions, 3,411. Mr. A. B. Harris, Superintendent (resident—mixed service).

PENNSYLVANIA

Northeastern Hospital, Philadelphia. Capacity, 102; admissions, 2,455. Mr. Charles H. Dabbs, Administrator (2 interns).

SOUTH CAROLINA

Greenville General Hospital, Greenville. Capacity, 355; admissions, 8,515. Mr. J. B. Norman, Superintendent (interns).

UTAH

Thomas D. Dee Memorial Hospital, Ogden. Capacity, 400; admissions, 8,405. Mr. Lawrence H. Evans, Superintendent (interns).

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

July 14, 1945.

Downey Charges Army Is "Hoarding" Doctors

Senator Sheridan Downey of California has charged that surplus army doctors in Europe are not working "more than an hour or two a day" and should be returned at once to this country to relieve the shortage of civilian doctors. As chairman of a special military affairs subcommittee investigating army use of doctors, he says that 7,000 doctors the Army promised to release by next May 1 should be returned to civilian service immediately. Mr. Downey said that since the investigation was reported in the army newspaper *Stars and Stripes* he has "had letters from doctors who are not working more than two hours a day—majors, colonels, captains." He said their morale "is breaking down" and letters from the Pacific reveal a similar situation there. Brig. Gen. Robert Berry informed the hearing that the War Department wants to return these doctors "as soon as it can," but that the commanding general of the European theater had advised the department on July 5 that "he flatly can't see any possibility of giving up these men immediately." The Army's "leisurely attitude" toward releasing surplus doctors was condemned by Senator Johnson of Colorado, and Senator Gurney of South Dakota suggested that something might be done to bring them home ahead of troops to be discharged. He reported complaints from 60 year old doctors who have "worked their hearts out" and want to be relieved.

Fewer Infantile Paralysis Cases Expected in 1945

Although the U. S. Public Health Service has warned of a seasonal rise in infantile paralysis, it also reports evidence that the number of infantile paralysis cases this year may be much fewer than the 19,053 recorded during 1944, which was the second highest number on record; 27,363 cases occurred in 1916. Through July 7 this year 1,424 cases had been reported from all parts of the country, as compared with 1,290 for the period last year. The excess for 1945 was explained by an unusually high incidence early in the year. Encouragement was reported from the fact that for the third consecutive week new cases have been fewer than for the corresponding week of 1944. Texas has been hardest hit so far this year; it reports a drop in new cases from 54 for the week ended June 30 to 21 for the week ended July 7. The worst epidemics last year were in North Carolina, Virginia, Kentucky and Erie County, N. Y. Health authorities believe that the high incidence in New York early this year was due to cases which started in 1944 but were not reported until this year. Health officials said that normally regions where the disease is widespread one season do not suffer visitations the next. Infantile paralysis is a warm weather scourge of countries in the temperate zone, with the United States probably the greatest sufferer. The malady usually tapers off with the arrival of cool fall weather.

Hospitals Included in Five Billion Dollar Postwar Construction

Erection of new hospitals and extensions to existing facilities are included in plans for a 5-billion dollar reserve of state and local construction projects now being assembled by a House postwar economic planning committee to stabilize the building industry after the war. This construction reserve, according to the committee, should be in addition to those plans for which local financing is available. Representative Colmer of Mississippi laid down three principles "as a foundation on which to erect a healthy national construction program: 1. The federal government should hold out no promise of aid to states or municipalities during the first peace years for financing their public works—especially since many of these are in a stronger financial position than before the war. 2. The federal government should assume leadership in building up an adequate reserve shelf of engineering plans . . . to lay the foundation for an orderly long term public works program and to provide a cushion against future drastic decline in the construction industry. 3. A construction policy board would be established in the executive office of the President to guide the public works program and to serve the construction industry in its efforts to maintain a healthy, stable growth in relation to national income.

Office Space Lacking in Capital for Returning Doctors

A serious shortage of office space in Washington, which is believed to exist in many other communities, is under study by the District of Columbia Medical Society. Col. A. Clagett Gray, medical officer of District Selective Service, is chairman of the Medical Society Committee on Service Physicians, which is endeavoring to obtain special preference for office space for service doctors returning to civilian practice. Some doctors who have already returned have been unable to find offices according to secretary Theodore Wiprud, who revealed that a survey of medical buildings and office space in other buildings revealed little hope of relieving the situation soon. He explains that Washington is now being served with a "minimum" number of doctors for its population and that the city needs the additional medical care which could be given by returning physicians and surgeons.

How Whole Blood is Shipped to the Pacific by Air

Whole blood is shipped successfully across the Pacific by air in an insulated container in which the bottled blood is placed in racks around a large compartment of cracked ice, according to Charles F. Belshaw, research consultant of the National Association of Ice Industries. He explained that although temperatures inside planes in the Pacific often go as high as 130 F., this method keeps the blood to be used in treating the wounded at a temperature between 40 and 45 F., which is necessary to keep it in usable condition. He also revealed that vegetable produce shipped bedded down in finely granulated ice keeps its freshness, crispness and vitamin C content over a longer period. This was learned from research conducted in twenty-one colleges. "This method of refrigerating produce with snow-ice is like the protective effect of the late spring snows on vegetation," Mr. Belshaw said. The research further showed that vitamin C retention in foods is essential in maintaining flavor and that keeping vegetables fresh through the use of snow-ice will bring food to the dinner table so that it tastes better and is better nutritionally.

Cleric Criticizes District Sterilization Bill

Rev. Patrick J. O'Connor, professor of sacred eloquence at Catholic University, has criticized what he terms efforts to "railroad" legislation to permit the sterilization of the feeble-minded. He spoke at the laying of a cornerstone of the new $240,000 graduate nurses' building and called attention to the House bill with the question "Is this the price of victory?" His remarks recalled the storm three months ago when the District of Columbia commissioners were under fire for allowing the sterilization of 3 patients at Gallinger Hospital. Subsequently Corporation Counsel Keech decided that there was no legal authorization even if a waiver by the patient or parents had been obtained.

Capital Notes

The gravest possible manpower shortage in local hospital history may close the tuberculosis ward in Gallinger Hospital, according to a report by Health Officer George C. Ruhland.

More than 8,000 of the 12,000 commitments to the District of Columbia jail in the past year were from alcoholism, and a sharp increase after the war is expected, reports Howard B. Gill, superintendent of penal institutions.

Gen. Jacob L. Devers, former commander of the 6th Army group in Europe and newly appointed chief of Army Ground Forces, recently visited wounded officers and men who had served under him, now hospitalized at Walter Reed Hospital.

Bureau of Information

SUMMARY SHEETS FROM ALABAMA, NEW YORK AND NORTH DAKOTA

Completed county summary sheets have been received from the Medical Association of the State of Alabama through Dr. D. L. Cannon, secretary; from the Medical Society of the State of New York through Dr. Walter P. Anderton, and from the North Dakota State Medical Association through Dr. L. W. Larson, secretary.

Alabama

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Chambers		37,777	10	3,778	225
	Lanett	6,141			
Cherokee		15,891	3	5,297	91
Colbert		35,493	12	2,958	27
	Sheffield	7,933			
	Tuscumbia	5,515			
Coosa		11,749	2	5,575	136
Escambia		28,265	3	9,422	50
	Brewton	5,323			
	Atmore	3,200			
Limestone		31,679	10	3,168	62
	Athens	4,342			
Monroe		23,355	7	3,336	85
Perry		20,722	4	5,180	53
Pike		27,775	8	3,472	31
	Troy	7,055			
Washington		13,347	2	6,674	152

New York

Allegany		36,534	24	1,522	8
	Wellsville	5,942			
		33,476	29	1,154	8
		2,530			
		4,976			
Montgomery		53,415	58	921	8
	Amsterdam	33,329			
	Canajoharie	2,577			
	Fort Plain	2,770			
Niagara		165,981	86	1,930	11
	Niagara Falls	78,029			
	Lockport	24 379			
	N. Tonawanda	20,254			
Ontario		49,874	59	845	8
	Canandaigua	8,221			
	Geneva	15,555			
Orleans		25,224	19	1,328	10
	Medina	5,871			
	Albion	4,069			
Oswego		63,559	46	1,382	9
	Oswego	22,062			
	Fulton	13,362			
Otsego		41.157	31	1,328	6
	Oneonta	17,731			
	Cooperstown	2,599			
Putnam		14,557	10	1,456	6
Wyoming		29,087	20	1,453	9
	Perry	4,468			
	Warsaw	3,554			

North Dakota

Burke	6,442	1	6,442	13
Burleigh	19,299	22	877	7
Bismarck	15,496			
Cavalier	11,830	4	2,958	17
Golden Valley	2,995	1	2,995	11
Grant	6,365	3	2,122	33
Kidder	5,599	1	5,599	39
McHenry	12,080	3	4,027	12
McKenzie	6,456	1	6,456	35
Mercer	8,019	2	4,009	23
Steele	4,247	2	2,124	17

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

The accompanying table gives data from counties in each of these states. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. They are not included in computing physician population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Council on Medical Service and Public Relations

MEETING OF JUNE 21-22, 1945

The meeting of the Council on Medical Service and Public Relations was called to order by the vice chairman, Edward J. McCormick, Toledo, Ohio, in the Council offices, American Medical Association, Chicago. Present were Drs. McVay, McGoldrick, Adson, Lawrence, Bauer, West and Mr. Hendricks.

Election of Chairman and Changes in Council Personnel.—A letter of resignation as chairman was received from Dr. John H. Fitzgibbon, Portland, Ore. A motion was made by Dr. McVay, seconded by Dr. McGoldrick and carried, that a letter be sent to Dr. Fitzgibbon expressing appreciation of his services and untiring effort for the success of the Council. Dr. Fitzgibbon is to continue as a member of the Council.

A motion was made by Dr. McVay, seconded by Dr. Adson and carried, that Dr. McCormick be elected chairman of the Council.

A motion was made by Dr. McGoldrick and carried that Dr. McVay be vice chairman and a member of the executive committee of the Council. The executive committee of the Council is now composed of Drs. McCormick, McVay, Adson and Bauer.

During the meeting word was received that the Board of Trustees had elected Dr. William R. Brooksher, Fort Smith, Ark., a member of the Council to succeed Dr. Leathers, whose resignation had been accepted at the May 10-11 meeting of the Council, until the next session of the House of Delegates.

Meeting with the Board of Trustees.—Members of the Council met with the Board of Trustees.

The Board of Trustees addressed a communication to the Council concerning relationships of the Board of Trustees, the Council on Medical Service and Public Relations and the work of the Association.

Statements from Council to Board of Trustees.—The following day the Council again met with the Board of Trustees and presented a constructive program for medical care (see page 883 of this issue of THE JOURNAL), the Council suggestions relative to medical aspects of the Wagner-Murray-Dingell bill and the program of the Washington office.

The Board of Trustees approved the publication and distribution of the "Constructive Program for Medical Care" after being properly edited. The Board approved the Council suggestions relative to the medical aspects of the Wagner-Murray-Dingell bill. The Board approved the Washington office program, after discussion.

Informing County Societies of Council Action.—A motion was made by Dr. McGoldrick, seconded by Dr. McVay, and carried, that the Council's point of view in regard to pending legislation be forwarded to the chairmen of the legislative committees of the state societies. A motion also was made and carried that

the chairmen of the state legislative committees or their representatives be invited to attend a meeting in Chicago to discuss and plan for the better and wider dissemination of medical care for the people of this country.

Statement on Wagner-Murray-Dingell Bill.—A motion was made by Dr. McVay, seconded by Dr. McGoldrick, that the director of the Bureau of Legal Medicine and Legislation and the secretary prepare a statement on the Wagner-Murray-Dingell bill. Such a statement was prepared by the Council in 1943.

Speakers' Kits.—The Council is to stimulate the preparation of speakers' kits containing material which might be used by speakers before medical societies or lay groups in regard to the present Wagner-Murray-Dingell bill. These folders of material were collected and made available to speakers in 1943-1944 in Michigan and in Indiana. The Council is to obtain copies of these kits and suggests that similar kits be prepared for the 1945 bill by the various state legislative and public relations committees.

Service Plan Survey.—The preliminary chart that has been prepared on the service plans which are conducted under the approval of county and state medical societies was approved by the Council. This is to be checked with the various state and county plan managers and published in THE JOURNAL.

Journal Column with Regard to Medical Care and Hospital Insurance News.—Attention of the Council was called to the news column that appears under the Council on Medical Service and Public Relations heading in THE JOURNAL about hospital and sickness insurance. In addition articles are appearing under the heading of Medical Economics prepared by the Council summarizing reviews that are appearing in the *British Medical Journal* concerning the medical care programs of foreign countries. Suggestions were made that included in these should be summaries of the New Zealand and Australian medical care programs as they are appearing in the *British Medical Journal* and the *Lancet*.

Annual Report of Council.—A draft of the report prepared by Dr. Louis Bauer was distributed to members of the Council. It is to be reviewed by them and suggestions, corrections and additions sent to the Council office in order that a final draft of the report may be prepared. A suggestion was made by Dr. McCormick that the number of state and county societies addressed by Council members should be carried in this report.

Insurance Plan Advertisements.—The Board of Trustees referred to the Council for attention the question whether or not THE JOURNAL should carry advertisements for insurance plans for patients and stated that until principles were better established such advertisements could not be carried in THE JOURNAL. The Council approved the following statement: "The Council does not feel it can pass intelligently on the advisability of insurance advertising until an insurance bureau in the American Medical Association has been set up and proper standards for such plans have been determined. These standards cannot be determined *without the help of this Bureau.*"

Medical Care in Rural Areas.—Dr. McVay discussed the problem of medical care in rural areas. He told how this problem is being approached in Missouri. The Council suggested that Dr. McVay write a statement of some five hundred words in regard to this question, which might be submitted for publication under the Council heading in THE JOURNAL.

Committee to Function with Farm Bureau.—Announcements were made that the Board of Trustees had appointed a committee to be headed by Dr. F. S. Crockett of Lafayette, Ind., to cooperate with the Farm Bureau in working out medical care program. Dr. McCormick was placed on that committee as a representative from the Council. The Council is to offer its full cooperation to Dr. Crockett and his committee.

Health Insurance: An Inquiry into Some of the Factors and Forces Underlying the Demand for a Compulsory System.—Dr. Fishbein called the attention of the Council to an article entitled "Health Insurance" by Carl W. Strow and Gerhard Hirschfeld. The article has been read by members of the Council, and the Council approved its publication "for the information that it contains relating to the factors underlying the demand for federal sickness insurance."

Additional Employment for Council Office.—The Council suggested several names to be considered for employment as an assistant to the secretary and as director of the Bureau of Medical Economics.

Public Relations Charts.—Charts showing the relation of the Council on Medical Service and Public Relations to other bureaus and councils in the American Medical Association and to the state and county medical societies were discussed before the Council by Mr. T. V. McDavitt of the Bureau of Legal Medicine and Legislation. These charts are to be completed for presentation at the next meeting of the Council.

Return of Physicians in Service.—The Council discussed the possibility of the return of those physicians in military service who can be spared now that the war in Europe is over. The Council believes that the return of these men as soon as national security will allow is one of the essential factors in the entire picture of the medical care program of the country. The return of these men is one of the points covered in the Constructive Program for Medical Care outlined by the Council.

American Cancer Society.—Dr. McGoldrick, chairman of this committee, stated that he and Dr. Bauer had arranged a meeting for the coming week with Louis Neff, Director of the American Cancer Society.

Public Relations by County and State Medical Societies.—In answer to requests as to what a county medical society can do in regard to public relations, Dr. Harold Camp, secretary, Illinois State Medical Society, and James Kelley, executive secretary, Milwaukee County Medical Society, wrote letters to outline the work a county medical society might do in public relations work.

Regional Conferences.—The secretary was instructed to make recommendations in regard to locations and schedules for regional conferences to be held this fall and winter and have these ready for presentation at the next meeting of the Council.

Lending Library.—A recommendation was made by Dr. McGoldrick that the Council establish a lending library system on subjects having to do with medical care, compulsory health insurance and subjects especially relating to the field covered by the Council.

Radio Programs.—Dr. W. W. Bauer, Director of the Bureau of Health Education, discussed the problem of radio with the Council. The Council discussed the idea of a nationwide hook-up proposed at the conference of seventeen presidents held recently in Detroit, at the invitation of the Michigan State Medical Society. Dr. Bauer discussed the preparation of "platters" (radio transcriptions) by the Council.

EDWARD J. MCCORMICK, M.D., Chairman.
THOMAS A. HENDRICKS, Secretary.

Medical Legislation

MEDICAL BILLS IN CONGRESS

G. I. Bill of Rights

The chairman of the House Committee on World War Veterans' Legislation, Representative Rankin, has introduced H. R. 3749, a bill to amend the Servicemen's Readjustment Act of 1944. In addition to liberalizing the loan provisions of the existing law, the pending bill would effect certain changes in the provisions relating to the education of veterans. It would provide that courses may be initiated four years after the date of the discharge of the veteran or the termination of the present war and that no course shall extend beyond nine years after the termination of the war; it would provide for short intensive postgraduate or vocational training courses of not less than thirty weeks; it would authorize correspondence courses of education or training and would increase the subsistence allowance of a veteran undergoing training or pursuing a course of education from $50 to $60 a month, if the veteran is without dependents, and from $75 to $85 a month if the veteran has dependents.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Institute for Negro Physicians.—The state department of health cooperated with the Jefferson County Health Department and the Slossfield Health Center in a five day institute for Negro physicians of the state at the health center in Birmingham, July 9-13.

Changes in Health Officers.—Dr. Charles J. Fisher, formerly health officer of Tuscaloosa County, has been named to a similar position in Lauderdale County.——Dr. Sydney E. Langer, U. S. Public Health Service, has been appointed health officer of Calhoun County to succeed the late Dr. Artice E. Culberson, Anniston. Dr. Culberson died while serving as acting health officer of the county following the resignation of Dr. Julius E. Dunn, Anniston, as health officer of Calhoun and Etowah counties to enter private practice in Wetumpka. Dr. Elmus K. Hanby, Attalla, is acting health officer in Etowah County.

CONNECTICUT

Herbert Miller Goes to Kansas.—Dr. Herbert C. Miller Jr. has resigned as assistant professor of pediatrics, Yale University School of Medicine, New Haven, effective July 1, to become professor and head of the department of pediatrics at the University of Kansas School of Medicine, Kansas City. Dr. Miller graduated at Yale in 1934 and became a member of the faculty the following year.

DISTRICT OF COLUMBIA

Personal.—Dr. Alvin R. Sweeney, U. S. Public Health Service, has been appointed superintendent of the Gallinger Municipal Hospital.

District Election.—Dr. William P. Herbst Jr. was chosen president-elect of the Medical Society of the District of Columbia during the annual business meeting of the society in May. Dr. William E. Clark took over the office of president on July 1. Other officers include Drs. Fred A. J. Geier and Dorothy S. Jaeger, vice presidents; Coursen B. Conklin, delegate to the American Medical Association, and Archibald L. Riddick, alternate. Dr. William M. Ballinger had been acting as president of the society since Lieut. Col. James N. Greear Jr., M. C., was ordered overseas several months ago.

Progress of George Washington University Hospital.—The new George Washington University Hospital will be ready for occupancy in about eighteen months, according to the *Medical Annals*. The 400 bed structure, six stories high, will be equipped and managed as a teaching hospital, replacing an older building in use since 1898. It was made possible by a federal works agency grant in the amount of $2,700,000. Mr. Leo G. Schmelzer, who was recently appointed superintendent of the hospital, will supervise the construction and equipment, assisting Dr. Walter A. Bloedorn, dean of George Washington University School of Medicine and medical director of the hospital.

ILLINOIS

A. L. Bowen Dies.—A. L. Bowen, formerly director of the state department of public welfare, died in Elgin July 8, aged 75.

Counties Vote for Health Departments.—McLean and Montgomery counties voted in their June elections to establish their own permanent health departments under the provisions of the Searcy-Clabaugh county health department law. Other counties in the state which had previously voted for their own health units include Adams, DuPage, Edwards, Lawrence, Morgan and Wabash counties.

Temporary Health Commissioner for Peoria.—Dr. George P. Gannon, U. S. Public Health Service, formerly of Pittsburgh and more recently state venereal disease control officer in Denver, has been appointed temporary health commissioner of Peoria. He will continue in this position until the return of Dr. Sumner M. Miller, who is away because of ill health. Dr. John L. Lincoln, U. S. Public Health Service, held the position until the appointment of Dr. Gannon.

Chicago

The Allergy Unit at Illinois College of Medicine.—The University of Illinois College of Medicine has devised a plan for using in a consultative and teaching capacity its various departments. The Allergy Unit is composed of specialists in the fundamental and clinical branches of medicine. William H. Welker, Sc.D., head of the department of physiologic chemistry, is the director of research in the fundamental sciences. Under him are men who have gained recognition in bacteriology and immunology, in botany, in immunochemistry and in pharmacology. The clinical division of the Allergy Unit is headed by Dr. Ben Z. Rappaport, who will devote half of his time as director of clinical investigation and clinical head of the Allergy Unit. Dr. Adolph Rostenberg Jr., a dermatologist, is the associate director of clinical investigation and is appointed on a full time basis. In addition, there are in the Allergy Unit specialists in pediatrics, rhinology, ophthalmology and psychiatry. Supervised training by the staff in the fundamental sciences and by the clinical staff will prepare selected students in the subjects of biochemistry, immunology and botany as related to allergy. The primary training in allergy will be supplemented by training in clinical medicine, pediatrics and dermatology together with a fundamental understanding of otolaryngology and psychiatry. The period of training following the completion of an internship will be for three years on a full time basis or for an equivalent length of time if the training is taken on a part time (half time) basis. Two full time allergy research assistantships at $1,200 to $1,800 a year will be established. When the new building program is completed it is hoped that provision will be made for residence in the hospital for the senior of the two research assistants. During this period of training it is expected that the research assistant will be registered for graduate work and conduct research work equivalent to a year of graduate residence with the completion of a satisfactory thesis for the M.S. degree. The emphasis from the clinical standpoint will be placed primarily on clinical medicine, which training will be continued throughout the three year period. The first year will be devoted to clinical medicine and attendance in the Allergy Clinic. In addition, the student will attend the seminars in allergy, biologic chemistry and clinical medicine. In the second year the training in clinical medicine will be continued. Six months, half time basis, will be spent in pediatrics, four months in dermatology (half time) and two months on a half time basis in laryngology, rhinology and otology. Work on a research problem will be initiated. Attendance in the Allergy Clinic and the seminars in allergy, biologic chemistry and clinical medicine will be continued. A training course of six months will be given either as a separate subject to students who are well trained in internal medicine, pediatrics, dermatology or otolaryngology or as a subject supplementing any one of these courses taken by the student. Such a course will be planned especially for men who return from military service to give them an appreciation of allergy as a specialty, either separately or in conjunction with any of the related fields. The practice of allergy is primarily confined to office work. It is therefore one of the specialties suitable for physically handicapped physicians who might find it difficult to do the type of work requiring house calls. The large number of people who are allergic (about 10 per cent of the total population) and the relatively small number of specialists in this field will in all likelihood be additional reason for the choice of allergy as a specialty. The six month course will also meet the requirements of graduate students in pediatrics, dermatology or otolaryngology who may desire to study allergy as a supplementary subject. Qualified students may apply for study in biochemistry, bacteriology or immunology under the direction of the fundamental science staff of the Allergy Unit. A research assistantship ($1,800 a year) may be available for exceptional students who have an M.S. degree and who qualify for study toward a Ph.D. degree. The funds for the establishment of the Allergy Research Unit were provided by several donors. First, the nucleus and major portion was provided by the Field Foundation. This consisted of $23,000. Additional funds were obtained from the Asthmatic Children's Aid of Chicago. Finally, a large portion of the fund came from private patients who were interested in furthering investigative work.

INDIANA

School for Crippled Children Named for Harry Mock.—The Harry Mock School for Crippled Children was recently opened in Muncie under the sponsorship of the Delaware County Crippled Children's Association in cooperation with the city. The school was named for Dr. Harry E. Mock, Chicago, who was born in Muncie, where he later went to school. Dr. Mock, who served as a colonel in the medical corps during World War I, in charge of rehabilitation of disabled soldiers, wrote a "Creed of the Handicapped," which had been adopted as the motto for the school named in his honor. It reads:

> Once more to be useful; to see the pity in the eyes of my friends replaced by commendation; to work, produce, provide—seeking no favors and given none—a man among men in spite of my physical handicap.

Woman Enjoined from Practicing Medicine.—The state board of medical examination and registration was upheld in an injunction action seeking to restrain Della Moser, Decatur, from practicing medicine without a license. Judge W. H. Eichhorn of the Wells Circuit Court at Bluffton in his decision found in favor of the state medical board. According to newspapers, June 19, a motion by the defense attorney to arrest judgment on the findings was overruled and judgment was entered against Miss Moser prohibiting her from the practice of medicine without a license. The state contended, it was stated, that her treatment of persons at Decatur constituted the practice of medicine, while the defense contended that she did not go further than to manufacture medicines under a state permit authorizing her to do so. It was further contended that she sold customers only what they asked for and that she did not prescribe or give treatments.

KANSAS

Personal.—Dr. Clay E. Coburn, Kansas City, was recently guest of honor at a dinner given by the Kansas State Tuberculosis and Health Association in recognition of his service as an officer of the association for twenty-five years, during eleven years of which he held the presidency.——Dr. James D. Colt Jr., Manhattan, has been appointed a member of the state board of medical registration and education for a four year term expiring April 30, 1949. Drs. Harry L. Aldrich, Caney, and George I. Thacher, Waterville, were named to the board for three year terms expiring March 31, 1948.

Health Education Council Recommended.—The establishment of a Kansas Health Education Council was recommended recently, to be composed of twenty members, with Governor Andrew F. Schoeppel to serve as honorary chairman and with certain executive officers of the state board of health to serve as ex officio members. The recommendation was the result of a school health study which has been under way for the past year under the direction of Clair E. Turner, Dr.P.H. (THE JOURNAL, March 24, p. 723). In addition to the council it was recommended that an advisory committee be formed, the committee to consist of one member representing each of the fifty-three statewide organizations that have participated in the study.

MAINE

State Medical Election.—Dr. John O. Piper, Waterville, was chosen president-elect of the Maine Medical Association at its meeting of the house of delegates in Augusta, June 24. Dr. Adam P. Leighton, Portland, was installed as president. Dr. Frederick R. Carter, Portland, is secretary-treasurer. Speakers at the meeting were Dr. John J. Moorhead, New York, who discussed his impressions of the attack on Pearl Harbor, which occurred while he was there, and Dr. Albert S. Crawford, Detroit, who spoke on "Nerve Compression Syndrome of Lumbar Nerves: Modern Concepts and Surgical Treatment."

MINNESOTA

Resolution on Operating Room Privileges.—The board of directors of Asbury Hospital, Minneapolis, has approved for operating room privileges physicians of Minneapolis who are fellows of the American College of Surgeons, surgical specialists certified by the American boards and physicians of the city who, on the basis of training and experience in surgery, have been recommended by the operating room committee and the medical advisory board of the staff and the superintendent of the Asbury Hospital. This list shall be kept up to date in the records of the board of directors and a copy of this list shall be posted in the office of the operating room supervisor for guidance in scheduling operations. No operation shall be scheduled under the name of any doctor not on this list except by special permission from the superintendent of the hospital to the operating supervisor in each instance.

NEW HAMPSHIRE

Industrial Health Law.—Authority was granted to the State Department of Health of New Hampshire to engage in industrial hygiene by a law signed by Governor Charles M. Dale May 15. According to the *Industrial Hygiene News Letter*, rules and regulations relating to industrial health are authorized to be made by the health department and enforced by the state department of labor. Under the new act the health department may investigate all mines, quarries, foundries and industrial establishments employing five or more persons in manufacturing or processing of goods, in order to determine what health hazards may exist from noxious gases, fumes, dusts or other toxic materials. A penalty clause provides for fining employers who refuse to comply with rules and regulations formulated under the act, which took effect on its passage.

NEW YORK

School for Physical Therapists.—Albany Hospital, Albany, has established a new school for the training of physical therapists. The period of study is nine months, with a preclinical course of three months and a clinical course of six months. It consists of both didactic lectures and practical work carried on in the Albany Hospital and the Albany Medical College and affiliated institutions. The course will be given twice yearly, the first class to be admitted Sept. 12, 1945 and the second on March 13, 1946. Additional information may be obtained from Dr. John W. Ghormley, medical director of the school. Miss Catharine Graham is the technical director.

Personal.—Dr. Arthur J. Redmond has been appointed medical officer at the University of Rochester's college for men and for the men students at the Eastman School of Music. He succeeds Dr. Edwin Fauver, who recently retired as college physician and head of the physical education department but who will continue as an instructor in the medical school (THE JOURNAL, May 26, p. 300). Lieut. George P. Heckel (MC), U. S. Naval Reserve, will continue as medical officer for the Navy V-12 unit at the river campus and will share with Dr. Redmond the medical duties in connection with the welfare of the university's athletic teams.——Dr. Robert F. Korns, Amsterdam, former epidemiologist in the division of communicable diseases, New York State Department of Health, has been made acting associate director of the division for the duration of the war. He fills the vacancy that occurred when Dr. Herman F. Senftner, Albany, retired after twenty-eight years of service. Dr. Korns took over his new activities May 1.

New York City

Memorial to Physician.—The residuary estate, after a number of bequests, of Mr. Alfred F. Heim, who died June 11, will go to Cornell University for free scholarships to be known as the "Dr. John A. Heim Scholarship" in honor of his son, the late Dr. John A. Heim. Lenox Hill Hospital will receive a bequest of $5,000, also to be set up as a memorial to Mr. Heim's son.

Louis Pink Named Insurance Adviser for Philippine Government.—Louis H. Pink, president of the Associated Hospital Service of New York and formerly superintendent of insurance of the state of New York, has been given a leave of absence until September to serve the Philippine government as a special adviser in reorganizing the insurance industry of the Philippines.

Medical Service for Small Industries.—The first step in a proposed program to provide medical service for small industries has been taken by the special committee on industrial medicine of the Medical Society of the County of New York. Questionnaires are being issued to members of the society to determine what physicians would be interested to engage in this type of work and to assist the committee in developing a program to provide medical service for small industries.

Personal.—Erwin F. Fauser, executive vice president and general manager of William R. Warner & Company, Inc., manufacturing pharmaceutists, was elected president of the company to succeed Marvin R. Thompson, Ph.D., who resigned recently (THE JOURNAL, June 23, p. 605).——Dr. Samuel T. Orton, who gave the principal address during the commencement exercises of the University of Pennsylvania School of Medicine, Philadelphia, June 18, received on this occasion the honorary degree of doctor of science from the university.

Form Society for the Study of the Blood.—The Society for the Study of the Blood was organized at a meeting at the New York Academy of Medicine, June 14, with Drs. Alexander S. Wiener president, Paul Reznikoff vice president and Peter Vogel secretary-treasurer. The society will concern itself with problems in the allied fields of clinical and experimental hematology, blood grouping and transfusion. Three scientific meetings will be held a year. At the first meeting the speakers were Drs. Nathan Rosenthal on "The Development of Hematology in New York City"; Eugene R. Marzullo, "The Role of the Hematologist in the General Hospital," and Lester J. Unger, "Blood Banks of the Future."

Teaching and Research Fellowships Available Through Eye Bank.—Teaching and research fellowships to extend the knowledge and skill required for the delicate operation which restores sight to a blind person with a corneal defect through the grafting of healthy corneal tissue will be established in leading medical schools throughout the country by the Eye-Bank for Sight Restoration, it was announced July 16. The initial grant of $25,000 has been made by the Milbank Memorial Fund to enable the eye bank to function pending the time when the importance of the undertaking may gain recognition in widespread support, it was stated. It is hoped that financial support would be forthcoming from the general public in sums of any amount.

OHIO

Dickinson Models of Human Reproduction Acquired by Health Museum.—The Cleveland Health Museum has acquired the 100 R. L. Dickinson sculptural models for human reproduction for display and distribution to medical, nursing and health groups. The acquisition was made possible through the Prentiss Foundation, created by Elizabeth Severance Prentiss, who gave the original building to the museum, contributed to it while living and left an endowment on her death in January 1944. The collection, which is the result of sixty years of study and research by Dr. Robert L. Dickinson, New York, is based on life studies as contrasted with measurements based on postmortem examinations. It includes standard figures of the adult male and female and of the newborn baby; pregnancy and labor; anatomy of male and female reproductive organs; venereal diseases; some surgical operations; full-sized manikin for teaching medical students delivery; the World's Fair series of childbirth in successive stages; six small models for the doctor's desk for explanation to patients or students, and others for specialized uses. In the transaction the museum acquires possession and control of distribution of the models and an option on further additions to the collection, placing the museum in a position to make copies from the original for other institutions.

OKLAHOMA

Course in Surgical Diagnosis.—Dr. Patrick P. T. Wu, formerly assistant professor of surgery at Peiping Union Medical College and recently a fellow in surgery at the Mayo Clinic, Rochester, Minn., recently conducted a postgraduate course in surgical diagnosis in Guthrie, Stillwater-Cushing, Ponca City, Pawhuska and Bristow-Sapulpa. On completion of the course, which was given under the auspices of the Oklahoma State Medical Association, Dr. Wu was planning to return to Hong Kong, China.

Changes at University of Oklahoma.—The recent passage of appropriations bill 101 makes available $1,432,503 for construction of buildings, improvements and purchase of equipment for and at the University of Oklahoma School of Medicine and Associated Hospitals. In a report to the appropriations committee, Dr. Tom Lowry, dean of the medical school, recommended that the needs of the school of medicine be portioned in the following manner:

$375,000 for the school of nursing.
$175,000 for the isolation wing.
$75,000 for the Outpatient Department.
$400,000 for additional hospital beds.
$225,000 for an annex to the medical school.
$100,000 for remodeling, heating, power plant, laundry and shops.

The passage of house bill 200 changes the name of the Confederate Home, Ardmore, to the Southern Oklahoma Hospital, to be under the supervision of the University of Oklahoma. A $250,000 appropriation will be used to match a similar total from the citizens of Ardmore; this total, it is hoped, will be matched with a similar appropriation from federal funds. Dr. George N. Barry has resigned as medical director of the State University Hospital and the Crippled Children's Hospital in order to be available for a commission in the U. S. Navy. He has been a member of the staff at the hospital since 1937 and medical director since 1941. Dr. Barry has been granted a leave of absence from the medical school as assistant professor of clinical medicine.

RHODE ISLAND

Supreme Court Upholds Examining Board.—The supreme court of the state of Rhode Island has affirmed the action of the state board of examiners in medicine in revoking the license of Dr. Charles Jacobson, Providence. Dr. Jacobson appealed from the decision of the board to the supreme court. After a hearing before the full court, the appeal was denied in a rather lengthy opinion.

Francis Blake Receives Chapin Award.—Dr. Francis G. Blake, dean and Sterling professor of medicine, Yale University School of Medicine, New Haven, Conn., was presented with the Charles V. Chapin Memorial Award of the city of Providence for 1945, May 16, during the one hundred and thirty-fourth annual meeting of the Rhode Island Medical Society. The presentation was made by Hon. Dennis J. Roberts, mayor of Providence. Dr. Blake gave the annual Charles V. Chapin Oration before the medical society, on "Some Recent Advances in the Control of Infectious Diseases." The presentation of the award followed the oration. The award and the oration honor the late Dr. Chapin, who was superintendent of health of Providence for forty-eight years.

TEXAS

Proposed Advisory Council.—Dr. Edward H. Cary, president of the Southwestern Medical Foundation, Dallas, announced recently that an advisory council was to be formed soon to help acquaint the public of the Southwest with the program to build a great medical center in Dallas, it is reported. Both lay and medical representatives from each county of Texas and from adjoining states which the medical center proposes to serve will comprise the council.

Personal.—Dr. John T. Lawson, Bowie, was recently appointed a member of the state board of medical examiners for a term of six years. Dr. Lawson served as a member of the board from 1936 to 1942.——Dr. Tip M. Collins, Big Spring, recently completed fifty years in the practice of medicine.——Dr. Henry A. Petersen, Houston, was elected president of the Houston School Board recently.——Dr. Benjamin F. Arnold was recently appointed health officer of Greenville.——Dr. David Grady Deaton, Houston, has been appointed full time director of the Harris County Public Health Unit.

Merger of Hospitals.—The Medical and Surgical Memorial Hospital, San Antonio, operating under a nonprofit charter, has absorbed the Physicians and Surgeons Hospital. The trustees have arranged to erect a clinic building and establish a medical center operated on a nonprofit basis. The clinic will be supported by the hospital until it can become self sustaining, but it will not be run as a part of the hospital. Work will begin as soon as possible on a three story addition to the Medical and Surgical Hospital office building to provide accommodations for the clinic. According to the San Antonio *Evening News*, June 29, the enlarged hospital will have 215 beds. There are 150 at the Medical and Surgical Hospital and 65 at the Physicians and Surgeons Hospital. The two properties, situated on the opposite sides of Camden Street, may be linked by an underground passage. The Medical and Surgical Memorial Hospital was organized in 1927; the present organization was created in 1934 and was issued a charter by the state.

WEST VIRGINIA

Personal.—Dr. Harry A. Garrison has resigned as superintendent of the Weston State Hospital (mental), Weston, effective July 1, having held the position since Aug. 1, 1943, when he succeeded Dr. John E. Offner, Weston, who resigned to become state health commissioner. Dr. Homer O. Van Tromp, French Creek, has been named acting superintendent.

State Association Creates New Committees.—Dr. David Salkin, superintendent of Hopemont Sanitarium, Hopemont, has been named chairman of the new tuberculosis committee created by the house of delegates of the West Virginia State Medical Association at its meeting in May. Other members of the committee include Drs. Eustace T. Goff, Parkersburg; John N. Reeves, Charleston; George E. Gwinn, Beckley, and Sarah Elizabeth McFetridge, Shepherdstown. The new committee on relocation and reestablishment of doctors returning from service was also created with Dr. Wade H. St. Clair, Bluefield, as chairman. Other members include Drs. James P. McMullen, Wellsburg; Benjamin I. Golden, Elkins; Thomas Kerr Laird, Montgomery; Eugene C. Hartman, Parkersburg, and Hugh A. Bailey, Charleston.

HAWAII

Board of Health Publishes Annual Report.—The board of health of the Territory of Hawaii has issued its annual report for the fiscal year ended June 30, 1944. Dr. Charles L. Wilbar Jr., Honolulu, president, emphasizes that the report covers a wartime period. Infant mortality, maternal mortality and stillbirth mortality reached new all time lows during the year. The infant mortality rate was 31.3 per thousand live births as compared with 40.2 for the previous year and the previous record low of 38.6 for 1942. The maternal mortality rate was 1.97 per thousand live births compared with 2.28 for 1943 and the previous record low of 1.98 for 1941. The stillbirth mortality rate was 16.1 per thousand live births compared with 17.9 for 1943 and the previous record low of 17.39 for 1941. The overall civilian death rate in the period reached an all time low of 6.1 per estimated thousand of population, which, according to the report, is a lower death rate than has ever been recorded for any state. It is pointed out, however, that this does not mean that people are less likely to die in Hawaii than on the mainland but rather that the low death rate reflects the presence of large numbers of young people. The overall death rate including military personnel would be 7.4 for the year if the same number of persons were included as in prewar days, but this is a misleading figure as it includes military deaths from the whole area without considering the present military population. Deaths of military personnel stationed in the area are reported to the health department, but, according to the record, the department has received no figures on military population since the beginning of the war. The report states that accidental deaths have moved into first place instead of deaths due to heart disease in the ten leading causes of death for the 1943-1944 fiscal period. Deaths from tuberculosis have moved into fourth place ahead of deaths due to congenital malformation and diseases in early infancy. The figure on accidental deaths is somewhat misleading in the overall picture in that several large scale military accidents are included. If these were excluded, accidental deaths would be in fifth place. The ten leading causes and their rates for 100,000 of population are:

Accidental deaths 150.9 as compared with 112.6 for the previous year.
Heart disease 125 as compared with 121.1 in 1943.
Cancer 76.5 as compared with 63.5 in 1943.
Tuberculosis 57.6 as compared with 56.6 in 1943.
Congenital malformations and diseases of early infancy 53.1 as compared with 61.2 in 1943.
Nephritis 48.2 as compared with 47 in 1943.
Cerebral hemorrhage 41 as compared with 43.6 in 1943.
Pneumonia 32.2 as compared with 35.5 in 1943.
Suicide 20.1 as compared with 20 in 1943.
Diabetes mellitus 16.6 as compared with 16.5 in 1943.

GENERAL

American-Soviet Medical Society in New Offices.—As of September 1 the new address of the American-Soviet Medical Society will be 58 Park Avenue, New York 16. The offices will be located in the American Russian Institute Building. The society will occupy the entire sixth floor penthouse and will have facilities for its library and research workers, business office and editorial departments.

Biography of Dr. Joseph B. De Lee.—Authors are now at work on a biography of the late Dr. Joseph B. De Lee. They are anxious to receive copies of correspondence or other documentary material which would be useful for inclusion in such a biography. Material may be sent to Dr. Sol. T. De Lee at 5028 South Ellis Avenue, Chicago. Any material that is sent will be carefully preserved and will be returned on request to those who sent it. Due acknowledgment will also be made for such material as is used.

Changes in Rockefeller Institute.—The board of scientific directors of the Rockefeller Institute for Medical Research, New York, announces the following promotions and appointments, among others:

Dr. Charles L. Hoagland, New York, to member.
Lyman C. Craig, Ph.D., New York, to associate member.
Lewis G. Longsworth, Ph.D., New York, to associate member.
Theodore Shedlovsky, Ph.D., New York, to associate member.
Dr. Paul B. Hamilton, New York, to associate.
C. Arthur Knight Jr., Ph.D., Princeton, N. J., to associate.

New appointments include:

Henrik Dam, D.Sc., Rochester, N. Y., associate member.
Dr. Maclyn McCarty, New York, associate.

Narcotic Violations.—The U. S. Bureau of Narcotics announces the following actions:

Dr. Henry C. Chalmers, Brookneal, Va., pleaded guilty in the U. S. District Court at Lynchburg, Va., June 4 to violation of the internal revenue code; his sentence was suspended and he was placed on probation for a period of three years on condition that he surrender his narcotic special tax stamp.

Dr. Edward Harmon Teed, Coeur d'Alene, Idaho, was convicted at Coeur d'Alene of violation of the federal narcotic law; on June 2 he was sentenced to a term of one year and one day and was fined $2,500. The penitentiary sentence was suspended and Dr. Teed was placed on probation for a period of one year.

Dr. Henry Raymond Gross, Chicago, pleaded guilty to violation of the federal narcotic law and on June 1 was sentenced to a term of three years; his sentence was suspended and Dr. Gross was placed on probation for a period of three years.

Dr. James Franklin Johantgen, Talladega, Ala., pleaded guilty in the U. S. District Court to violation of the Harrison narcotic law and on June 8 was fined $200 and placed on probation for a period of five years.

Dr. Benjamin F. Lazenby, Treece, Kansas, pleaded guilty in United States District Court at Wichita, Kan., to violation of the Harrison Narcotic Law and on May 7 was fined $100.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended July 7 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Maine	1	West Virginia	2
New Hampshire	2	North Carolina	1
Vermont	..	South Carolina	6
Massachusetts	1	Georgia	5
Rhode Island	..	Florida	..
Connecticut	7	Kentucky	1
		Tennessee	13
New York	21	Alabama	5
New Jersey	10	Mississippi	1
Pennsylvania	..		
		Arkansas	..
Ohio	5	Louisiana	3
Indiana	..	Oklahoma	6
Illinois	2	Texas	21
Michigan	3		
Wisconsin	..	Montana	1
		Idaho	..
Minnesota	..	Wyoming	..
Iowa	2	Colorado	..
Missouri	1	New Mexico	..
North Dakota	1	Arizona	..
South Dakota	..	Utah	..
Nebraska	..	Nevada	..
Kansas	1		
		Washington	..
Delaware	1	Oregon	..
Maryland	3	California	18
District of Columbia	..		
Virginia	5	Total	154

Basal Temperature Records to Aid Infertility Treatment.—A basal temperature record to aid in determining the probable time of ovulation in individual women is being made available by the medical committee of the Planned Parenthood Federation of America to physicians interested in the treatment of infertility and the planning of conception. As reported by Dr. Pendleton S. Tompkins, Philadelphia, in THE JOURNAL (March 11, 1944, p. 698) it has been found that an accurate daily record of basal temperature is valuable in estimating the optimal time for conception. There is a slight rhythm of variation in the normal temperature of a healthy woman, the temperature being lower during the first half of the menstrual cycle than during the latter half. The transition from the lower level to the higher one occurs at about the time of ovulation. In many cases the temperature will show a sharp drop and then shoot immediately to the higher level, which can be taken as an indication that ovulation is taking place. As the variation for the entire cycle may be less than half a degree, the patient must be provided with complete instructions and forms with which to plot her temperature accurately. The temperature is taken rectally each morning immediately on awaking before the patient has got out of bed, talked, eaten, drunk or smoked. The charts, as provided by the Planned Parenthood Federation, provide for a six months record. They indicate the calendar months, the length of the individual cycle and the number of days backward from the onset of the menses at which ovulation can be estimated to occur. The charts, together with the instruction forms for patient use, are available at cost through the medical department, Planned Parenthood Federation of America, 501 Madison Avenue, New York 22.

FOREIGN

Three Medical Schools to Be Opened in Reich.—Three of seven German medical schools, including the University of Heidelberg, will open September 1, Major Gen. Morrison C. Stayer stated July 15, if the necessary equipment, a faculty and coal to heat the buildings can be assembled, newspapers reported. General Stayer, chief of public health branch G-5, United States forces in the European theater, said there was a serious need in Germany for well educated physicians and surgeons, as German medicine declined badly during the Hitler period. He said that in order to protect the health of allied troops it is necessary that German health be kept at a high level. He added that many German prisoners were in bad health. General Stayer said that present plans call for the matriculation of 300 doctors for advanced training at Heidelberg, 500 students at Marburg University and 300 students at Erlangen University, adding that the other schools were too badly damaged to function.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 16, 1945.

The Teaching of Pediatrics

A pediatric committee of the Royal College of Physicians has presented an important report on the teaching of pediatrics. It suggests that the student's attention should be directed to the growth and development of children while he is still learning biology, physiology and anatomy and that the diseases peculiar to childhood should find a place in his studies of pathology and psychology. In his midwifery course he should be taught by a pediatrician about health and disease in the newborn. He should also spend eight sessions at a child welfare center, where he will be taught by a pediatrician or a suitably qualified maternity and child welfare officer. Courses in the care of the newborn and in child welfare should precede his course in general clinical pediatrics, which should occupy not less than a third of his whole time given to clinical medicine and should include a resident period of a month. In the study of social medicine the social services dealing with children should be given proper weight, so that the student may gain some insight into the school medical service, child guidance centers and children's courts.

THE TEACHING UNIT

The report holds that a hospital center, closely linked to a university and with a separate children's hospital attached to it, has much to recommend it. A university department of pediatrics, housed in a children's hospital, would forward teaching and research. Alternatively the university pediatric department might be developed as part of a general undergraduate teaching center admitting 80 to 100 students a year. In any case it should have at least 100 beds for general medical and surgical cases and possibly additional beds for tonsillectomy. At least 20 more beds should be set aside for infectious diseases, and the department should be linked to an appropriate fever hospital. Students should also have access to rheumatic heart homes, orthopedic hospitals and institutions for tuberculous children, so that they can study disease in childhood, and they should see rehabilitation applied in convalescent homes. In London much larger children's units will have to be developed in many medical schools; meanwhile students should get the necessary experience in children's hospitals. In provincial schools the children's hospitals will provide the main teaching in pediatrics, though these should in due course become university centers. The staff of the children's department should consist of a whole time director of professional rank, a whole time senior assistant, a registrar and a resident house officer. Also there should be two part time pediatricians of the standing of physicians or assistant physicians. A senior pathologist should take a special interest in the pathology of children's diseases, and similarly a senior radiologist in x-ray examinations.

Fellowships to Promote the Study of the Maintenance of Health

The Nuffield Foundation announces yet another benefaction. It proposes to award a number of medical fellowships to help promising men and women who wish to follow an academic career in social medicine, child health, industrial health and psychiatry to obtain at home or abroad the necessary postgraduate training and experience. More men and women trained in research and teaching are needed to secure the continued advance of medical knowledge and the standard of medical education. The foundation believes that there is a special need for carefully selected persons to have opportunities for studies which relate to the promotion and maintenance of health as distinct from the recognition and treatment of established disease. It hopes that the fellowships being offered will help to meet this need.

Normally the annual value of a fellowship will be between $2,500 and $4,000. It may be awarded for one or more years but as a rule for not longer than three years. Candidates must hold a university degree in medicine registerable in Britain and have had general clinical experience since qualification. In order that doctors serving overseas may not be at a disadvantage, the trustees have refrained from requiring applications to be submitted by a specified date. Medical officers serving with the armed forces may apply now for fellowships tenable on demobilization.

Emergency Rations for Polar Flights

For the polar flights of the British airplane *Aries* it was decided to provide emergency rations sufficient to last the crew of 9 for twenty-eight days. These were designed and prepared by the Low Temperature Research Station of the Department of Scientific and Industrial Research in consultation with Wing Commander Macrae of the Air Force Institute of Pathology and Wing Commander Winfield of the Air Force Institute of Aviation Medicine, who was medical officer on the flights. As the normal rations would have been too heavy and bulky, dehydrated foodstuffs were adopted. These were in the form of 2 inch tablets wrapped in waxed films. Each on addition of water gave a ready made meal and there was sufficient range to provide four different menus. For example one menu for lunch was meat and vegetable stew, fruit, biscuits, butter and tea. The total weight of the rations was 393 pounds. It was found that rations for two days could be packed in a standard 4 gallon can, which not only was convenient but also could be gas packed to ensure that the food remained in the best condition possible.

Pulmonary Embolism in Liberated Prisoners of War

In a communication to the *Lancet* (June 2, p. 703) H. L. Miller calls attention to a condition that does not seem to have been previously observed in the war. Between May 1 and May 9 about 300 men were admitted to a hospital in this country suffering from the effects of privations as prisoners of war in Germany. About 200 were stretcher cases. In only 2 was the malnutrition severe enough to cause anxiety, but it was noticed during the first week that the majority had fever. One of them died in five minutes of pulmonary embolism, which was confirmed by necropsy. He had been allowed up for a day or two but had been put back to bed because of recurrence of edema of the legs. Nine days after admission another man died of pulmonary embolism six hours after the first manifestation. The question arose whether some of the symptoms and signs noted in the other men were not also due to pulmonary embolism. Most of the men had marched 500 to 1,000 miles between January and May on very short rations. During the last month of the march almost all of these developed diarrhea and swelling of the legs. The edema was usually limited to the lower shin but sometimes extended above the knee and in some was asymmetrical. Among the symptoms which they developed were paroxysmal dyspnea while at rest, chest oppression or pain, palpitation, cough (with hemoptysis in at least 1 case) and sudden collapse. The diagnoses made by the medical officers who examined the prisoners after liberation included pleural effusion, bronchitis, bronchopneumonia, lobar pneumonia and pulmonary tuberculosis. There were cases of sudden death and "pneumonia that kills in a few hours."

The signs remaining in the chest on admission to the hospital were in some attributed at first to unresolved pneumonia or atypical pneumonia, but the hospital staff now suspect that at least a proportion were the result of pulmonary infarction.

Some of the other signs so often seen in these ex-prisoners—slight cyanosis of the lips, pyrexia, tachycardia—may have been caused by small emboli without infarction. Paul White, who believes that pulmonary embolism commonly goes unrecognized, states that its principal cause is thrombosis of the leg veins, beginning as a rule in the calf and extending to the long saphenous and femoral veins. Such thrombosis would explain the edema developing in these prisoners as their malnutrition increased. After the war of 1914-1918 an increase of pulmonary embolism was attributed by Burwinkle to malnutrition.

PARIS

(From Our Regular Correspondent)

June 17, 1945.

Repatriation

The problem of repatriation of prisoners of war, of political or racial deportees, of supposedly voluntary workers and those recruited by force, who find themselves in Germany, presents an urgent problem to the French government. Even if limited to its health aspects and the demographic consequences, this problem is immense. Arrangements had been made and a plan of action decided, but the débacle of Germany has been so rapid and the prisoners and their families are so anxious to be reunited immediately that all plans were sidetracked.

There were various groups to be repatriated. The sick and wounded numbered about 250,000; more had already been cared for in Germany and had been liberated through the intervention of the International Red Cross. Others were still under treatment in German hospitals but could not be transported. There were many political transportees and "voluntary" workers. The majority of them were not patients in the strict sense of the term, but the suffering which they had to endure makes them practically convalescents, who have to be treated with special consideration. There were a million of such convalescents.

The return of these exiles took place by land, by sea (especially those who were liberated by the Soviet armies) or by air. Many of them had at the time of their liberation started on foot toward France, escaping from all control. It has been estimated that there were 15 million foreigners in Germany, and about 6 million of them spontaneously took to the road.

About 150 advance posts were organized quickly on the German roads, where the first selection was assured and where some urgent care could be given. There the repatriates were given instructions and directions. At the border itself, at the principal points of arrival by sea, by land and by air, health stations were created which directed them to regulatory stations as the last halting place before their return home. These health stations not only had to assure the administrative registration of the repatriates but also had to determine the control of this heterogeneous mass of refugees, their present and future health, the immediate care to be given them, the supervision to which they had to be subjected on their way home, their present capacity for work and the recuperation from which they were to benefit. The health supervision which they required was assured by the local health authorities, and a new examination was planned after six months. It was necessary that the examination on entrance into France should be complete and made moreover with all the caution merited. Everything was done in as simple a manner as possible to avoid any unnecessary delay.

They proceed first to the police department, where after identification their administrative papers are set up. Then they are undressed and their clothing is disinfected either by DDT or by fumigation. Then they receive a prolonged hot shower and a thorough soaping, followed by drying in hot air after a careful rinse. At this time those with scabies were marked and were painted with benzyl benzoate. Then came weighing and measuring and vaccination against smallpox. An orderly obtained 10 drops of blood from the ear lobe, and the slide with this blood was sent to the laboratory for a Kline test, which was chosen because it is especially rapid and sensitive. After this the medical examination is completed by roentgenography or by fluoroscopy if indicated by special examinations.

With the health record established, the repatriates are directed either to the hospital if they need treatment urgently or for a more thorough clinical examination, while the rest are sent to the regulatory station for their return home.

TUBERCULOSIS

Some 2,500,000 persons had to be examined rapidly. The first step was to make an x-ray examination. It was impossible to carry this examination out in Germany, where equipment and personnel were lacking. The task was performed in the frontier posts. Roentgenography is preferred over fluoroscopy because it is made more easily on large numbers and there remains an authentic document. Fluoroscopy is reserved for particular cases. A regular control is assured to the personnel who work in the radiologic crew. This systematic search for tuberculosis has proved fruitful; according to preliminary statistics on 24,695 repatriates of the department of the North, the mortality rate and the morbidity were double that in the other war. After the examination with x-rays, all the suspected cases are called to the attention of the health office of their home district and they will be subject to inquiry and supervision and will receive care when they need it. Convalescent homes and sanatoriums will be open for them.

SYPHILIS

Even when the presence of a contagious lesion was established, the serologic reaction was determined. Treatment was not enforced nor was return home delayed. Those infected were urged to obtain treatment. The health authorities at the patient's home were notified for future supervision.

CANCER

The great majority of repatriates are young men. Thus it was the more surprising to detect in them carcinomatous manifestations. Cancer, of course, is not necessarily a disease of mature age. Unfortunately the means of rapid and systematic detection of cancer have not been perfected as yet.

Marriages

RUSH E. NETTERVILLE, Wilkinson, Miss., to First Lieut. Frances Foil McAllister of Mount Pleasant, N. C., in Epinal, France, April 12.

GUTHRIE YOEHLEE GRAVES, Bowling Green, Ky., to Miss Elizabeth Hannan Ellis of Hopkinsville, June 9.

JAMES C. SPALDING, Lebanon, Ky., to Miss Arminta Scott of Corinth, Miss., in Nashville, Tenn., June 2.

CHARLES SAMUEL MCCAMMON, Maryville, Tenn., to Miss Mary A. Thornburgh of Knoxville, June 14.

HAROLD FREDERICK BERTRAM, Memphis, Mo., to Miss Margaret Baden Patterson of Baltimore, May 7.

JOHN HARVEY NICHOLSON, Statesville, N. C., to Miss Gertrude James May in Richmond, Va., June 2.

GEORGE H. MCSWAIN, Paris, Tenn., to Miss Mary Jane Allred of Bowling Green, Fla., May 27.

JOHN MILTON MOOK, Metuchen, N. J., to Miss Jean Marie Wallace of Nashville, Tenn., June 12.

JOHN COVINGTON TINSLEY Jr., Lynchburg, Va., to Miss Ellen Luberger of Wyoming, Ohio, June 9.

FRANK J. PICKETT, Joplin, Mo., to Miss Yvonne Best of Vandalia, Ill., in St. Louis, June 8.

RUSSELL DORRIS WARD to Miss Margaret Virginia Bowen, both of Nashville, Tenn., June 8.

JEROME J. ROMAGOSA to Miss Ethyl Mae Litton, both of Opelousas, La., Nov. 4, 1944.

Deaths

Horace Newhart ⊕ Minneapolis, authority in otology, died July 9, aged 72, of cancer.

Dr. Newhart was born in New Ulm, Minn., Dec. 9, 1872. He studied in the New Ulm public schools, Carleton College and Dartmouth College and graduated at the University of Michigan Department of Medicine and Surgery, Ann Arbor, in 1898. Intermittently until 1912, when he joined the faculty of the University of Minnesota School of Medicine, he engaged in graduate study in Vienna. At the time of his death he was professor emeritus in otolaryngology at Minnesota, where for a long period he had been head of his department, and at the University of Minnesota Graduate School, Minneapolis-Rochester. He had been a member of the staff of the Glen Lake Sanatorium, Oak Terrace, University of Minnesota, Northwestern, St. Barnabas and the Abbott hospitals.

His many affiliations included service as consultant on audiometers and hearing aids of the Council on Physical Medicine of the American Medical Association and as president of the American Laryngological, Rhinological and Otological Society, American Acoustical Society, Minnesota Academy of Ophthalmology and Otolaryngology and the Minnesota Academy of Medicine, a fellow of the American College of Surgeons and a member of the committee on conservation of hearing of the Minnesota State Medical Association. For many years he was consulting otologist to the public schools in Minneapolis. Dr. Newhart was one of the first to be certified as a specialist by the American Board of Otolaryngology.

Exceedingly active in promoting the importance of testing the hearing of school children, Dr. Newhart had only recently completed with Scott N. Reger, Ph.D., a "Syllabus of Audiometric Procedures in the Administration of a Program for the Conservation of Hearing of School Children" while serving as a member of the executive committee of the committee on the conservation of hearing of the American Academy of Ophthalmology and Otolaryngology. In 1937 he was given honorable mention by the Minnesota State Medical Association for his exhibit on the prevention of deafness.

Henry Onslow Smith, Hudson, N. H.; Bellevue Hospital Medical College, New York, 1887; member of the American Medical Association, the New Hampshire Historical Society and the New England Historic Genealogical Society; served as president and for many years a member of the board of trustees of the New Hampshire Medical Society, from which he had received a fifty year medal in 1937; served as a member of the school board, trustee of the public library and member of the board of health; on the staff and trustee of the Memorial Hos-



CAPT. FREDERICK EMIL BARTHES
M. C., A. U. S., 1908-1944



CAPT. JAMES S. BERTOGLIO
M. C., A. U. S., 1917-1945



LIEUT. COMDR. JOHN W. FISH
(MC), U.S.N.R., 1908-1944

KILLED IN ACTION

Frederick Emil Barthes, La Grange Park, Ill.; Loyola University School of Medicine, Chicago, 1942; interned at the Columbus Hospital in Seattle; began active duty as a first lieutenant in the medical corps, Army of the United States, on Aug. 8, 1942; promoted to captain; killed in action in Belgium Dec. 18, 1944, aged 36.

James Stephen Bertoglio, Butte, Mont.; University of Michigan Medical School, Ann Arbor, 1943; interned at the City of Detroit Receiving Hospital; began active duty in the medical corps, Army of the United States, on Dec. 26, 1943; later promoted to captain; killed in action in Germany January 10, aged 27.

John Winston Fish, Louisville, Ky.; University of Louisville School of Medicine, 1934; member of the American Medical Association; on the staff and formerly an intern at the Kentucky Baptist Hospital; served a residency at the Eye, Ear, Nose and Throat Hospital in New Orleans, and the Methodist Episcopal Deaconess Hospital; on the staffs of the Norton Memorial Infirmary and the Jewish Hospital; commissioned a lieutenant in the medical corps of the U. S. Naval Reserve on Feb. 4, 1942; reported to Marine Corps Base, San Diego, Calif., for active duty; went to the Naval Air Station, Pensacola, Fla., for temporary duty in attendance on a course of instruction leading to the designation of aviation medical examiner; from there he went to Naval Reserve Air Base, Oakland, Calif., for duty with designation of "qualified medical examiner"; later ordered to Naval Air Station at Oakland for duty involving flying with designation of naval flight surgeon; ordered to report to an air group for duty involving flying on board a vessel; promoted to lieutenant commander on March 1, 1944; awarded the Asiatic-Pacific Area Campaign Medal and the Purple Heart; died in the Pacific area Nov. 25, 1944, aged 36, of blast concussion and bomb asphyxiation while on duty in the battle dressing station of an aircraft carrier.

pital and on the staff of St. Joseph's Hospital, both in Nashua; chairman of the local committee on public safety during World War I and chairman of the emergency medical service of civilian defense during World War II; in 1927 compiled and published "The Early Story of Hudson, N. H."; edited, amended and brought up to 1941 "The Story of the New Hampshire Medical Society"; died May 14, aged 80.

Grover C. Daniel, Whipple, Ariz.; Loyola University School of Medicine, Chicago, 1919; member of the Washington State Medical Association and the American Medical Association; served in the medical corps of the U. S. Army from September 1917 to December 1918; formerly assistant surgeon in the U. S. Public Health Service Reserve; manager of the Veterans Administration Facility; formerly manager and clinical director of the Veterans Administration Facility in Walla Walla, Wash.; at one time on the staff of the Veterans Administration Facility in West Los Angeles, where he died May 16, aged 53, of abdominal carcinomatosis.

Henry Houston Ogilvie ⊕ San Antonio, Texas; University of Texas School of Medicine, Galveston, 1910; fellow of the American College of Surgeons; served during World War I; in July 1943 cited by the office of civilian defense in Washington for his service while chairman of the local emergency hospital corps; served as surgeon at the Santa Rosa, Nix, Medical Arts, Physicians and Surgeons and Medical and Surgical Memorial hospitals; consulting surgeon at the Robert B. Green Memorial Hospital; died in the Touro Infirmary, New Orleans, June 15, aged 60.

Herman Schwarz ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1898; served on the faculty of his alma mater; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; director of the department of pediatrics, serving as president of the medical board, Beth Israel Hospital; for many years associated with Mount Sinai Hospital, serving on the staff as consulting pediatrician at the time of his death; died in Bedford Village, N. Y., May 19, aged 69, of coronary thrombosis.

Eleanor Holden Balph ⊕ Philadelphia; University of Pittsburgh School of Medicine, 1918; clinical assistant professor of gynecology at the Woman's Medical College of Pennsylvania; member of the Philadelphia Obstetrical Society; fellow of the American College of Surgeons; interned at the Hospital of the Woman's Medical College of Pennsylvania; chief of gynecology at the Woman's Hospital, where she died May 21, aged 57.

Annetta E. Barber, Glens Falls, N. Y.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1898; retired member of the Medical Society of the State of New York and member of the American Medical Association; died April 26, aged 86.

Foster Flavorial Burnett, Wilmington, N. C.; Howard University College of Medicine, Washington, D. C., 1917; served during World War I; an examining physician for city draft board number 1; a founder of the Community Hospital, where he died May 31, aged 54, of pulmonary embolism and chronic leukemia.

John William Patton, Cabool, Mo.; University of Maryland School of Medicine, Baltimore, 1886; served on the staffs of the North Dakota State Hospital for Insane, Jamestown, and the Toledo State Hospital in Toledo, Ohio; died March 17, aged 84, of ascites and cerebral hemorrhage.

James L. Prine, Day, Fla.; University of Georgia Medical Department, Augusta, 1900; died March 6, aged 71.



CAPT. TRUMBULL FRAZER
M. C., A. U. S., 1915-1945



LIEUT. WILLIAM H. MILLMANN
M. C., A. U. S., 1918-1945



LIEUT. (JG) ROBERT SMITH NICHOLS
(MC), U.S.N.R., 1920-1945

KILLED IN ACTION

Trumbull Frazer, Asheville, N. C.; Cornell University Medical College, New York, 1942; diplomate of the National Board of Medical Examiners; interned at the Rhode Island Hospital in Providence; served a residency at the Massachusetts Eye and Ear Infirmary in Boston and the Station Hospital, U. S. Army, Biggs Field, El Paso, Texas; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 30, 1943; later promoted to captain; killed in action in Germany February 7, aged 29.

William Henry Millmann, Shorewood, Wis.; Marquette University School of Medicine, Milwaukee, 1943; interned at St. Mary's Hospital in Milwaukee; entered the medical corps of the Army of the United States as a first lieutenant on Oct. 18, 1943; began active duty on Aug. 4, 1944; killed in action in Italy February 21, aged 26.

Robert Smith Nichols, Hanover, N. H.; University of Pennsylvania School of Medicine, Philadelphia, 1943; diplomate of the National Board of Medical Examiners; interned at the Hospital of the University of Pennsylvania in Philadelphia; began active duty as a lieutenant (jg) in the medical corps, U. S. Naval Reserve, on Nov. 14, 1944; assigned to Navy Yard in Philadelphia; killed in action on Okinawa April 1, aged 24, while attempting to give aid to a wounded hospital corpsman.

Correspondence

MARIHUANA PROBLEMS

To the Editor:—In an editorial (THE JOURNAL, April 28, p. 1129) appears a criticism of a report on marihuana by the New York City Mayor's Committee on Marihuana.

The editorial states "Nevertheless, a book called 'Marihuana Problems' by the New York City Mayor's Committee on Marihuana submits an analysis by seventeen doctors of tests on 77 prisoners and, on this narrow and thoroughly unscientific foundation, draws sweeping and inadequate conclusions which *minimize the harmfulness of marihuana.*"

The report was not an analysis by seventeen doctors of 77 prisoners. The Mayor's committee did not even consist of seventeen doctors of medicine; and if the writer of the editorial had read the report carefully he would have noted that only sixteen different names are given as comprising the Mayor's committee and that two of these are not M.D.'s. Nor were there 77 prisoners studied. Of the 77 persons studied 5 were volunteers, not prisoners. This is clearly stated in the text.

Any one reading the editorial would not realize that Mayor La Guardia "sought advice from the New York Academy of Medicine"; and, as he states in the foreword, "On the academy's recommendation I appointed a special committee to make a thorough sociological and scientific investigation and secured funds from three foundations with which to finance these studies." The New York Academy of Medicine kept in close touch and advised concerning the study throughout the entire period during which it was carried out.

The study was actually carried out as follows: Two subcommittees were appointed, one to plan a sociological study, the other to work out details of the clinical study. The sociological study was carried out under the active direction of Dr. Dudley D. Shoenfeld, using six police officers who had been specially trained as social investigators. The Police Department placed the services of the Narcotic Squad Division at the disposal of the Mayor's committee. Six members, four men and two women, carried out for a period of over one year a painstaking investigation of the use of marihuana in the city of New York.

The report states that in this period of over a year "while on duty, the squad actually lived in the environment in which marihuana smoking or peddling was suspected. They frequented poolrooms, bars and grills. . . . They consorted with habitués of these places. . . . They posed as suckers from out of town and as students in colleges and high schools." From this sociological study and not simply from tests of 77 (actually 72) prisoners, as stated in the editorial, thirteen conclusions were drawn, the following of which are quoted:

7. The practice of smoking marihuana does not lead to addiction in the medical sense of the word.

10. Marihuana is not the determining factor in the commission of major crimes.

13. The publicity concerning the catastrophic effects of marihuana smoking in New York City is unfounded.

The editorial states that "the report states that the relation between marihuana and crime is unfounded. This opinion, based on tests of 77 prisoners, denies much available evidence." Since, as has just been shown, the report describes conditions in New York City and concludes that there is no important relationship between marihuana and crime in that city, and since these conclusions are not based on "tests of 77 prisoners," it is apparent that the writer of the editorial has either not read the report carefully or is deliberately misrepresenting the facts.

Besides the sociological study, clinical studies including medical aspects, psychologic aspects and pharmacologic aspects are reported. The pharmacologic study takes up sixty-four pages of the report and includes much valuable material as to the active principle of marihuana and gives actual experimental work with animals. The psychologic studies, which were most carefully done, include the use of a large number of the standard types of tests and some of the newer technics, such as play technic.

The conclusions as written by Dr. Wallace, chairman of the committee, are that the first phase of the study, namely the sociological, indicates that "the marihuana user does not come from the hardened criminal class, and there was found no direct relationship between the commission of crimes of violence and marihuana." He then goes on to state that under the clinical study "in a limited number of the subjects there were alterations in behavior giving rise to antisocial expression. This was shown by unconventional acts not permitted in public, anxiety reactions, opposition and antagonism, and eroticism. Effects such as these would be considered conducive to acts of violence. However, any tendency toward violence was expressed verbally and not by physical actions, and in no case was restraint by force needed." These, then, were some of the conclusions drawn from the study of 72 confined criminals and 5 volunteers. They are not what one would assume to be the case in reading the editorial in THE JOURNAL.

The editorial then goes on, "Kolb, nationally known addiction expert, after reading the report stated 'one may say of such a drug that, if it were abused as alcohol is abused, it might be an important cause of crimes and other misdemeanors.'" The report of the Mayor's committee was published in the latter part of 1944. The quotation from Dr. Lawrence Kolb appears in the discussion of a paper read at the meeting of the American Psychiatric Association at Boston, May 18 to 21, 1942. At least one presumes that the quotation intended is the following: "It can readily be seen that a drug which produces all these effects, if used as widely as alcohol is used in this country, might be like alcohol a very important contributing cause to crimes of various kinds."

Kolb's discussion occupies a considerable part of a whole page, the quotation being from page 251 of volume 99, number 2, September 1942, of the *American Journal of Psychiatry.* One wonders why the writer of the editorial left out the following portion of Kolb's statement, which would certainly give the readers of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION an entirely different idea of the dangers of marihuana than the partial and garbled quotation. I quote as follows: "In view of the misinformation and alarm that has gotten abroad about marihuana it is important to have a competent group like the Mayor's committee to study this drug and present the real facts. *In the meantime* [italics mine], Dr. Allentuck's timely paper will tend at least to get physicians' feet back on the ground. The case against marihuana has been very much overdrawn, but we learn from Dr. Allentuck that the drug does have intoxicating effects and that in susceptible people it may precipitate a psychosis. A drug which has these properties is, of course, dangerous. . . . The studies should be made if possible in a country such as Mexico where there is said to be a really widespread use of marihuana. It is of interest, however, that many physicians in Mexico feel that marihuana does little if any harm. It is reassuring to find from the careful study that Dr. Allentuck has made that the alarm about the relation of marihuana to crime is unfounded. The drug, like most other intoxicants, is taken mostly because it produces a sense of ease and finally sleep, but on its way to this final result there is a peculiar, bizarre type of intoxication with release of inhibitions."

The editorial further states that "the report proposes the use of marihuana in the treatment of drug addiction and chronic alcoholism. Bouquet, the League of Nations expert, and others agree with Kolb that this proposal enters dangerous territory and that the result can only be the substitution of one addiction for another." On page 218 of the Report of the Mayor's Committee, under "Summary," appears the following statement: "From limited observations on addicts undergoing morphine

withdrawal and on certain types of psychopathic disturbances, the impression was gained that marihuana had beneficial effects, but much more extensive and controlled study is required for definite conclusions to be drawn concerning therapeutic usage." Likewise, on page 148 under chapter "Possible Therapeutic Applications" it is also stated "However, the studies here described were not sufficiently complete to establish the value of such treatment, and before conclusions can be drawn the problem must be investigated under completely controlled conditions."

Do these sound like "sweeping and inadequate conclusions" on "narrow and thoroughly unscientific foundations"? Or does this not seem like the type of conclusions which careful, scientific observers give after a study which they feel does not warrant final conclusions?

There have been further studies made in New York City on the relationship of marihuana to crime, and the psychiatric examination of convicted prisoners at the Court of General Sessions and the studies of persons charged with crime made in the prison wards of the psychiatric division of Bellevue Hospital confirm that marihuana is not an important cause of crimes of violence in New York City.

The claim in the editorial that "the recent article which appeared in the December 1944 issue of *War Medicine* entitled 'The Marihuana Addict in the Army,' by Captain Eli Marcovitz and Captain Henry J. Myers, is a devastating refutation of the information contained in the La Guardia report" is hardly borne out by a careful study of the article. On page 4 it is stated that "marihuana addicts usually present an extremely complex picture in which the use of the drug is but one aspect." Under "Summary and Conclusions" on page 9 it states that, "as a group, their backgrounds were heavily loaded with adverse familial, social and economic factors. Their histories were characterized by delinquent and criminal behavior and failure to develop any consistent patterns of productive work." It is also stated "Our experience indicates that a confirmed marihuana addict of the type described here is a sick personality whose maladjustment has been determined not only by his own personality and character patterns but by adverse socioeconomic factors."

It is also pointed out in their study that "it must be emphasized that our conclusions are based on observations of a specialized group of marihuana addicts, namely a group in military service with difficulties which brought them to the attention of the military or medical authorities. Undoubtedly there are other types of marihuana users or even addicts (e. g., band musicians), observation of whom might lead to somewhat different conclusions."

Many persons fail to differentiate between cause and effect. Marihuana is often used by inadequate and maladjusted individuals who were this way long before they started the use of marihuana. It is also used by many unstable psychopaths, and acute psychotic episodes may be precipitated in these individuals by its use. The conclusion that they are maladjusted because of the use of marihuana is only a partial truth. The use of any narcotizing drug, as marihuana, alcohol or opium, contributes to further maladjustment, but the fundamental personality defect and the original maladjustment are the important problems and the marihuana is much more a symptom than a cause.

The report describes conditions in New York City, gives details of careful medical, psychiatric and psychologic tests on 5 volunteers and 72 prisoners and of special pharmacologic studies. As a result of the sociological studies certain conclusions were drawn about the use of marihuana and its relation to crime in New York City. From the other studies certain conclusions were drawn, and in certain instances it was pointed out that further studies were necessary before any decision could be made.

KARL M. BOWMAN, M.D., San Francisco.

BLOOD BANK OF QUEENS COUNTY, INC.

To the Editor:—Supplementing my communication in THE JOURNAL, May 19, I wish to call attention to the results obtained at the Mary Immaculate Hospital, adjacent to the Blood Bank of Queens County, as submitted to me by the obstetric department. Excepting one death from a brain tumor and one from pneumonia, there was not a maternal death for a period of one year. There were 1,736 deliveries. This was due in part to having blood of the proper type and Rh factor available at the moment the patient entered the delivery room.

When the obstetrician draws blood for a Wassermann test in the early stages of pregnancy he also determines the type and Rh factor of the patient and on admission to the hospital blood of her type and Rh factor is placed in an ice box adjacent to the delivery room in case of need. Blood of all types is easily kept through the cooperation of both doctor and hospital insisting that relatives or friends replace on a two for one basis. Persons paying for their hospitalization in 80 per cent of the cases have blood on deposit in advance. The uncooperative 20 per cent are asked to make a cash deposit equivalent to the cost of a professional donor. In our plan it is $35, which is returned to them on replacement.

Blood may be obtained at varying prices, as low as $15, but the replacements are so few, owing to the small deposit required, that it is necessary for suppliers to solicit random donors for a fee, usually $5. When the deposit is kept at the higher level, it is unnecessary to solicit donors and we always have more blood than we need, even for all the free cases, and no one is denied blood regardless of ability to pay or replace. Four out of five of the few who do put up the deposit come in during the ninety day period allowed for replacement and obtain their refund.

The identification card for blood donors as described in THE JOURNAL of May 19 has created great interest in mutual blood donor groups, especially among Rh negatives.

EDWARD J. MADDEN, Jamaica, N. Y.
Chairman, Blood Bank of Queens County.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, July 14, page 826.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, May 27. Final date for filing application is Jan. 31. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Fall, 1945. Final date for filing application is Aug. 1. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, October 24. Final date for filing application is Aug. 1. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Requirement of Maine Nurses Registration Act That Applicant for Registration Be Graduate of Nursing School Presided over by Maine Registrant Valid.—The nurses registration act of Maine provides for the registration and certification of professional trained nurses and that a register of their names be open at all times to public scrutiny. The administration of the act is committed to a Board of Registration of Nurses. Registration is purely voluntary and in no way compulsory. Any nurse possessing the qualifications required in the act may submit to examination for registration. Nurses who are registered in other states are entitled to registration without examination. While the practice of professional nursing as a registered nurse without a certificate of registration is prohibited, the act expressly states that it does not apply to the nursing of the sick by any person who does not represent himself or herself to be a registered nurse. One section of the act authorizes the board to admit to examination for registration any applicant who possesses stated qualifications, among which is the completion of a course of not less than two years in a school of nursing approved by the board "and presided over by a nurse registered in accordance with the requirements" of the act. Irene Snelson, who apparently possessed all the qualifications required by the act except that she had not graduated from a school of nursing presided over by a nurse registered under the Maine act, sought to be examined for registration under the Maine act. The board refused to examine her and she subsequently sought a writ of mandamus for admission to examination for registration as a registered nurse, alleging that she was eligible for registration and that the refusal of the board to admit her to examination was illegal and a violation of her constitutional rights. In effect, there was a judgment in favor of Irene Snelson and the board appealed to the Supreme Judicial Court of Maine.

The purpose of the nurses registration act of Maine, said the court, relating to the registration and certification of registered nurses is not to regulate or control the practice of nursing as a calling but to designate by public registry and certification those nurses for whose qualifications the state is willing to vouch and to prevent others who are not entitled to it from claiming falsely such sponsorship Under the act no applicant for registration and certification as a registered nurse can be admitted to examination unless he or she has complied with all the conditions there enumerated and one of those conditions is that the applicant for examination for registration shall have been trained in an approved school of nursing presided over by a nurse registered in Maine. This requirement applies alike to nursing schools in Maine and to nursing schools situated outside the state. The language of that provision is clear and unambiguous, and its operation cannot be limited or extended by reading into it a meaning at variance with its express terms. Regardless of the standing of the nursing school at which the applicant had studied or the reasons why the school had not been approved, the fact that it was neither approved nor presided over by the act in question compelled the board to refuse to admit her to examination. The board cannot be required by a mandamus to violate its duty and to disobey the law.

On the record before us it is unnecessary, continued the court, to pass on the contention that that portion of the act is unconstitutional that requires an applicant for admission to examination to have been trained in an approved school of nursing presided over by a nurse registered in Maine. That provision is an integral part of the nurses registration act, and if that provision is void the act in its entirety is a nullity and registration and certification of registered nurses by examination has no sanction in law and a right to registration would therefore not exist in the state. On a premise of the unconstitutionality of the act authorizing the registration and certification of registered nurses by examination a writ of mandamus could not be issued commanding the performance of an act by the board which it had no power to perform. The validity of a statute cannot be assailed if the benefits of that statute are invoked in the same proceeding.

The court accordingly held that the board acted properly in refusing to admit Irene Snelson to examination for registration as a registered nurse—*Snelson v. Culton et al., Board of Registration of Nurses, 42 A. (2d) 505 (Maine, 1945).*

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Delayed Menstruation Tablets and Herb Tea.—Bernard McBrady, trading as J. E. McBrady & Company, Chicago Shipped July 28 and 29 and Dec 12, 1941. Composition: Delayed Menstruation Tablets contained iron sulfate, extracts of plant drugs, including aloe, and an alkaloid bearing drug, with oil of savin, and coating of red calcium carbonate, Herb Tea No 104, chiefly a mixture of senna leaves, camomile, cascara sagrada, elder flowers, dill seed, caraway, American saffron, uva ursi, licorice root, peppermint and sassafras, Herb Tea No. 107, senna leaves and pods, uva ursi, camomile flowers, rosemary leaves, sage leaves, comfrey root, oak bark, sweet orange peel, unicorn root, condurango bark, peppermint leaves and gentian root; Herb Tea No. 109, essentially a mixture of senna leaves and pods, cinchona bark, sweet orange peel, comfrey root, red clover tops, sassafras bark and sarsaparilla root; Herb Tea No. 110, essentially senna pods, malva flowers, horehound, tansy herb, camomile flowers, comfrey root, cinchona bark, ruta herb and sage; Herb Tea No 114, chiefly marshmallow root, coltsfoot leaves, licorice root, mullein leaves, broom tops and linden flowers, Herb Tea *No. 124, essentially* leaves of spearmint, uva ursi and witch hazel, with hops, camomile flowers, red oak bark and unidentified plant material Delayed Menstruation Tablets misbranded because of false implication in the name and the label claim, "For Painful, Suppressed, Profuse or delayed by Colds" Herb Tea No 104 misbranded because represented to prevent or correct indigestion, poor appetite, sluggishness and some other things, and to save health and prolong life Herb Tea No. 107 misbranded because falsely represented in labeling as a cure or preventive of leucorrhea. Herb Tea No 109 misbranded because label falsely represented it as efficacious for skin eruptions. Herb Tea No 110 misbranded because of misleading label representation that it was effective in delayed menstruation. Herb Tea No 114 misbranded because labeling represented product as an effective treatment for irritating cough, minor chest colds and pains Herb Tea No 124 misbranded because it was not a cure or effective treatment or preventive of sores and ulcers—[*D D N. J., F. D. C. 887, May 1944*]

Sill's Powder Treatment and Sill's Powder Foot Treatment.—Sills Company, Vinita, Okla Shipped Feb 17 and March 27, 1942. Composition of both products identical, consisting essentially of salicylic acid, small amounts of bismuth subcarbonate, ammonium alum, boric acid, and aspirin in a base of talc Misbranded because falsely represented in labeling as an effective treatment for many foot and general skin disorders—[*D. D. N. J., F. D. C. 892; May 1944*]

VeDor No. 578 Injection.—Primrose R Devore, trading as Drug Products Company, Columbus, Ohio Shipped June 18 and Sept. 4, 1941. Composition: essentially small amounts of zinc sulfate and lead acetate in water. Misbranded because statement "Use in connection with Anti-Gon Internal No. 578" falsely implied that the product constituted part of a treatment for gonorrhea and that, when used in connection with the one named, it would be efficacious in treating that condition, whereas it had no value either alone or in conjunction with the other mixture in such treatment. Also misbranded in that label failed to give the common name of each active ingredient, inasmuch as zinc sulfate was not declared Misbranded, further, because label did not bear an adequate statement of the quantity of the contents—[*D. D N. J., F. D. C. 884; May 1944*]

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order Reprints as a rule are the property of authors and can be obtained for *permanent possession only from them.*

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Fort Wayne, Ind.

12:151-186 (May) 1945

Acute Hepatitis: Clinical Observations in 63 Cases N. W. Chaikin and S O Chlenoff—p 151
Drugs in Treatment of Peptic Ulcer and Hypersecretion R. Ehrmann —p 154
*Appetite and Obesity F Hoelzel—p 156
*Disturbances in Sugar Metabolism After Subtotal Gastrectomy. C. L Glaessner—p 157
Observations on Ascorbic Acid Level of Blood Plasma of Women Maintained on a Thiamine Deficient Diet Anne Bourquin—p. 162
Effect of Concentration of Pepsin and Differential Susceptibility of Jejunal Segments in Experimental Jejunal Ulcers in Dog. R L. Driver, R H. Chappell and E B Carmichael—p 166
Effect of Hydrostatic Pressure on Experimental Production of Ulcers R L Driver, R H Chappell and E B Carmichael—p 168
Increased Intra Abdominal Pressure as Means of Inhibiting Perforations Due to Pepsin Solutions Under Hydrostatic Pressure in Small Intestine of Dogs R H Chappell, R L Driver and E B. Carmichael. —p. 169
Pruritus Ani G R McCutchan—p 171
Effect of Epidemic Gastroenteritis on Enterozoic Parasites R L Brown. —p 174
Relation of Respiratory Allergy to Unresolved Pneumonia J. A. Turnbull—p 176

Appetite and Obesity.—Hoelzel asserts that all normal rats will eat enough to become fat if enough palatable and highly nutritious food is available. Uninhibited, normal human beings will apparently do likewise. Apart from this, appetite is likely to become excessive when hydration becomes abnormally increased, either because of the type of diet used or because of the amount of food eaten or as a result of endocrine factors (as in menstrual edema and hydration associated with pregnancy) or after recovery from disease. Appetite can best be controlled by keeping hydration within normal bounds

Sugar Metabolism After Subtotal Gastrectomy.—In 14 patients who had undergone subtotal gastrectomy, Glaessner found that even oral intake of 100 Gm. of glucose provoked characteristic attacks of hyperglycemic shock consisting of manifestations of nausea, vomiting, headache, cramps in the abdomen, coma and nystagmus. These attacks are probably caused by a sudden rise of blood sugar. Studies during hyperglycemic shock revealed disorders of the vascular system such as increase of the pulse rate and decrease of the systolic and especially of the diastolic blood pressure. In a few cases a comatose condition could be observed · disorientation and soft eyeballs

American Journal of Diseases of Children, Chicago

69:203-266 (April) 1945

Blood Pressures in Children Between Ages of 5 and 16 Years A W. Graham, E A Hine Jr and R P Gage—p 203
*Initial Aerobic Flora of Newborn Infants Selective Tolerance of Upper Respiratory Tract for Bacteria J C Torrey and M K Reese —p 208
*Treatment of Rate Bite Fevers with Penicillin W E Wheeler—p 215
Celiac Syndrome II Fecal Excretion in Congenital Pancreatic Deficiency at Various Ages and with Various Diets, with Discussion of Optimal Diet. D H Andersen—p 221.
Clinical Survey of 125 Cases of Infection with Ascaris Lumbricoides in Children N H. Einhorn, J F Miller and L Whittier—p 237.

Flora of Upper Respiratory Tract of Newborn Infants.—Torrey and Reese made cultures of material from the throats and the noses of 105 full term infants during the first twenty-four hours after birth No bacterial growth was obtained from swabbings of those regions taken within four hours after birth in 95 per cent of the group so studied. This result confirms the conclusion of a previous study that normally the initial flora of the nose and throat is acquired mainly from the environment after birth and not from the parturient canal Cultures of material from infants 13 to 18 hours old indicated continued sterility of the nose in 31 per cent and of the throat in 4 per cent, but by the end of the first day the cultures of all infants examined yielded growth from both regions. White staphylococci, alpha or gamma streptococci and, less frequently, diphtheroids were the first organisms to invade the oral cavity. The upper respiratory tract during the first two weeks of life rarely becomes infected with the pneumococcus, the beta hemolytic streptococcus, Hemophilus influenzae and the Friedlander bacillus through contact with nursing mothers who are carriers of these organisms. Although occasionally the pneumococcus was cultured from the nasopharynx within a few days of birth, it soon disappeared from the secretions. The mucous membrane of this region of the newborn infant is unreceptive not only to these pathogens but to certain other bacterial types, such as Streptococcus salivarius, the gram-negative diplococci and the hemoglobinophilic Hemophilus hemolyticus, which thrive there later in life. If acquired, these organisms are also soon eliminated. Routine use of the conventional types of face masks by persons in contact with the infants is of little value in preventing the acquisition by the newborn infant of organisms of the respiratory tract, pathogenic or otherwise.

Penicillin Therapy of Rat Bite Fevers.—Twenty-five cases of rat bite were treated at the Children's Hospital of Michigan during 1944. One child died of pneumonia after extensive rat bites but without clinical signs characteristic of rat bite fever. Five others had rat bite fever. Spirillum moniliformis was isolated from the blood stream of 4 of these children and Spirillum minus from that of 1 child One of the children with infection due to S. moniliformis died of diarrhea and jaundice after having had one dose of oxophenarsine hydrochloride. The remaining patients were treated with penicillin and had prompt and dramatic recovery. A dose of 5,000 units of penicillin given intramuscularly every two to three hours for a week to ten days seemed adequate to control both types of infection in these babies, who weighed from 5 to 12 pounds (2 3 to 5 4 Kg.). Wheeler has found that it has been possible to isolate and cultivate Streptobacillus moniliformis easily, using only the mediums and equipment which are routinely employed in the laboratories of most children's hospitals.

American Journal of Ophthalmology, Cincinnati

28:451-580 (May) 1945

Direct Utilization of Eye as Camera W A Mann—p 451
Use of Artificial Fever Therapy in Ophthalmology. I C Smith and G C Struble—p 461.
Some Observations on Divergent Strabismus with Anomalous Retinal Correspondence H W Grant—p 472
Amyloid Disease of Conjunctiva N B Elles—p 486
Clinical Effects of Local Use of Sulfonamides on Eyes M E Alvaro —p 497
Dacryocystitis Part Played by Syphilis in Its Etiology. J O Wetzel —p 511
Use of Scleral Resection in High Myopia: Report of Case. W. E Borley and O R Tanner—p 517
Penicillin Administered Locally in *Gonorrheal Ophthalmia Sensitization* Reaction E A Vorisek and A. L Evans—p 520

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:319-422 (April) 1945

Myelography by Use of Pantopaque in Diagnosis of Herniations of Intervertebral Disk A B Soule Jr, S W Gross and J. G Irving —p 319
Arteriography for Demonstration of Intracranial Aneurysms R M Lowman and S D Doff—p 341
Diseases of Vertebral Column· Roentgenologic Analysis A Oppenheimer—p 348
Importance of Examination of Sputum in Evaluating Parenchymal Infiltration A Rest—p 370
Hemangioendothelioma of Diaphragm Report of Fatal Case in Infant W K Van Alstyne—p 373
Results of Irradiation of Ovarian Tumors H D Kerr and R A J Einstein—p 376
Roentgenologic Filing System Adapted from "Standard Nomenclature of Disease" O H Grunow—p 385
Behavior of Thimble Chambers When Used for Measurement of Very Soft Radiation J A Victoreen, Z J Atlee and E D Trout—p 391.

Annals of Allergy, Minneapolis

3:91-162 (March-April) 1945

Autonomic Nervous System in Relation to Allergy. A. Kuntz —p 91.
Dermatologic Manifestations of Familial Nonreaginic Allergy. A. F. Coca.—p 101.
Agglutination of Pollen Antigen Coated Bacteria by Serums of Ragweed Sensitive Patients B B Alperstein —p 110.
Military Aspects of Allergic Rhinitis P Blank and H Levitt.—p 113.
*Severe Light Hypersensitiveness Cured by Cholecystectomy. E Urbach and H. Shay.—p. 124

Hypersensitiveness to Light Cured by Cholecystectomy.—A woman aged 63 had a severe light dermatosis, which was cured by extirpation of the infected gallbladder. As in other cases of light hypersensitiveness, a pathologic intestinal flora was found. This may well have been the cause of the increased porphyrin content of the stool. Two possible mechanisms are suggested by Urbach and Shay through either of which the diseased gallbladder might have been responsible for the agent causing the hypersensitiveness to light.

Annals of Surgery, Philadelphia

121:545-768 (May) 1945

Current Considerations of War Surgery. M E. DeBakey and N Carter. —p 545
Remarks on Few Surgical Problems in Aviation Medicine R. L Clark Jr. and A. R. Shands Jr —p 564
Emergency Surgical Plan in Army Air Force Hospital H. J Warthen Jr.—p. 573.
Analysis of Results of Surgical Treatment of 260 Consecutive Cases of Chronic Peptic Ulcer of Duodenum W. F. Rienhoff Jr.—p 583
Transthoracic Gastrectomy for Unusual Lesions of the Stomach. R A Griswold —p 600
Plan for Surgical Management of Gastrojejunocolic Fistula S. F Marshall —p 620
*Full Thickness Skin Grafts from Neck for Function and Color in Eyelid and Face Repairs J B Brown and B. Cannon —p 639
Tattooing of Free Skin Grafts and Pedicle Flaps L. T. Byars —p 644
Tantalum Cranioplasty for War Wounds of Skull B Woodhall and R G Spurling —p 649
Penicillin as Adjunct to Surgical Treatment of Acute and Chronic Empyemas B Blades —p 672
Total Hysterectomy H L Foss —p 680
Surgical Principles Underlying Use of Grafts in Repair of Peripheral Nerve Injuries L Davis, G Perret and W. Carroll —p 686.
Observations on Conversion of Normal into Malignant Cells W. M. Firor and G. O. Gey.—p 700
Mucoid Disease of Appendix G. H Bunch —p 704
Appendicitis: Possible Effects of Sulfonamides on Mortality. T B. Aycock and E M. Farris —p 710.
Sacral and Presacral Tumors G V Brindley —p 721.
Treatment of Varicose Veins by Stripping, Excision and Evulsion G B Hodge, K S Grimson and H M Schiebel —p 737.
Quadriceps plasty T. C Thompson —p 751.

Skin Grafts from Neck for Eyelid and Face Repairs.—Brown and Cannon say that full thickness grafts from the neck and the clavicular region have been found to give superior results in the repair of facial defects. The amount of skin available is limited, but there is enough for the eyelids, for the nose and about the mouth. The color is nearly always close to that of the normal face. None of these grafts so far have had to have pigment injection for color matching, whereas dead whiteness or darkness of other grafts often leaves much to be desired. The second advantage is softness and therefore function. These grafts heal and have such thickness that the best kinesis of grafted areas can develop This property is best expressed in eyelid repairs, where hard, boardlike scars of gasoline and phosphorus burns have to be literally dug out of the lids and across from one eye to the other over the nose When these areas are covered with the neck grafts there is often a dramatic relief of scar fixation and return of softness and function. The main areas for use are on the lids, in the canthal regions, about the ala, over the nose and about the lips and angles of the mouth. As a rule, flap repairs are considered for gunshot wounds, whereas grafts usually suffice for burns. However, about the lids, if a bed at all suitable can be obtained by dissection of the scars, these full thickness grafts are used in preference to flaps and, it is thought, with better results. Donor sites can be closed, left open to granulate or grafted. They may make troublesome scars for a while, but no permanent severe trouble has been seen.

Archives of Dermatology and Syphilology, Chicago

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Ulcerative Hodgkin's Disease and Lymph Node Imprints S. E. Sweitzer and L H Winer.—p 229
Experimental Prophylaxis of Chancroid F. C. Combes and O. Canizares —p 237.
Treatment of Dermatitis Herpetiformis with Penicillin. C. C. Carpenter and W. H Hall Jr —p 241.
Ulcerative Diphtheria of Skin, Desert Sore and Tropical Ulcer: Report of Epidemic Observed in Haifa, Palestine S. Gill —p 243
Psychosomatic Studies in Dermatology A. Motivation of Self Induced Eruptions. H E Michelson —p. 245
Id B. Psychobiologic Studies of Patients with Atopic Eczema (Disseminated Neurodermatitis). F. W. Lynch, R G. Hinckley and D. W. Cown —p 251
Papular Sporotrichosis O. G Costa and M A Junqueira.—p 261.
Herpes Zoster Generalisatus Associated with Chronic Lymphatic Leukemia R L Barton and P. A O'Leary —p 263
Nutritional Survey of 354 Dermatologic Patients J L. Callaway, D. F. Milan and R. O. Noojin —p. 266.

Archives of Surgery, Chicago

50:177-222 (April) 1945

*Prophylaxis of Wound Infection Studies with Particular Reference to Soaps and Irrigation. L W. Peterson —p 177
Osseous, Cartilaginous and Mixed Tumors of Human Breast: Review of Literature. A Rottino and Kathleen Willson.—p. 184.
Metabolic Alterations Following Thermal Burns: III. Effect of Variations in Food Intake on Nitrogen Balance of Burned Patients J. W. Hirshfeld, W. E Abbott, M A Pilling and others —p. 194.
Influence of Environmental Temperature on Shock H. C. Bergman and M. Prinzmetal —p 201.
*Blood Iodine Studies: VI. Analysis of Blood Iodine in Thyroid Disease. G M. Curtis and M. B. Fertman —p 207
Early and Late Postoperative Ambulation: Comparative Study of 303 Cases V. D'Ingianni —p 214
Topical Use of Concentrated Penicillin in Surface Active Solution E J Grace and V. Bryson.—p 219

Prophylaxis of Wound Infection.—A series of experiments performed by Peterson on animals indicated the efficacy of the various soaps as germicidal agents. When the soaps were placed in actual contact with the uncontaminated fresh wounds they produced a definite but slight irritation. This was noted only on microscopic examination; gross examination revealed no difference between control wounds and wounds into which soap had been placed. In wounds which were contaminated by placing a given amount of a culture of Staphylococcus aureus within their depths and then exposed to soap there was a definite increase in signs of infection over those found in the control wounds not exposed to soap; "green" soap was found more irritating than "white" soap. The harmful effect of mechanical washing of wounds is in direct proportion to the coarseness of the material used. Of the various methods studied the cleansing of contaminated wounds by a gentle irrigation with isotonic solution of sodium chloride is the most effective prophylaxis of wound infection Contaminated wounds treated with this gentle irrigation healed with less evidence of infection than did control contaminated wounds subjected to no treatment other than closure at the specified time. Best results in cleansing small wounds were obtained by irrigating them with 1,000 cc. of saline solution with no scrubbing, utilizing the force of the stream as the washing mechanism.

Blood Iodine.—Curtis and Fertman made a comparative analysis of the blood iodine, basal metabolic rate and certain other factors in 138 different clinical conditions in a total of 818 persons. In the years between 1932 and 1936 they determined the blood iodine by the dry ash technic, from 1936 to date by the chromium trioxide method. The average blood iodine level was found to be significantly elevated in all forms of toxic goiter. Associated with the increase in the blood iodine there occurred an elevated average basal metabolic rate. In no two groups of toxic goiter, including the exophthalmic variety, was there found by statistical test any significant difference between the average blood iodine concentrations. Some difference in the nature or quantity of the whole or fractionated blood iodine might be expected in exophthalmic goiter and should be further investigated The blood iodine may rise as high in toxic nodular goiter as in exophthalmic goiter. The average blood iodine level was not significantly elevated in nontoxic nodular goiter and in nontoxic diffuse colloid goiter. The average basal metabolic rate was significantly increased in nontoxic nodular goiter but averaged only minus 7 per cent

in diffuse nontoxic colloid goiter. The average blood iodine in 79 patients with hypothyroidism was not significantly lower than that in normal persons from this goitrous region, although the average basal metabolic rate was reduced. The average blood iodine in 9 patients with carcinoma of the thyroid, unlike that of a previous group of 3 similar patients, did not differ significantly from the normal in spite of an elevated basal metabolic rate. There was no significant correlation between the blood iodine level and the duration of the symptoms due to the carcinoma or to those of goiter when such was recorded. It would appear that the level of the blood iodine in carcinoma of the thyroid is more dependent on the nature of the thyroid gland in which the malignant growth occurs than on the malignant growth itself. In none of the thyroid disorders investigated was there any significant linear correlation between the level of the blood iodine and the duration of symptoms or of goiter. That some association may exist was indicated by a significant positive multiple correlation coefficient of the blood iodine in relation to the basal metabolic rate and the duration of toxic symptoms in hyperthyroidism or of goiter in nontoxic nodular goiter. This relationship shows that the blood iodine increases rather than decreases with some combination of the other two factors. In 3 patients with chronic thyroiditis the average blood iodine was not significantly elevated.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

88:1-122 (May) 1945

Suggestions to Improve Early Treatment of Hand Injuries. S. Bunnell.—p. 78.
Invasion Eye Injuries. J. W. Clark.—p. 83.
Fractures of Femur. W. R. Hochwalt, S. C. Rogers and A. E. Culmer Jr.—p. 86.
Clearing Company for Gastrointestinal Disease? J. A. Halsted.—p. 90.
Scrub Typhus from Epidemiologic Viewpoint. J. F. Morehead.—p. 95.
Control of Sandflies with DDT. M. Hertig and R. A. Fisher.—p. 97.
Dentistry in Japanese Armed Forces. C. H. Harrill.—p. 102.
Roentgenographic Method for Localization of Foreign Bodies. J. J. Moore and W. M. Loehr.—p. 104.
*Reactions to Typhus Vaccine. V. E. Roth.—p. 111.
Technic for Staining Malaria Smears. D. A. Boroff and R. W. Gronemyer.—p. 113.

Reactions to Typhus Vaccine.—Roth states that constitutional or allergic reactions may occur following injections of typhus vaccine. Four of 9 patients with allergic reactions gave a history of egg allergy. Available evidence indicates that allergic reactions are caused by some residual egg allergen in the vaccine. To avoid serious and possibly fatal reactions, precautions should be the same as those taken before injecting horse serum products.

Connecticut State Medical Journal, Hartford

9:331-412 (May) 1945

Fundamental Concepts in Diagnosis and Treatment of Early and Limited Tuberculosis. J. B. Amberson.—p. 333.
Meeting Community Responsibility for Control of Tuberculosis. J. G. Stone.—p. 342.
Doctor and Group Insurance. H. S. D. Carlos.—p. 344.
Value of Cardiograms as Aid to Early Diagnosis in Suspected Cardiovascular Emergencies. C. F. Yeager.—p. 349.
Choline and Inositol Therapy of Cirrhosis of Liver. M. R. Goldstein and P. D. Rosahn.—p. 351.
Social Implications of Scientific Research. J. R. Williams.—p. 357.

Delaware State Medical Journal, Wilmington

17:59-80 (April) 1945

Employment Examination for Psychiatric Casualties. F. W. Dershimer.—p. 59.
Caudal Analgesia in Obstetrics. N. W. Vaux.—p. 68.
Carcinoma of Bartholin's Gland. J. F. Hynes.—p. 70.
Aspiration Biopsy of Kidney Region. D. M. Gay.—p. 71.

Journal of Clinical Endocrinology, Springfield, Ill.

5:119-162 (March) 1945

Hypopituitarism Associated with Epilepsy Following Head Injury: Report of 2 Cases. J. Lerman and J. H. Means.—p. 119.
Treatment of Menstrual Disorders with Prolactin. M. A. Goldzieher.—p. 132.
Studies on Pigmentation of Endocrine Origin. M. E. Davis, M. W. Boynton, J. H. Ferguson and S. Rothman.—p. 138.
Clinical Observations on Case of Idiopathic Tetany and Epilepsy. M. Taubenhaus and H. M. Engle.—p. 147.
Clinical Evaluation of Insulin. J. R. Williams.—p. 151.

Journal of Neurosurgery, Springfield, Ill.

2:181-256 (May) 1945

Ventriculographic Diagnosis of Cysticercosis of Posterior Fossa. R. Arana and A. Asenjo.—p. 181.
Cyst of Sixth Ventricle (Cavum of Verga): Successful Removal Through Transventricular Approach, with Notes on Embryology and Histopathology. M. Scott.—p. 191.
*Peripheral Nerve Injury in Fractures and Dislocations of Long Bones. E. S. Gurdjian and H. M. Smathers.—p. 202.
Pantopaque Myelography: Results, Comparison of Contrast Mediums and Spinal Fluid Reaction. W. G. Peacher and R. C. L. Robertson.—p. 220.
Subependymoma: Newly Recognized Tumor of Subependymal Derivation. I. M. Scheinker.—p. 232.
Method for Control of Carotid Cerebral Circulation During Operation. W. B. Hamby.—p. 241.
Arnold-Chiari Deformity in Adult Without Obvious Cause. P. C. Bucy and B. W. Lichtenstein.—p. 245.
*Phantom Limb Syndrome: Discussion of Role of Major Peripheral Nerve Neuromas. K. E. Livingston.—p. 251.

Peripheral Nerve Injury After Fractures.—The 53 nerve injuries for which Gurdjian and Smathers performed operations included 32 radial, 9 ulnar, 3 median, 8 peroneal and 1 sciatic nerve. The work was done mainly at the Receiving and Grace hospitals in Detroit. Early exploration in cases of nerve lesion associated with fracture of long bones is justifiable after complete study of the history, physical findings and x-ray films. If, from an orthopedic standpoint, open reduction is a procedure of choice, the involved nerve can be explored at the same time. Early exploration in ulnar nerve palsy associated with fracture of the medial condyle of the humerus is preferable. Anterior transposition of the nerve may then be carried out. Early exploration of primary peroneal palsy is desirable in injuries of the knee joint with fracture of the upper end of the fibula. There is a great likelihood of a torn nerve in most cases of primary peroneal palsy with fracture of the upper end of the fibula. In fractures of the middle third of the humerus complicated with radial palsy, exploration in eight to ten weeks is justifiable if there are no evidences of returning function. In compound fractures associated with nerve lesions early repair is feasible, particularly with present day chemotherapeutic measures. A nerve should be explored if there is no evidence of regeneration three to four months after a fracture of the neighboring bone.

Phantom Limb Syndrome.—Forty-two patients with a total of 50 major extremity amputations were studied in detail. Of the 50 amputations only 1 was never associated with phantom limb symptoms. The phantom limb is not a total reproduction of the amputated extremity. In upper extremity amputations the fingers are most prominent. The palm is less frequently felt, and the wrist and dorsum of the hand are usually not present. The forearm and upper arm are rarely perceived. Many patients give the impression that they feel "the whole thing," but on careful questioning it is evident that the posture and presence of much of the phantom limb are inferred often from small portions of the hand or fingers of which the patient has specific impressions. In lower extremity amputations similar phantom patterning is found. In neither extremity does the pattern correspond to the major peripheral nerve distributions. A majority of these patients felt that their phantom limbs had been clearly established immediately or very soon after amputation. The neuroma is not established early enough to be the determining factor in these initial symptoms. In 14 of these patients with 20 amputated limbs a total of 30 major nerve neuromas were accessible. On vigorous palpation of the neuroma, most of the patients described their sensation as like "striking your funny-bone." In no case did stimulation of the neuroma excite or simulate typical phantom sensations. Livingston thinks that the high incidence of phantom limb impression following amputation, its early appearance and its stability suggest a central rather than a peripheral denominator for these symptoms. The occurrence and persistence of severe phantom limb pain in a comparatively small proportion of the patients with phantom limb symptoms suggest an irritative disturbance that is superimposed on the underlying phantom limb mechanism. Evidence from these observations and from clinical experience suggests that the major peripheral nerve neuroma is rarely the "key" factor in this irritative process.

Northwest Medicine, Seattle

44:139-170 (May) 1945

Lupus Erythematosus Disseminatus: Two Cases, with Special Reference to Serology. R. P. Pillow and L. J. Palmer.—p. 142.
Brucellosis: Is It Public Health Menace? M. J. Goodman.—p. 145.
Practical Pentothal Anesthesia. A. C. Miller.—p. 147.
Guillain-Barré Syndrome: Report of Case with Death. N. K. Rickles. —p. 148.
Diagnosis and Evaluation of Activity in Tuberculosis. F. Slyfield. —p. 149.
Roentgenographic Features of Pulmonary Tuberculosis. E. W. Roberts. —p. 151.
Indications for Hysterectomy. A. F. Lee.—p. 154.
Treatment of Recurrent Boils. T. W. Houk.—p. 158.

Pennsylvania Medical Journal, Harrisburg

48:753-880 (May) 1945

Some Misconceptions and Abuses in Gynecologic Organotherapy. E. Novak.—p. 771.
Clinical Endocrinology. E. H. Rynearson.—p. 775.
Male Hormone Therapy. C. W. Dunn.—p. 780.
Convalescent Care and Postoperative Management: General Principles of Convalescent Care. H. T. Kelly.—p. 792.
Lung Abscess and Its Treatment. C. P. Bailey.—p. 799.
Medicine in Wartime Britain. H. A. Clegg.—p. 806.
Cancer of Larynx: Modern Diagnosis and Treatment. G. Tucker. —p. 809.
Enterozoic Parasitism in Infants. R. L. Brown.—p. 812.

Psychosomatic Medicine, Baltimore

7:135-194 (May) 1945

Incidence of Psychosomatic Affections in Britain. J. L. Halliday. —p. 135.
Therapeutic Role of Drugs in Process of Repression, Dissociation and Synthesis. L. S. Kubie.—p. 147.
Effect of Suggestion in Treatment of Vasospastic Disorders of Extremities. M. Lipkin, Ellen McDevitt, M. S. Schwartz and A. W. Duryee. —p. 152.
Psychophysiologic Relations in Cases with Head Injuries. J. Ruesch. —p. 158.

Surgery, Gynecology and Obstetrics, Chicago

80:449-560 (May) 1945

*Nutrition of Patients with Thermal Burns. S. M. Levenson, C. S. Davidson, C. C. Lund and F. H. L. Taylor.—p. 449.
*Absorbable Oxidized Cellulose with Thrombin as Hemostatic Agent in Surgical Procedures. A. Uihlein, O. T. Clagett, O. E. Osterberg and W. A. Bennett.—p. 470.
Clinical Appraisal of Cetylpyridinium Chloride as Skin Antiseptic. J. A. Helmsworth and P. I. Hoxworth.—p. 473.
Treatment of Postoperative Infections Following Internal Fixation for Fracture of Neck of Femur. K. Speed.—p. 479.
Hydronephrosis: Classification and Plastic Repair of Ureteropelvic Obstructions. T. E. Gibson.—p. 485.
Sickle Flap for Nasal Reconstruction. G. B. New.—p. 497.
Tumors of Subcutaneous Tissue and Fascia, with Special Reference to Fibrosarcoma: Clinical Study. D. A. Wilson.—p. 500.
Arterial Embolism: Simplified Technic for Removal of Saddle Embolus at Bifurcation of Aorta, with Report of Successful Case. R. R. Linton.—p. 509.
*Further Studies on Diagnosis of Bone Tumors by Aspiration Biopsy. Ruth E. Snyder and B. L. Coley.—p. 517.
Intravenous Alcohol in Surgical Patient: Preliminary Report. D. C. Moore and Mary Karp.—p. 523.
Influence of Thyroidectomy on Prominence of Eyes in Guinea Pig and in Man. B. M. Dobyns.—p. 526.
Total Gastrectomy: Report of 8 Cases. T. E. Jones and R. W. Kehm. —p. 534.
Total Abdominal Hysterectomy and "Occasional Operator." E. A. Gaston. —p. 539.
Carcinoma of Colon: Producing Acute Intestinal Obstruction During Pregnancy. W. F. Finn and J. W. Lord Jr.—p. 545.
Defect on Anterior Mediastinum: Successful Surgical Repair. R. E. Gross and J. E. Lewis Jr.—p. 549.

Nutrition of Patients with Thermal Burns.—Levenson and his associates say that with the increased use of plasma and the reemphasis of the proper use of electrolyte solutions many of the severely burned patients who formerly died of circulatory collapse are being brought through the early shock phase into the later period frequently characterized by nutritional disturbances. Thus the problem of malnutrition following thermal injury must now be faced in an increasing number of patients. The authors report 32 cases in which an effort was made to determine the protein and caloric requirements. The nutritional disturbances and especially the increased demand for protein was found to be directly related to the extent of the third degree burn. High caloric, high vitamin diets with up to 400 Gm. of protein per day were necessary in some cases. When this quantity of food could not be taken or tolerated, gavage and intravenous supplements were given. In cases in which nutritional requirements were not met, malnutrition developed, skin grafting and healing were delayed and, frequently, death ensued.

Absorbable Oxidized Cellulose with Thrombin as Hemostatic Agent.—Absorbable oxidized cellulose is prepared in the form of a transparent gauzelike material and a heavier material that resembles absorbent cotton. The material placed in individual sterile envelops cannot be reautoclaved, since it disintegrates. It may be boiled three minutes or kept in 70 per cent alcohol until used. The manufacturer also supplies concentrated dried thrombin in ampules containing either 5,000 or 10,000 units. The thrombin should be dissolved in no more than 5 cc. of a sterile saline solution. Absorbable oxidized cellulose, either gauzelike or cottonlike in type, with a solution of thrombin, was tried by surgeons of the Mayo Clinic as an aid to hemostasis in 60 cases. Results were encouraging; hemostasis was excellent and immediate in 37 cases and satisfactory in 20 cases. The hemostatic effect of oxidized cellulose seems to depend on its sticky character when saturated with blood. It produces minimum tissue reaction and is relatively nonirritating and readily absorbable. It can be removed from a wound without the secondary bleeding that so frequently occurs after removal of ordinary gauze. Since cellulose is a foreign body, however, use of a large amount of it in a deep, nondrained wound may be unwise. In pathologic studies no fibers were found remaining in the tissues four and one-half days after the material had been introduced into the wound.

Diagnosis of Bone Tumors by Aspiration Biopsy.—Snyder and Coley survey 567 bone aspirations done on 474 patients during the last twelve years. There have been no immediate complications of the procedure and no evidence to suggest more rapid development of metastasis. In primary bone tumors and metastatic carcinoma of bone, aspiration has been done in 385 cases, of which 67.5 per cent were definitely and specifically diagnostic, while a total of 82 per cent showed material sufficient for the diagnosis of tumor, the exact type diagnosis not being called in 14.5 per cent. In only 1 instance was a diagnosis of malignant tumor made when the resected specimen showed a benign tumor and in this case the treatment was local resection. Thus in no case did a false aspiration diagnosis lead to amputation for a benign process. The clinician must understand the scope and limitations of the method and realize that failure to obtain cells means only that no tissue was obtained, further interpretation depending on the clinical and roentgenographic findings. Aspiration biopsy has proved itself to be a valuable and reliable diagnostic procedure.

Texas State Journal of Medicine, Fort Worth

41:1-64 (May) 1945

Care of Premature Infant from an Obstetric Standpoint. R. A. Johnston.—p. 5.
Lobectomy and Pneumonectomy for Pulmonary Tuberculosis. A. O. Singleton and M. D. Knight.—p. 10.
Carcinoma of Vulva. O. W. English and E. L. Hunt.—p. 16.
Diverticulitis of Colon. J. G. Kerr.—p. 18.
Facts That Should Be Known About Allergy. J. H. Black.—p. 21.
Feeding Trends in Pediatrics. P. E. Luecke.—p. 24.
Use of Barbiturates in Obstetrics. R. L. Grogan.—p. 28.
Intraocular Melanoma: Case Reports. C. P. Schenck.—p. 31.
Practical Public Health Procedures in Control of Some of More Common Communicable Diseases. E. W. Prothro.—p. 35.
Malignant Epithelial Tumors in Young Age Groups. A. J. Gill and C. T. Ashworth.—p. 39.

Yale Journal of Biology and Medicine, New Haven

17:583-684 (May) 1945

Oral Manifestations of Certain Systemic Disorders. M. Heinemann and B. G. Anderson.—p. 583.
Influence of *pH* on Growth Factor Requirements of Bacteria. D. R. Doede.—p. 595.
Attitudes of Medical Students Toward Psychiatry. E. Kahn, F. C. Redlich and Margaret Keller.—p. 611.
Health Services for Hospital Personnel: III. Physical and Professional Organization and Operation of Personnel Health Service. A. J. Geiger and M. Calabresi.—p. 635.
Problems in Comparative Study of Brain Waves. T. H. Bullock. —p. 657.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

1:423-454 (April 7) 1945

Wynds of Glasgow: Hundred Years of Property or Life. T. Garland. —p. 423.
*Pulmonary Concussion ("Blast") in Nonthoracic Battle Wounds. O. Savage.—p. 424.
Primary Tuberculous Infection in Sanatorium Staff: Investigation and Supervision. P. W. Edwards, A. C. Penman, with Radiologic Interpretations by L. G. Blair.—p. 429.
Biosynthesis of "Nicotinamide" in Human Gut. P. Ellinger and R. Benesch, with addendum by W. W. Kay.—p. 432.
Postoperative Cutaneous Gangrene: Effect of Penicillin. C. Grimshaw and L. Stent.—p. 434.
Psychopathic Reactions in Liberated Countries. A. M. Meerloo.—p. 443.

Pulmonary Concussion in Nonthoracic Battle Wounds.—Savage performed complete necropsies on 87 battle casualties who had died mostly of various types of head wounds, spinal wounds, burns and the like. In 30 of these there were lung changes which were considered to be due to blast. In the earlier cases there was no evidence before death that the lungs were affected, but later in the series, when routine chest x-ray films were taken in patients who might have been exposed to blast, the typical radiologic changes were sometimes found. The time between wounding and death varied from under an hour to eighty-three days. The surfaces of the lungs generally showed no change, but when sectioned a striking "spatter" of hemorrhages was seen. In some, these had coalesced to form areas of consolidation. To obtain a record of the distribution of the hemorrhages, many of these lungs were reinflated at necropsy and x-rayed. Two types of picture were seen: (1) scattered opacities, sometimes confined to one lobe, and (2) the same scattered opacities, but in parts with hemorrhages so numerous that an appearance of consolidation was given. Evidence of blast hemorrhage elsewhere in the body was seen ten times. The liver was found bruised in 6 patients. Hemorrhages on the surface of the heart were seen four times. Small areas of hemorrhage were seen in the pancreas, spleen and colon, each on 1 occasion. In 23 of the 30 cases showing lung hemorrhages it was certain that they had been exposed to blast; in the remaining 7 the method of wounding was unknown.

Chinese Medical Journal, Washington, D. C.

62:111-220 (April-June) 1944

*Use of Placental Globulin Extract in Measles Contact: Attempt to Standardize the Dosage. F. T. Chu and S. C. Liu.—p. 111.
Studies on Murine Origin of Typhus Epidemics in North China: 3. Isolation of Murine Typhus Rickettsia from Rats, Rat Fleas and Body Lice of Patients During an Epidemic in a Poorhouse. W. T. Liu.—p. 119.
Riboflavin Deficiency Among Chinese: 3. Urinary Excretion of Riboflavin. H. C. Hou and M. Y. Dju.—p. 140.
Id.: 4. Glossitis. H. C. Hou.—p. 152.
Disease Incidence, Absenteeism and Medical Expenses of Public Utility Company in Shanghai. T. Kang.—p. 166.
Methods of Treating Opium Addiction. H. W. H. McClelland.—p. 176.
Present Status of Studies on Chinese Antimalarial Drugs. C. S. Jang. —p. 185.
Experimental Studies on Living Plague Vaccines. L. T. Hsue.—p. 193.
Case of Abdominal Pregnancy. N. Bercovitz.—p. 197.
*Congenital Malaria: Report of Case. K. T. Chen, I. L. Tang and M. C. Wang.—p. 199.

Placental Globulin Extract for Measles.—According to Chu and Liu a dry form of placental globulin extract may be prepared by means of methyl alcohol precipitation. It has the advantage over the usual wet product, as prepared by ammonium sulfate precipitation, in that it is convenient for pooling and storage without deterioration. When the dry product is redissolved and sterilized by the addition of merthiolate, it is ready for intramuscular injection for measles prophylaxis. The protein content of the solution should be determined for the calculation of doses. Ninety children who had been exposed to measles in families and orphanages were passively immunized by this placental extract. Either modification or prevention of the disease could be accomplished. Mild and general reactions were observed in 54 and 33 cases respectively. An attempt was made to standardize the dosage. It was found that the range of doses effective for modification was overlapped on the one hand by the range for complete prevention and on the other hand by that producing no effect at all. A dose of 25 to 30 mg. per kilogram of body weight for the fourth to sixth day of exposure or of 40 to 45 mg. per kilogram for the seventh to ninth day is very likely to result in the modification of the disease. Complete protection can be expected if a dose of more than 40 mg. per kilogram is used in the early incubation period.

Congenital Malaria.—According to Chen and his associates it has been amply proved that malaria can be transmitted through the placenta. They give a tabulated report of 39 cases which they collected from the literature and also present an observation of their own concerning a male infant whose mother had an attack of chills and fever when labor pains began. Two days later she had another bout of chills and fever, and tertian malarial parasites were found in the blood. On examination of the infant about seven weeks after birth the mother stated that he had been pale and losing weight since birth and that he had nursed poorly during the week prior to admission. The blood was found to have a hemoglobin content of only 10 per cent and an erythrocyte count of 1,060,000. Gametocytes of tertian malaria were found in the peripheral blood. It is believed that this is a case of congenital malaria. The history is suggestive. The mother had repeated attacks of malaria throughout the period of gestation and finally the infant was delivered during one such attack. The extreme degree of anemia cannot be explained on any other basis. The enlarged liver and spleen are presumably due to malaria. Finally the finding of the tertian malarial parasites in the peripheral blood is diagnostic and conclusive. The child responded splendidly to blood transfusion. Unfortunately an infection of the meninges interrupted the course of illness. Quinine was given but there was not enough time to determine its effect before the patient succumbed to the complication. The time of year, December-January, makes a postnatal infection unlikely.

Münchener medizinische Wochenschrift, Munich

91:297-322 (June 16) 1944. **Partial Index**

Neurotic Diseases as Allergic Reactions in Soldiers. E. Hofmann. —p. 297.
Principles and Experiences with Regard to Injuries Suffered in Military Service: Degrees of Brain Injuries. F. Schmieder.—p. 300.
Growth of Living Tissue Outside of the Organism Under Artificial Conditions. K. F. Bauer.—p. 303.
Diagnosis and Therapy of Acute Diseases of Throat. E. Reye.—p. 307.
New Findings with Regard to Evaluation of Electrocardiogram and Dangers of Overevaluation. Bauke.—p. 309.
Syphilis and Its Provocation. E. M. Müller.—p. 312.
*Hereditary Damage by Roentgen Rays. K. A. Fick.—p. 312.

Hereditary Damage by Roentgen Rays.—Fick's patient was a woman aged 28 with peritoneal tuberculosis. The family history of the woman as well as that of her husband did not reveal any hereditary disease. Four applications of roentgen rays with a total dosage of 350 roentgens were applied to the hypogastrium of the patient. This treatment was erroneously considered responsible for the amenorrhea occurring after the first application, being revealed only later as pregnancy amenorrhea. A premature boy was born with microcephaly, club foot, dislocation of the hip joint, microphthalmia and peromelia of the hands. A phenotypic girl was born two years after the application of the roentgen rays to her mother. Within another year a second boy with peromelia was born. The infant presented stump formation in the upper third of the forearm in the absence of the distal part of the forearm and of the hand. The application of a large dose of roentgen rays to the ovary of the mother during the first five weeks of pregnancy, i. e. during the period in which the fetus is most susceptible to rays, and the presence of microcephaly and microphthalmia frequently described by other authors as characteristic of hereditary damage by rays, strongly suggest that the roentgen therapy applied to the mother was responsible for the malformation of the first child. Animal experiments demonstrated that larger doses of roentgen rays may cause mutation in the first filial generation of mice. The conical hypoplasia of the forearm stump of the second boy with peromelia and the absence of any cicatrization makes it likely that the roentgen rays rather than amniotic adhesions were responsible for the malformation of the arm.

Book Notices

Medical Gynecology. By James C. Janney, M.D., F.A.C.S., Assistant Professor of Gynecology, Boston University School of Medicine, Boston. Cloth. Price, $5. Pp. 389, with 97 illustrations. Philadelphia & London: W. B. Saunders Company, 1945.

The presentation is straightforward and consistent and is illustrated with many drawings and reproductions, some of which are taken from standard textbooks. Considerable space is given to pelvic examination and history taking. The symptoms are considered appropriately by headings and presented in an outline fashion under headings of physiologic and pathologic causes. Immediately following this brief is offered the differential points by history, physical examination, pelvic observations and laboratory findings. The treatment of vaginal trichomoniasis is abstracted and the treatment of gonorrhea infection is not quite up to date. In particular there is insufficient emphasis on the use and interpretation of cultures in gonococcic infections. The use of sulfonamides is slightly indefinite, and comments on penicillin are extremely brief and inconclusive. The author gives ample discussions on dyspareunia, frigidity and passion and the sociomedical problems in gynecology. Under the latter heading illegitimacy, abortion, sterilization and contraception are included, with expressions of his views. The discussion on the preparation for marriage and marital maladjustments is straightforward and practical. Throughout the book the history and physical findings and diagnosis stand out. The author adhered to his aims for this publication, as mentioned in the preface, (1) to aid the medical student in correlating the didactic lectures with the experience obtained in the gynecologic clinic and (2) to provide refresher material for the general practitioner. This publication is essentially a diagnostic gynecology, as less attention is given to the therapy. The weaker points can be easily corrected in the next edition. The many good qualities are immediately evident. However, the book will be valuable to both the medical student and the general practitioner, particularly from a diagnostic point of view. The publishers have done remarkably well. Both the author and the publishers can be appropriately complimented.

Studies of Burns and Scalds. (Reports of the Burns Unit, Royal Infirmary, Glasgow, 1942-43.) By *L. Colebrook and others.* Medical Research Council Special Report Series No. 249. Boards. Price, 4s. Pp. 210, with 50 illustrations. London: His Majesty's Stationery Office, 1944.

This small monograph contains a tremendous amount of clinical information about thermal injuries treated at the Glasgow Royal Infirmary during the years 1942 and 1943. About 400 patients admitted to the hospital are represented; 127 cases are summarized and 30 described in detail. Of the 127 cases, 37 were fatal. Six of them were burns involving 20 per cent of the body or under; in 15 of the fatal cases the burns were of 50 per cent or more of the body surface and death occurred within two days. All were treated locally by gentle débridement and cleansing with a detergent and dressed with a cream containing sulfonamide. Anesthesia was not necessary for this procedure; morphine was used as a routine and proved adequate.

Dr. Robert Cruickshank at the Royal Infirmary at Glasgow showed in 1935 that many infections in burns are caused by hemolytic streptococci, which are contaminants and reach the damaged area within a few days after admission to the hospital. These organisms were demonstrated in the air and on the floor of the wards in which the patients were treated. The obvious inference from this important study was the employment of painstaking aseptic technic, with special emphasis on careful avoidance of contamination once the patient enters the hospital. In other words, these studies applied to burns the basic principles of aseptic surgery.

By maintaining a rigid aseptic technic it was possible to demonstrate convincingly a substantial reduction in the incidence of infection. For example, in a series of 282 cases treated with such precautions only 20 passed through an acute suppurative phase due to streptococcic infection, none of which showed any evidence of spreading cellulitis. In another group of 119 patients treated locally with sulfonamide cream, daily temperatures were averaged and charted for a period of twenty-nine days. Half were treated before and the other half after the drive against contamination and cross infection had been instituted. The difference in the two groups was striking. In the group treated aseptically a temperature elevation above 99 F. occurred only on the second day, whereas in the control group the temperature did not drop below 99 F. until the eighth day. Moreover, the level of temperature was consistently lower for the rest of the period in the group handled with careful aseptic precautions. This program to eliminate contamination required painstaking attention to detail, masking of the patient and the personnel, and the education of nurses and attendants. Extending the bandage well beyond the burned area and firmly applying it to the normal skin were also important and prevented the entrance of infection from the outside by the dirty fingers of the patient. The authors also ascribe a definite bactericidal effect to the use of local sulfonamide therapy, which, they admit however is based on a strong impression rather than on any actual objective evidence. Sulfonamides were not used by mouth or by injection.

An interesting and important experiment was carried out on 4 patients who were given intravenous injections of a green dye to determine the extent of the increased capillary permeability. In at least 1 case the center and therefore the more severely burned area remained unstained by the dye. This obviously indicated a type of burn which had destroyed the circulation through the skin and was therefore associated with less extravasation. This observation perhaps was not sufficiently emphasized. It has an important bearing on the general assumption that the amount of fluid lost in a burn and therefore the amount required to correct hemoconcentration varies roughly with the extent of the burn. It seems clear that this would apply only if the entire burned area was associated with extravasation. This would be more likely when the thermal injury did not coagulate the skin, e. g. in scalds. Flame burns, on the other hand, might destroy the circulation through the injured area and thus limit the degree of exudation. Such differences may explain some of the discrepancies between the degree of hemoconcentration and the extent of the burn which the authors noted. These considerations emphasize the need for describing the type of burn present in each case. The title of the monograph "Burns and Scalds" suggested that the cases would be so classified, but this promise was not fulfilled. It might have been profitable to compare the degree of hemoconcentration with the kind of thermal injury (i. e. scald or burn) as well as with its extent. An instructive series of photographs showed the rapidity with which edema of the face subsides spontaneously after a superficial burn. Twenty-four hours after the injury the patient's facial edema, which nine hours before prevented the eyes from opening, had almost completely subsided.

Intravenous injections were carried out rather extensively, the fluid being largely serum or plasma. In some cases concentrated serum was used. The amounts injected were large and by present standards might be called excessive. The indications for the use of intravenous fluids was at first based on the development of hemoconcentration or other evidence of need. Soon this plan was changed to one in which plasma or serum was given early and more or less as a routine in order to prevent hemoconcentration. The latter plan was said to be justified by the results, which, however, on analysis seemed equivocal. Indeed, the authors admit that in at least 1 case there was an excessive amount of intravenous fluid. For example, a 6 year old child with a burn involving but 10 per cent of the body was given intravenously 1,900 cc. (about 75 cc. per kilogram) of plasma during six hours.

Fairly complete studies were made of the degree of hemoconcentration and an attempt was made to correlate this finding with the severity of the burn. While in general the extreme degrees of hemoconcentration were found only in the more severe burns, there were many cases in which the changes in relatively mild burns greatly surpassed those found with more extensive burns. Moreover, hemoconcentration was not infrequently slight or absent in severe burns. Explanation is not offered for this discrepancy, which of course has commonly been observed by many others. Obviously, as pointed out by the authors, factors other than the extent of injury are responsible for hemoconcentration and with it evidence of dehydration

and shock. One of these factors might well be the type of burn actually produced. As indicated, a dry, hard necrosis as produced by flame might involve less loss of plasma and less hemoconcentration than the extensive inflammation resulting from a scald.

Although hemoconcentration was present early in the burn, anemia was observed later, but only in the more serious cases. Red blood cell levels about 50 per cent of normal were reached in practically all of the most extensive burns on the tenth to the fourteenth day. In an attempt to explain this anemia, studies were made of the fragility of the red cells. Significant alterations were observed in the response of the red cells in burn patients as compared with the fragility of the red cells in normal subjects subjected to the same test. Moreover, many patients showed gross hemolysis in their circulating blood and a few contained hemoglobin in the urine. All patients showing hemolysis in the plasma in large amounts were extensively and severely burned, and all except 1 died within twelve hours of injury.

Chemical studies were carried out on many of these burned patients. Following are a few of the general conclusions: There was a rise in blood urea and nonprotein nitrogen in most cases in conformity with the observations of others. The total nitrogen excretion in the urine was fairly large in 1 or 2 cases but did not exceed 17 Gm. per day, which is somewhat less than the findings of others. As the authors state, this may have been due to a small intake of food, particularly by female patients. A fall in the level of plasma protein was observed even though large amounts of serum were given intravenously. Undoubtedly this was due to a loss of protein from the burned surfaces. This was suggested by the fact that the most rapid fall in plasma protein was seen in a case in which exudation was excessive. A striking feature of all burns aside from the very minor ones was the early rise in serum bilirubin. However, the rise was small, and clinical jaundice was never seen early and only once as a terminal event. There was an increased excretion of urobilinogen in 2 cases, which was taken as evidence of disturbance of hepatic function, although it could have been due to increased hemolysis. A transient rise in blood sugar was observed in a few cases during the early hours after the burn.

Postmortem findings are recorded in 30 fatal cases, and these may be summarized in general as being relatively meager, particularly in cases in which death occurred early after the burn. Aside from some edema and congestion in the brain and the occurrence of punctate hemorrhages in various organs and of catarrhal changes in the renal epithelium, little of significance was made out.

This extremely valuable and detailed study will be scrutinized with great interest by all those devoted to the various problems which are still unsolved in the treatment of this distressing injury. It should be read with profit by all who would control the incidence of infection in burns by simple but careful attention to aseptic surgical technic. It will provoke many questions and stimulate further study of the intravenous use of serum and plasma.

Woman's Medical Problems. By Maxine Davis. Cloth. Price, $2. Pp. 220. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1945.

This book was written by a woman reporter of medical news. She is not a physician, nor most likely is she a nurse. Nevertheless the publishers state that "this fine book sets forth in clear and understandable language but with complete authority all that medical science knows about the biologic functions of woman and the condition of disease or misfunctioning that may affect them."

Miss Davis writes "In the course of my many years of writing medical articles in magazines I have received tens of thousands of letters from suffering people from one end of this country to the other. Each month each fresh article brings in hundreds of letters. Ninety-nine per cent of the letters describe symptoms and ask me to recommend treatment or else they ask me to diagnose their illness and tell them what to suggest to the doctor" (page 4). This is a sad commentary on medicine. Authorities in the various fields of medicine should educate the public.

In the chapter on abortion the author dramatizes a story about a woman who wants an illegal abortion performed and must go to a disreputable and shabby physician. She then contrasts this with the recital of how abortions are done by high class abortionists, and this is based on a "description of one the author has seen" (page 56). After women read this ideal way of having a criminal abortion performed the author will indeed be deluged with letters asking for the name of the skilled abortionist whose office and technic she so vividly described.

The author says "a breech presentation means that labor is a little longer for you, but that is all; there is no greater likelihood of complications than in a head presentation" (page 50). Perhaps an increased fetal death rate is not important in the opinion of the author.

In describing cesarean section the author says "Under ideal conditions the risk of dying in a caesarian [sic] birth is only about 2.5 in a thousand" (page 82). Then on page 84 she says "You can see by the very low death rate, which in the case of many good obstetricians sinks to 1.5 per cent, that there is now no more danger in a caesarian section than in any other type of abdominal operation"! In the hands of skilled obstetricians the death rate for cesarean section is less than 1.5 per cent. However, the mortality for cesarean section in the hands of general surgeons and general practitioners is much, much higher than it is for nonobstetric laparotomies.

The author repeatedly quotes a few gynecologists such as Emil Novak and Alan Guttmacher, each of whom has written an excellent book on most of the subjects Miss Davis discusses.

Supervoltage X-Ray Therapy: A Report for the Years 1937-1942 on The Mozelle Sassoon Supervoltage X-Ray Therapy Department, St. Bartholomew's Hospital. By Ralph Phillips, M.S., M.B., F.R.C.S., Sir Halley Stewart Fellow. With the technical assistance of G. S. Innes, B.Sc., A.M.I.E.E., Physicist to the Mozelle Sassoon Department. With a foreword by The Rt. Hon. The Lord Horder, G.C.V.O., M.D., F.R.C.P. Cloth. Price, 16s. Pp. 141, with 95 illustrations. London: Published for the Sir Halley Stewart Trust by H. K. Lewis & Co., Ltd., 1944.

The x-ray department of St. Bartholomew's Hospital, London, under the direction of Dr. N. S. Finzi, presents in this report a summary of the work on supervoltage x-ray therapy for the five years ended in 1942. After this five year trial with a million volt x-ray equipment the author presents this interim report with the hope that the information contained will be helpful to others planning the establishment of radiotherapeutic centers.

A critical assessment of its value is not yet possible, but certain observations are made available, so that this work is a veritable mine of information regarding the technical installation and management of supervoltage x-ray equipment.

The investigation on cancer x-ray therapy really began in 1924 and was limited to carcinoma of the breast, locally inoperable and unsuitable for interstitial radium needling but without distant metastases; carcinoma of the uterus in all stages of the disease; cancer of the upper air and food passages unsuitable for surgery or interstitial radium needling; carcinoma of the rectum, similarly limited, and all cases of carcinoma of the esophagus.

In reviewing the results there does appear to be some advantage in the use of 1,000 volts as compared with 200 kilovolts. It is obvious that the clinical result of radiotherapy of malignant disease does not depend altogether on the wavelength of the radiation employed. If the clinical results depend to a large extent on the physical dose of radiation absorbed in a tumor, then supervoltage x-rays should prove superior to deep x-rays in the treatment of deep-seated tumors of limited extent. It has long been recognized that different types of cancer require different radiation technics for optimum results. Certain differences in favor of supervoltage have been found in the treatment of certain carcinomas, such as maxillary and breast tumors. The unpleasant by-effects of nausea and vomiting and anorexia which sometimes accompany x-ray therapy have been somewhat less noticeable with supervoltage than with 200 kilovolt x-ray treatment. A similar slight advantage relates to the changes produced in the blood picture, intensity of skin reaction and time of healing of tissue reactions.

In short, the author concludes that the results of this investigation permit the definite statement that supervoltage x-ray therapy is superior to deep x-ray therapy (200 kilovolt) in the treatment of certain types of malignant disease.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PROPHYLAXIS AND TREATMENT OF WHOOPING COUGH

To the Editor:—What is the present status of the pertussis vaccines as a prophylactic and in the treatment of pertussis? I refer to the ordinary stock vaccines. The literature concerning the value of pertussis vaccination is confusing: the manufacturers continue to laud them highly. What are the Sauer and Kendrick vaccines? How do they differ from other types? What is the minimum age for the administration of pertussis vaccines?

T. E. Brewer, M.D., Mount Vernon, Ark.

ANSWER.—The present status of pertussis vaccine as a prophylactic or immunizing agent is authoritatively reviewed by Felton and Willard in a Report of the Council on Pharmacy and Chemistry (Current Status of Prophylaxis by Hemophilus Pertussis Vaccine, THE JOURNAL, Sept. 30, 1944, p. 294). It is now the consensus that phase I pertussis vaccine of the proper concentration and dosage will confer prolonged active immunity to children if the vaccine has been kept properly refrigerated and if injection is begun after the sixth month of life. The three doses are given subcutaneously in alternate arms, preferably at monthly intervals. In treatment, vaccine is useless or of questionable value chiefly perhaps because a time interval of at least several weeks must elapse after the final dose before an adequate concentration of specific antibodies has developed. Patients recover because the infecting bacilli stimulate the body to specific antibody production. Intimately exposed but not yet immunized infants and infants already infected should be injected promptly with hyperimmune human serum as prepared by the Philadelphia Serum Exchange (Children's Hospital of Philadelphia). It yields encouraging results when an adequate dose is injected. (Felton, Harriet M.: The Status of Passive Immunization and Treatment in Pertussis, THE JOURNAL, May 5, 1945, p. 26).

A chief difference between Sauer Hemophilus Pertussis Vaccine and that of the Kendrick type is that Sauer vaccine is prepared from bacilli grown on culture medium made with human blood. It is not "washed" and will not sensitize when injected. Northwestern University Medical School authorized Parke, Davis & Co. to market it. Because the Kendrick type of vaccine is prepared from bacilli grown on culture medium made with animal blood, it is necessary to "wash" the harvest to eliminate the alien protein, which might otherwise sensitize when injected. It is prepared at the Michigan State Department of Health and is marketed by several biologic laboratories. Pertussis vaccine made from old stock cultures are inert and should not be used. Sako, Treuting, Witt and Nichamin (Early Immunization Against Pertussis with Alum Precipitated Vaccine, THE JOURNAL, Feb. 17, 1945, p. 379) injected younger infants with three doses of alum precipitated pertussis vaccine. Although pertussis occurred in an appreciable percentage of the children injected so early in life, none who subsequently developed the disease died.

In recent years the use of a mixture of pertussis vaccine and diphtheria toxoid has increased. The infant, however, should be at least 6 or 7 months old before the first dose is given. The alum precipitated mixture yields the best results when the three doses are injected at monthly or bimonthly intervals. Alum abscess can be prevented by the proper injection technic. Such dual immunizations are based on well established laboratory and clinical evidence of effective protection. A five year summary has been published by Sauer, Tucker and Markley (Immunity Responses to Mixtures of Diphtheria Toxoid and Pertussis Vaccine, THE JOURNAL, Aug. 5, 1944, p. 949), who concluded that "infants can be immunized successfully against the two diseases at the same time."

STIFF JOINT AFTER OPERATION ON LIGAMENTS

To the Editor:—In what percentage of patients does a stiff joint result after operation for torn ligaments of the knee joint?

Benjamin Berger, M.D., New York.

ANSWER.—A stiff joint after an operation for torn ligaments of the knee joint should occur only seldom. One reason for a stiff knee following this operation would be an infection which caused a destruction of the joint surfaces, resulting in either a fibrous union or a bony ankylosis between the joint surfaces. There are no figures that would answer the question raised. All one can say is that if a stiff joint follows an operation on the knee it must be due to an infection or a chronic inflammatory joint disease.

COLMETANESE FOR UNDULANT FEVER

To the Editor:—A woman aged 40 is suffering from undulant fever. The agglutination test showed complete agglutination in serum dilutions of 1:20 to 1:40 and partial agglutination at 1:80. The infection apparently was contracted about six years ago. She has had typhoid injections, liver and iron for her secondary anemia and general supportive treatments. The typhoid injections were given about two years ago by a doctor in Texas and I do not know about the results. The patient brought in an ampule of Colmetanese. It is made by Farnsworth Laboratories in Chicago. A doctor in Texas gave her four ampules intravenously, two per week, and these injections together with vitamin B_1 caused a drastic improvement in the patient's condition. She also brought in an article written by O. W. Schreiner, M.D., medical director, Wilson & Co., Chicago, entitled "Brucellosis—A Preliminary Report of Cases Treated with Radioactive Colloidal Manganese." I discussed the matter with a pathologist who had no knowledge of this substance but who advised extreme caution in the use of heavy metals and radioactive substances. What is known concerning this preparation?

M.D., *California.*

ANSWER.—No preparation of the Farnsworth Laboratories stands accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies, and the Council has made no investigation of Colmetanese, which was formerly called Colmanganese. Colmetanese is claimed to be a combination of manganese and radium in colloidal form. According to the promoters "the metal (manganese) is used in an extremely finely dispersed colloidal form, in conjunction with a special ionizing principle so introduced as to give Colmetanese the equivalent of 0.01875 microgram of radium chloride per 10 cc. of solution, and it is the combination of these materials (in the same vehicle) which is responsible for the results described later."

The use of Colmetanese has been proposed for intravenous, intramuscular or rectal administration for a wide variety of disorders including streptococcic and staphylococcic infections, chronic prostatitis, gastric and duodenal ulcers, arthritis, chronic otitis media, mastoiditis, purulent sinusitis, postpartum septicemia, osteomyelitis and pyonephritis, as well as undulant fever. Although strong claims have been advanced for the therapeutic value of Colmetanese, these do not appear to be supported by anything more substantial than a number of uncritical testimonials which cannot be accepted as scientific evidence of the therapeutic worth of the preparation. Colmanganese, now called Colmetanese, has been advertised in connection with the Farnsworth Laboratories' "Alphacatalyst," which is a more recent name for the treatment that was formerly called "Oxycatalyst." This was originally promoted as a cancer cure and was discussed in THE JOURNAL, May 19, 1928. This background information on Colmetanese together with the unusual course of undulant fever, which makes it impossible to give a fair appraisal of any therapeutic agent on a few cases and over a short period of time, does not lead to the development of any confidence whatever in the use of Colmetanese in the treatment of brucellosis.

CUTANEOUS LESIONS AND GONORRHEA

To the Editor:—A man aged 45 has had tumors all over the surface of his body for about ten years. The condition has been diagnosed by skin specialists as von Recklinghausen's disease. His wife, to whom he has been married for fifteen years, acquired gonorrhea from her first husband. She had never been treated for the disease. The patient came to me for treatment of a discharge from the urethra; gram negative intracellular diplococci were found on examination. Treatment has consisted of 2 Gm. of sulfathiazole daily with the result that the discharge has changed from purulent to watery. But more interesting is the fact that the tumors have started to disappear; the skin of his face and neck is almost completely clear, and the other parts of the body are at least 50 per cent better. Is it known that sulfathiazole influences von Recklinghausen's disease?

Ernest Weiss, M.D., Westwood, Calif.

ANSWER.—If sulfathiazole has caused the disappearance of some of these tumors, the condition is not von Recklinghausen's disease. The tumors in von Recklinghausen's disease are new growths of connective tissue, and sulfathiazole would have no effect on them. The lesions of keratosis blennorrhagica, a cutaneous disorder which occurs in connection with gonorrhea, appear as isolated, sometimes confluent, hornlike yellowish brown crusts. However, these lesions occur only during an attack of acute gonorrhea and are accompanied by arthritis and other complications. They do not resemble in any possible manner the lesions seen in von Recklinghausen's disease.

ANURIA

To the Editor:—Would you please let me have the accepted method of treatment of anuria (1) after transfusion of large quantities of blood (5,000 cc.) and (2) after shock, postoperative. Major, M. C., A. U. S.

ANSWER.—The mechanisms of anuria in the instances cited may be the same or they may be of separate origin. 1. After the transfusion of large quantities of blood (5,000 cc.) anuria may result from the condition for which the blood was given, e. g. shock, or from some variety of transfusion reaction. Transfusion reactions may be of three types: that due to an error in performing the conventional crossmatching, that due to the existence of a subgroup such as Rh incompatibility when large amounts of blood or repeated transfusions are used or that due to the presence of isoagglutinins in plasma, serum or group O blood in sufficiently high titer to clump and hemolyze the recipient's cells. M. M. Strumia (*Pennsylvania M. J.* **47**:668 [April] 1944) lists four possible explanations for manifestations of anuria after post-transfusion hemolytic reactions: blockage of renal tubules, anaphylaxis or sensitization to anomalous agglutinogens such as the Rh factor, ischemia of the kidneys from vasoconstriction or nephrotoxic substances released from hemolysis. None of these theories explain all the occurrences, although there is considerable evidence for the theory of toxic nephrosis. Ayer and Kammer (Ayer, G. D., and Kammer, W. F.: *Arch. Int. Med.* **73**:199 [March] 1944) state that intragroup incompatibilities are produced by immune isoagglutinins that develop in the recipient. The factor responsible is usually Rh, and the intragroup transfusion reactions in male patients usually occur after repeated transfusions. The mechanism may be similar to that in crush injury in some instances (Bywaters, E. G. L.: THE JOURNAL, April 15, 1944, p. 1103).

Treatment is largely prophylactic. Careful attention to typing and cross matching and the use of test serums of high potency are essential. Transfusions should be given slowly. When repeated transfusions are done, Rh typing is advisable and, if repeated transfusions of group O blood are used, such blood should have a low titer. Such prophylactic measures are especially important since therapeutic measures are so ineffective. Strumia stated that, "to our knowledge, there is no therapeutic procedure which has proved uniformly successful in the treatment of renal damage following transfusions of incompatible blood. Alkalization, renal decapsulation or sympathectomy, renal pelvic lavage, blood and plasma transfusions and many other procedures have been advocated. In any event it seems logical to maintain an adequate fluid intake and blood volume." Specifically, alkalization can be accomplished by oral or parenteral administration of basic solutions. For prophylaxis, after an initial dose of 4 Gm., 2 Gm. of sodium bicarbonate should be given by mouth in water every three hours (18 Gm. a day). If sodium bicarbonate solution is used by mouth or by vein, 1,500 cc. of isotonic (one-sixth molar) sodium bicarbonate solution should be given daily in divided doses. If sodium lactate solution (one-sixth molar) is used, the dosages are identical. For therapeutic use with already developed anuria, these dosages may not be sufficient and can safely be tripled the first day and thereafter be reduced to the prophylactic dose. Other fluid should be given in addition to the alkaline solution, and in general for every unit of bicarbonate or lactate solution given, an equal quantity of isotonic solution of sodium chloride may be administered. The use of physiologic electrolyte solution (2 parts of isotonic solution of sodium chloride and 1 part of sixth-molar bicarbonate or lactate solution), as advised for burns, can be given by mouth or by vein for the purposes of alkalization. Such a solution in double or triple the prophylactic dose mentioned supplies the alkali and saline in a combined form.

2. After postoperative shock, anuria may develop as a result of the shock itself, from transfusion reactions or from the anesthesia. In postoperative shock a crush syndrome-like mechanism is seldom operative except in extremity cases when there has been a tourniquet on the extremity during operation or in instances of release of large segments of strangulated bowel. Most often the anuria results from a profound and continued fall in blood pressure with associated decreased renal flow. Such damage may be permanent or may be temporary. Injury to the kidneys by anesthetic agents either with or without prolonged blood pressure fall has been studied by Coller (Coller, F. G., and others: *Ann. Surg.* **118**:717 [Oct.] 1943).

Treatment consists in preventing and managing shock in the usually accepted ways by the administration of plasma, whole blood and adequate fluids and in using controlled anesthesia. Large doses of spinal anesthesia are especially dangerous in hypertensive patients. When anuria has already developed despite antishock measures, the methods of treatment listed in the previous section, alkalization and administration of fluids, can be tried but are not always successful.

ASTHMA AND TUBERCULOSIS

To the Editor:—A physician has had moderately severe bronchial asthma for eight years, presumably due to multiple allergens. Exhaustive diagnostic tests have failed to reveal any specific etiologic factor or factors. Inhalations of a solution of 1:100 epinephrine hydrochloride by nebulizer generally give a fair degree of relief. Use of epinephrine is necessary two to four times a week. This physician has contended that with this condition present it would be unwise for him to perform duties in a tuberculosis hospital. M.D., Ohio.

ANSWER.—From the description given it is fairly safe to assume that the case described is one of moderate rather than of severe asthma, since inhalation of a solution of 1:100 epinephrine gives a fair degree of relief and is not required more often than two to four times a week.

The literature is full of contradictions as to whether such an individual is more likely to develop tuberculosis than the average adult. However many of the older writers (Rokitansky, Bruegelman, Schroeder) were of the opinion that asthma and tuberculosis are seldom found together. More recent authors are inclined to the opinion that tuberculosis does not occur more frequently in patients with asthma than in persons suffering from other diseases. With the exercise of ordinary precautions the physician who has the degree of asthma indicated in this question should be able to work in a tuberculosis hospital with no more danger than if he did not have asthma.

EFFECT OF HEAT ON MUCOSA OF RECTUM AND COLON

To the Editor:—What work has been done on the effect of heat, as from a hot enema on the rectal and colon mucosa? Has there been any comparison made between a lesion so produced and that produced by chemical irritation? Is there any reference in the literature to the medicolegal implications? M.D., Pennsylvania.

ANSWER.—The medical literature is conspicuously devoid of contributions concerning the effect of heat on the mucosa of the rectum and colon. In the discussion of a paper by Ault dealing with perforation of the rectum with enema tips (Ault, G. W.: Perforation of Rectum with Enema Tips, *Tr. Am. Proct. Soc.* **40**:203, 1939 Murray briefly cites 1 case with fatal termination four days after administration of an enema "at too high a temperature." Death was attributed to shock and sepsis following intestinal burns. There has been no known reported comparison made between a lesion produced by the effect of heat and that produced by chemical irritation. There is no reference in the available textbooks on medical jurisprudence with respect to the medicolegal implications.

PENICILLIN AND PROCAINE HYDROCHLORIDE

To the Editor:—I have recently treated multiple furunculosis (boils) by infiltration with a solution of penicillin and procaine hydrochloride. The results were successful far beyond expectation. This solution was prepared by taking 1 cc. of penicillin solution, 20,000 units per cubic centimeter, in a sterile syringe and then drawing 1 cc. of 2 per cent procaine hydrochloride solution into the same syringe. The mixture was agitated a little and then infiltrated into the furuncle slowly. The amount of injection depended on the size of the furuncle and ranged from 0.1 to 0.5 cc. Thus the syringe contained enough for several furuncles. The furuncles healed rapidly and there was no after-pain as commonly found with straight penicillin. I have been wondering what effect procaine hydrochloride has on the stability or activity of penicillin when mixed together and used immediately as described. Alex J. Otten, M.D., Grand Forks, N. D.

ANSWER.—There is no evidence that mixing procaine hydrochloride has any deleterious effect on penicillin when it is mixed with it and used immediately as described. This method has been used frequently to avoid painful reactions when penicillin of low potency is injected intramuscularly.

POSSIBLE FROEHLICH'S SYNDROME

To the Editor:—The answer to the query on "Possible Froehlich's Syndrome" in The Journal, May 26, 1945, page 318, contains certain inaccuracies. In the first place, contrary to the statement made, gonadotropic hormones are capable of increasing the gonads and frequently also the genitalia and other sexual characteristics. Secondly, x-ray films of the skull detect mainly disturbances in the growth hormone fraction, which does not seem disturbed in this case. Abnormalities in the size of the sella are inconclusive in most cases, and absent or too small size of sinuses are not indicative of gonadotropic dysfunction per se. Thirdly, the basal metabolic rate will probably be normal and any possible small deviation will not be helpful in the diagnosis or plan of treatment. Of greater value would be a determination of the blood cholesterol and uric acid.

William Wolf, M.D., New York.

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TRANSMISSION EXPERIMENTS IN SERUM JAUNDICE AND INFECTIOUS HEPATITIS

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In this paper we describe our experiences with the transmission of serum (or plasma) jaundice and infectious hepatitis. Actually these two conditions may be closely related in that the former may represent the artificial production of the latter; but, while this may be true in some instances, it cannot yet be said that all serum jaundice belongs in this category. The etiologic agents in both of these conditions appear to be quite similar, and this holds for the clinical picture, which in both resembles "catarrhal jaundice." On the other hand there are differences which are poorly understood and can be best illustrated perhaps in terms of transmission experiments.

HOMOLOGOUS SERUM JAUNDICE

Homologous serum jaundice is not easy to define. It is produced by the parenteral inoculation of whole blood, serum or plasma, ordinarily obtained from an individual who is supposedly nonjaundiced, or at least from a donor not known (at the time) to be ill with infectious hepatitis. Such a definition is highly artificial, as is also the disease itself. But this does not detract from its significance, for serum jaundice is an important and common entity, with numerous examples resulting from the prophylactic injection of serum for measles,[1] mumps,[2] other virus diseases [3] and also from vaccines containing serum,[4] as well as from the experimental injection of some of these serums.[5] It appears that the "icterogenic capacity" of various lots of serums differs as far as the rates at which jaundice is produced and the lengths of the incubation periods are concerned.

The agent of serum jaundice has not been actually "isolated" in the sense that it has been seen, cultured or transmitted to laboratory animals, in spite of repeated attempts by Findlay and Martin,[6] Oliphant and his associates [7] and Sawyer and his associates.[8] It is known to be filtrable and to be sufficiently heat resistant to withstand 56 C. for one hour.[7] It produces jaundice in human beings somewhat irregularly when given parenterally, with a clinical picture not unlike that of infectious hepatitis (table 1). The incubation period is long (seventy to one hundred days or more) although mild hepatitis may occur early in this long incubation period—many days before true jaundice is actually recognizable.[9]

Serum jaundice has been transmitted in human beings by feeding serum in 1 instance,[10] and it is possible that this has been accomplished with nasopharyngeal washings.[6]

Our own transmission experiments with serum jaundice were first carried out in the Middle East (first series, chart 1) and later supplemented by work in this country (see second series). Twenty-six individuals

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1. McNalty, A. S.: Acute Infectious Jaundice and Administration of Measles Serum, in Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1937, London, His Majesty's Stationery Office, 1938. Propert, A. S.: Hepatitis After Prophylactic Serum, Brit. M. J. 2: 677 (Sept. 24) 19[illegible] Jaundice, Memorandum Prepared by Medical [illegible] Health, Lancet 1: 81 (Jan. 16) 1943. Morgan, D. A. J.: Jaundice Following Administration of Human Blood Products, Brit. M. J. 1: 750 (June 19) 1943.

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3. Sergiev, P. G.; Tareev, E. M.; Gontaeva, A. A.; Livschiz, I. M.; Sairnski, G. N.; Trofimovcki, M. A., and Zimmerman, A. N.: Virus Jaundice: Epidemic Hepatitis in Relation to Immunization with Human Serum, Terap. Arkh. 18: 595, 1940.

4. Findlay, G. M., and McCallum, F. O.: Hepatitis and Jaundice Associated with Immunization Against Certain Virus Diseases, Proc. Roy. Soc. Med. 31: 799 (May) 1938. Findlay, G. M.; MacCallum, F. O., and Murgatroyd, F.: Observations Bearing on Etiology of Infective Hepatitis (So-Called Epidemic Catarrhal Jaundice), Tr. Roy. Soc. Trop. Med. & Hyg. 32: 575 (Feb.) 1939. Findlay, G. M.; Martin, N. H., and Mitchell, J. B.: Hepatitis After Yellow Fever Inoculation: Relation to Infective Hepatitis, Lancet 2: 301 (Sept. 2), 340 (Sept. 9), 365 (Sept. 16) 1944. Soper, F. L., and Smith, H. H.: Yellow Fever Vaccination with Cultivated Virus and Immune and Hyperimmune Serum, Am. J. Trop. Med. 18: 111 (March) 1938. Fox, J. P.; Manso, C.; Penna, H. A., and Pará, M.: Observations on the Occurrence of Icterus in Brazil Following Vaccination Against Yellow Fever, Am. J. Hyg. 36: 68 (Sept.) 1942. Turner, R. H.; Snavely, J. R.; Grossman, E. B.; Buchanan, R. N., and Foster, S. O.: Some Clinical Studies of Acute Hepatitis Occurring in Soldiers After Inoculation with Yellow Fever Vaccine, with Especial Consideration of Severe Attacks, Ann. Int. Med. 20: 193 (Feb.) 1944.

5. Oliphant, Gilliam and Larson.[7] Oliphant.[7] Neefe, Stokes, Reinhold and Lukens.[9] MacCallum and Bauer.[10]

6. Findlay, G. M., and Martin, N. H.: Jaundice Following Yellow Fever Immunization. Transmission by Intranasal Instillation, Lancet 1: 678 (May 29) 1943.

7. Oliphant, J. W.; Gilliam, A. G., and Larson, C. L.: Jaundice Following Administration of Human Serum, Pub. Health Rep. 58: 1233 (Aug. 13) 1943. Oliphant, J. W.: Jaundice Following Administration of Human Serum, Harvey Lecture Series 39: 254, 1943-1944.

8. Sawyer, W. A.; Meyer, K. F.; Eaton, M. D.; Bauer, J. H.; Putnam, P., and Schwentker, F. F.: Jaundice in Army Personnel in the Western Region of the United States and Its Relation to Vaccination Against Yellow Fever: Part III, Am. J. Hyg. 40: 90 (July) 1944.

9. Neefe, J. R.; Stokes, J.; Reinhold, J. G., and Lukens, F. D. W.: Hepatitis Due to the Injection of Homologous Blood Products in Human Volunteers, J. Clin. Investigation 23: 836 (Sept.) 1944. MacCallum and Bauer.[10]

10. MacCallum, F. O., and Bauer, D. J.: Homologous Serum Jaundice: Transmission Experiments with Human Volunteers, Lancet 1: 622 (May 13) 1944.

were tested. The icterogenic agent used was originally derived from a serum pool collected from British and American troops in the course of studies on sandfly fever in Egypt.[11]

Material from this inoculum (pool 1) produced sandfly fever in 9 out of 10 inoculated volunteers after the usual incubation period of from three to five days. Beginning at about seventy days after the first inoculation and sixty days after the attack of sandfly fever was over, a member of this group of 10 volunteers developed jaundice and suspicion was immediately aroused that besides the virus of sandfly fever there had also been an icterogenic agent in pool 1. The original acute sandfly fever patients who had acted as donors for the blood samples in pool 1 had all been living (during June 1943) within an area endemic for infectious hepatitis, although at the time the samples were obtained the prevalence of this disease was low. The donors had been questioned specifically at the time the blood was drawn and had stated that they had not had jaundice recently. Attempts were therefore made in October 1943 to trace the fate of these donors. Information was obtained from 10 of them. None of these reported having had jaundice during the four month period after they had been bled (June to October 1943). The eleventh man had left the country and could not be traced.

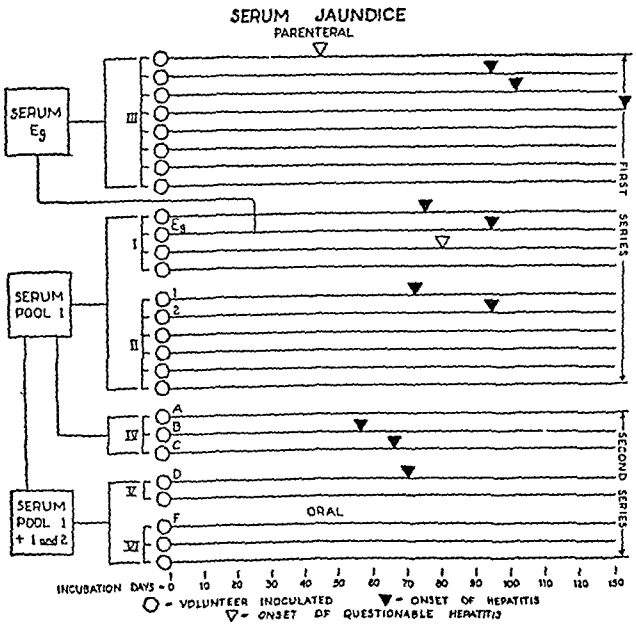


Chart 1.—Results of administering icterogenic serum (homologous serum jaundice) to six groups of human volunteers, each subject being represented by a horizontal line. The six groups are indicated by the Roman numerals at the left of the column of circles. The first series and the second series (indicated on extreme right) represent experiments done in the Middle East and in the United States respectively.

TABLE 1.—*Experimental Serum Jaundice Produced Parenterally in Human Volunteers*

Author	Serum Inoculum	Number Tested	Number Positive *	Incubation to Onset of Jaundice †
Oliphant and others [7]	In yellow fever vaccine and serum of vaccines	189	30	28 - 133
MacCallum and Bauer [10]	Various types homologous serums	5 11	2 4	63 - 70 59 - 129
Neefe and others [9]	Mumps convalescent	6	5	73 - 110
	Passage of foregoing	2	0	
	In yellow fever vaccine	2	1	99

* Only those men who developed clinical jaundice are listed as positive. Hepatitis without jaundice also occurred.
† Days between inoculation and onset of jaundice

In spite of inability to ascertain its source, suspicion that there was an icterogenic agent in our pool 1 was well grounded, for in due course 3 more of the 10 volunteers developed hepatitis, giving us an incidence of 40 per cent. This occurred during the local hepatitis season (October to February), but actually the prevalence of infectious hepatitis at the desert camp where the volunteers were quartered was very low (under 0.5 per cent) at this time, in contrast to the higher prevalence of the disease in adjacent areas.

Details of these inoculations are recorded in table 2. Here the volunteers, listed as groups I and II, are seen to total 10 men in all. Four of them developed jaundice after incubation periods ranging from seventy-two to ninety-four days. Two other members of the whole group of 10 were ill with a nonicteric illness during the same general period (September to December 1943); viz., 1 volunteer (Pvt. Dk.), who had a history of psychasthenic difficulties in the past, became nervous and depressed and was hospitalized for a period of two months. Jaundice was not clinically evident in this patient. Another (Pvt. By.) was hospitalized during December with the diagnosis of atypical pneumonia.

The next experimental cases occurred in group III (table 3), consisting of 8 subjects who had submitted to skin tests on Aug. 21, 1943. The tests were performed with serum obtained from Pvt. Eg. on Aug. 18, a member of group I. The blood was drawn from Pvt. Eg.

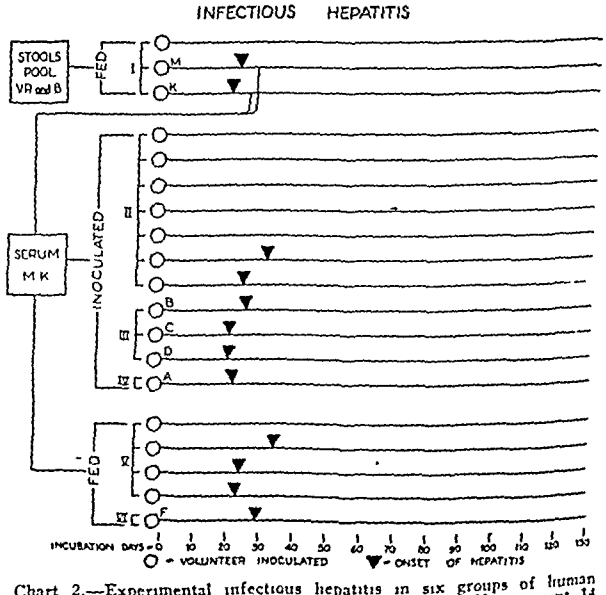


Chart 2.—Experimental infectious hepatitis in six groups of human volunteers. Legends as in chart 1. Groups I, II and V represent 14 normal subjects. Groups III, IV and VI represent 5 subjects, B, C, D, A and F, all used six months previously in the serum jaundice experiment in chart 1, second series. Three of these subjects, B, C and D, were convalescent from serum jaundice. The stools pool (see upper left) consisted of (VR) a pool of dehydrated Seitz filtrates of stool and urine extracts from British soldiers in various stages of infectious hepatitis, prepared by Major C. E. van Rooyen, R. A. M. C., and (B) a stool obtained eight days after the appearance of jaundice in an American soldier with infectious hepatitis.

thirty-four days after his first inoculation with icterogenic serum (on July 15) and sixty days prior to the date on which he developed jaundice. In other words, the sample was obtained during the early part of a long

11. Sabin, A. B.; Philip, C. B., and Paul, J. R.: Phlebotomus (Pappataci or Sandfly) Fever, a Disease of Military Importance, J. A. M. A. 125:603 (July 1), 693 (July 8) 1944.

incubation period, preceding his attack of serum jaundice. Eg.'s serum was heated at 56 C. for half an hour before it was used for skin testing the 8 persons in group III. Of the 8 persons who received 0.1 cc. of Eg.'s heated serum intracutaneously, 3 developed jaundice after incubation periods ranging from ninety-four to one hundred and thirty-two days (table 3). Besides these 3, 2 other members of group III contracted nonicteric illnesses during the one hundred and thirty day period following the skin tests; viz., 2d Lieut. Cs. (a nurse) was hospitalized between October 4 and November 14 suffering from indefinite symptoms of malaise and diarrhea. The exact nature of her condition was not determined. She was discharged from the hospital with a diagnosis of pyelonephritis (mild, nonsuppurative) and anemia (type undetermined). Another person, T/3 Td., was hospitalized for a short time beginning November 20 with the diagnosis of respiratory infection. There was no evidence of jaundice in these 2 patients.

These experiments were repeated several months later in the United States (see second series in chart 1). Pool 1 alone (and mixed with first passage serums) was used. It produced serum jaundice in 3 of 5 volunteers inoculated parenterally. Three attempts to produce jaundice by the oral administration of this icterogenic serum were negative.

It thus appears that jaundice was produced parenterally 10 times in 23 individuals with different (first and second) passages of this icterogenic material and that the incubation period was invariably long (fifty to one hundred and thirty-five days).

TABLE 2.—*Jaundice Cases Following Inoculation of Serum from Pool 1*

Group	Subject	Dose in Cc.	Route of Inoculation *	Dates of Inoculation	Subsequent Jaundice	Onset of Symptoms	Onset of Jaundice	Incubation Period †	Comment
I	Cpl. Rb.	1.0 and 0.1	sc. and ic.	7/15 and 7/28	++	?	9/28	75	Below par from 8/18 until discharge from hospital 11/17
	Pvt. Eg.	1.0 and 0.1	sc. and ic.	7/15 and 7/28	+	9/30	10/17	94	
	Pvt. Dk.	1.0 and 0.1	sc. and ic.	7/15 and 7/28	—	?	.....	..	Nervousness and depression requiring hospitalization 8/20
	Cpl. Bl.	1.0 and 0.1	sc. and ic.	7/15 and 7/28	—	.....	.....	..	
II	Cpl. Dm.	0.2 and 0.1 ‡	ic.	8/19 and 8/22	++	10/25	10/30	72	
	Pvt. Hb.	0.2 and 0.1	ic.	8/19 and 8/22	++	11/1	11/11	94	Developed eczema after jaundice attack
	Cpl. Pr.	0.2 and 0.1	ic.	8/19 and 8/22	—	.....	.....	..	
	T/5 Bd.	0.2 and 0.1	ic.	8/19 and 8/22	—	.....	.....	..	
	Pvt. By.	0.2 and 0.1	ic.	8/19 and 8/22	—	11/23	.....	..	Hospitalized 12/1-12/23; diagnosis, atypical pneumonia
	Pfc. Rg.	0.2 and 0.1	ic.	8/19 and 8/22	—	....	.. ..	..	

* sc. = subcutaneous; ic. = intracutaneous.
† Days between first inoculation and onset of jaundice.
‡ Given in 3 piqûres: 0.1 cc. fresh serum and 0.1 cc. heated serum on August 19, and 0.1 cc. fresh August 22.

TABLE 3.—*Jaundice Cases Following Intracutaneous Inoculation of 0.1 Cc. of Heated Serum from Eg. (8/18)*

Group	Subject	Date of Inoculation	Subsequent Jaundice	Onset of Symptoms	Onset of Jaundice	Incubation Period	Comment
III	2d Lt. Cn	8/21	—	10/4	—	—	Hospitalized 10/4 to 11/14
	Capt Hn.	8/21	++	11/17	11/23	94	Hospitalized 11/23 to 1/15
	P.	8/21	++	11/17	12/1	101	Hospitalized 12/3 to 2/1
	Pvt. Hk.	8/21	+	1/1	1/6	132	Hospitalized 1/7 to 2/1
	Major S.	8/21	—	.....	—	...	
	T/3 Td.	8/21	—	11/20	—	...	Hospitalized 11/20, respiratory infection
	T/3 Dw.	8/21	—	.....	—	...	
	Cpl. Sp	8/21	—	.....	—	...	

INFECTIOUS HEPATITIS

Infectious hepatitis has an older and less artificial history. It is common and widespread and in the present war, as in former wars, has been prevalent among the troops. As far as published records are available, this seems to have been especially true of British forces in the Middle East,[12] but the disease has not been limited to the British or to that particular geographic area, for it has occurred in the French army in Tunisia,[13] in the Italian army in Sicily in 1941 [14] and in the German army.[15] American troops in North Africa [16] and Italy have not been spared.

There is as yet no good reason to believe that this Middle Eastern type of infectious hepatitis differs from that which has been noted in the United States [17] or differs from the disease frequently described as infective hepatitis in England [18] or as hepatitis epidemica in Scandinavia,[19] Germany [20] and many other parts of the world. There is still no ready means of differentiating it from catarrhal jaundice,[21] except that the latter term has been applied more to sporadic than to epidemic cases. These and other questions deserve extensive further study, but on two points at least

12. van Rooyen, C. E., and Gordon, I.: Some Experimental Work on Infective Hepatitis in M. E. F., J. Roy. Army M. Corps **79**: 213 (Nov.) 1942. Gear, H. S.: Hygiene Aspects of the El Alamein Victory, 1942, Brit. M. J. **1**: 383 (March 18) 1944. Spooner, E. T. C.: The 1942 Epidemic of Infective Hepatitis in the Middle East, Proc. Roy. Soc. Med. **37**: 171 (Feb.) 1944. Dixon, H. B. F.: Notes on Infective Hepatitis in Malta, 1938-1942, J. Roy. Army M. Corps **82**: 44 (Jan.) 1944.

13. Senevet, G.; Moutrier, P.; Gros, H.; Alcay, L., and Bougarel, R.: A propos de l'ictère de Tunisie, Arch. Inst. Pasteur d'Algerie **19**: 47 (March) 1941.

14. de Benedetto, J.: Contributo alla conoscenza dell'epatite epidemica fra le Truppe in Sicilia, Sett. med. **30**: No. 50, 1942.

15. Siegmund, H.: Pathology of Epidemic Hepatitis Occurring in Troops, München med. Wchnschr. **89**: 463 (May 22) 1942. Gutzeit, K.: Icterus infectiosus, ibid. **89**: 161 (Feb. 20), 185 (Feb. 27) 1942.

16. Hepatitis in North Africa, Bull. U. S. Army M. Dept. May 1944, No. 76, p. 26.

17. Molner, J. G., and Kasper, J. A.: An Outbreak of Jaundice in Detroit, J. A. M. A. **110**: 2069 (June 18) 1938. Molner, J. G., and Meyer, K. F.: Jaundice in Detroit, Am. J. Pub. Health **30**: 509 (May) 1940. Norton, J. A.: Acute Infectious Jaundice, J. A. M. A. **113**: 916 (Sept. 2) 1939. Symmers, D.: Epidemic Jaundice, Correspondence, ibid. **123**: 1066 (Dec. 18) 1943. Rogers, O. F.: Epidemic Hepatitis, Correspondence, ibid. **123**: 1066 (Dec. 18) 1943. Blumer.[22]

18. Follows, A. B.: Epidemic Catarrhal Jaundice, M. Officer **63**: 23 (Jan. 20) 1940. Edwards, L. R. H.: Outbreak of Epidemic Catarrhal Jaundice, Brit. M. J. **1**: 474 (April 17) 1943. Pickles, W. N.: Epidemiology in Country Practice, Baltimore, Williams & Wilkins Company, 1939, p. 59. Ford, J. C.: Infective Hepatitis (Epidemic Catarrhal Jaundice): 300 Cases in Outer London Borough, Lancet **1**: 675 (May 29) 1943.

19. Stuhlfauth, K.: Group Outbreak Among Soldiers and Civil Population in Norway, Deutsche Militärarzt **5**: 591 (Oct.) 1941; abstr., Bull. War Med. **3**: 213 (Dec.) 1942.

20. Siegmund, H.: Zur pathologischen Anatomie der Hepatitis epidemica (zugleich als Beispiel für die Grenzen der anat. Pathologie), München med. Wchnschr. **89**: 463 (May 22) 1942. Gutzeit, K.: Icterus infectiosus, ibid. **89**: 161 (Feb. 20) 1942, 185 (Feb. 27) 1942.

21. Dietrich, S.: Der sogenannte katarrhalische Ikterus und die Hepatitis epidemica, Deutsche med. Wchnschr. **68**: 5 (Jan. 2) 1942. Wolter, F.: Der sogenannte katarrhalische Ikterus (Eppinger) und die Hepatitis epidemica mit besonderer Berücksichtigung ihres Verhaltnisses zum Ikterus catarrhalis Virchows, ibid. **68**: 558 (May 29) 1942. Epidemic Hepatitis, or Catarrhal Jaundice, editorial, J. A. M. A. **123**: 636 (Nov. 6) 1943. Blumer.[22]

there is universal agreement; namely, infectious hepatitis can be differentiated from spirochetal jaundice (Weil's disease) and from yellow fever.

The manner in which infectious hepatitis spreads from person to person is not completely known, but the intestinal-oral circuit has long been suspected.[22] Recently this has been proved experimentally to be one means of transfer.[23] Not only does the disease flourish under poor sanitary conditions but it frequently (although by no means always) follows outbreaks of intestinal disease. Kirk's study[24] of infectious hepatitis among New Zealand soldiers at Alamein in Egypt in 1942 led him to believe that the disease was spread by flies carrying the infection from human excreta.

Exact knowledge as to immunity in this disease is not yet available. It has been noted that troops newly introduced into an endemic or epidemic area are more susceptible to infectious hepatitis than is the local population. This observation has been made in Egypt[25] (where the disease has been regarded by civilian doctors as essentially one of childhood), in Palestine,[26] in Malta[27] and elsewhere. This suggests but does not establish the fact that immunity is readily acquired. On the other hand, second attacks are said to occur. It is also pertinent to mention that (with the exception of one experimental report by Oliphant[28]) there is little evidence that immunity to infectious hepatitis is induced by an attack of serum jaundice or of "catarrhal jaundice."

Etiologic Agent.—Like that of serum jaundice, the agent of infectious hepatitis has not been transmitted to laboratory animals in spite of attempts by van Rooyen and Gordon,[12] Cameron[29] and others. In our own laboratories both in the Middle East and in this country we have tried in vain to transmit infectious hepatitis to white mice, guinea pigs, hamsters, gerbils, Cercopithecus, Erythrocebus and Macacus monkeys and Abyssinian baboons. It is possible that the type of jaundice transmitted to pigs in Denmark by Andersen[30] was infectious jaundice of this type. More recently Siede, working with Meding, and Luz[31] in Germany, claims to have propagated this agent in the developing chick embryo, and Dresel and his associates[32] claim to have infected birds with it. These reports have not been confirmed. Nevertheless it has been passed serially in man (two passages), thus conclusively indicating the infectious nature of the disease[33] and by using man as the experimental animal some of the properties of the agent of infectious hepatitis have been determined. Thus, like the agent of serum jaundice, it also has been found to resist heating at 56 C. for one-half hour and to pass bacteria tight filters.[33] As in serum jaundice, the agent or virus is present in the blood stream during active stages of the disease[34] and for an indeterminate period before the onset of jaundice. It is similarly present in feces[35] and perhaps in the urine.[36] Furthermore, experimental infectious hepatitis can be readily produced in man by the oral route[35] (table 4).

TABLE 4.—*Experimental Infectious Hepatitis Produced in Human Volunteers by Various Investigators**

Parenteral							Oral					
Authors	Year	"Inoculum"	Route Inoc †	Number Tested	Number Positive	Incubation Periods	Authors	Year	"Inoculum"	Route Inoc †	Number Tested	Number Positive	Incubation Periods
Voegt [37]	1942	Serum	sc.	?	1	19 ?	Voegt [37]	1942	Duodenal fluid	Oral	4	1 ?	23
Cameron [29]	1943	Blood Serum	im.	6	6	30 and 30+	Voegt [37]	1942	Urine	Oral	?	1	?
							Voegt [37]	1942	Blood	Oral	?	1	?
Oliphant [28]	1944	Serum	sc	21	4	85 - 106	MacCallum and Bradley [38]	1944	Nasal wash	in.	16	0	..
MacCallum and Bradley [38]	1944	Serum	sc	6	3	64 - 92	MacCallum and Bradley [38]	1944	Urine	in Oral	19	0	..
Havens and others [39,40]	1945	Serum	sc ic.	11	6	20 - 31	MacCallum and Bradley [38]	1944	Feces	in	26	3	27 31
							Havens and others [39]	1944	Feces (froz) Feces and urine (extr. dried)	Oral	3	2	20 22
							Havens and others [39]	1944	Feces and urine (extr. dried)	Oral	3	0	..
							Havens and others [33,40]	1945	Serum	in. Oral	5	4	23 34

* Only those cases in which clinical jaundice developed have been listed as positive
† sc = subcutaneous; ic. = intracutaneous, im = intramuscular; iv. = intravenous; in. = intranasal and in most cases intrapharyngeal.

Among early claims of success at transmission are those of Voegt[37] in Germany. Details are incomplete, but Voegt described having infected 1 out of 4 volunteers by feeding them duodenal fluid. He also claimed that he produced hepatitis experimentally by the inoculation of human serum and by the ingestion of urine and of hemolyzed red blood cells.

In Cameron's investigations,[29] carried out in Palestine, serum and whole blood from cases of hepatitis were injected intramuscularly. Seven volunteers were inoculated, of which 6 could be followed. All of these developed jaundice, although details as to the time of onset are not available.

22. Blumer, G.: Infectious Jaundice in the United States, J. A. M. A. **81**:353 (Aug. 4) 1923.
23. MacCallum and Bradley,[38] Havens, Ward, Drill and Paul[39]
24. Kirk, R.: Spread of Infective Hepatitis, Lancet **1**:80 (Jan. 20) 1945.
25. Personal communication to one of the authors (J. R. P.).
26. Kligler, I. J.; Bitesh, D. S., and Koch, W.: Observations on Two Epidemics of Infective Hepatitis in Palestine Among Recent Immigrants, J. Infect. Dis. **74**:234 (May-June) 1944.
27. Dixon, H. B. F.: Notes on Infective Hepatitis in Malta, 1938-1942, J. Roy. Army M. Corps **82**:44 (Jan.) 1944.
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Most significant experiments have been recently reported in a short note by MacCallum and Bradley,[38] who found the virus in the feces, and that the disease can be induced (after a "thirty day" incubation period) by feeding such material to arthritic patients who volunteered for these experiments. The infective fecal material was collected from several patients in the early stages of infectious hepatitis. A few positive results were also obtained both from nasopharyngeal washings (which gave rise to subicteric hepatitis in volunteers) also after a relatively short incubation period—twenty-seven to thirty-one days.

These results have been independently duplicated and somewhat enhanced by Havens and his associates [39] in our own laboratory of the Neurotropic Virus Disease Commission of the U. S. Army, where healthy human subjects have been used for the tests. The infective material was also collected from American and British troops during acute stages of infectious hepatitis acquired in the Middle East and Mediterranean area. It was kept frozen until administered by various routes to several groups of human volunteers in the United States (chart 2). The most important findings can be summarized as follows:

When fecal material from patients with the naturally occurring disease was fed to human volunteers, 2 out of 3 contracted the disease in twenty and twenty-two days respectively.[39] Serum obtained from these 2 patients in the preicteric phase was filtered (Chamberland number 2) and immediately afterward heated (56 C. for thirty minutes). This heated serum filtrate (MK) produced infectious hepatitis when fed to 4 of 5 human volunteers with an incubation period ranging from twenty-three to thirty-four days. The same material was simultaneously inoculated parenterally in the same amount and produced infectious hepatitis in 6 of 11 volunteers with an incubation period ranging from twenty to thirty-one days.[40] Some of the latter group of volunteers had recovered some months before from serum jaundice, but this did not protect them against an attack of infectious hepatitis.[40]

It thus appears in experiments with one strain of the virus that jaundice was produced 6 times in 11 subjects when the virus was inoculated and 6 times in 8 subjects when the virus was fed and that the incubation period was invariably less than thirty-four days in these experiments.

SUMMARY

Transmission experiments in man have enhanced our knowledge of serum jaundice and infectious hepatitis.

In serum jaundice the interval between inoculation and the development of symptoms is usually relatively long, averaging from sixty to one hundred and twenty days.

The agent (or "virus") of serum jaundice is in the blood during active stages of the disease and also during the interval between inoculation and the development of serum jaundice. In 1 instance it was present in blood obtained sixty days prior to the onset of jaundice.

Experimental work indicates that the agent or agents of serum jaundice and of infectious hepatitis are quite similar, as is also the clinical picture of the disease produced, resembling, as it does, the picture of catarrhal jaundice.

The agent or agents of serum jaundice and of experimental hepatitis are both filtrable and both relatively resistant to heat.

A prominent difference between serum jaundice and infectious hepatitis, yet to be explained, lies in the length of the incubation period, which may be quite variable, but in our experimental cases of infectious hepatitis it tended to be from eighteen to thirty days, in contrast to the sixty to one hundred and twenty day incubation period of experimental cases of serum jaundice.

Three patients who had recovered from serum jaundice six months before were not found to be immune to experimentally induced attacks of infectious hepatitis. However, little is known regarding immunity in infectious hepatitis, and the ease with which these 3 patients were "reinfected" is not regarded as an indication that the two diseases are fundamentally different.

The virus of infectious hepatitis is in the blood and in the feces during active stages of the disease.

Infectious hepatitis can be readily produced in man by the oral route. This can be accomplished by feeding infective feces or by spraying such material into the nasopharyngeal passages. Similarly the disease can be produced by feeding infective serum as well as by its parenteral administration.

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EXTRATHYROID EFFECTS OF THIOURACIL THERAPY

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Thiouracil, a derivative of thiourea, exerts a powerful depressant action on the production of thyroid hormone and hence has been applied clinically to secure reduction of the basal metabolic rate in thyrotoxic patients. During the past twenty-one months we have used thiouracil in the treatment of a series of 96 patients with hyperthyroidism, which in many of the patients was complicated by other conditions and, in addition, there were several who were reluctant to undergo a second operation for recurrent hyperthyroidism. We have been much impressed by the favorable effect of the drug on these extrathyroid complications caused by the heightened basal metabolism or by a disturbance of glandular equilibrium, or both. As the basal metabolic rate fell, we observed a high degree of amelioration in the cardiac sequelae, great lessening of the associated diabetes, decrease in exophthalmos and improvement of the psychic state. On the other hand, in contrast to previous reports, we have encountered a much higher incidence of granulopenia, about 20 per cent, including 1 case of typical agranulocytosis.

In general, the dosage was 1 Gm. daily for three days, followed by 0.6 Gm. until the basal metabolic rate dropped to within normal limits, approximately + 10 or less. In the 15 cases of sustained remission for periods between two and fifteen months, all medication was dropped. In every case in which more than 0.2 Gm. was administered daily, it was a fixed rule that a white blood count had to be made every three days, and a differential count, if there was over 20 per cent drop in

From the Biochemical Laboratory and the Medical Division of the Beth Israel Hospital. With the technical assistance of Virginia Rechnitzer, B.A.

the total number of leukocytes. When the maintenance dose was reduced to 0.2 Gm. or less and the leukocyte count remained within normal limits, 0.2 Gm. daily was given for one week, no medication for the second week and 0.2 Gm. daily for the third week. A blood count was then made. This method reduces the necessary blood counts from one every three days to one every three weeks and sufficient thiouracil is administered to maintain the basal metabolic rate within normal limits. There were no restrictions put on the patients, who were freely ambulatory.

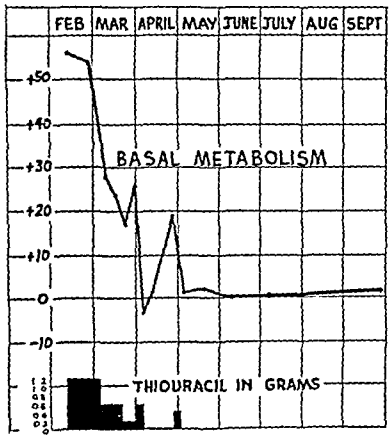


Chart 1.—Drop in basal metabolic rate in an uncomplicated case of hyperthyroidism The patient continued work as a welder in a shipyard during the entire period of therapy apparently in continued remission.

The first response was subjective. After seven to ten days the patients stated that they felt calmer. Charts 1, 2 and 3 sum up the metabolic changes. With lowering of the basal metabolic rate there were objective signs of loss of agitation, decreased perspiration, decrease to loss of tremor and disappearance of diarrhea. It was striking that there was a lag in the slowing of the pulse and in the gain in weight, particularly the latter. In some cases there was even a slight loss of weight during the first weeks of active treatment, but following this there was a gradual gain, amounting in 1 case to 55 pounds (25 Kg.). In many cases loss of tachycardia did not occur until a considerable period after the drop in basal metabolic rate. This lag in response would perhaps be expected from the pharmacologic action of the drug. Shortly after thiouracil is taken the rate of synthesis of the thyroid hormone falls and the thyrotropic hormone of the pituitary, released in excess, stimulates the thyroid gland and liberates the hormone stored therein. When this accumulated thyroid hormone is used up, since none is now being produced, the basal metabolic rate falls. Contrary to the findings in animal experiments, we were unable to note any increase in size of the thyroid gland or increased exophthalmos in human beings as a result of thiouracil therapy. On the contrary, we found a decrease in one or both, in the majority of cases.

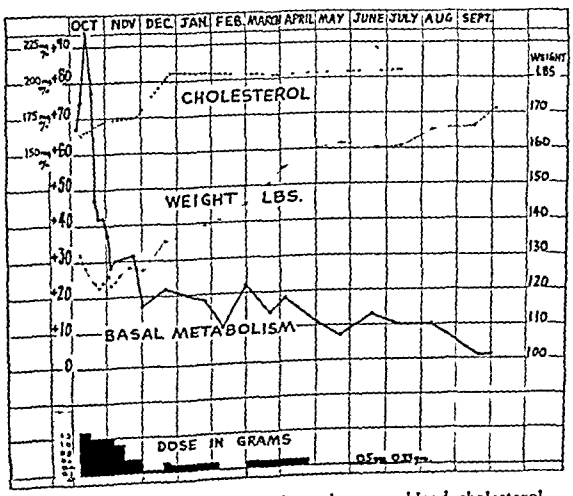


Chart 2.—Lag in gain in weight and rise in blood cholesterol.

Our results would point to thiouracil therapy as an ideal method for securing reduction in basal metabolic rate with a minimum of effort. It entails no interruption of the patient's normal occupation nor prolonged periods of rest and often avoids the necessity of operation, were it not for the ever possible danger of granulopenia and true agranulocytosis if the drug is not stopped forthwith. There seems to be no cumulative action of the drug itself, because 1 patient who developed granulocytopenia (chart 4) showed a maximum thiouracil concentration of 3 mg. per hundred cubic centimeters [1] in the blood with a normal excretion, while another with no drop in the white count showed a concentration of 6.75 mg. per hundred cubic centimeters. Rabbits, carried along for months on the comparatively enormous dosage of 0.1 Gm. daily, with a concentration of 9 mg. per hundred cubic centimeters in the blood, showed no granulopenia nor bone marrow changes. It can be seen from chart 4 that three separate attempts were made to reinstate thiouracil therapy but each time neutrophilic granulopenia followed. One patient developed granulopenia on the eighty-fifth day of therapy, while the white count of another patient dropped from 8,100 to 4,400 thirty-six hours after taking the drug. In the following cases thiouracil therapy had to be interrupted and finally terminated because of intolerance to the drug, manifested mainly by a toxic effect on the bone marrow:

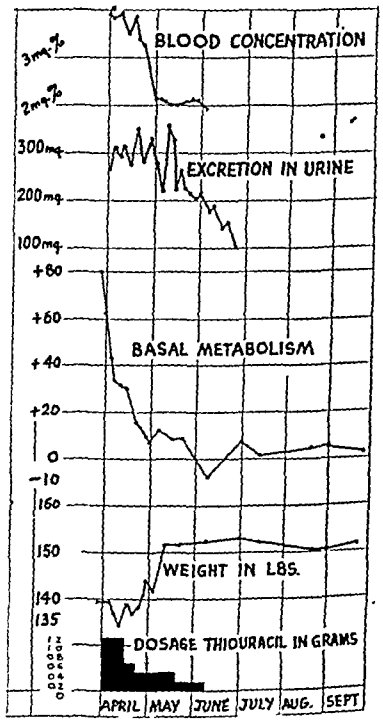


Chart 3.—Typical concentration of thiouracil in blood and excretion in urine during period of intensive therapy.

Case 1.—E. F., a woman aged 38, was admitted with a three months history of nervousness, loss of 19 pounds (8.6 Kg.), sweating and palpitation. Examination revealed agitation, tremor, sweating and enlargement of the thyroid. The basal metabolic rate was + 41. After 1.2 Gm. of thiouracil had been given for ten days there was a drop in white blood cells from 9,700 to 5,000 with a pronounced decrease in granulocytes. No constitutional reaction was noted. At this time the basal metabolic

1. A very simple method, using the reagent for the detection of acetone that is found in every laboratory, was developed for the clinical determination of thiouracil in blood, urine or body tissues. It was based on the finding by Grote that sodium nitroprusside, when treated by various reagents, gives a color with compounds containing a sulfur radical in organic combination. We found that thiouracil will give a green color when treated with sodium nitroprusside which has been exposed to the action of ultraviolet light for two and three-fourths hours Method: To 1 cc. of blood serum or urine there is added 1 cc. of a 5 per cent solution of irradiated sodium nitroprusside and 1 cc. of a buffer phosphate solution of pH 5.5. After ten minutes a green color develops which can be measured in a colorimeter or photoelectric colorimeter (red filter) against a standard solution of thiouracil similarly treated Grote, I W L A New Color Reaction for Soluble Organic Sulfur Compounds, J Biol Chem. 93: 25, 1931.

rate dropped to + 13. Because of the toxic effect on the bone marrow, the patient was prepared for operation. Thyroidectomy was performed. There was no excessive bleeding at operation and the patient made an uneventful recovery.

CASE 2.—L. S., a woman aged 30, married, admitted to the hospital with a history of palpitation, oligomenorrhea, nervousness, excessive perspiration and diarrhea of several months' duration and a loss of 10 pounds (4.5 Kg.) in one month, had noted prominence of the eyes and enlargement of the neck.

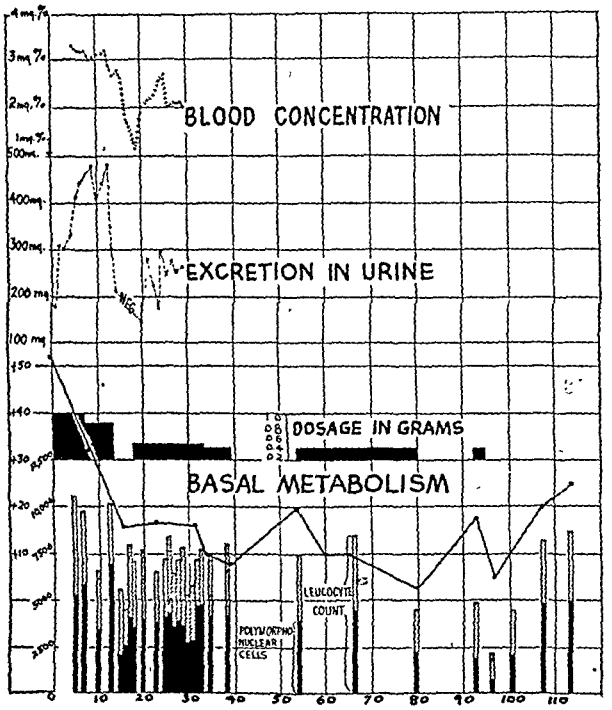


Chart 4.—Three attempts to reinstate thiouracil therapy in a patient sensitive to thiouracil.

Examination revealed agitation, tremor, perspiration and tachycardia, with slight exophthalmos. The basal metabolic rate was + 58. Cholesterol was 178 mg. per hundred cubic centimeters. Thiouracil therapy was inaugurated on February 1 with a dosage of 1.2 Gm. daily. After the first week the patient noted that she felt calmer and that the sweating was much less. The basal metabolic rate fell steadily so that it was + 54 on February 16, + 44 on February 21 and + 29 on February 25. On the morning of the 26th the patient complained of severe headache, pains in the legs and nausea, and she felt chilly. There was a rise in temperature to 104.4 F. At this time generalized enlargement of the lymph nodes was noticed. The nodes were firm, discrete and almost 1 cm. in diameter. Some were tender and others only slightly so. The spleen was not palpable. The white blood cell count was 9,700, with 80 per cent polymorphonuclear cells. No rash was seen. Thiouracil was stopped and the temperature returned to normal. The adenopathy persisted and the white blood count dropped to 5,800. By February 28 the adenopathy had disappeared and the basal metabolic rate was found to be + 7. On the 29th thiouracil was ordered. Following the second dose there was a recurrence of headache, muscular pains and chilliness, with a rise in temperature to 103.6 F. Examination again revealed lymph node enlargement but no rash. Because of the definite intolerance to the drug, this therapy was not attempted again. Only after two months had this patient shown a high degree of sensitivity to the drug. Since the hyperthyroidism had been so well controlled, thyroidectomy was performed at once. As in case 1, no excessive bleeding was noted. The postoperative course was uneventful and the patient was discharged on the thirteenth postoperative day with a basal metabolic rate of + 1.

CASE 3.—E. E., a woman aged 35, married, admitted in July 1944, complained of weakness, loss of 20 pounds (9 Kg.), nervousness, excessive perspiration, palpitation and tremor of four months' duration. Examination revealed typical hyperthyroidism with no exophthalmos or palpable enlargement of the gland. The basal metabolic rate was + 70. Cholesterol was 152 mg. per hundred cubic centimeters. Thiouracil .1 Gm. daily was started on July 17. On the 19th the dose was reduced to 0.6 Gm. The white blood cell count varied between 6,700 and 7,600, with 60 to 70 per cent polymorphonuclear cells until July 28, when there was a sudden drop to 4,800 with 20 per cent polymorphonuclear cells and the patient complained of diffuse myalgia and arthralgia. This was associated with a rise in temperature to 103 F., generalized lymph node enlargement and a palpable spleen. Thiouracil was stopped and within twenty-four hours all signs of a reaction had disappeared, with the temperature returning to normal within twelve hours. During the next two days, in spite of a normal white count, the granulocytes were only 42 per cent. The patient was then given Lugol's solution and referred to the surgical service, where thyroidectomy was performed. There was no increased bleeding and the postoperative course was uneventful.[2]

CASE 4.—Y. L., a woman aged 37, a nurse, was admitted on March 14, 1944 with complaints of nervousness and perspiration, frequent diarrhea, increasing prominence of the eyes and loss of 11 pounds (5 Kg.) in two months. Examination revealed tachycardia, an enlarged thyroid, especially the right lobe, exophthalmos more pronounced on the right side, perspiration, agitation and tremor. The progress of the case is shown on chart 4, and it can be seen that three separate attempts were made to resume thiouracil therapy after a drop in the white count, with a drop at the last attempt to 2,200 white cells and 38 per cent polymorphonuclears. At no time was there any other warning of bone marrow depression, and the patient never stopped work as a nurse on night duty in this hospital.

CASE 5.—B. A., a woman aged 50, was admitted to the hospital with a history of nervousness, palpitation, profuse sweating, and loss of 21 pounds (9.5 Kg.) in two years. Enlargement of the thyroid was noted a few months before admission. The patient had been given Lugol's solution but had taken none for nine months prior to admission. Examination revealed agitation, excess sweating, tachycardia and enlargement of the thyroid gland. The basal metabolic rate was + 53. Thiouracil 1.2 Gm. was given for three days and then reduced to 0.8 Gm. After

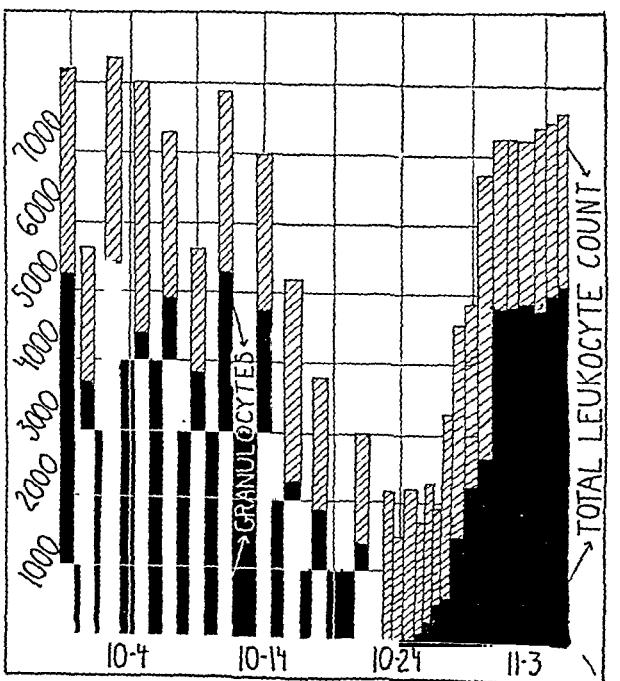


Chart 5.—Development of agranulocytosis from failure to stop administration of thiouracil.

2. The pathologic report on the thyroids in these 3 cases stated that they were well within the range of variation for a larger group of hyperthyroidism specimens.

four weeks of hospitalization the basal metabolic rate dropped to + 23. There was a gain of 11 pounds (5 Kg.) in weight. She was discharged from the hospital and treated as an ambulatory patient. On October 16 her basal metabolic rate was + 19, but the white blood count had fallen. She complained of a sore throat, had a temperature of 104 F. and after a sternal puncture was made she was readmitted to the hospital. Sternal puncture revealed a normocellular marrow with slightly decreased myelocytes and myeloblasts, and a pronounced decrease in polymorphonuclear leukocytes, many very young red cells and platelets in abundance. Findings were typical of a maturation arrest in granulocytes. Chart 5 shows the drop in the total leukocytes with disappearance of granulocytes. We were unable to find any thiouracil chemically in the bone marrow, though a control normal marrow to which thiouracil had been added was positive. Twenty thousand units of penicillin was given intramuscularly every three hours. In addition, 6 Gm. of liver fraction L [3] was given orally daily, and a transfusion of 400 cc. of blood was administered. After three days the temperature fell to normal and as soon as the white count was normal the patient was discharged on the eleventh day. She is now being treated with Lugol's solution.

Case 6.—D. M., a woman aged 18, for three months, following appendectomy, had suffered from palpitation, nervousness, loss of weight, perspiration, diarrhea and slight prominence of the eyes. The basal metabolic rate was + 41. Thiouracil was given, 0.4 Gm. three times a day for two days and then reduced to 0.2 Gm. three times a day. On Oct. 20, 1944 there was a sudden onset of rash and fever of 103.5 F. with pains in the legs and swelling of the lymph nodes. Medication was stopped and an outside physician diagnosed a scarlatinal rash and administered sulfonamide drugs. The fever subsided in twenty-four hours and the rash in two days. On October 27 the patient telephoned that after two doses of 0.2 Gm. the same aches and pains and rash appeared, with a temperature of 101.5 F., which disappeared in twenty-four hours after stopping medication.

Case 7.—D. T., a woman aged 27, first noted nervousness, tremor of the hands and fatigue nine months before admission. At that time the basal metabolic rate was + 32. She was given iodine and in one month the basal metabolism dropped to + 18. In spite of this there was a persistence of nervousness, which became very evident and associated with "crying fits" and melancholia four months prior to admission. At this time iodine therapy was stopped, although the basal metabolic rate was found to be + 71. On no treatment there was a rise in metabolism to + 81, so that the patient was admitted to the hospital in November 1944. Enlargement of the neck was noted six months prior to admission and there had been a loss of 29 pounds (13 Kg.) since the onset of her illness. She was obviously malnourished on admission and psychotic looking. There were nervousness, tremor, perspiration and tachycardia. The thyroid was diffusely enlarged. There was slight prominence of the eyes. The basal metabolism was + 85. After one week of thiouracil therapy there was a drop to + 57 and after fifteen days to + 48. At this time there was a drop in the white count from 6,750 with 50 per cent polymorphonuclear leukocytes to 4,000 with 34 per cent granulocytes. The drug was stopped because of the granulopenia.

On theoretical grounds, thyroid hormone decreases the output of thyrotropin while a lack of thyroid hormone or a consequent lowering of the metabolism is considered to be a normal stimulus to the release of thyrotropin from the hypophysis. Therefore it would seem that excessive thyrotropin released through inhibition of the synthesis of thyroid hormone would result in exophthalmos or an exacerbation of that already present. Contrary to certain other observations, we found that exophthalmos never appeared in any case in which it was not present at the start of therapy and was, when present, not exacerbated by thiouracil. In the following 2 cases of malignant exophthalmos 1, in which thyroid and pituitary irradiation also were given, was unchanged, while the other, as a control, in which no therapy other than thiouracil was given, showed much improvement as demonstrated by the exophthalmometric measurements.

Case 8.—C. K., a man aged 24, a truck driver, was admitted to the hospital in 1940 when a thyroidectomy was performed because of nervousness, loss of weight, perspiration, weakness, diarrhea and progressive prominence of the eyes. The basal metabolic rate was + 50. Cholesterol was 125 mg. per hundred cubic centimeters. The pathologic report showed diffuse hyperplasia of the thyroid. On discharge, with the exception of slight tremor and exophthalmos, the symptoms and signs of hyperthyroidism had disappeared and there was a gain in weight of 8 pounds (3.6 Kg.). The basal metabolic rate was 0. In January 1941 the patient was readmitted because of a progressive return of the original symptoms, with loss of 17 pounds (7.7 Kg.) and an abscess in the scar, which was incised and drained. Examination at the time revealed hyperthyroidism with tachycardia of 110, diffuse swelling in the region of the thyroid, and a basal metabolic rate of + 45. On Lugol's solution the basal metabolic rate dropped to — 5. The thyroid region was explored, but no hyperplastic thyroid tissue was found. The swelling noted clinically was due to induration and fibrosis of the muscles and tissues of the neck. The symptoms then decreased but did not disappear. He was again admitted in August 1944 complaining of nervousness, loss of 40 pounds (18 Kg.), severe exophthalmos and enlargement of the neck. The basal metabolic rate was + 45 on admission, with cholesterol of 150 mg. per hundred cubic centimeters and blood sugar of 76 mg. per hundred cubic centimeters. Thiouracil therapy was instituted with a dose of 1 Gm. per day for seven days then reduced to 0.6 Gm. In spite of the severe exophthalmos, as a control for the next case, no thyroid or pituitary irradiation was given. The basal metabolic rate was reduced to + 5 in two weeks. There was a gain of 5 pounds (2.3 Kg.) and cessation of nervousness, tremor, palpitation and tachycardia. He was discharged on a dose of 0.3 Gm. This was continued for two weeks and the patient returned to work, the medication stopped. After one month without medication, the basal metabolic rate remained at — 3 and there was a gain of 17 pounds (7.7 Kg.) in weight. There was evident recession in the prominence of the eyes. On admission the exophthalmometric reading was right eye 28 mm., left eye 30 mm. On discharge it was right eye 24 mm., left eye 26 mm.

Case 9.—S. C., a man aged 27, had a thyroidectomy performed three and one-half years before the present admission because of tremor, nervousness, palpitation, loss of weight, enlargement of the thyroid and exophthalmos of six months' duration. Following this he received 10 minims (0.6 cc.) of Lugol's solution, three times a day for three years. The patient remained in good health with the exception of persistent and pronounced exophthalmos. Six months prior to admission Lugol's [illegible] and he promptly noted a recurrence of his symptoms. In the two months prior to admission, tremor and nervousness became very noticeable and he had frequent attacks of diarrhea. There was a loss of 20 pounds (9 Kg.) in this short period. A point of unusual interest is the occurrence of a rare symmetrical skin lesion in the legs which, clinically and on biopsy, proved to be localized myxedema. On admission the patient, with effort, was almost able to express both eyeballs from their sockets. The basal metabolic rate on June 27 was + 30 and on July 3 was + 32. The cholesterol on three occasions was 144, 140 and 138 mg. per hundred cubic centimeters, with blood sugar of 79, 78 and 70 mg. per hundred cubic centimeters. One Gm. of thiouracil was given daily over a period of ten days, following which the dose was reduced to 0.5 Gm. until discharge. The patient was ambulatory and received no sedation. Because of the severity of the exophthalmos, 0.03 Gm. of thyroid was given twice daily and pituitary irradiation every three days. On admission, exophthalmometric readings were right eye 31 mm., left eye 33 mm. and on discharge right eye 30 mm., left eye 31 mm., showing no increase in exophthalmos. The basal metabolic rate fell progressively to + 2, and there was a gain of 5¼ pounds (2.4 Kg.) and disappearance of all symptoms of hyperthyroidism at the end of the twenty-fourth day hospital stay. There was no change in the localized myxedema of the extremities

3. Courtesy of the Winthrop Chemical Company.

The two cases just presented would seem to indicate that even malignant exophthalmos is no contraindication to the use of this form of therapy.

A third case of recurrent hyperthyroidism is presented:

CASE 10.—S. T., a woman aged 35, married, had a thyroidectomy performed in October 1943 for thyrotoxicosis, as evidenced by enlargement of the gland, perspiration, exophthalmos and a basal metabolic rate of + 59. The pathologic report was thyroid hyperplasia. The postoperative course was uneventful and the symptoms and signs of the disease abated. Three months later all the previously mentioned symptoms had returned. Bilateral exophthalmos was present, more pronounced on the right side. The basal metabolic rate on June 16 was + 51. Cholesterol 150 mg. per hundred cubic centimeters, blood sugar 80 mg. per hundred cubic centimeters. The patient was given 1 Gm. of thiouracil daily for four days, then reduced to 0.6 Gm. until discharge. Within a week the patient stated that she was feeling less nervous. The symptoms gradually disappeared and there was a striking decrease in the size of the thyroid gland and a recession of the exophthalmos to the point where the eyes were no longer at all prominent. There was a gain in weight of 7 pounds (3.2 Kg.) and a fall in the basal metabolic rate from + 51 to — 3 in the thirty days of hospitalization. We had admitted the patient for a second thyroidectomy to compare our pathologic specimens but found the second operation superfluous. The patient has remained symptom free with a basal metabolic rate of + 9 on August 10, + 2 on August 24 and + 7 on September 7, on a maintenance dose of one 1 Gm. tablet every three days.

Thiouracil seemed to yield an excellent result in these cases of recurrent hyperthyroidism. In 2 cases there was palpable thyroid tissue, but in the third none could be found in the second operation. In some cases no definite thyroid tissue can be felt or found at operation. In these, as in the cases of deep substernal thyroid, use of thiouracil in the absence of intolerance is unquestionably the procedure of choice.

Thyrocardiac disease is the result of the increased circulatory demands on the heart due to the heightened basal metabolic rate and imposed on heart muscle whose metabolism has itself been altered like all other body tissues by thyrotoxicosis.

CASE 11.—M. P., a woman aged 38, married, was seen by an ophthalmologist five years before admission because of prominence of one eye, for which Lugol's solution was prescribed. There were complaints of nervousness, but the patient took Lugol's solution daily for four and one half years. Four months prior to admission she stopped taking this medication and began to lose weight. There were tremor, shortness of breath, perspiration and enlargement of the thyroid. There was no history of rheumatic fever. Examination revealed bilateral exophthalmos, an enlarged, somewhat nodular thyroid, the neck veins were engorged, and there was tachycardia, 140-150 per minute, with a heaving apical impulse. There was a systolic murmur at the apex, but no diastolic murmur could be heard at this time. There were rales at the base of both lungs. The liver was palpable five fingerbreadths below the costal margin. The spleen was palpable. On a dehydration regimen with digitalis therapy the signs of congestive heart failure decreased very slowly. Two days after admission a small amount of fluid was removed from the right pleural cavity. Five days after admission there was sufficient improvement to allow a basal metabolic rate determination, which was + 60. Cholesterol was 110 mg. per hundred cubic centimeters. At this time a definite diastolic murmur was heard at the apex and the cardiac contour revealed a general enlargement of the heart with prominence of the pulmonary conus. With barium in the esophagus a posterior displacement by an enlarged left auricle was noted. These findings, in addition to the later finding of elevation of the left bronchus, indicated the presence of mitral stenosis and insufficiency on a rheumatic basis associated with hyperthyroidism. It was the opinion of the observers that the patient had rheumatic heart disease and cardiac failure precipitated by the occurrence of hyperthyroidism. On July 22, ten days after admission, thiouracil therapy was begun with a dosage of 1 Gm. daily. This was continued for nine days and then reduced to 0.6 Gm. daily for eighteen days. During this time the subjective improvement was striking. Digitalis was stopped. The basal metabolic rate dropped to + 46 and then to + 35. There it remained at a fairly constant level for three weeks, during which time the dose of thiouracil was increased to 0.8 Gm. and then to 1.2 Gm. On September 8, fifty-four days after admission, the basal metabolic rate had dropped to + 30. There was no recurrence of congestive failure with the patient off digitalis during the last four weeks. Since there was a complete cessation of excessive perspiration, tremor, and a gain of 16 pounds (7.3 Kg.) with a normal pulse rate, the patient was discharged on a dose of 0.6 Gm. On October 16 the basal metabolic rate was + 10, the dose was reduced to 0.2 Gm., and on October 30 the basal metabolic rate was + 11.

CASE 12.—R. R., a woman aged 57, admitted with a history of nervousness, palpitation, profuse sweating and loss of 19 pounds (8.6 Kg.) in three years, with enlargement of the thyroid of several months' duration, had not been given Lugol's solution for five months prior to admission. The basal metabolic rate was + 55. The patient was given 1.2 Gm. of thiouracil for three days, the dose then being reduced to 0.8 Gm. for most of her hospital stay. There were attacks of palpitation during severe bouts of paroxysmal auricular fibrillation several times a day, lasting from one to two hours and causing the patient considerable distress. At the end of the first week the attacks of palpitation were found to be due to auricular tachycardia; there were no further attacks of paroxysmal auricular fibrillation. In addition, these attacks of tachycardia occurred less frequently. By the twelfth day they had disappeared completely and were replaced by extrasystoles. The patient still felt palpitation, but this was not as troublesome. At the end of the third week the extrasystoles were no longer present. During four weeks of hospitalization the basal metabolic rate was reduced to + 29. Signs of hyperthyroidism and the attacks of palpitation had disappeared and the patient gained 8 pounds (3.6 Kg.). After discharge the patient attended the follow-up clinic and on a dose of 0.6 Gm. daily the basal metabolic rate fell to + 16.

Since thyroid disease is one of the reversible types of heart disease, the toxic effect on the heart disappears with control of the hyperthyroidism. In case 1, as a result of thyrotoxicosis, circulatory failure was precipitated in a patient with mitral stenosis; as the thyrotoxicosis was controlled the patient improved, so that there was no recurrence of circulatory failure with physical activity for a period of weeks. In case 2 the gradually disappearing toxic effect was shown by the transition from attacks of auricular fibrillation to extrasystoles and finally a reversion to normal rhythm rate. The same result was obtained in both these cases that could have been accomplished by surgery, without the risks of thyroidectomy in cases of this type. In the first case there was some refractoriness to the drug; in the second the results were quite rapid. It is our opinion that as long as some improvement occurs thiouracil therapy should be continued, since some cases may be more refractory than others. In case 1, after the basal metabolic rate leveled off at + 40 after four weeks, it was suggested that no further result could be expected, but since the patient was doing well we persisted in using thiouracil therapy with ultimate success after eight weeks. This refractoriness of cardiac patients has been previously noted. It is of interest that there were no electrocardiographic changes in these or any other cases which could be attributed to direct action of thiouracil on the heart muscle.

There is some clinical evidence that the amount of diabetes, when present in patients with thyrotoxicosis, is a direct function of the basal metabolic rate. Total thyroidectomy ameliorates the coexisting diabetes. In Means's patient it was observed that as long as by withdrawal of thyroid she was allowed to remain myxedematous there was considerable lessening of her diabetes, but as soon as thyroid was administered her diabetes became intensified; when fully myxedematous she had no diabetes. The following 2 cases constitute a physiologic experiment of the same nature in reverse where, through administration and withdrawal of thiouracil, we were able to vary the intensity of the diabetes as measured by the insulin requirement. It would scarcely be possible to postulate the existence of a specific thyroid antagonism between the hormones of the pancreas and the thyroid, because the amount of diabetes may simply be the result of the decreased basal metabolic rate brought about by thiouracil.

CASE 13.—E. R., a woman aged 55, was admitted with a history of diabetes of five years' duration which had been

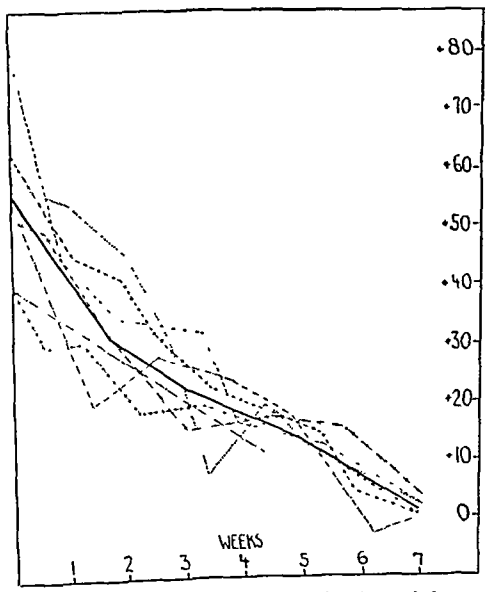


Chart 6.—A composite of the drop in the basal metabolic rate in first 8 cases treated with thiouracil. Average curves, the heavy black line, shows a drop of 1 unit in the basal metabolic rate per day.

controlled with diet and 60 units of protamine insulin daily. Enlargement of the thyroid gland was noted two years prior to admission. For several months she had complained of nervousness, weakness and loss of 15 pounds (6.8 Kg.). The diabetes was noted shortly after the menopause. Examination revealed agitation, slight stare, enlarged nodular thyroid and no tremor. The basal metabolic rate was + 40, the blood pressure 210/90, tachycardia 110 per minute. The urine contained 4 + sugar and traces of acetone. Blood sugar was 220 mg. per hundred cubic centimeters, cholesterol 256 mg. per hundred cubic centimeters. The patient was placed on a diet of carbohydrate 250, protein 80, fat 80, with 60 units of protamine zinc insulin daily. The urine became acetone free with 3 + to 4 + sugar. Four days after admission, thiouracil therapy was inaugurated with a dose of 1 Gm. daily for three days, which was then reduced to 0.6 Gm. until discharge. The basal metabolic rate gradually dropped over a period of two weeks to + 15, at which level it remained. There was general improvement in the diabetic status, so that with a constant diet the insulin was withdrawn by degrees until the patient received no insulin at all. The urine showed 1 + sugar with no acetone. The basal metabolic rate two months after discharge was + 12. There was a gain in weight of 6¾ pounds (3 Kg.). The subjective improvement in this patient was remarkable. Her family stated that she was a changed woman, no longer irritable but transformed into an energetic and useful woman. Objectively, all signs of hyperthyroidism had disappeared at discharge.

CASE 14.—E. K., a woman aged 55, weight 116 pounds (52 Kg.), was admitted November 15 with complaints of infection of the left leg of three weeks' duration. There was increased perspiration, swelling of the neck of one week's duration, nervousness, insomnia and loss of weight of 80 pounds (36 Kg.) in fifteen years. In addition, she had developed an infection of the left leg of three weeks' duration. She had had diabetes for thirteen years, of late controlled by 25 units of protamine zinc insulin and 15 units of regular insulin daily. The basal metabolic rate was + 33. The thyroid was enlarged, with a nodule in the left lobe. A systolic murmur could be heard over the precordium. The blood pressure was 190/90. The patient was placed on thiouracil 1 Gm. daily for three days, then reduced to 0.8 Gm. daily. After six days of thiouracil therapy her basal metabolism had dropped to + 18. At the end of ten days the regular insulin was stopped. Two days later the protamine was cut to 15 units, and at the end of two weeks all insulin was stopped. She is now under good diabetic control, on a diet of carbohydrate 250, protein 80, fat 80, with no insulin. The blood sugar is 183, with moderate glycosuria and no acetonuria.

It is well known that diabetes associated with hyperthyroidism is difficult to control. Improvement in the diabetic status goes hand in hand with improvement in the thyroid status. This has been frequently demonstrated by thyroidectomy and iodine. As would be expected, thiouracil yields similar results. As in cardiac patients, it would seem preferable to accomplish such a result by medical rather than surgical means, since the risks of anesthesia and operation can be avoided.

In our series of 96 cases of thyrotoxicosis treated with thiouracil, there were only 4 in which the drop in basal metabolic rate could not be fitted into the limits of the curve shown in chart 6. These were four severely ill thyrocardiac patients and the drop was distinct but the rate was slower. The median curve (heavy black line) shows a drop of 50 units in seven weeks. A rough rule may therefore be predicated that the basal metabolic rate will drop to zero in as many days as the height of the basal metabolic rate just before administering thiouracil. When medication had to be discontinued because of toxic effects of the drug, the fall in basal metabolic rate took place at the average rate up to the time of discontinuance of the thiouracil. Sixteen per cent of our patients are in sustained remission with no medication whatever for periods ranging from over two months to fifteen months after discontinuance of the drug. In 20 per cent thiouracil had to be discontinued because of sensitivity, and 9 of these were submitted to surgery without any untoward finding at operation. In fact, this drug is an excellent means of securing the lowering of the basal metabolic rate requisite for operation without necessitating any preliminary period of rest. There are 25 cases (26 per cent) in which the basal metabolic rate rises as soon as the maintenance dosage is lower than 0.2 Gm. daily. These have blood counts every three weeks, as outlined.

We have noticed an excellent response to the drug in young people who have had no previous treatment with iodine. The drop in basal metabolic rate is very rapid and the fall sustained. It is our opinion that thiouracil will find a wide field of application in these "fresh" cases as they occur.

CONCLUSION

Our results would seem to indicate that thiouracil will bring about a drop in the basal metabolic rate in all patients suffering from hyperthyroidism. It has, how-

ever, serious toxic effects and the patient must be kept under continuous medical observation so that the drug may be promptly discontinued and further injury to the patient prevented. The precautions to be observed are very similar to those employed for the careful administration of sulfonamide drugs. However, examination of the red blood cells is not necessary, as no injury to the erythrocytes has been noted. The main danger is agranulocytosis, and since we have noted a definite and sudden granulopenia in 20 per cent of our patients, it is apparent that a white blood count must be done every second or third day, and the drug must be stopped instantly if there is a sudden drop in the total leukocyte count, or if the granulocytes drop below 45 per cent. If there is a sudden rise in temperature, accompanied by arthralgia, myalgia, lymphadenopathy or the appearance of a rash, the drug must be discontinued. It is well to instruct the patient to inform any physician called in of the medication being taken so that sulfonamide drugs or other compounds containing the benzene ring are not prescribed. The patient should be given only two or three days' supply, just enough to last until the next blood count. Since this drop in the white count can occur with disconcerting suddenness at any time, it is doubtful whether thiouracil is as yet ready for long continued use in routine medical practice, until some method of protecting the bone marrow is perfected. The use of pyridoxine, vitamin B_6, in prophylactic doses of 150 mg. daily by mouth, or 200 mg. intravenously where a severe drop in the leukocyte count has taken place, seems at present to be most promising.

HERNIATION OF FASCIAL FAT AS A CAUSE OF LOW BACK PAIN

WITH RELIEF BY SURGERY IN SIX CASES

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Eight years ago (1937) I observed a patient suffering from excruciating low back pain so severe that she was unable to get out of bed. Examination revealed a small tumor in the left sacroiliac region; pressure on this tumor intensified the pain. A biopsy was suggested, but the patient refused to have it done. Injection of 1 per cent aqueous procaine solution around the tumor gave temporary relief. Since then the patient has had periodic attacks of the same type of pain, necessitating bed rest. Injections of metycaine, strapping and physical therapy produced temporary relief.

In October 1943 another patient, also a woman, was seen because of acute low back pain, and she also displayed a small palpable mass over the right side of the sacrum, which was extremely tender and painful. Circuminjection with 2 per cent metycaine gave immediate relief. The patient had a history of "lumbago" of several years' duration. Often when she stooped she could not rise unaided, and during acute exacerbations she could not turn in bed. The patient agreed to a biopsy. On cutting down on the tumor, no demarcation was present, and it could not be differentiated from surrounding fatty tissue. Nevertheless, a wide dissection of fat was made in this area. When the patient emerged from anesthesia she volunteered the information that the pain in her back had disappeared, and she has remained free from it ever since.

This excellent clinical result was impossible to explain on the basis of any previous knowledge or experience. The pathologist's report was not enlightening. The specimen consisted of two similar lobulated masses of fat, roughly round and measuring 5 cm. in diameter. Sections showed homogeneous yellow fat, slightly lobulated. Around one surface there was a partial covering of loose but tough grayish brown fibrous connective tissue, apparently the seat of edema and hemorrhage. Microscopically there were lobulated groups of mature adipose cells separated by dense bands of fibrous connective tissue. In some places the latter showed edema and focal hemorrhage. The tissue was consistent with a pathologic diagnosis of fibrolipoma.

Within the next year 2 more women were seen with similar symptoms and similar painful, palpable masses. They also were subjected to surgical excision of the fatty tumor and experienced similar striking relief.

These first 3 patients who were operated on were all somewhat obese, and it was difficult in all to differentiate the mass from surrounding fatty tissue. Nevertheless excision of fatty tissue in the painful area afforded complete and immediate relief from the back pain.

The literature and anatomy textbooks were searched for an adequate explanation of the clinical results, but none was found until the article by Copeman and Ackerman [1] appeared. They reported 10 similar cases (all in men in the armed services) in which fatty tumors were excised, with striking relief. They also reported an anatomic study on 14 normal backs and showed that the palpable masses which are the seats of pain are herniations of fascial fat.

Since I have studied their report, I have operated on 3 additional patients, and the lesions undoubtedly are the herniations these authors described. In 1 patient the lobule of fat was discernible as soon as the incision was made (case 4).

ANATOMIC CONSIDERATIONS

Since the concept advanced by Copeman and Ackerman to explain the trigger points or "tender rheumatic nodules" of so-called fibrositis of the back offers an explanation for a condition whose etiology has been obscure, it seems worth while to present their findings in considerable detail.

The pain generally originates in certain focal points, from which more generalized subjective pain is referred segmentally. This referred pain may be at a considerable distance from its real origin, as in many cases of sciatica, in which the original focal point is in the lumbar or gluteal muscles. When these points are found by the palpating finger, the patient winces involuntarily. Pressure of the same intensity only a few millimeters away will not produce the same response. Pain referred to other areas from such a point will also generally be reproduced by this pressure. These trigger points tend to occur in certain predictable sites in the lumbar and gluteal areas and also throughout most of the dorsal area.

In the lumbar region the most common sites are at the edge of the sacrospinalis muscle just above the iliac crest, 1 inch above this level, and at the level at which the latissimus dorsi crosses the sacrospinalis. In the gluteal region points may be found all along the

Dr. Normand L. Hoerr, professor of anatomy, Western Reserve University School of Medicine, saw several of these patients before and after operation and discussed the findings during the investigation. Dr. Simon Koletzky of the Department of Pathology made the pathologic study of tissue removed at the operations.

1. Copeman, W. S. C., and Ackerman, W. L.: "Fibrositis" of the Back, Quart. J. Med. 13:37-51 (April-July) 1944.

crest of the ilium and for a distance of about 2 inches below it; also along the sacroiliac junction, where the deep fascia is attached. They are not commonly found elsewhere in the buttock.

Copeman and Ackerman dissected 14 backs, with special attention to areas which are the commonest sites of pain in so-called fibrositis. After one or two dissections their preconceived ideas of the importance of fibrous tissue were modified, as no fibrous lesions, abnormalities or adhesions were found at a deeper level than the subcutaneous tissues; and moreover it became obvious that the basic fat pattern, which persisted in even the most cachectic bodies, corresponded exactly with the pain patterns previously charted. Increasing attention was therefore paid in subsequent dissections to relationships of this fat and the fibrous tissues.

Beneath the subcutaneous fat and areolar tissue lies the highly vascular superficial fascia, which forms a continuous sheet from the neck to the gluteal region. Space between this and the deep fascia is principally potential, containing little or no fat. In certain well defined places, however, deposits of pinkish fat constantly occur. These, with equally constant deep areas, constitute the basic fat pattern. In obese persons this fat pattern tends to be obscured by more generalized deposition of fat. The fascias are not of uniform thickness, being notably thinner in certain places, and frequently there are actual deficiencies in the fascial membranes. In these places the underlying fat tends to bulge through, sometimes resulting in a complete herniation (fat hernia).

Detailed examination of synovial sheaths of all tendons and joints showed that they consist largely of rather fibrous fat, which forms a loose tunnel through which the tendon moves. As tendons are avascular and their microscopic structure does not suggest that they can readily become edematous owing to the dense nature of their constituent fibrous tissue, it is suggested that it is this investing fatty capsule which becomes edematous, thus narrowing the lumen of the tendon sheath and impeding its action, causing stiffness, which may ultimately lead to cessation of voluntary movement on account of pain.

In the lumbar region the sacrospinalis muscle is edged with fat, some lying superficial to the deep fascia (lumbar fat pad) and some lying within the angle made by the deep fascia as it splits to invest this muscle. In very wasted bodies this fat is deficient along the upper portion, where it lies under cover of the latissimus dorsi muscle. Below this strip the fat follows the line of attachment of the deep fascia and the muscle along the sacroiliac junction. Small fat hernias have frequently been observed in both these areas.

Although a majority of trigger points of pain in clinical subjects occurred at certain levels, these varied by about ½ inch on their horizontal plane. Dissection showed that this is due to variation in width of the sacrospinalis muscle according to muscular development. In the vertical plane, levels at which trigger points cluster most thickly are at the junction of the outer border of the sacrospinalis with the iliac crest 1-1½ inches above the crest, and 2-2½ inches above. Careful dissection at these areas, through the basic fat pad which lies in the superficial fascia, revealed that at these points the cutaneous branches of the posterior primary rami of the first three lumbar nerves pierce the deep fascia after leaving the body of the muscle. This they do through definite foramens accompanied by small blood vessels. There is a small horizontal fold of membrane, overhanging each foramen, which probably acts as a valve and prevents herniation of fat when the back is flexed. It is believed that these valves do not always perform this function efficiently, and failure to do so allows herniation to occur; this may result in lumbago.

It is not uncommon to find at intervals along the edge of the muscle small bubbles of deep fascia containing a few lobules of fat bulging up from the angle in which it is contained, and firm pressure can easily convert it into a true fat hernia. These small hernias tend to occur at points where the fascia is weak and do not give rise to symptoms until some incident, such as sudden trauma or some pyrexial illness which entails lying on the back for several days produces an increase in the fat pressure and a painful degree of distention. This leads to edema, which may perpetuate the condition.

In the gluteal region there is a crescent of pink fat, extending along the crest of the ilium and for about 2 inches below. It is contained within the superficial fascia and extends from the anterior superior spine back to the sacroiliac junction, often sending a narrow prolongation down this area. A similar tongue of fat lies in this region, but at a deeper level, being contained in the angle of the deep fascia. It is thus continuous with the fat along the edge of the sacrospinalis muscle in the lumbar region.

The fat along the iliac crest lies in layers, where it has split the superficial fascia in which it is contained, and it is common for lobules of one layer to herniate into a more superficial layer, or laterally into an adjoining compartment, where the fibrous walls are weak or deficient. The fact that this pad of fat lies almost directly over the unyielding bone of the ilium may account for the common occurrence of such lesions in this area.

PATHOLOGIC CONSIDERATIONS

The anatomic study by Copeman and Ackerman showed that trigger points of pain in the back apparently have a topographic relationship to the basic fat pattern. Herniation of fat lobules through fascial weaknesses, deficiencies or foramens was found in dissection, and such herniations were proved to be sites of pain in living patients. They differentiate three types of fat hernias: nonpedunculated, pedunculated and foraminal.

Fat which lies under a fascial covering, as in the angle of the deep fascia where it splits to invest the sacrospinalis muscle, or along the crest of the ilium, is always under tension and so will bulge into any potential hernial space, as the result either of congenital weakness or of trauma. This tendency will be increased by muscular action. Such potential hernias probably should not be considered pathologic unless they cause congestion and pain by constriction of enclosed fat. In this case edema and hemorrhage may have occurred which, by increasing the tension, initiate a vicious circle and so in time tend to make the condition chronic. In microscopic sections from biopsy specimens some degree of commencing fibrosis has also been seen, suggesting that if such a hernia is subjected to chronic "strangulation" for a sufficiently long period it might be converted into a true fibrous nodule, though this has not been observed.

Nonpedunculated hernias were most commonly found in the lumbar fat pad, lying within the superficial fascia and in its extension downward along the crest of the ilium, in the gluteal region. These tense swollen fat nodules were palpable when sufficiently superficial. A

variant of this type is that which protrudes in a horizontal direction, the contents of one fibrous compartment herniating through an imperfection in the wall of the neighboring compartment as the result of some extra tension; this type occurred most frequently along the iliac crest.

The authors found no instance of pedunculated hernias in normal backs dissected, but several were found and removed in patients subjected to operation. In each of these cases there was sudden onset of pain produced by a strain several years previously. Hence it is thought that this type probably is a late result of strangulation in a hernia originally of the nonpedunculated type. The appearance is similar to that of an ordinary pedunculated polyp, but a lobule of fat replaces the terminal polypoid tissue. This polyp lies in a layer of fat more superficial than that from which it springs, being connected with its roots by a pedicle which generally contains fibrous tissue and a blood vessel. The pedicle sometimes appears to be twisted. Histologically there is generally some fibrous tissue merging into the terminal fat of the lobule.

Copeman and Ackerman also report a foraminal type of hernia found only along the edges of the sacrospinalis muscles, supplied by the lumbar nerves, in the first, second and third of which the lateral branches of the posterior rami become cutaneous and pierce the deep fascia at the spots where trigger points of pain chiefly occur. In several cases a herniation of this type was found to be the cause of sudden lumbago, and removal of the edematous fat and enlargement of the foramen proved curative.

Of the 6 cases presented in this report, not one of the foraminal type was seen, and only one of the fat lobules removed had a discernible pedicle. Histologic findings were similar to those described by Copeman and Ackerman. They report that microscopically the nodules removed at operation consisted principally of fatty tissue with young cellular fibrous tissue growing into it. The blood vessels were congested and their walls thickened, with perivascular proliferation. There were also in some nodules occasional patches of older fibrous tissue. In 1 case there were lobulated groups of mature adipose cells separated by dense bands of fibrous connective tissue, which in some places exhibited edema and focal hemorrhage. In 1 (case 6) nerve tissue was found in the fat lobule, with edema and focal hemorrhage. In other cases the specimen consisted only of fat tissue showing edema and hemorrhage.

CLINICAL CONSIDERATIONS

In all 6 cases in this series there was a history of trauma due to strain which had initiated the pain. Pain in the back was extremely severe in all and in some instances was referred down one leg. Two patients had had recurrent attacks of acute lumbago for fifteen years which had been incapacitating and required bed rest. One could not turn in bed during these exacerbations. In all cases a definite mass was palpable which was extremely tender and pressure on it intensified the pain. Injection of these masses with procaine or metycaine solution provided temporary relief in all instances. In 1 instance the condition was bilateral, although the symptoms were more severe on one side.

Important diagnostic features are the severity of the pain, the frequency of radiating pain down the leg, the presence of a palpable tender mass which is a "trigger point" of the pain, which can be relieved temporarily by injection with anesthetic solution. This condition may be present with other diseases, such as pelvic disorders, to which the back pain may be erroneously attributed. One patient in this series had had fibromyomas of the uterus for which hysterectomy had been performed, but severe attacks of back pain had continued and had not been relieved until the fascial fat hernia was removed.

It is my impression that some, and perhaps many, of the cases of so-called functional back pain, which is considered to be psychogenic, may be due to fascial fat hernias. Whenever one makes a search for psychic disturbances they are quite easy to find in almost any patient, but my experience convinces me that they are seldom, if ever, the cause of excruciating pain in the back.

From a surgical standpoint, removal of the palpable fat mass presents some difficulty, especially when there is considerable superficial fatty tissue. In the first case in which operation was performed, a wide dissection of fat in the painful area relieved the pain immediately and permanently. In subsequent operations the palpable mass was transfixed with needles before the incision was made, a procedure which Copeman and Ackerman also used. In the first 3 cases in this series it was not possible to see a definite mass that could be clearly differentiated as the palpable nodule. As already mentioned, these patients were relatively obese women, which undoubtedly accounts for at least part of the difficulty. It was also occasioned by a lack of knowledge as to the type of lesion being sought. In the fourth operation, on dividing the superficial fat and retracting the edges of the wound a fat tumor popped into the wound. In this and the subsequent instances, operations were performed with more assurance, since it was known that the lesion would be a lobule of fat, as proved by the three previous operations and the elucidation of the condition in the article by Copeman and Ackerman.

COMMENT

Since all the patients so far operated on were women, I thought at first that perhaps the condition was confined to females or at least more prevalent in them. However, all 10 cases reported by Copeman and Ackerman were in men. Recently I saw a man with severe lumbago who had several palpable nodules that were trigger points of pain; injection of these with metycaine solution has provided temporary relief. It would seem that in civilian practice the condition may possibly be more prevalent in women, since with their inferior muscular development a less severe strain may cause herniation of fascial fat. It also seems likely that the lesion may be more difficult to discern at operation in women because of their greater superficial fat padding.

In these 6 cases fairly wide dissection of fat in the painful area has relieved the pain, whether or not the herniation could be clearly delineated. One or more lobules of fat were removed in all the cases reported by Copeman and Ackerman. They also describe a technic which they call "teasing" the nodule which produces more lasting results than ordinary injections.

REPORT OF CASES

CASE 1.—A married woman aged 30 had had recurrent symptoms of lumbago for fifteen years. She always had to be careful when she stooped or lay down, for she was prone to get a "catch" in her right leg and would have to have some one pull her to an upright position. She had noticed a minute tumor over the right sacral region, which she thought had been present throughout the period in which she had had diffi-

culty with her back. Examination revealed a small mass over the right side of the sacrum. Circuminjection with procaine solution afforded temporary relief from the pain.

At operation a transverse incision was made over the fifth right lumbar area and carried down through the subcutaneous tissues. Bleeding points were clamped and ligated with plain number 1 catgut. A firm nodule and its surrounding tissues were widely excised. Comparatively little bleeding was encountered. The skin was closed with silk sutures.

The pathologist's report on the tissue removed was that it consisted of two similar lobulated masses of fat, roughly round and measuring 5 cm. in diameter. Sections showed homogeneous yellow, slightly lobulated fat. Around one surface was a partial covering of loose but tough grayish brown fibrous connective tissue which appeared to be the seat of edema and hemorrhage. Microscopic examination showed lobulated groups of mature adipose cells separated by dense bands of fibrous connective tissue. In some places the latter showed edema and focal hemorrhage. The tissue was consistent with a clinical diagnosis of fibrolipoma.

As soon as the patient recovered from the anesthetic she remarked that the pain in her back and leg was gone, and she has been entirely free from it since operation, eighteen months ago.

CASE 2.—A woman aged 67 sought medical attention because of a severe pain in the back which had appeared as she was getting out of bed; she had had similar attacks before. At examination a painful nodule was discovered in the right sacroiliac region; this was relieved with injection of 2 per cent procaine solution. Before operation the painful tumor was transfixed with two needles. An incision about 3 inches long was made over the tumor and wide dissection carried out to the fascia of the sacrospinalis muscle. A portion of the fifth lumbar nerve about 2 inches long was dissected and removed. The wound was closed with interrupted silk sutures, and sulfathiazole powder was applied. This patient also experienced complete relief immediately after operation. It has been impossible to follow her progress since.

CASE 3.—A woman aged 50 complained of pain in the back and along the back of the left leg, which had been present two months and had become exceedingly severe during the last week. A palpable nodule was found in the left sacroiliac region; this was relieved by metycaine injections. Under 2 per cent procaine infiltration anesthesia an incision was made just lateral to the left sacroiliac joint down through the fatty tissue. With a combination of blunt and sharp dissection a mass of fatty tissue was excised. The specimen consisted of three similar irregular masses of yellow adipose tissue measuring 1, 1.8 and 4 cm. in longest diameter respectively. Cross sections were homogeneous except for foci of hyperemia and hemorrhage. Microscopic sections showed fragments of fat, with edema and focal hemorrhage; there was no inflammation or necrosis. Pain in the back was completely relieved, and there has been no recurrence in the nine months since.

CASE 4.—A woman aged 48 had been struck by a 2 by 4 plank in the left buttock eighteen years previously and had had a "weak" back ever since. Two years before, the pain had become appreciably worse. Osteopathic treatments had afforded no relief and she had spent more time in bed than out during this period. The last two weeks the pain had become unbearable. When she was standing or walking the pain seemed to advance from the heels over the calves and thighs into the back. She was carried into the office for examination, which revealed a nodule in the left gluteal region. This was circuminjected with 2 per cent metycaine solution. The pain subsided promptly and the patient was able to get up from the couch and walk out of the office unaided. Injection of the nodule was done again twenty-four and forty-eight hours later, at which time she was hospitalized for operation.

An incision about 4 inches long was made over the fatty tumor in the left sacroiliac region about 2 inches below the iliac crest. On division of the superficial fat and retraction of the edges of the wound a fat tumor about 2 cm. in diameter popped into the wound; this was densely adherent to fascia of the gluteal muscles. It was dissected with sharp dissection and excised. After it was removed, another tumor about the same size appeared in the wound; this was also removed by sharp dissection. Exploration revealed no additional tumors.

The specimen consisted of two similar small roughly round masses of homogeneous lobulated yellow fat measuring 2.5 and 4 cm. in diameter. Both were composed of homogeneous adipose tissue showing focal edema and hemorrhage; there was no inflammation.

The patient had complete relief from pain when she emerged from the anesthetic.

CASE 5.—A woman aged 42 was first seen in November 1944 complaining of back pain and pains in the legs of more than two months' duration. She had been under the care of another physician and had been hospitalized for complete examination but had been dismissed without a definite diagnosis and with the pain persisting. My own examination at that time did not reveal a definite mass, and the diagnosis was indefinite. This attack subsided, but the patient consulted me again in March 1945, after having suffered an exacerbation of the pain for five weeks. At this examination a definite tumor was palpated in the left lumbar region, and pain was relieved by injection of metycaine solution.

At operation an incision about 4 inches long was made about 2 inches below the crest of the ilium. A herniation of fascial fat was located and excised, with some surrounding fatty tissue. The pathologic diagnosis was fatty tissue, herniated tumor. Pain was absent when the patient emerged from the anesthetic and she was out of bed, walking, the following day.

CASE 6.—A woman aged 51 sought relief from low back pain at a time when she was having an exacerbation of excruciating pain. She had had pain in the lumbosacral region, radiating into the groin and thigh, especially on the left side, with periodic exacerbations of severe agony. Roentgenograms recently made at an osteopathic clinic had shown calcium deposits in several vertebrae but no lesion in the sacroiliac region. Tender masses were found on both sides of the spine in the sacroiliac region; circuminjection of these produced prompt relief of pain.

The diagnosis was bilateral herniations of fascial fat. At operation a 4 inch incision was made over each mass. Hernial openings in the fascial membrane were found and the herniated fat was excised on both sides. Each hernial opening was closed with three interrupted sutures of chromic number 1 catgut. The skin was sutured with number 30 alloy steel wire, and sulfathiazole was applied to the wounds. Immediately after operation the patient experienced complete relief.

The pathologist's report was as follows: The specimen consisted of two similar flat masses of yellow adipose tissue meauring 3 and 3.5 cm. in diameter and a few millimeters in thickness. The outer surfaces were slightly nodular and covered in part by strands of pale gray firm connective tissue. Cross sections showed homogeneous fat. Also present were eleven separate similar small fragments of yellow lobulated fat measuring 1 to 1.5 cm. in diameter. Cross section showed that the strands of connective tissue partly lobulated the adipose material.

Microscopic examination of the specimen removed from the left side showed mature adipose tissue supported by numerous strands of dense collagen. Focal edema and hyperemia were present, but no exudative change. In some places small nerve fibers and nerve trunks were observed in the collagenous stroma. The specimen from the right side consisted of mature fat with only a small amount of fibrous connective tissue. Edema, focal hemorrhage and hyperemia were present, but no inflammation was found. No nerve tissue was identified in the second specimen.

The pathologist's diagnosis was fibroadipose tissue, the seat of edema and hyperemia (region of the left buttocks), and adipose tissue, the seat of edema and hemorrhage (region of the right buttocks).

SUMMARY AND CONCLUSIONS

In 6 cases excruciating pain in the back, sometimes accompanied by leg pain, was relieved by removal of a herniated tumor of fascial fat. In all instances there was a palpable mass which proved to be a trigger point

of pain, and the diagnosis was confirmed by injections of anesthetic solutions around the mass, which produced prompt though temporary relief.

Since pain in the back is such a common cause of disability, any light that can be thrown on any of these cases is valuable from the clinical standpoint. There are many known causes of back pain for which there are standard treatments, but there are also many cases in which the cause is obscure and the patient gets little or no relief from symptomatic treatment. In some cases severe pain in the back is attributed to psychic disturbances. It seems probable that some patients (perhaps a fairly large proportion) in whom the cause of back pain has not been diagnosed previously may have herniations of fascial fat and that surgical removal of these will bring prompt and lasting relief. This operation is not presented as a panacea for all types of low back pain. However, it seems certain that if the possibility of such a lesion is recognized and if careful examination is made for palpable masses which may prove to be trigger points of pain, numerous patients may by this procedure be relieved of a condition that has been incapacitating, sometimes for many years.

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CALLUSES, CICATRICES AND OTHER STIGMAS AS AN AID TO PERSONAL IDENTIFICATION

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From Ramazzini to the modern outstanding works of Oppenheim,[1] Natori,[2] Prosser White [3] and Schwartz and Tulipan [4] much has been written on the subject of professional stigmas.

Many investigators have been interested particularly in a rapid detection of a person's occupation or business by a glance at his palms, by his general appearance, by the odor emanating from his body or clothes, and so on. For instance Tardieu,[5] in his lengthy paper published almost a century ago, tells of the pride of Corvisart, Dupuytren and Trousseau in announcing the patient's profession at first sight.

The present study is an attempt to assemble examples of stigmas, some characteristic and common, valuable for identification purposes, some uncommon or rare or obsolete, of much less practical value but interesting.

Most of the observations were made on private or hospital patients seeking various forms of medical care. Inevitable omissions and errors are due to the difficulty of covering all trades or professions, to the ever changing ways of doing the same kind of work, to the machine substituting for man, giving him a handle to grasp or a pedal to press instead of employing his fingers, to the use of gloves or other protecting devices, to the variety of works using the same tools and producing the same calluses, and to the disappearance of some of them soon after the work is discontinued. Hence a characteristic stigma has a positive value when found, but a trade or profession cannot be ruled out when it is not found.

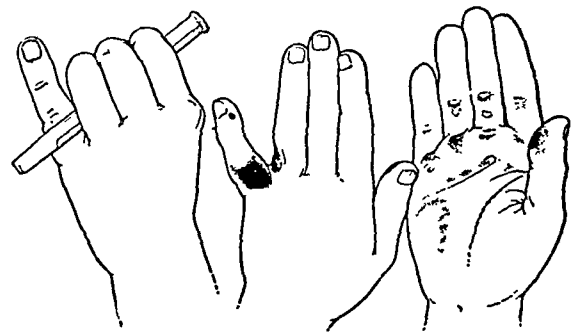


Fig. 1.—Location of the stone cutter's "ring."

A stone cutter can use heavy gloves, and the characteristic callus on his little finger (figs. 1 and 2) may be missing. A tailor may show only needle marks on his left index finger tip, if he is a sewer, or only a heavy callus on his right thumb, if he is a cutter.

There are manual laborers with unmarked hands because of the use of gloves, and intellectuals with laborers' hands because of sporting or laboring hobbies.



Fig. 2.—The stone cutter's "ring," one of the most characteristic examples of a stigma helpful for personal identification because exclusive of the stone cutter or maker of funeral monuments or curb stones, *mostly* using the mechanical chisel resting on the little finger.

A small number of trades or professions leave characteristic, unique, unchallengeable stigmas.

The skin has been called the monumental façade of the human body telling the age, the peaceful or

From the Department of Dermatology, Boston University School of Medicine. Drawings by Adrian J. Iorio.

Figure 6, a color plate, omitted from this article as published in THE JOURNAL, will appear in the author's reprints.

Read before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Ullmann, K.; Oppenheim, M., and Rille, J. H.: Die Schädigungen der Haut durch Beruf und gewerbliche Arbeit, Leipzig, L. Voss, 1922; Ein noch nicht beschriebenes berufliches Kennzeichen der Lokomotivführer und Heizer, Dermat. Wchnschr. **95**: 1674, 1932.

2. Natori, F. [illegible] zwischen Berufsarten und Handschwielen vom Standpunkte aus: Part II, Acta dermat. **3**: 253

3. White, R. P.: Occupational Affections of the Skin, New York, Paul B. Hoeber, 1915.

4. Schwartz, L., and Tulipan, L.: A Text-Book of Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939.

5. Tardieu, A.: Mémoire sur les modifications physiques et chimiques que détermine dans certaines parties du corps l'exercice des diverses professions, pour servir á la recherche médicolégale de l'identité, Ann. d'hyg. **42**: 388, 1849; **43**: 131, 1850.

calamitous past, the effeminate or virile character, the constitution of its bearer.[6] The hands are an important part of the revealing monumental façade. They may record what the face may conceal. The warm and dry handshake, the cold and clammy handshake, the clasping and twisting and biting of one's hands in an effort to control one's emotions, the opening of the same hands in a state of peace and relaxation, the gesture in conversation or public speaking are revealing psychologic characteristics. Material past and present are revealed by the professional marks (calluses, scars, pigmentations, tattoos and the like). Illnesses (such as cachexia, hemiplegia, arthritis, parkinsonism, pellagra and thyrotoxicosis) leave distinctive signs. Besides the dead, identification may be useful in the living, in cases for instance of amnesia or of unsatisfactory fingerprints.

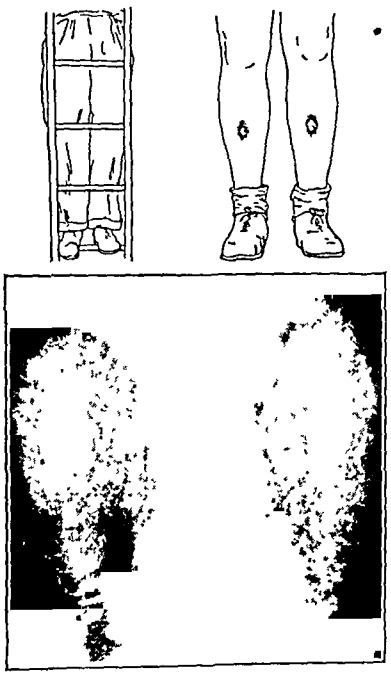


Fig. 3.—The painter's calluses, an elongated yellowish swelling about the middle of both shins from pressure on one rung of the ladder on an area practically without subcutaneous fat: a good professional stigma. However, it can be found in carpenters doing some painting, in maintenance workers in any factory, in electricians and, in general, in a worker standing for a certain length of time on a ladder.

Fingerprinting is considered the infallible method of personal identification. However, besides the cases in in which no fingerprints had been previously recorded, or the case of the criminal having a plastic operation done, there are cases in which fingerprints are unsuccessful, temporarily or permanently. For instance, in diseases of the skin, such as acute or chronic eczema involving the fingertips, there is peeling or cracking or smoothing out of the fingertips sometimes so severe that the remnants of papillary lines may be useless for fingerprinting purposes. This is, or may be, only a temporary occurrence, but it is a frequent one. Just consider how common is eczema of the fingers and one can figure out how often fingerprinting may fail. In chronic diseases of the skin, as in scleroderma, Raynaud's disease and Darier's disease, the absence of fingerprinting possibilities is permanent.

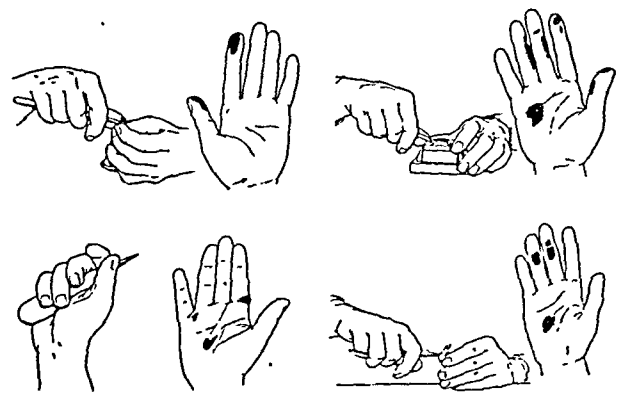


Fig 4.—Most common calluses of the jeweler engraver's profession.

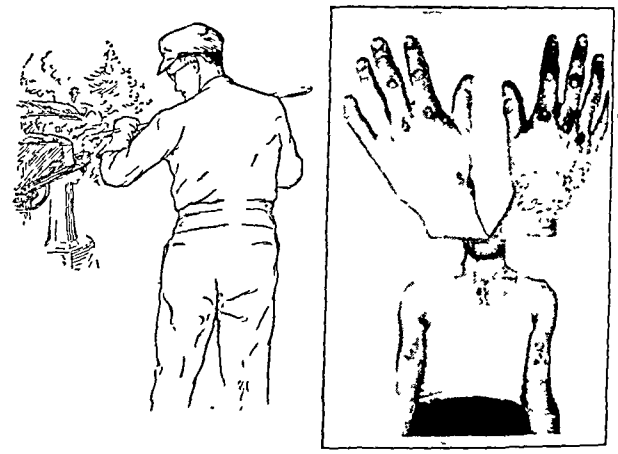


Fig. 5.—Quite characteristic stigmas of the optical glass molder. In spite of gloves or clothes, knuckles and arms receive repeated burns while standing in front of small ovens heated to 2300 F. Scars may also be found on dorsa of feet from dropping molten material.

Transitory absence of papillary lines is found in workers handling heavy and rough metal parts (steel, file, bricks), in pottery workers and in marble polishers. Some of the workers remark that they are free to commit a crime because their fingerprints will not identify them. This absence may, of course, be for short duration. In fact, papillary lines are promptly reformed as soon as work is discontinued. But if a worker is killed at work and his body lies unidentified and no help is to be obtained from his fingertips, other means of identification may become useful. This is the case in which professional calluses, worn out fingertips or scars may supply the identifying clue.



Fig. 7.—The junk worker or dealer shirs. A good professional stigma, found in a lesser degree in railroad conductors or engineers, garbage collectors, firemen, truck drivers, foundry workers and others.

Ribeiro,[7] a pioneer in the study and demonstration of the shortcomings of fingerprinting, has demonstrated in several publications the cases of Brazilian convicts fingerprinted successfully in their youth; but fifteen to twenty years later this was useless

6. Cemel, M.: Fisiologia normale e patologica della cute umana, Milan, Fratelli Treves, 1933.

7. Ribeiro, Leonidio: Dáctilo diagnose (contribuição da medicina legal para a propedêutica medica), Rio de Janeiro, Imprensa Nacional, 1939.

because of the damage done to the papillary lines by leprosy. He even published the report of a case in which the altered papillary lines led to the diagnosis of leprosy.

Textbooks of dermatology and forensic medicine, very meager in text and illustrations on stigmas from trade or profession, do not even mention diseases or conditions making fingerprinting useless.

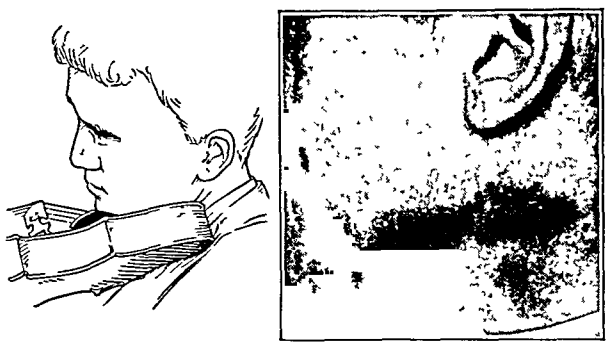


Fig 8.—The acneform dermatergosis of the violin or viola player, an exclusive stigma of the profession. A rather small percentage of violinists show a stigma as conspicuous as the one in the illustration. Generally it is found in players of the thin, pale, feminine type.

The odor emanating from clothes or the body may help considerably in determining the social status, the profession and the ancestry. Characteristic odors can be detected in bartenders permeated with the peculiar smell of the bar room, in incinerator workers and ash collectors from ashes, in doughnut dough mixers from vanilla, in tanyard workers, butchers, sauerkraut packers, fertilizer manufacturers, fish dealers or fishermen, stable hands, sewage farm attendants or dish washers,

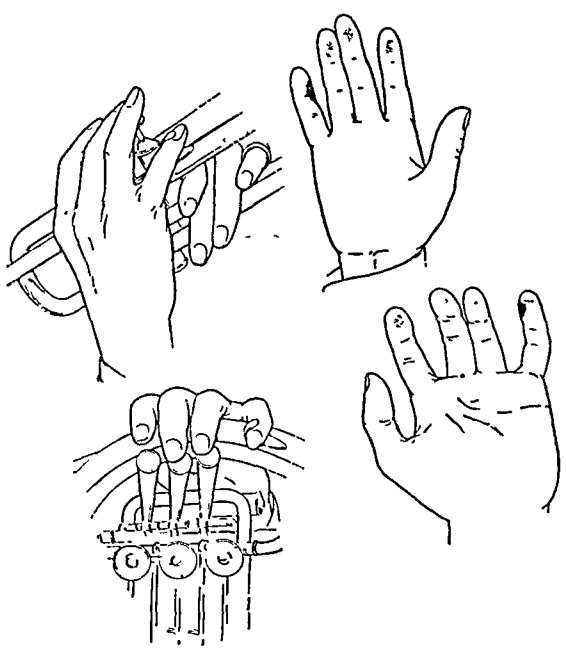


Fig. 9.—Above, callus on right little finger of the trumpet or tuba player. Below, callus on left little finger of the French horn player.

from the material contacted, from perspiration and from general habits of uncleanliness.

A characteristic odor emanates from grocers handling special types of food. For instance, persons working in Italian grocery stores where strong cheeses and peculiar smelling seasoning spices are handled all day emanate a distinctive odor from their clothes.

The odor of tobacco from cigarets, cigars or a pipe has little importance for personal identification, because

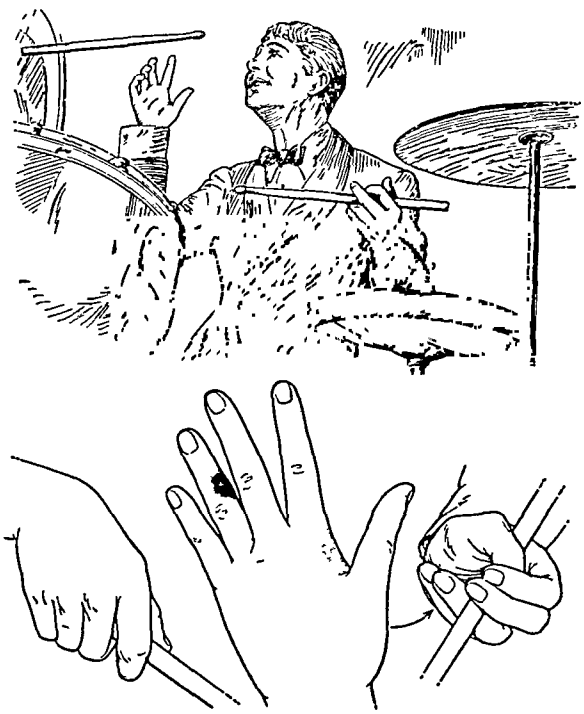


Fig 10.—Characteristic and peculiar callus of the jazz band drum player



Fig 11.—Cauliflower ear of the boxer-wrestler. With it goes a cracked nose, dislocated thumbs, a blind eye, eyebrow scars and the body build of a male fighter (female boxers are still rare). (Courtesy of Alfred A. Monner, Portland, Oregon.)

practically everybody indulges in one or all of them. However, when certain types of cigars are used by a relatively small percentage of the population, of one ancestry, the finding of those cigars and the odor emanating from the clothes or impregnating the room may be of diagnostic importance in the determination of the same ancestry. While others than Italians may occa-

sionally smoke a stogie, it can be safely stated that, when one sees one of those hard, thin, black, smoking sticks in a man's mouth, or if it is found in a man's pocket, the man is not only of Italian ancestry but almost certainly a native of Italy.

The color, besides the race, may give a hint of the occupation. Workers in contact with coal tar and petroleum derivatives show melanosis of the exposed

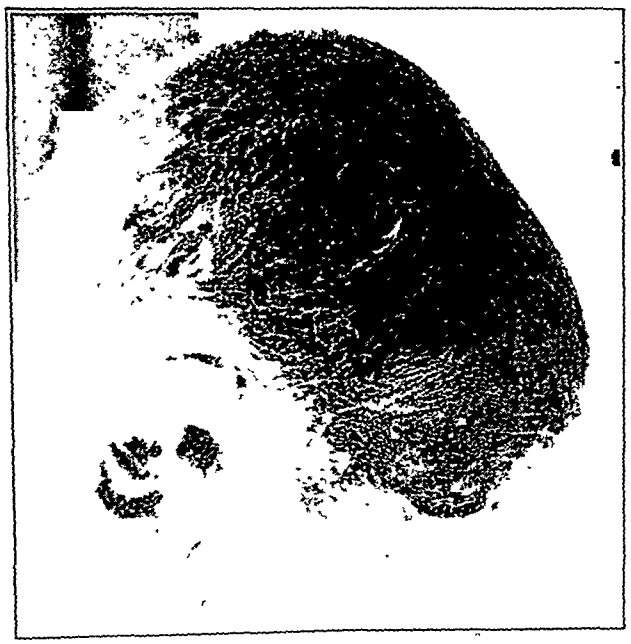


Fig. 12.—The peculiar scarry alopecia and the sparse coarse hair on the sides of the head of a commonly bald man, remnants of tinea favosa suffered during youth. This is common in Europe and rare in this country. Consequently its bearer is most likely of European birth.

parts and eventually cancer from photosensitization. Silversmiths may absorb so much silver as to become slate gray. Explosive powder workers, called "canaries," can be recognized in the street because of a

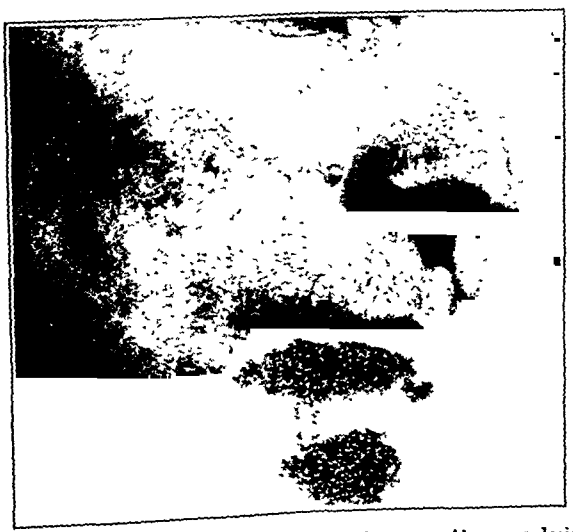


Fig. 13.—The scar of the so-called oriental sore or Aleppo or Jericho boil. A cutaneous lesion from Leishmania tropica, improperly called a boil. A characteristic stigma found practically only in persons of Armenian birth, in lesser number in Syrians and in general in natives of Asia Minor.

peculiar red-yellowish stain of hair and skin from tetryl. Workers with explosives may show deep yellow stains and exude the odor of picric acid. Yellow stains on the fingers can be found in laboratory workers from the xanthoprotein reaction of nitric acid, in jewelers from cyanides, in canners of pickles, in inveterate cigaret smokers. Photographers, shoemakers and shoeshiners show black stained nails. Electric bulb cleaners show a black discoloration of the nails from hydrochloric acid.[8]

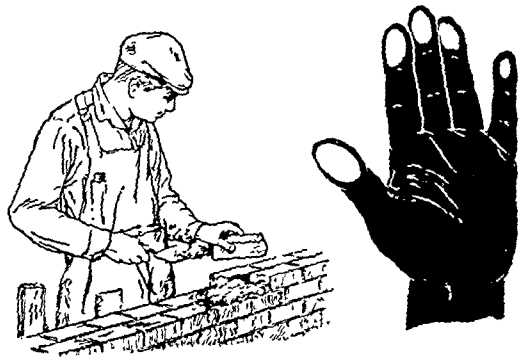


Fig. 14.—The left finger tips of a mason. Unless left handed, he grabs the rough brick with his left hand. His left finger tips are worn out, shiny, often bleeding, a valuable stigma for occupational identification. Satisfactory fingerprints may not be obtainable from the left hand. A similar condition may be found in file workers as the result of handling the rough surfaces and the heat of the files and in handlers of heavy metal parts

A peculiar depigmentation of the forearms in Negro tannery workers has been reported by Oliver and Schwartz[9] from an antioxidant added to the rubber of the gloves. Cleaners using oxalic acid show blue discolored fingers. Furniture polishers show reddish discoloration of the nails and shiny, worn out nails.

Age can be fairly well estimated from the color as well as texture in the so-called farmer or sailor or fisherman skin and from the middle age and old age spots popularly associated with the liver.

The hobo's "profession" can be recognized in a body covered with papules, pustules, scars, hyperpigmentations and depigmentations, characteristic of the so-called vagabond's disease.

Stigmas peculiar to a person's occupation are due to pressure, friction, repeated injuries and joint deformities.

Many diffuse palmar calluses begin with painful blisters, gradually replaced by the calluses which allow the continuance of the work without much discomfort.

Calluses may be so thick and hard as to be better labeled corns. Other body marks are the telangiectases,

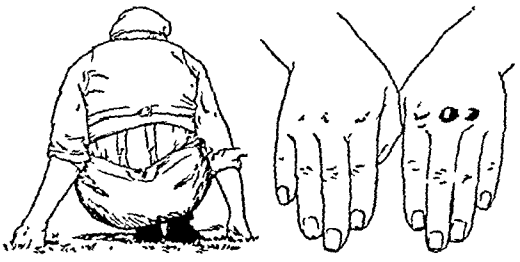


Fig. 15.—Landscape gardener leaning on fisted left hand while cutting grass with the right. The pressure of the leaning body produces knuckle calluses, particularly thick on the carpometacarpal knuckles of the left middle and ring fingers.

pigmentations, scars and eventual epitheliomas from repeated exposure to heat or burns, and tattooing seen in coal miners, together with pneumonoconiosis, in silversmiths and in file workers, or from intragluteal injections of mercury sulfide, a sign of antisyphilitic treatment. Scars are often characteristic of the man's

8. Downing, J. G.: Personal communication to the author.
9. Oliver, E. A.; Schwartz, L., and Warren, L. H.: Occupational Leukoderma, Arch. Dermat. & Syph. 42:993 (Dec.) 1940.

occupation, the classic ones of the shoemaker's knife on the right thigh, for example.

The importance of tattoo marks for identification purposes is well known. In fact, the tattooed often give identification as a reason for doing it.

Besides the actual name or initials of the owner, battleships, flags, knots and naked or seminaked women point toward the sailor's profession. Occupational signs, as a hammer or a razor, indicate the profession of carpenter or barber. Obscene figures and mottoes suggest a criminal or a prostitute. Tiny flowers, butterflies, united hearts, chains, artificial beauty spots, ruby tattooed lips suggest the body of a female.

Specialists in tattooing can recognize from the technic employed where the work was done and eventually identify the nationality of the tattooed.

The hand of the laborer shows characteristically rugged, leathery, thick, yellowish palms and rough, reddish brownish dorsa from the sun, the wind, the heat, the cold and the repeated injuries, and thick knuckles from repeated knocks. If past middle age, his dorsa will show the keratoses of the so-called farmer or sailor or fisherman skin, the forerunners of cancer.

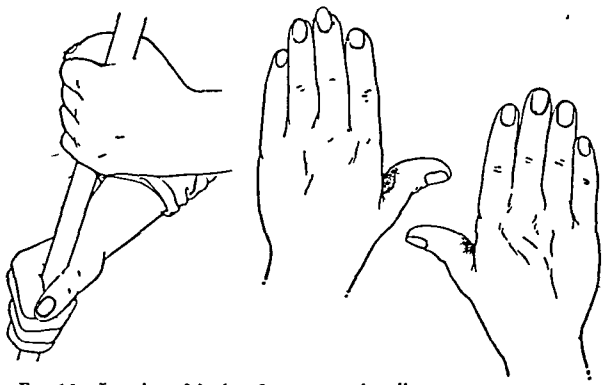


Fig. 16.—Location of janitor floor sweeper's callus.

Stone chiselers (the maker of monuments, sidewalk stones, building bases, marble ornaments) have a most characteristic mark of their profession, a large, soft rubbery callus at the proximal end of the left little finger (figs. 1 and 2).

Painters and paper hangers have a very distinctive elongated callus exactly on the center of both shins (fig. 3) resulting from the continuous pressure of one rung of the ladder on an area practically lacking subcutaneous fat.

Jewelers, engravers, ring makers and stone setters have as their most important tool the "plier," which produces a characteristic large and heavy callus in the center of the right palm (fig. 4). Other calluses also quite characteristic of the jeweler's profession differ according to the particular kind of object manufactured.

Machinists, mechanics and tool makers have in general rough hands and deeply cut and scratched, worn out nails, worn out and bleeding finger tips and palms studded with particles of steel from handling and filing rough and heavy steel parts. Machine oil, cutting oil and soda water do their part in roughening the hands of mechanics.

The handling of materials coming from highly heated ovens as in foundries and by optical (fig. 5). knife, file and incinerator workers produces heavy, painful calluses and deep fissures often necessitating discontinuance of work until the tissues are returned to a fair condition.

An interesting stigma can be observed in most foundry workers, feeders of large boilers and melters of metals. A forearm may be exposed continuously to such an intense dry heat in the procedure of pulling hot materials from the ovens that a red streak remains to tell the tale. Only a few spots show scar tissue.

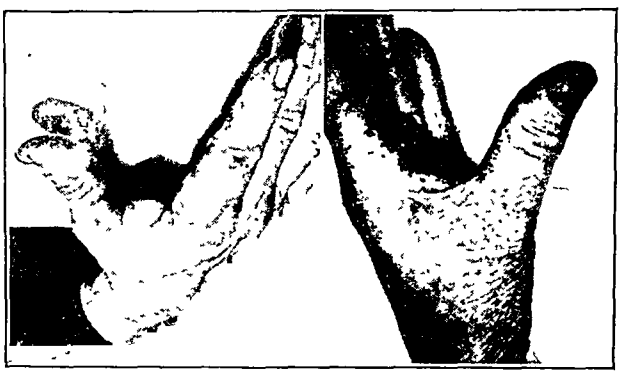


Fig. 17.—Janitor-floor sweeper's callus. Illustration at right shows an epidermoid carcinoma of grade 2 in a 50 year old woman, very likely an occupational carcinoma.

Except for the color, the skin and hair appear normal. The vivid red discoloration fades on vitropressure and could be taken for a common port wine birth mark. It is made up of telangiectases, as in radium or x-ray



Fig. 18.—The milker's nodules, a rather rare stigma of farming: warty, umbilicated nodules, somewhat similar to molluscum contagiosum but of a peculiar deep red, as if painted with mercurochrome. They are supposedly due to the entrance of a cow's hair into the skin. Essentially a foreign body reaction.

dermatitis the result of the repeated vasodilating stimulation of the heat. It is a perfect example of erythema ab igne (fig. 6).

Suppose a body is burned beyond recognition or a living but speechless or amnesic person is unidentified.

A streak of a vivid birth mark-like red on a forearm will tell that the person's occupation was in a foundry or, in general, in a factory where he had to stand in front of a highly heated oven or boiler.

The junk collector shin is represented by abrasions, cuts, scars and pigmentation (fig. 7). In a minor degree

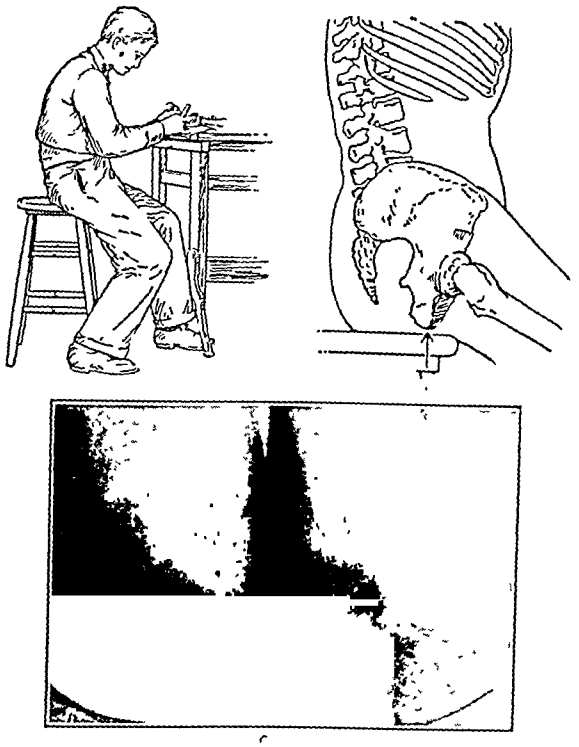


Fig. 19.—The marks of a sedentary occupation and their mechanism. Such an occupation is revealed by two areas of redness, scales, scars and atrophy due to the pressure on the skin between the seat and the ischium. Acne and boils may develop in this area from friction. An acneform dermatergosis like the one of the violin player. Two areas of hyperpigmentation may be found even if sedentary work has been discontinued for years.

the marks are noticeable in garbage collectors, truck drivers and foundry workers for the same reasons as the junk dealer and in railroad conductors, ship pilots,

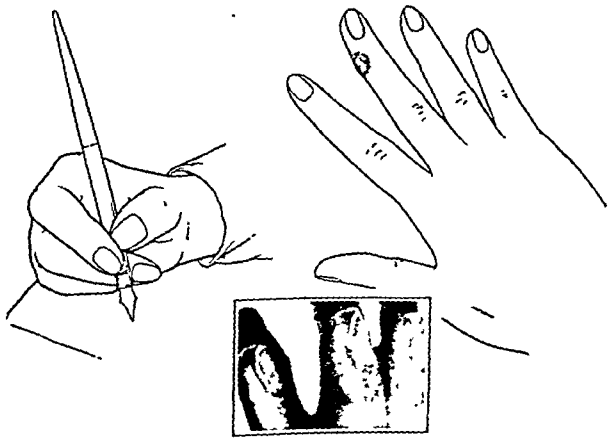


Fig. 20.—The writer's callus (of students, designers, bookkeepers), a stigma shared by dentists (from use of the drill), manipulators of small screw drivers (in work on jewelry, optical goods and precision instruments), painters from the brush and seamstresses from the thimble.

engineers and firemen, from hitting the steps of the railroad car or engine or ladder rungs.

Other interesting calluses are found in textile workers, bakers, shoemakers, tailors and cooks.

In the musical profession the callus on the neck of the violin or viola player is one of the most characteristic trade marks of all professions (fig. 8), a thick, acneform, scarry lump about the angle of the lower jaw, extending downward for a few square centimeters as a swollen area, soft, with hypertrophic hair follicles and sebaceous glands, with secondarily acne-like infected follicles, abscesses and finally acneform scars. Predisposition plays a great part in the development, size and severity of the violinist callus.

Characteristic calluses are found on certain finger tips of musicians, especially in the viola-violin, cello-contrabasso, guitar, saxophone, trombone, French horn (fig. 9) and jazz drum player (fig. 10).

The implements of some sports, such as the bar, the oar, the rope, the golf club, do not leave marks much different from what is produced by common manual labor, except for location; e. g., the golfer usually has calluses only on the left hand. The calluses of the golf player, shared by the baseball player, are also partly found in the carpenter. Characteristic calluses are found in the discus thrower, the bowler and the squash-tennis-badminton player. A characteristic mark is the permanently contracted in flexion tip of both little fingers due to the injury from passed balls in former baseball players.

But the best known of all are the cauliflower ears of the boxer (fig. 11). Most of the crushing is found

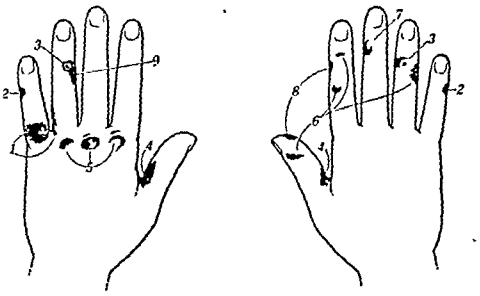


Fig. 21.—Ensemble of the most common calluses, cicatrices and stigmas: 1, the stone cutter's "ring"; 2, the burler; 3, the spectacle frame polisher; 4, the janitor-sweeper; 5, the landscape gardener; 6, the seamstress; 7, the writer, designer, dentist; 8, the barber; 9, the jazz band drum player.

on the left ear. With them go a flattened nose, a blind eye, scars on the eyebrows, dislocated thumbs and the build and sex of the body.

Scars, with few exceptions, are permanent, unremovable signs of something which has happened in the past. They stand as an unquestionable, unchallengeable proof of a past malady or operation or accident. Scars of the so-called Jericho or Aleppo boil or oriental sore (fig. 13), besides being a proof of previous disease, are a very valuable racial sign (Armenians).

Certain scars are positive signs of one disease or one operation, such as the scars of thyroidectomy, appendectomy, thoracoplasty, the square scar left by the radium plaque, the loss of substance of the frenum from a primary chancre, the typical archiform sequelae of late cutaneous syphilids, the radiating lines about the mouth remnants of infantile syphilitic rhagades and the scars of smallpox and of tinea favosa as a possible indication of foreign birth.

Dental lesions have been described in upholsterers, shoemakers and seamstresses from holding tacks or needles between their teeth. They seem to be of but small practical value.

Black-blue lines on the gums, cheeks or palate are valuable in demonstrating that the bearer is under bismuth therapy.

The only valuable professional or diagnostic sign obtained from the nails is left by trauma (saw bites, needle punctures, wheel or gear crushes, knife chopping, wear from handling rough material, chemical burns, infections, felons, x-rays and radium, wear and luster in severe chronic pruritus). However, the tiniest pit or detachment from the nail bed may be most valuable in the diagnosis of psoriasis.

Club nails, Beau's lines and spoon nails, in spite of hundreds of papers written and dozens of diseases or conditions held responsible for them, are interesting observations but of no diagnostic value.

SUMMARY

Stigmas and other body characteristics can be roughly divided in four groups according to their usefulness as an aid to personal identification:

1. Stigmas and characteristics very helpful because peculiar to one profession, one race, one disease or one operation. Such may be the calluses of certain musicians, the stone cutter, the sweeper, the barber, the shoemaker, the tailor, the cook; the telangiectases and burns of the foundry and optical glass molder; the scars of oriental sore, thyroidectomy, cocaine injection, radium and others; the odor from food or ashes; the color from various stains.

2. Stigmas and characteristics shared by more than one profession or disease or operation but helpful as an aid to personal identification. Such may be the calluses of the writer-designer-dentist, of the jeweler-engraver, of the mason (fig. 14) and file worker, of the plasterer-carpenter, of the gardener (fig. 15), plumber, housewife or textile worker, of the floor scrubber (figs. 16 and 17), plumber or praying kneeler; of the machinist, tool maker or knife, file or foundry worker; the scars

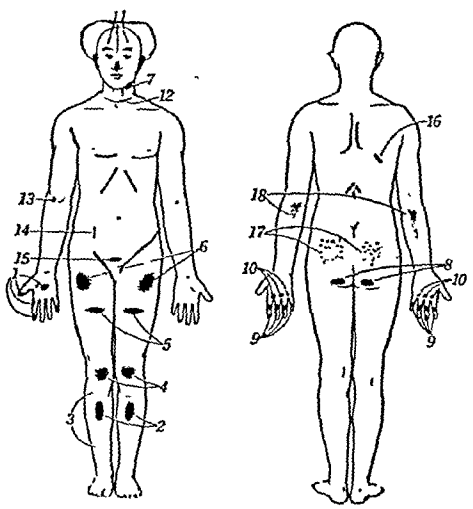


Fig. 22.—Ensemble, continued: 1, jewelers, engravers; 2, painters; 3, junk handlers, railroad workers; 4, floor scrapers, plumbers, those who kneel in prayer; 5, packers, bakers, leaning against table; 6, basket carriers; 7, violin, viola players; 8, marks of a sedentary occupation; 9, scrub women, plumbers, knuckle calluses; 10, landscape gardener (metacarpophalangeal knuckle calluses); 11, boxers', wrestlers', ears, nose, eyebrow scars; 12, thyroidectomy scar; 13, blood transfusion scar; 14, appendectomy scar; 15, steel brace mark; 16, empyema scar; 17, scar from old time antisyphilitic treatment; 18, packers or any workers leaning on the elbow.

shared by chickenpox and the remnants of removal of moles.

3. Stigmas and characteristics moderately helpful as an aid to personal identification. Such may be the packer-baker alopecia and acneform dermatergosis of the thighs from friction against the bench; the milker's nodules (fig. 18); the quite common marks on the buttocks in sedentary occupations (fig. 19); the nail mutilations in onychophagia as a sign of latent or well developed neurosis.

4. Stigmas and characteristics uncommon, rare or obsolete or from far away countries are interesting but of little value as an aid to personal identification. Such

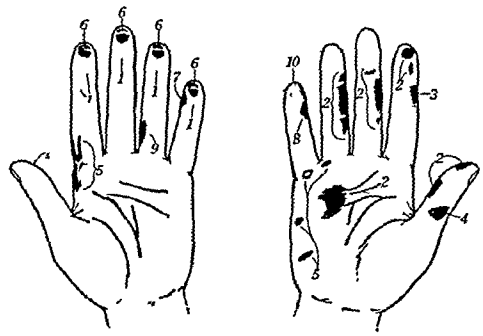


Fig. 23.—Ensemble, concluded: 1, masons' or bricklayers' worn out left finger tips; 2, jewelers, engravers; 3, barbers; 4, cobblers; 5, golf players; 6, stringed instrument players; 7, French horn players; 8, trumpet, tuba players; 9, trombone players.

may be the calluses of stevedores carrying coal baskets on their shoulders; the funnel shaped chest of the cobbler; the warty growths of cement, asbestos, fiberglass workers; the clean calluses of the soles in Turkish bath attendants.

CONCLUSION

Stigmas of a profession or disease are an interesting subject of study in dermatology and industrial medicine. In event of nonprintable fingerprints, which is not as rare as commonly believed, in amnesia and in other instances they may be a valuable addition to what is known in forensic medicine for personal identification.

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ABSTRACT OF DISCUSSION

DR. LOUIS SCHWARTZ, Bethesda, Md.: The word "stigmas" is an unfortunate one to apply to abnormalities on the body resulting from occupation, because the word as usually used carries with it a connotation of infamy, while in dermatologic language it simply means the "brand of a trade" on the skin, and there is no intended derogation. The chapter "Die beruflichen Stigmata der Haut" by Dr. Moritz Oppenheim in the first volume of "Die Schädigungen der Haut" defines occupational stigmas of the skin as "the similar changes of the skin occurring in all persons engaged for a long time at a particular occupation." Many of the trade stigmas described in the European literature are not seen in the United States because of differences in the method of manufacture. Many of the old trade stigmas in the United States have disappeared because industrial progress has devised mechanical methods to replace manual operations. Trade stigmas may be classified as resulting from (1) physical forces such as heat, cold and radiation, (2) mechanical causes such as pressure and friction and (3) chemical causes. Some of the stigmas, such as callosities, are a result of an inflammatory response of the skin to irritation; however, they do not impair the worker's functional capacity but rather make it possible for him to continue work without inconvenience. This is a protective mechanism. Trade stigmas may also be classified as (1) transitory, such as callosities and nail changes, because they soon disappear after occupation ceases, (2) as long lasting, such as the comedones, acnes and melanoses, and (3) those which are permanent, such as argyria, keratoses and telangiectases.

DR. JOHN G. DOWNING, Boston: Stigmas must be recognized or they may be mistaken for nonoccupational entities;

for example, the tailor who dips his hands in water many times daily and smooths the cloth with his finger develops calluses which may become fissured, leaving a port of entry for secondary infection with a resulting disability. These might be mistaken for psoriasis, which is considered by most boards to be nonindustrial. I believe we shall see many stigmas resulting from oil folliculitis. These will consist of areas of atrophy, pigmentation and loss of hair, especially on the flexor aspect of the arms and the anterior surface of the thighs. While not disabling, they will be disfiguring. If the worker is a machinist, he will be prohibited from contacting cutting oils and therefore entitled to partial compensation. Undoubtedly many women will present claims as a result of these stigmas. The literature states that eruptions from external irritants or sensitizers are not sufficiently characteristic to incriminate the offending substances. However, to the trained observer certain exposures present definite physical signs. The average worker in a given trade gives a fairly consistent history of the site and character of the onset and presents an eruption which is reasonably characteristic of an occupational dermatosis. This has been my experience in cases from the shipbuilding industry with a dermatitis from zinc chromate, described by Hall occurring among aircraft workers (THE JOURNAL, May 20, 1944, p. 179). He even differentiates between patients suffering from a sensitivity to the zinc chromate alone from that due to the resin ingredient, segregating also those sensitive to both of the constituents in the primer. A tanner presents a hidelike appearance of the forearms. A shoe trimmer's dermatitis appears on the dorsum of the thumb, the radial aspect of the index finger and the dorsum of the hand over the right first and second metacarpals. The dry, fissured appearance of the tips of the right first, second and third fingers, with separation of the free border of the nails, suggests a treer's dermatitis, while the shoedresser discloses a dermatitis on the dorsum of the first, second, third and fourth fingers of the left hand, especially at the tips where he holds the sponge. A soda fountain clerk presents paronychias and vesicles on the lateral aspects of the fingers of both hands, with enlargement of the epitrochlear and axillary glands. A dishwasher's hands are edematous, with maceration of the interdigital spaces; a baker's hand has a similar appearance plus an eruption on the lower half of the ulnar area of the right forearm due to the rotary motion in kneading dough. The eruption of the chocolate dipper generally begins on the right fourth and fifth finger and the outer half of the dorsum of the right hand.

DR. MAURICE OPPENHEIM, Chicago: A few years ago a coal miner was accused of murdering his comrade in a coal mine. The defendant denied ever having worked in a coal mine, but an examination of his skin proved that he was a coal miner. This proof was brought about by the so-called coal line or coal stripe. By hammering the coal in the mines, splinters of coal perforate the skin regularly. These remain permanently. They are mostly in the face; they are on the hands and on other areas of the body too. They are black lines as found in munitions workers, not points as after explosions of gunpowder. These are permanent, because coal in the skin doesn't undergo any change. This coal line or coal stripe was found on the forehead of the accused man. So the conviction was there that he was a coal miner once, what he had denied. He was found guilty of murder. This is my classification of the stigmas of the skin: Transient stigmas: colorings, stratifications, rhagades and excoriations, nail changes, pigmentations and callosities. Permanent stigmas: cicatrices, telangiectasia, hypertrophy of connective tissue, bursa formations, permanent pigmentations, tattooings and impressions. The permanent stigmas are more important than the transient; the latter are limited in their values because during the time of unemployment the laborers are leaving their jobs and taking over other jobs; therefore they are lacking for identification. In the same way as we have experts at police headquarters for fingerprinting, we should have expert dermatologists there who know the stigmas, to help to establish identification of unknown people, and especially of criminals, which asks for a special study and training.

HEPATITIS FOLLOWING BLOOD OR PLASMA TRANSFUSIONS

OBSERVATIONS IN THIRTY-THREE CASES

CAPTAIN EMANUEL M. RAPPAPORT
MEDICAL CORPS, ARMY OF THE UNITED STATES

Hepatitis due to inoculation with homologous serum has received considerable prominence in medical literature during the past few years owing to its widespread incidence following inoculation of troops with normal human serum employed as a vehicle for the yellow fever virus. While the pathogenesis of this disease has not been definitely established, the result of considerable investigation in both this country and England suggests that the icterogenic agent is a virus which retains its virulence after storage for long periods in a dried state. Hepatitis has been produced experimentally in human volunteers by parenteral injection,[1] by feeding [2] and by nasal inoculation [3] of material containing the infective agent.

Similar sequelae following whole blood or plasma transfusions were reported in 9 cases by Morgan and Williamson [4] and in 5 cases by Steiner.[5] Beeson,[6] in describing the occurrence of jaundice in 7 cases following the use of pooled plasma and extracted whole blood, prophetically states that "the present large scale use of blood and plasma transfusions may lead to the occurrence of a considerable number of such cases of hepatitis."

Between May 1 and Dec. 31, 1944, 31 soldiers recently returned from overseas were referred to the gastrointestinal section of the Schick General Hospital because of jaundice which had developed in 9 while en route here and in 22 others while they were being treated in other sections at this hospital. All had previously received either blood or plasma transfusions, occasionally both, almost invariably necessitated by hemorrhage resulting from wounds in combat. Evidence will be presented which indicates that this complication resulted from transmission of the icterogenic agent via the medium of human blood products.

It is my chief purpose in this presentation to focus wider attention on this syndrome, with particular reference to the occasional development of subclinical or latent hepatitis, which is easily overlooked because of the absence of jaundice.

CLINICAL MATERIAL

This series comprises 33 patients, 31 of whom developed jaundice and 2 exhibiting latent hepatitis without visible jaundice. All were returned to this country following service in widely separated geographic areas, representing every theater in which our armies have been engaged in combat. Thirty-one had been originally admitted to the surgical service; 30 of these were battle casualties, while 1 had been subjected to a nephrectomy in Alaska because of carbuncle of the right kidney. Only 2 were referred from other sec-

From the Medical Service, Schick General Hospital, Clinton, Iowa.

1. Oliphant, J. W.: Jaundice Following Administration of Human Serum, Bull. New York Acad. Med. **20**: 429-445 (Aug.) 1944.
2. Experimental Production of Hepatitis, News and Comment, Bull. U. S. Army M. Dept., November 1944, no. 82, pp. 7-8.
3. Findlay, G. M., and Martin, N. H.: Jaundice Following Yellow Fever Immunization, Lancet **1**: 678-680 (May 29) 1943.
4. Morgan, H. V., and Williamson, D. A. J.: Jaundice Following Administration of Human Blood Products, Brit. M. J. **1**: 750-753 (June 19) 1943.
5. Steiner, R. E.: Five Cases of Jaundice Following Transfusion of Whole Blood or Human Plasma, Brit. M. J. **1**: 110-111 (Jan. 22) 1944.
6. Beeson, P. B.: Jaundice Occurring One to Four Months After Transfusion of Blood or Plasma, J. A. M. A. **121**: 1332-1334 (April 24) 1943.

tions of the medical service. Of the latter, 1 had been evacuated from the South Pacific area because of acute infectious eczematoid dermatitis and had received plasma to combat hypoproteinemia which resulted from oozing of serum from the skin lesions. The other was an evacuee from Australia with dementia precox who, while en route to the United States, developed pneumonia, multiple skin abscesses and secondary anemia. He had been given plasma on the hospital ship prior to admission to the West Coast hospital. Following an uneventful recovery he was transferred to the psychiatric section of this hospital, and jaundice developed five weeks after arrival here. In fact, the sudden onset of hepatitis always marred an otherwise satisfactory convalescence from a totally unrelated disease, usually of surgical nature.

Twenty-two patients developed jaundice one to six weeks following arrival at this hospital. In 9 others icterus had started either while en route to this country or shortly after reaching coastal hospitals. Six had been retained at the latter institutions for observation and transferred here when their condition permitted travel, while 3 were sent on to this hospital without preliminary study. Since the term "jaundice" in this discussion will be used relative to clinical icterus, the 2 cases of latent hepatitis will be accorded consideration apart from the others under the heading "hepatitis without jaundice."

It might be reasonably suggested that jaundice developing in some instances shortly after leaving overseas ports or even after arrival in this country could have been of the epidemic variety, since the disease is ubiquitous. That contact was not a factor in the epidemiology is based on the following considerations:

1. During the period covered by this survey, only those overseas evacuees who had previously received blood or plasma developed jaundice while in this hospital, as shown in the accompanying chart.

2. Battle casualties comprised less than 20 per cent of the total admissions here and yet constitute 93.8 per cent of the group in whom jaundice occurred.

3. If hepatitis was of the epidemic or infectious type, it would be anticipated that chain spread would have involved other patients in the same wards, yet this did not occur in a single instance.

4. During the same period 32 patients observed at this hospital shortly after return from overseas duty acquired jaundice subsequent to leaving foreign ports; 31 had previously received transfusions. The lone exception was an evacuee who developed jaundice of undetermined origin the day he embarked on a hospital ship.

Thus the onset of this disease almost exclusively in those who had received blood products can hardly be considered either fortuitous or due to contagion.

INCIDENCE

It is impossible to determine accurately the frequency of this complication, as no statistics are available recording the number of soldiers who received transfusions prior to admission here. If it should be assumed that every combat casualty received blood or plasma, 2 to 3 per cent would form a conservative estimate of its incidence based solely on observations at this hospital. This estimate is subject to considerable variation and thus cannot be given wide application, since only the more seriously wounded require transfusions. Furthermore, as only the more complicated cases are evacuated and are more likely to have received multiple transfusions, the incidence of jaundice is probably higher among casualties returned to the zone of interior than those remaining overseas.

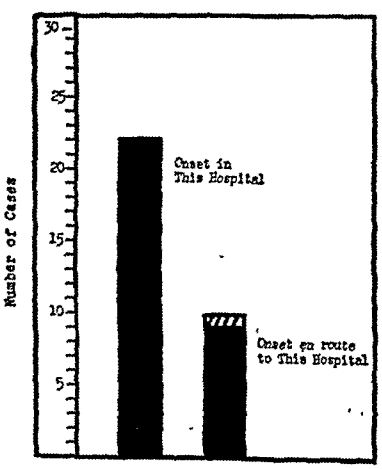
PREDISPOSING FACTORS

No specific factors predisposing to jaundice were noted other than the receipt of blood or plasma. The previous incidence of malaria, dysentery or other debilitating diseases, which are so commonly precursors of infectious hepatitis, was no more frequent in this group than in the nonjaundiced.

There was no antecedent history of alcoholism or liver disease in any of these patients. All had received penicillin and sulfonamide compounds several weeks prior to the onset of this disease.

VEHICLE AND LATENT PERIOD

Twenty-five patients had received 1 or more units of plasma. Four had been given plasma and blood, while, in 2, blood alone had served as the vehicle for the icterogenic agent. It was impossible to trace the original source of the tainted material, as available records merely indicated the amount employed, without denoting lot numbers.



Incidence of jaundice following evacuation from overseas. Solid columns, received blood or plasma; cross hatched, did not receive blood products.

The incubation period varied from nine to eighteen weeks, with an average of 12.6 weeks. Although multiple transfusions were given in 18 cases, the latent period was calculated from the date of the first injection, as no more than four days elapsed between the first and the last transfusion in any case. The long latency of the disease transmitted by inoculation as contrasted with the incubation period in epidemic hepatitis (approximately thirty days) has not as yet been explained. No relationship between the incubation period and the severity of the disease was noted.

SYMPTOMATOLOGY

Preicteric symptoms were frequently more disabling than those which attended the jaundice. Anorexia, malaise, lassitude, headache, chilly sensations, arthralgia, myalgia, epigastric pain and bloating, with nausea and occasional vomiting or diarrhea, were experienced by nearly all. These symptoms were so uniformly present before the onset of jaundice that in 2 cases the prediction that jaundice would follow was correctly made in the absence of positive physical findings. Fever up to 100 F. was present for one to three days in all cases observed in the initial stages. Prodromal symptoms lasted two to four days before jaundice became apparent and continued for three to five days thereafter but usually disappeard rapidly even before icterus began to recede. No correlation between intensity of jaundice and severity of symptoms was noted. Not a single patient in this series mentioned pruritus as a symptom unless specifically asked about itching. All reported

dark urine and pale stools before icterus became apparent. Abdominal pain was usually referred vaguely to the epigastrium or midabdomen, rarely to the right upper quadrant. None of those observed in the preicteric phase presented symptoms suggestive of biliary colic but rather of gastroenteritis or upper respiratory infection. Pain was never an outstanding symptom. Anorexia and lassitude were the complaints of longest duration, but the rapidity with which all symptoms disappeared despite intense icterus and pronounced hepatic dysfunction was remarkable.

CLINICAL FEATURES

This disease is clinically indistinguishable from infectious or catarrhal jaundice spontaneously acquired or from cases of yellow fever inoculation jaundice. The clinical features are so well known that it is unnecessary to dwell on them in detail. The most striking finding apart from the icterus was hepatomegaly without associated tenderness. Although hepatomegaly was noted in all cases, the degree of liver tenderness varied inversely with the extent of enlargement, contrary to expectations. Furthermore, the larger livers which extended 4 fingerbreadths below the costal border were extremely soft, pliable, nontender and with poorly defined lower border, whereas slight or moderate enlargement was usually characterized by firm consistency and an easily defined margin. With clinical improvement the liver receded, becoming firm and developing an easily palpable, tender border. The size of the liver was not directly related to the depth of icterus, nor did it invariably revert to normal size when jaundice had completely receded. Thus in case 5 in the table, with a maximum icterus index of 50, the liver extended to the pelvic brim, while in case 8, with an icterus index of 147, the lower edge never extended more than 1½ inches below the costal border. Occasionally the liver became progressively larger as jaundice diminished.

The incidence of splenomegaly was considerably less than is usually noted in infectious hepatitis. If splenic enlargement occurred it did not reach proportions rendering it palpable except in 1 of the 22 cases that were observed in this hospital from the onset of the disease (case 22). This is hardly a differential point. Abdominal tenderness, when present, was localized to the right of the midline in the midepigastrium, well above the liver edge.

At no time did any of these patients appear seriously ill, nor did their clinical appearance, apart from intense jaundice, reflect the laboratory evidence of severe hepatic involvement. Only 2 (cases 1 and 22) could have been considered moderately cholemic.

Bradycardia was uncommon, while transient urticaria appeared in only 2 cases. Tender axillary nodes developed in 4 cases. There was no correlation noted between age and severity of the disease.

LABORATORY FINDINGS

Blood Count.—Anemia, unless present prior to the onset of this disease, did not occur as a result of it. The white blood cell count, except in 1 case with wound sepsis, ranged between 5,200 and 6,850 with an average of 6,400 during the acute phase; polymorphonuclears varied between 39 and 60, lymphocytes between 36 and 56 per cent, with averages of 51 and 45 per cent respectively. Lymphocytes, particularly when associated with axillary adenopathy, necessitated the consideration of infectious mononucleosis, but serial heterophile antibody tests were uniformly negative. Platelets were normal or slightly diminished; reticulocytes, bleeding and coagulation time were normal.

Icterus.—The icterus index at its peak ranged from 50 to 185; in 10 cases it exceeded 100, while in 5 it never surpassed 75. The quantitative van den Bergh test (Malloy and Evelyn method) was invariably direct positive at the outset but became delayed in 4 during the recovery phase. No special significance is attached to it. The duration of visible jaundice was three and one-half to twelve weeks, with an average of four and one-half, but elevation of serum bilirubin was frequently demonstrated for long periods thereafter. As a rule the duration of hyperbilirubinemia was proportional to the initial intensity of jaundice.

Urine.—Albuminuria and cylindruria were noted in the very early phases in 3 cases. Bile was always demonstrated in the urine in the early stages but during the recovery phase was absent, despite obvious jaundice. Increase of urobilinogenuria as estimated quantitatively could be frequently demonstrated when serum bilirubin was slightly elevated or even normal and when other liver function studies were normal.

Stools.—Pallor of the stools appeared to antedate visible jaundice in most cases. Quantitative stercobilinogen studies were conducted when pale stools suggested acholia, but twenty-four hour specimens always contained more than 30 mg. of stercobilinogen, which is well above the level compatible with complete obstruction. If absolute biliary obstruction ever existed it was probably of short duration.

LIVER FUNCTION TESTS

All methods of evaluating liver function available at this hospital were applied from the earliest stage of observation. Serial studies at regular intervals afforded an effective means of determining the type and degree of hepatic involvement and permitted a reasonable correlation of the respective utility of the individual tests usually employed in assaying both severe and minimal liver damage. Where jaundice had antedated admission here, such complete studies were not initiated at previous installations, but their laboratory findings are incorporated with results obtained at this hospital. These are given in the table, which lists only pertinent data at selected intervals which clearly indicate the course of the disease in the individual case.

(*a*) *Hippuric Acid Excretion.*—The ability of the liver to synthesize hippuric acid was determined by estimating the four hour urinary excretion of hippuric acid after oral administration of 6 Gm. of sodium benzoate. Reduction in this function was evident in the early stages of the disease in all of the 22 cases tested. Rapid reversion to normal occurred in 17 even before jaundice disappeared, while low urinary levels persisted for prolonged periods in 5. In 2 patients without evidence of renal impairment but with severe liver damage, no hippuric acid was elaborated until the recovery phase (cases 16 and 22).

Results with the intravenous test devised by Quick[7] are not included in the table since the material was not available for use until the later phases of this study. Although more sensitive and remaining positive longer than the oral test, in the few cases of this series in

7. Quick, A. J.; Ottenstein, H. N., and Weltchek, H.: Synthesis of Hippuric Acid in Man Following Intravenous Injection of Sodium Benzoate, Proc. Soc. Exper. Biol. & Med. 38:77-78 (Feb.) 1938

which it was employed, normal results were occasionally obtained even in the presence of residual jaundice.

(*b*) *Galactose Tolerance* (40 Gm. oral method).—This test was employed in only 12 cases during the height of jaundice and was normal in 5. It is likely that the intravenous test would have proved more sensitive. Where abnormal results were obtained initially, return to normal occurred earlier than any of the other tests.

(*c*) *Cephalin-Cholesterol Flocculation* (Difco antigen).—The cephalin-cholesterol flocculation test of Hanger [8] was strongly positive at the peak of jaundice in 25 of the 31 cases in this series, dropping rapidly to normal usually within three to four weeks despite persistence of jaundice and other evidences of parenchymatous dysfunction. In 6 cases this test was negative or doubtfully positive throughout the disease despite definite hepatic damage.

(*d*) *Total Cholesterol-Cholesterol Esters.*—Total, free and cholesterol esters were determined by the Schoenheimer and Sperry method.[9] The maximum alteration of the total cholesterol-cholesterol ester ratio was almost invariably due to depression of the ester fraction during the acute stage This change was noted in 14 of 22 cases, some of which exhibited remarkably low levels. The total cholesterol showed no constant variation. Rise in the ester fraction paralleled clinical improvement but frequently lagged behind the galactose tolerance, cephalin flocculation and hippuric acid excretion tests in reverting to normal. It is to be emphasized that only serial studies are of any value in following the course of jaundice, owing to considerable variation in the total cholesterol and cholesterol ester levels obtained in normals.

(*e*) *Sulfobromophthalein Excretion* (5 mg. per kilogram, thirty minute test).—This test was used when serum bilirubin had returned to normal, as in the presence of an elevation of serum bilirubin above 2 mg. per hundred cubic centimeters retention of dye is inconclusive evidence of impaired function. It could thus be employed in only 18 cases in this series. Retention up to 5 per cent in thirty minutes, which is within normal limits, was present in only 4 patients. Complete clearance of dye was effected by 14 even though clinical evidence of persistent disease remained in some.

(*f*) *Plasma Proteins, Albumin/Globulin Ratio.*—Results of these determinations are not included in the table because plasma protein levels were difficult to evaluate in this series owing to the fact that many of these patients exhibited malnutrition even prior to the onset of jaundice, and their overseas records not infrequently indicated the existence of hypoproteinemia following hemorrhage and wound sepsis. Serial studies revealed no striking changes during the course of this disease, but there was a tendency toward diminution of the A/G ratio chiefly due to a rise in the globulin fraction. Hypoproteinemia, when noted at the onset of jaundice, was actively combated by the use of concentrated serum albumin, so that the albumin fraction occasionally rose despite progression of hepatic damage. Thus, three days after the onset of jaundice in case 22 plasma proteins were 5.7 Gm. per hundred cubic centimeters with A/G ratio of 0.88. Hypoproteinemia at this early stage of hepatitis could not be attributed to the recent liver insult but to previous sepsis which had resulted in considerable malnutrition. Despite evidence of severe disruption of normal hepatic function, plasma proteins rose to 7.0 with A/G ratio of 1.3 following daily parenteral injections of 25 Gm. of concentrated human serum albumin for six days.

(*g*) *Prothrombin Time.*—Significant prolongation of prothrombin time determined by Quick's [10] method was observed in only 1 case (case 22). An initial increase to 105 seconds (normal control 20 seconds) was restored to normal after fourteen days of intensive therapy. Similar changes of a much milder degree were noted in 3, but prothrombin time was normal in all others.

ANALYSIS OF RESULTS OF LIVER FUNCTION TESTS

As would be anticipated, maximum deviations from normal were present during the acute stage. Furthermore, a dissociation of different liver functions and capacities was demonstrated. While individual tests were normal in some cases, analysis of the results of the battery of procedures lends overwhelming support to the belief that disruption of liver function was primarily mediated by cellular damage. Confirming the observations of Turner and his co-workers,[11] impaired excretory function as evidenced by persistent hyperbilirubinemia appeared to dominate the later stages. However, since excretion of bilirubin is the normal function of the liver cell, this dysfunction may well reflect residual cellular damage rather than a faulty extracellular excretory mechanism. This survey further emphasizes the importance of employing a medley of diagnostic methods from the incipience of the disease, and the danger of leaning too heavily on individual or even multiple liver function tests in differentiating obstructive from hepatocellular jaundice. Thus, in cases admitted during the subacute phase, sole reliance on liver function tests would have indicated a subsiding extrahepatic jaundice. Serial studies, however, serve to reflect the remarkably rapid regenerative power of the liver.

MISCELLANEOUS DATA

Duodenal intubation for biliary drainage was instituted in 10 cases to recover bile for microscopic study and not for therapeutic purposes. This procedure was undertaken during the period when jaundice was intense. Bile was obtained in all cases subjected to this procedure and presented a normal macroscopic appearance except that it appeared less concentrated, and B bile could not be identified. Microscopic studies were not remarkable. Occasional pus cells were found in 6 and tyrosine crystals in 1 (case 3). Cholesterol crystals were observed in 4 specimens, probably resulting from diminished bile salts causing precipitation of crystals. Cholecystograms with a double dose of oral dye were taken in 10 cases following subsidence of visible jaundice, because of persistent fat intolerance, of tenderness in the right upper quadrant or of the previous demonstration of cholesterol crystals in the bile. The gallbladder was visualized in all cases and

8. Hanger, F. M.: Serological [illegible] uctive from Hematogenous Jaundice by [illegible] terol Emulsions, J. Clin. Investigation [illegible]

9. Simmons, J. S., and Ger[illegible] Cholesterol: Free, Esters and Total by Sc[illegible] in Laboratory Methods of the United [illegible] Army, ed. 3, Philadelphia, Lea & Febiger, 1944, pp. 211-213

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displayed adequate contraction with fatty stimulation and contained no calculi. Gastric analysis and gastroscopy in cases with persistent dyspepsia were normal.

COURSE

As a rule, jaundice reached its peak of intensity in seven to twelve days after onset of symptoms and then subsided gradually. Sixteen patients were still under observation three to five months after the onset of the disease and some showed symptomatic clinical or laboratory evidence or combinations of these criteria, which, if not conclusively indicative of residual hepatitis, suggested functional or morphologic alterations in the liver.

Abnormal clinical findings alone were unquestionably the most frequent residuums. Tenderness along the right costal border, with or without a palpable liver, was almost invariably found long after complete subsidence of jaundice. When palpable, the liver was firm and tender even when, with considerable enlargement in the early stage, tenderness to pressure had not been noted. Intolerance of fatty foods and pain in the right upper quadrant on bending were the commonest residual symptoms. Slight hyperbilirubinemia or increase in urinary urobilinogen with otherwise normal liver function tests were occasionally the only laboratory findings indicating persistent hepatitis.

HEPATITIS WITHOUT JAUNDICE

The possibility that subclinical forms of hepatitis may result from causes similar to those evoking frank jaundice is well known. Such cases are easily overlooked in soldiers who have sustained multiple wounds, particularly abdominal, because mild, transient symptoms such as anorexia, nausea and lassitude in the absence of visible jaundice may be considered secondary to their primary disease.

This syndrome is illustrated by the following cases:

A.—A private aged 20 sustained shell fragment wounds of his left ankle Sept. 15, 1944. He was given a 250 cc. plasma transfusion the same day, fragments were removed and a cast was applied Recovery was uneventful and he was evacuated to the United States, arriving at this hospital November 14. He

Summary of Cases

Case No.*	Primary Diagnosis	Latent Period (Weeks)	Maximum Hepatomegaly (Fingers)	Week After Onset of Jaundice	Icterus Index	Serum Bilirubin, Mg. per 100 Cc.	Total Cholesterol Cholesterol Ester, Mg per 100 Cc	Hippuric Acid Excretion, Gm per 4 Hr	Ceph alin-Cholesterol Flocculation (48 Hr.)	Galactose Tolerance, Gm per 5 Hr.	Sulfobromophthalein Retention in 30 Min., 5 Mg Dose	Additional Data and Status on Discharge
1	Multiple head wounds; hemianopsia	18	2	1	110	12 2	176/ 75	2 42	+	4 4	.	Transferred to neurosurgical center; persistent tenderness and slight enlargement of liver
				4	16	2.8	155/ 44	1 6	0	2 0		
				8	7	1.1	166/ 23	1 8	0	—		
2	Compound fracture of femur	18	4+	1	119	15 5	168/100	2 1	+ + + +	1 57	.	Large soft liver at onset, later becoming firm and tender, 1 fingerbreadth enlarged after 3 months
				4	21	3 1	168/ 98	2 0	0	1.7		
				8	9	1.1	183/116	3 1	0			
				12	7	0 6	.. .	..	....	...	0	
3	Acute infectious eczematoid dermatitis	11	2	1	86	9 2	221/ 75	1 9	+ + + +	...	.	Bile contained cholesterol and tyrosine crystals; cholecystogram normal except for diminished dye concentration; no residual symptoms, but liver 1 fingerbreadth enlarged and tender
				2½	49	6 1	190/ 80	2 1	±			
				4	25	3.1	200/100	4 3	0			
				8	15 6	1 9	.	3 8	0			
				12	8	0.75	198/137	..	....	...	0	
4	Compound fracture of tibia	10	4	1	101	15.1	186/ 52	1.6	+ + + +	4 5	.	Persistent fat intolerance; liver still palpable, firm and tender; bile contained cholesterol crystals; cholecystogram normal, faint gallbladder filling
				3	61	8 4	175/ 60	2 2	+	2.1		
				6	41	4 5	147/ 80	4 24	0			
				10	15	2 1	160/110					
5	Carbuncle of kidney, nephrectomy	10	5	1	50	6 1	114/ 14	1 1	+	1 9	.	Extremely large, soft liver, never tender; transferred to hospital nearer home
				3	23	3 0	152/ 40	2 3	0			
6	Multiple fractures of both legs	18	2+	1	75	8 4	238/ 37	1.1	+ + + +	6 03	.	Received multiple injections of concentrated serum albumin because of hypoproteinemia; persistent fat intolerance; liver palpable
				3	21	3 1	210/ 80	2.5	+ +	2 7		
				6	14	1.4	.... .	2 8	0			
				12	8	0 9	189/110	3 4	....	...	0	
7	Head wounds; loss of eye	11	3	1	58	7 3	175/ 60	1.3	+ + +	2 4	.	Asymptomatic on transfer to another hospital; liver still large and tender
				3	21	2.5	178/100	3 9	0	1.7		
				8	9	1.1	163/110					
8	Multiple wounds and fractures	11 5	2+	1	147	18 2	210/ 42	1 2	+ + + +	3 4	.	Asymptomatic; liver enlarged and tender on transfer to another hospital
				3	82	11.3	180/ 51	2.4	+	1.8		
				5	30	5 1	176/ 80	3 4				
				8	12	2.1	168/ 96					
9	Multiple fractures; ulnar paralysis	12	3	1	116	17 1	184/ 45	2 1	+ + + +	..	.	Pus cells and cholesterol crystals in bile; cholecystogram normal; liver edge palpable and tender after 10 weeks
				3	52	8 2	161/ 52	2 6	+ +			
				6	26	2 8	.. ....	3.3	0			
				9	8	0.9	166/105	..	.. .	..	0	
10	Compound fracture of humerus	9	2	1	52	5 8	154/ 70	2 1	+ + +	...	.	Still under observation
				3	24	3.1	... ...	2 2	0			
				5	11	1.4	159/ 98	3 5				
11	Wounds of perineum	12	3	1	94	10 1	240/ 89	2.1	+ + + +	1 9	.	Cholesterol crystals in bile; after 3½ months liver edge palpable and tender, pain in right upper quadrant on bending
				4	33	4 2	224/ 62	2 0	+			
				8	20	3 2						
				12	14	1.9	199/ 80	1 9	0			
12	Multiple intestinal wounds	15	4	1	184	22 1	195/ 40	1 2	+ + + +	4 8	.	At onset plasma protein 6 2; A/G ratio 0 8; received concentrated serum albumin; tender palpable liver on transfer from hospital
				4	79	8 9	174/ 70	2 0	±	2 4		
				8	25	3 4	.	3 6	0			
				16	8	1 1	170/110	..	0			
13	Multiple wounds; laceration of sciatic nerve	12	1	1	88	9 8	144/ 60	2 1	—	...	.	Asymptomatic; liver still palpable and tender
				3	30	4 2	152/ 89	3 5	0			
				6	9	0 9	151/100	.	. ..	...	5%	
14	Multiple fractures	14	8	1	120	16 5	228/ 65	1.5	+ + + +	...	.	Persistent fat intolerance after 4 months; liver edge palpable and tender
				3	45	6 1	200/ 80	2 0	—			
				5	14	1.2	182/ 60	3.5	0			
				16	7	0.5	169/ 9[illegible]	...	. ..	...	0	

Summary of Cases—Continued

Case No.*	Primary Diagnosis	Latent Period (Weeks)	Maximum Hepatomegaly (Fingers)	Week After Onset of Jaundice	Icterus Index	Serum Bilirubin, Mg. per 100 Cc.	Total Cholesterol-Cholesterol Ester, Mg. per 100 Cc.	Hippuric† Acid Excretion, Gm. per 4 Hr.	Cephalin-Cholesterol Flocculation (48 Hr.)	Galactose‡ Tolerance, Gm. per 5 Hr.	Sulfobromophthalein§ Retention in 30 Min., 5 Mg. Dose	Additional Data and Status on Discharge
15	Multiple leg wounds	9½	2	1	50	5.5	135/ 54	2.2	+++	...	.	Persistent fat intolerance; liver enlarged 2 fingerbreadths and tender
				4	11	1.0	158/ 80	3.7	0			
				12	7	0.4	.....	...	....	...	4%	
16	Chest wound; compound fracture of ulna	14	4+	1	71	9.4	207/ 53	0	0	6.4	.	Asymptomatic; liver 2 fingerbreadths enlarged and tender after 5 months
				2	67	5.9	.....	0	0	3.1		
				4	21	2.3	207/130	3.4	0			
				20	5	0.4	186/119	...	....	...	0	
17	Fracture of leg; bladder wound	16	2	1	84	9.5	118/ 40	1.8	0	...	.	Cholesterol crystals in bile; liver not *palpable* but right upper quadrant tenderness persists
				4	21	3.2	149/ 50	2.6	0			
				8	9.5	0.8	152/ 98	3.3	....	...	4%	
18	Compound fracture of tibia	10	4	1	73	7.1	208/ 84	1.8	+++	1.35	.	Liver 2 fingerbreadths enlarged on transfer to another hospital
				2	40	5.3	183/101	2.2	+	1.5		
				4	20	1.7	210/154	3.6	0			
19	Multiple wounds	10	2	1	140	23.0	140/ 30	1.6	++	...	.	Still under observation
				3	29	3.4	120/ 50	2.2	0			
				6	10	1.7	117/ 60	3.0				
20	Multiple fractures	12	2	1	105	11.0	168/ 40	1.2	++++	2.4	.	Still under observation
				3	62	5.4	165/ 50	2.3	+	1.8		
				6	24	3.2	158/ 52	3.4	0			
21	Compound fracture of ankle	14	4	1	98	11.8	117/ 38	2.62	+++	...	.	Asymptomatic; *physical findings* normal; still under observation
				4	32	4.5	128/ 30	2.2	0			
				8	10	1.1	152/118	3.2				
				18	6	0.4	.....	...	....	...	0	
22	Psychosis, pneumonia and skin abscesses	12	3	1	119	19.7	.....	0	++++	...	.	Total protein 5.75; A/G ratio 0.88; prothrombin time 105 sec.; still under observation
				2	75	15.7	.....	0				
				4	68	9.0	.....	1.6	+++			
23	Compound fracture of humerus	10	3	2	97	...	.....	...	++	...	.	Asymptomatic on admission; no abnormal physical findings
				10	6	0.5	.....	...	0	...	0	
24	Compound fracture of ankle	12	?	1	84	...	.....	...	++++	...	.	Liver 2 fingerbreadths enlarged and tender on admission; still under observation
				6	22	2.4	184/ 60	3.1	0			
				10	7	0.7	190/115	...	....	...	0	
25	Multiple abdominal wounds	14	3	1	110	14.1	.....	...	++++	...	.	Liver not palpable but tenderness in right upper quadrant after 4 mos.; fat intolerance
				5	30	3.4	141/ 72	2.9	++			
				16	9	1.1	172/110	...	0			
26	Compound fracture of femur	13	2	2	85	...	.....	...	+++	...	.	Liver edge palpable and tender after 5 mos.; pain in right upper quadrant on motion
				6	8	1.2	176/107	3.4	0			
				20	6	0.5	.....	...	....	...	0	
27	Multiple wounds	16	4	1	93	11.5	.....	...	++++	...	.	Liver barely palpable and tender; persistent fat intolerance; cholecystogram normal
				6	11	1.5	152/ 90	3.8	0	...		
				22	9	0.9	.....	3.4	0	...	5%	
28	Compound fracture of humerus	10	1	1	68	9.4	.....	...	....	...	.	Asymptomatic on admission; *physical findings normal*
				6	9	1.1	.....	3.1	0			
				12	7	0.6	.....	...	....	...	0	
29	Penetrating abdominal wound	13	?	1	94	...	.....	...	++++	...	.	Liver slightly enlarged on admission; enlarged and tender after 4 months; cholecystogram normal
				4	22	3.1	149/ 70	2.3	0			
				8	9	1.4	176/100	3.5	0			
				15	8	1.0	.....	...	....	...	0	
30	Compound fracture of tibia	10	1	1	81	9.7	.....	...	++	...	.	Liver edge palpable and tender after 4 months; fat intolerance; pain in right upper quadrant
				5	33	4.4	178/ 95	2.3	0			
				9	15	3.2	185/110	3.2	0			
				14	7	0.6	3.3	3.3	....	...	0	
31	Bullet wound of 5th dorsal vertebra	14	3	1	119	12.9	.....	...	++++	...	.	Asymptomatic after 3 months; physical findings normal
				4	25	4.1	118/ 40	2.4	+			
				8	11	1.1	158/ 80	2.9	0			
				12	7	0.6						

* Cases 1 to 22 observed from onset of disease; cases 23 to 31 transferred from other hospitals.
† Normal, 2.5-3.3 Gm. in 4 hours.
‡ Normal, 3.0 Gm. or less in 5 hours.
§ Normal, up to 5% in 30 minutes.

was 1 of 20 patients who, having received plasma three to five months previously, were selected at random in an orthopedic ward for determination of the icterus index and quantitative van den Bergh on December 29 with a view to uncovering cases of latent jaundice. His icterus index was 9.1 and van den Bergh 1.3 mg. per hundred cubic centimeters delayed. Results in all the others of the group were normal. Questioning revealed that for the past two weeks he had noted lassitude, anorexia, nausea and epigastric bloating, although he had not reported his symptoms to the ward officer. Examination revealed no visible icterus. The only significant finding was a firm, tender liver palpable 2 fingerbreadths below the costal border. The spleen was not enlarged. Hemoglobin was 13.5 Gm., the red blood cell count 4,750,000 and the white blood cell count 5,300, with 49 per cent polymorphonuclears and 51 per cent lymphocytes. A comprehensive laboratory survey was instituted, including cholecystogram, x-ray examination of the upper gastrointestinal tract, gastric analysis and gastroscopy, all of which were normal. Cephalin flocculation, hippuric acid excretion (oral and intravenous), urinalysis, heterophile and sedimentation index were normal. Sulfobromophthalein retention in forty-five minutes (5 mg. per kilogram) was 36 per cent.

On Jan. 10, 1945 the icterus index was 9.5 and serum bilirubin 1.5 mg. per hundred cubic centimeters. Because of continuation of his symptoms, he was placed on a low fat, high carbohydrate and protein diet. Symptomatic response was almost immediate.

On January 23 he was relatively asymptomatic on the foregoing regimen and the liver was barely palpable but still tender. The icterus index was 9.0 and serum bilirubin 1.1 mg. per hundred cubic centimeters. Sulfobromophthalein retention in forty-five minutes was 32 per cent. On February 26 the following results were obtained: serum bilirubin direct, 0.35 mg. per hundred cubic centimeters, indirect 0.30 mg. per hundred cubic centimeters (normal); total cholesterol 148 and cholesterol esters 59 mg. per hundred cubic centimeters; cephalin flocculation +; sulfobromophthalein retention 22 per cent in forty-five minutes; hippuric acid excretion after intravenous injection

of 1.77 Gm. of sodium benzoate 0.4 Gm. (normal 0.7-0.9 Gm.); 2 to 4 p. m. urine urobilinogen 1.05 mg. (normal). Although he felt well, the liver was still palpable and slightly tender. This patient is still under observation.

B.—A sergeant aged 25, with three years of military service during which time he had never noted dyspepsia, on Sept. 1, 1944 sustained shell fragment wounds of his right arm with a compound fracture of the right humerus. Following débridement a cast was applied and 500 cc. of plasma was administered. Convalescence was satisfactory and he was eventually admitted to this hospital November 28. He was referred to the gastrointestinal section for consultation on December 29 because of nausea, anorexia and upper abdominal distress of one month's duration. The only significant finding was a decidedly tender liver the firm lower edge of which was palpable 2 fingerbreadths below the costal border. The spleen could not be felt. Repeated determinations revealed that serum bilirubin ranged between 1.0 and 1.3 mg. per hundred cubic centimeters and urinary urobilinogen was elevated. Cephalin flocculation and hippuric acid excretion (oral and intravenous tests) were normal. Complete investigation of the gastrointestinal tract, including a cholecystogram, proved normal. He was given a diet high in carbohydrates and proteins with limitation of fat and showed rapid symptomatic improvement, although after three weeks the liver was still tender but barely palpable.

Too much reliance must not be placed on liver function tests in the diagnosis of mild hepatitis of short duration. It has been amply demonstrated that even in cases with jaundice the clinical features of subacute hepatitis were not directly or precisely correlated with the laboratory findings.

MANAGEMENT

Whenever possible patients were transferred to the gastrointestinal section for observation and treatment until at least clinical jaundice had subsided. No supplementary vitamin therapy was prescribed, sole reliance for nutritive requirements being placed on adequate carbohydrate and protein intake. Of late a modified Varco diet has been employed to advantage, using gastric intubation if indicated. In combating hypoproteinemia, however, concentrated serum albumin has given gratifying results unattended by any reactions noted with plasma or blood. Intravenous glucose and saline solution were rarely indicated. Surgical procedures were delayed until jaundice had receded and normal liver function had recovered in large measure. Jaundice per se was not considered an indication for absolute bed rest, and all patients were encouraged to partake of mild activity as the disease showed signs of subsiding. Convalescence appeared to proceed as rapidly in the ambulatory group as in those confined to bed because of casts or traction appliances.

COMMENT

Since blood products are administered as an emergency and frequently life saving measure, it is fortunate that the sequelae herein reported have thus far been unattended by any deaths despite the extreme initial cellular damage produced in the liver.

Pooling of plasma probably increases considerably the incidence of jaundice among the recipients. However, this procedure has been recommended to diminish the titers of isoagglutinins mainly by dilution and to some extent by action of group substances in neutralizing isoagglutinins, thus permitting universal use of plasma regardless of blood grouping. Hence the method employed to avoid initial severe post-transfusion reactions serves to increase the incidence of delayed jaundice. It is believed that the latter is the less objectionable, since severe reactions coming at a time when the recipient is in a precarious state might prejudice his chances of survival and interfere with urgent surgical procedures. An alternative to pooling would be the addition of purified solutions of group substances to plasma as suggested by Witebsky.[12] The use of plasma of the same group as the patient is obviously impossible in battlefield emergencies. Unfortunately skin tests to determine the sensitivity of the recipient to the icterogenic serum have been unsuccessful. While it has been demonstrated that ultraviolet radiation renders this agent innocuous, this seems unpractical for use on a large scale.

The most promising approach to the problem is the recent success attained by Stokes and Neefe[13] in preventing and attenuating infectious hepatitis by intramuscular injection of gamma globulin in subjects exposed to the disease. As most effective results were obtained by early injection, addition of gamma globulin to pooled plasma prior to its use or administering it early in the incubation period of jaundice to all individuals who have received plasma warrants trial as a prophylactic measure.

Oliphant[1] found that the jaundice producing agent is present in the blood during the preicteric stage but not after two and one-half months following disappearance of jaundice, and somewhat similar findings were obtained by MacCallum and Bauer.[14] This indicates that blood donors who constitute the greatest menace are those in the preicteric stage, or with hepatitis unattended by jaundice, as obviously individuals who have recently recovered from jaundice are not accepted at Red Cross blood banks. In view of the widespread incidence of infectious hepatitis, a transient "healthy carrier" state might exist among some volunteer blood donors and detection of such depositors would be impossible.

It has been repeatedly stressed that prevention would be aided by recording the lot number of each flask of plasma at the time of its use, thus permitting ultimate withdawal of contaminated batches. This method was found practicable with yellow fever and measles vaccine and may be applied to blood and plasma as employed in civilian hospitals. The problem presented by this discussion is more complex, since multiple transfusions are frequently given within a few days in the course of evacuation from first aid stations to the rear, and, in view of the wide variation of the incubation period, it would be extremely difficult to incriminate any one lot. However, valuable information could be obtained from records of patients receiving but a single transfusion, as even if the entire lot of plasma had been exhausted when it fell under suspicion the source of contamination might be traced.

Observations here suggest that quantitative bilirubin determinations be performed routinely on all patients who have received plasma or blood from doubtful sources at monthly intervals from the third to the sixth month after transfusion. This procedure is considered to be of more than academic interest since hepatitis "sine ictero" might result in sequelae as disabling as hepatitis

12. Witebsky, E.; Klendshoj, N., and Swanson, P.: Preparation and Transfusion of Safe Universal Blood, J. A. M. A. **116**: 2654-2656 (June 14) 1941.

13. Stokes, Joseph, Jr.; and Neefe, J. R.: The Prevention and Attenuation of Infectious Hepatitis by Gamma Globulin, J. A. M. A. **127**: 144-145 (Jan. 20) 1945.

14. MacCallum, F. O., and Bauer, D. J.: Homologous Serum Jaundice: Transfusion Experiments with Human Volunteers, Lancet **1**: 622-627 (May 13) 1944.

with jaundice. Unless the etiology is established at the outset, its recognition at a later stage may be extremely difficult.

While this series represents the largest reported to date of hepatitis resulting from the therapeutic use of blood or plasma, it is likely that this syndrome will be encountered and recognized more frequently in the future. Many cases which belong in this category have hitherto been erroneously considered infectious hepatitis. On the other hand, rigid criteria for diagnosis of homologous serum jaundice should be established lest the onset of hepatitis in all battle casualties be considered related to blood products received following shock and hemorrhage. Nevertheless with mounting casualties necessitating the use of pooled plasma on an ever increasing scale, it is likely that, with the exception of epidemic hepatitis, transfusions may constitute the largest single cause of acute hepatitis with jaundice until a method is devised for either detecting donors harboring the agent or for rendering the latter innocuous by treating the plasma prior to use.

SUMMARY

1. Thirty-two patients evacuated from overseas developed jaundice either en route to or following admission to an inland general hospital. All had received plasma or blood transfusions nine to eighteen weeks previously.

2. Evidence strongly suggests that the parenteral blood products acted as a vehicle for the icterogenic agent.

3. Serial laboratory studies corroborated the clinical impression that the resultant hepatitis was primarily parenchymatous.

4. Despite hepatomegaly, intense icterus and almost uniform laboratory evidence of derangement of the liver function, the clinical picture did not reflect the severe hepatic damage in the acute phase.

5. Subclinical hepatitis resulting from homologous serum may pass completely unrecognized because of absence of jaundice.

6. Quantitative van den Bergh estimation should be determined at monthly intervals from the third to the sixth month following receipt of pooled plasma as a simple method of uncovering latent hepatitis.

7. Since persons with a history of recent jaundice are not accepted as volunteer donors at blood banks, it is suggested that the icterogenic agent may be transmitted by subjects in the preicteric phase of infectious hepatitis or by "healthy carriers."

8. Because of multiple transfusions administered at successive medical installations in the course of evacuation, the problem of tracing the contaminated plasma responsible for this complication is extremely complex. Nevertheless, valuable information might be obtained in tracing the source of contamination if plasma lot numbers were recorded immediately following use.

9. The prophylactic use of gamma globulin either by addition to pooled plasma or by intramuscular injection subsequent to transfusion appears to warrant trial.

10. Apart from epidemic hepatitis, transfusions may constitute the commonest cause of jaundice occurring in the armed forces at present

THE HYPEREMIA EFFECT OF GONADOTROPINS ON THE OVARY

AND ITS USE IN A RAPID PREGNANCY TEST

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The hormone pregnancy test is based on the following facts:

1. The gonadotropic reactions of the ovary in infantile rodents:[1] anterior pituitary reaction I, follicle ripening and induction of vaginal estrus; anterior pituitary reaction II, hyperemization of the ovary and follicle hemorrhage (blood dots); anterior pituitary reaction III, formation of corpora lutea.

2. The production and excretion in large amounts of gonadotropic hormone in pregnant women, monkeys and equines (but not in other mammals).[2] Immediately after nidation of the egg in the endometrium, production of the gonadotropic hormones occurs explosively in such great quantities that even small amounts of blood or urine suffice to induce the aforementioned gonadotropic reactions. The hormone appears in lower concentrations in the blood than in the urine.

APPLICATION OF THE ORDINARY HORMONE PREGNANCY TEST AND ITS MODIFICATIONS

The ordinary hormone pregnancy test and its modifications are carried out most dependably on the ovaries of infantile rodents. The three gonadotropic reactions are induced by two different factors: the follicle stimulating hormone yielding anterior pituitary reaction I, and the luteinizing hormone yielding anterior pituitary reactions II and III. In developing the pregnancy test it was found that only anterior pituitary reactions II and III may be used for an accurate evaluation of the test; viz., only the presence of large amounts of the luteinizing hormone indicates pregnancy. Increased quantities of the follicle stimulating hormone may be excreted in the urine in conditions other than pregnancy (polyhormonal amenorrhea, climax, tumor); hence an error of about 10 per cent would arise through the application of anterior pituitary reaction I for the diagnosis of pregnancy, thus upsetting the practical value of the reaction. The anterior pituitary reaction I, as will be shown later, is however of diagnostic importance in certain cases of disturbed pregnancy.

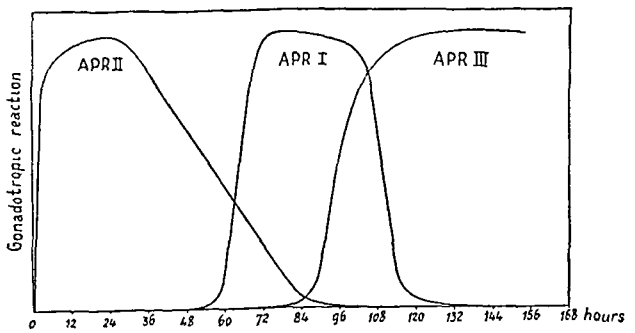
As we shall see, not all infantile rodents react in the same manner to chorionic gonadotropin. A most striking reaction, easily distinguished with the naked eye, is the induction of the blood dot which protrudes from the ovary. Infantile mice were chosen for the original hormone pregnancy test because of the ease with which blood dots are found in this species. The test animals are injected subcutaneously over a forty-eight hour period with 1.8 to 2.4 cc. of urine (six injections of 0.3 or 0.4 cc.) and are opened for inspection ninety-six hours later. The test thus takes four days. This delay is undoubtedly a shortcoming of the method.

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In view of the difficulties of international communication, the authors have not read the proof of this article.
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1. Zondek, B.: Ztschr. f. Geburtsh. u. Gynäk. **90**: 378, 1926. Zondek, B., and Aschheim, S.: Arch. f. Gynäk. **130**: 27, 1927.
2. Aschheim, S.: Klin. Wchnschr. **7**: 1453, 1928. Zondek, B., ibid. **7**: 1804, 1928.

MODIFICATIONS OF THE ORDINARY HORMONE PREGNANCY TEST

Repeated attempts have been made to shorten the duration of the reaction. In 1930 the senior author [3] described a rapid pregnancy test in which precipitation of the gonadotropin from pregnancy urine with alcohol was employed. The precipitate was washed with ether and later dissolved in water. This method affords the injection of larger quantities of hormones (the equivalent of up to 14 cc. of urine in every mouse) and the result could be ascertained in fifty hours. This method was further studied and recommended by Eberson and Silverberg [4] and by Latzka.[5] The disadvantage of this rapid method is that the precipitation of the hormone takes several hours and complicates the procedure. Furthermore, the precision of the method does not approximate that of the original hormone pregnancy test.

An important contribution was the modification proposed by Friedman,[6] in which the urine is injected intravenously into rabbits instead of subcutaneously into mice. This reaction can be read in thirty-six to forty-eight hours later from the blood dots of the ovary. Hence, in this method too the anterior pituitary reaction II serves as the basis of the test. The shortcoming of this modification lies in the fact that the rabbits



Time relationship of reactions: APR II (hyperemia of ovary), APR I (estrus) and APR III (formation of corpora lutea).

have to be kept in separate cages for four weeks before beginning the test, so as to obviate any attempts at mating, which may cause ovulation and so falsify the reaction. Good results have also been obtained with infantile rabbits, but this requires well organized breeding, as only animals weighing more than 800 Gm. give reliable reactions. We have found that in the subtropical climate of Palestine the rabbit test may be faulty. This is especially true in the spring and summer months during spells of sirocco (hamsin), as this hot dry wind may cause spontaneous formation of follicle hemorrhages (anterior pituitary reaction II).

THE HYPEREMIA EFFECT OF CHORIONIC GONADOTROPIN AS A PREGNANCY TEST

Zondek and Aschheim [7] showed that in infantile rodents strong hyperemia of the ovary and follicle hemorrhages (anterior pituitary reaction II) may be evoked by the implantation of pituitary anterior lobe or placenta and by the injection of blood or urine from pregnant women. This is accompanied by anterior pituitary reaction I, which evokes vaginal estrus (cornification) and luteinization of the ovary (anterior pituitary reaction III). It is interesting to note that the ovaries of different species of rodents react differently toward the administration of gonadotropic hormone.

In the infantile mouse the ovary is normally somewhat hyperemic; this hyperemia is enhanced by gonadotropic hormone, and the formation of blood dots is brought about. The infantile rat reacts otherwise. In this animal the ovary is anemic and gonadotropins scarcely provoke blood dot formation, but at an early stage extreme hyperemia of the whole ovary takes place, so that it stands out in a most characteristic way from the pale tubes and the uterus. In the infantile rabbit the ovary is also anemic but, in contrast to the rat, blood dots appear regularly, whereas the hyperemia reaction of the whole ovary is absent. Common to the three rodents is the stimulation by gonadotropin resulting in formation of corpora lutea (anterior pituitary reaction III). Hence the blood dot (anterior pituitary reaction II) is not a necessary feature of the gonadotropin reaction. If the blood dot is to be used as the indicator for gonadotropin, the mouse or rabbit is the most suitable test object, whereas if hyperemia is to be used the rat is most fitting.

TIME FACTOR

The gonadotropic reactions of the ovary (anterior pituitary reactions I-III) appear at different time intervals in the rat. Estrus appears between the sixtieth and the eightieth hour and corpus luteum formation between the eighty-sixth and the one hundred and twelfth hour. The hyperemia of the ovary is the first reaction, beginning in two hours (with pituitary gonadotropin even in fifteen minutes and with pregnant mare blood gonadotropin after three to four hours); it has its peak at the twenty-fourth hour and disappears within thirty-six to forty-eight hours, as shown in the accompanying chart. Thus it is obvious that the minimum period for hyperemia to set in is very short.

RELATION BETWEEN HYPEREMIA UNIT, ESTRUS UNIT AND CORPUS LUTEUM UNIT

We have designated as 1 hyperemia unit that amount of gonadotropic hormone which induces hyperemia of the whole ovary in an infantile female rat within twenty-four hours. We have investigated the quantitative relations of the hyperemia unit, the estrus unit and the corpus luteum unit in the rat with a single injection and the reactions were read as follows: for the hyperemia unit, twenty-four hours later, for the estrus unit in ninety-six hours and for the corpus luteum unit in one hundred and twenty hours. We also determined these values for three gonadotropins: (*a*) chorionic gonadotropin from pregnancy urine, (*b*) pregnant mare blood gonadotropin and (*c*) pituitary gonadotropin (sheep hypophysis). We shall here give only a summary of these examinations as carried out on 3,000 infantile female rats.

A puzzling fact was encountered in that the hyperemia unit varies considerably with different gonadotropins. The most active was pituitary gonadotropin, which evokes hyperemia with one tenth to one twentieth of the quantity of hormone necessary to induce vaginal estrus or luteinization. The most ineffective is pregnant mare blood gonadotropin, of which ten times the amount of hormone is needed for hyperemization as for estrus. With chorionic gonadotropin from pregnancy urine, the quantity of hormone needed for the hyperemia effect is intermediate: hyperemia is brought

3. Zondek, B.: Klin. Wchnschr. **9**: 964, 1930
4. Eberson, F., and Silverberg, M. H.: Anterior Pituitary Hormone in Urine, J. A. M. A. **96**: 2176 (June 27) 1931.
5. von Latzka, A.: Klin. Wchnschr. **12**: 1906, 1933.
6. Friedman, H. M.: Am. J. Physiol. **90**: 617, 1929; Am. J. Obst. **21**: 405, 1931.
7. Zondek and Aschheim, footnotes 1 and 2

on with the same amount which evokes estrus, whereas for luteinization three times the amount is necessary.

What conclusions may be drawn from these facts? It is possible that the hyperemia factor, whose effect is rapid and limited to a certain time interval (one-fourth to forty-eight hours), is a special factor, viz. a third hormone. This question can be decided only with experiments on hypophysectomized animals, which we intend to carry out. It is also possible that hyperemia is evoked by optimal proportions of follicle stimulating hormone and luteinizing hormone in the injected preparation. Chorionic gonadotropin contains preponderantly luteinizing hormone and pregnant mare blood gonadotropin chiefly follicle stimulating hormone, whereas pituitary gonadotropin contains follicle stimulating hormone and luteinizing hormone. Hence pituitary gonadotropin can evoke anterior pituitary reaction II with a minimum dosage in a minimum of time. On the other hand, pregnant mare blood gonadotropin containing follicle stimulating hormone and chorionic gonadotropin containing only luteinizing hormone must be given in larger doses.

It seems that hyperemia is evoked mainly by luteinizing hormone and that follicle stimulating hormone has only an augmentative effect. This would be in agreement with the conception of Zondek (1931-1935)[8] that the follicle hemorrhage, which constitutes the peak reaction of hyperemia, arises from a combined effect of follicle stimulating hormone and luteinizing hormone. The important fact which emerges from this discussion is that with pregnancy urine gonadotropin the hyperemia hormone pregnancy test is evoked with one third the amount of hormone that is necessary for luteinization. This renders the hyperemia hormone pregnancy test especially sensitive for the diagnosis of pregnancy.

RESULTS WITH THE HYPEREMIA HORMONE PREGNANCY TEST

There have been repeated attempts to use the hyperemia effect of chorionic gonadotropin as a pregnancy test. The first experiments were reported by Reiprich[9] and by Zondek.[10] Reiprich[9] injected infantile rats with quantities of urine as large as 10 to 14 cc. and found a positive reaction in twenty-four to thirty hours. Zondek[10] observed that such large amounts of urine are apt to give false results, especially in cases in which the follicle stimulating hormone content of the urine is high (menopause and tumors). The hyperemia reaction was further studied and employed for the diagnosis of pregnancy by the Walkers[11] and Falls, Kelso,[12] Frank and Berman,[13] the Salmons, Geist, Frank and Poole,[14] Kupperman and his associates,[15] Kaminester,[16] Kline[17] and Farris.[18]

For an exact diagnosis of pregnancy, special emphasis should be laid on the right dose, since the injection of excessive amounts of urine results in positive reactions from nonpregnant women with functional disturbances involving increased excretion of follicle stimulating hormone. When, for example, we injected 10 cc. of pregnancy urine, as proposed by Frank and Berman,[13] we obtained false positives, from which we concluded that the dose was too high. Generally, 20,000 rat units (estrus units) of gonadotropin is excreted in 1 liter of the urine of early pregnancy, so that 1 cc. contains 20 estrus units. The excretion of luteinizing hormone is about 5,000 to 10,000 rat units per liter. Since the estrus unit equals the hyperemia unit, it is obvious that 1 cc. contains 20 hyperemia units. We have found the most practical dose to be 4 cc. of pregnancy urine. This is given to the infantile female rat in two injections of 2 cc. each at an interval of one hour. The site of injection is the subcutis of the neck.

TABLE 1.—*Results of the Two, Six and Twenty-Four Hour Hyperemia Tests in 200 Cases Compared with the Ordinary Hormone Pregnancy Test*

Diagnosis	Number of Cases	2 Hour Test		6 Hour Test		24 Hour Test		Ordinary Hormone Pregnancy Test		
								Pos	Neg.	
		Correct	False	Correct	False	Correct	False	A—Pos B—Pos	A—Pos. B—Neg.	A—Neg. B—Neg
Early pregnancy (1st to 3d months)	80	53	27	75	5	80	0	80	0	0
Late pregnancy (4th to 9th months)	13	11	2	13	0	13	0	13	0	0
Extrauterine pregnancy										
Luteinizing hormone (B) positive	4	1	3	3	1	4	0	4	0	0
Follicle stimulating hormone (A) positive	4	4	0	4	0	4	0	0	4	0
Abortion										
Luteinizing hormone (B) positive	4	3	1	3	1	4	0	4	0	0
Follicle stimulating hormone (A) positive	9	9	0	9	0	9	0	0	9	0
Benign tumors	13	13	0	13	0	12	1*	0	6	7
"	10	10	0	10	0	10	0	0	3	7
"	7	7	0	7	0	7	0	0	4	3
"	19	19	0	19	0	18	1†	0	13	6
Secondary amenorrhea (¼ 10 years)	10	10	0	10	0	10	0	0	0	10
Normal persons (including cases of secondary amenorrhea of short duration)	27	27	0	27	0	27	0	0	0	27
Total	200	167	33	193	7	198	2	101	99	60

* A case of myoma; the ordinary hormone pregnancy test was negative in all 5 mice injected, but prolan A was positive. In the 24 hour hyperemia test 1 of the 3 rats employed reacted positively. The 2 and 6 hour test was negative.

† A case of corpus luteum persistens. The patient had a negative ordinary hormone pregnancy test, but the urine contained 500 M. U. prolan A and 250 M. U. prolan B. The latter finding could not be revealed by the ordinary hormone pregnancy test since it only indicates the presence of more than 417 M. U. prolan B. The hyperemia test was negative after 2 and 6 hours, but positive in all 3 rats used for the 24 hour test.

8 Zondek, B.: Die Hormone des Ovariums und des Hypophysenvorderlappens, ed. 1, Berlin, Julius Springer, 1931, p. 131; ed. 2, 1935, p. 202.

9. Reiprich, W.: Klin. Wchnschr. **12**: 1441, 1933.

10. Zondek, B.: Hormone des Ovariums und des Hypophysenvorderlappens, p. 563.

11. Walker, T. F., and Walker, Dora V. H.: Modification of Aschheim Zondek Test, J. A. M. A. **111**: 1460 (Oct. 15) 1938.

12. Kelso, R. E.: Am. J. Clin. Path. **10**: 293, 1940.

13. Frank, R. T., and Berman, R. L.: Am. J. Obst. & Gynec. **42**: 492, 1941.

14. Salmon, U. J.; Geist, S. H.; Salmon, A. A., and Frank, I. L.: J. Clin. Endocrinol. **2**: 167, 1942. Salmon, U. J.; Geist, S. H.; Poole, C. S., and Salmon, A. A.: Endocrinology (supp.) **30**: 1039, 1942.

15. Kupperman, H. S., Greenblatt, R. B., and Noback, C. R.: J. Clin. Endocrinol. **3**: 548, 1943. Kupperman, H. S., and Greenblatt, R. B.: Georgia Univ. Hosp. Bull. **5**: 6, 1944.

16. Kaminester, S.: Am. J. Obst. & Gynec. **47**: 265, 1944.

17. Kline, B. S.: Salmon, Geist, Salmon, Frank Six Hour Rat Test for Pregnancy, American Medical Association Scientific Exhibit, Section on Obstetrics and Gynecology, Chicago, June 12-16, 1944.

18. Farris, E. J.: Am. J. Obst. & Gynec. **45**: 200, 1944. See also the editorial in the *Journal of Clinical Endocrinology* **4**: 410, 1944.

Up to now we have tested 300 cases. In 200 cases (table 1) the previous diagnosis was unknown and the results were vertified by the ordinary hormone pregnancy test carried out on infantile mice. In a further 100 cases (table 2) the urine samples were taken from patients in our department. In these cases the diagnoses from the clinical data were known to the senior author but not to the laboratory personnel. The cases studied, which are compiled in tables 1 and 2, include early pregnancy, late pregnancy, extrauterine pregnancy, abortion, benign and malignant tumors, the menopause, polyhormonal disturbances, primary and secondary amenorrhea, febrile infections and normal subjects. Patients with tumors were tested only when the type of the tumor could be verified by laparatomy (Z.). In order to ascertain the time interval at which the hyperemia reaction gives most exact results, the animals were killed two, six and from eighteen to

TABLE 2.—*Results of the Hyperemia Test in 100 Cases of Known Diagnosis*

Diagnosis	Number of Cases	2 Hour Test		6 Hour Test		24 Hour Test	
		Correct	False	Correct	False	Correct	False
Early pregnancy (1st to 3d months)	18	12	6	17	1	18	0
Late pregnancy (4th to 9th months)	17	12	5	14	3	17	0
Extrauterine pregnancy	2	0	2	1	1	2	0
Febrile infections	4	4	0	4	0	4	0
Benign tumors	15	15	0	15	0	15	0
Malignant tumors	13	13	0	13	0	12	1*
Menopause	3	3	0	3	0	3	0
Primary amenorrhea	1	1	0	1	0	1	0
Polyhormonal disturbances	12	12	0	12	0	12	0
Normal persons (including secondary amenorrhea of short duration)	15	15	0	15	0	15	0
Total	100	87	13	95	5	99	1

* A case of pseudomyxoma ovarii. The hyperemia test was negative after two and six hours, but 1 of the 3 rats used for the twenty-four hour test reacted positively.

twenty-four hours after injection. The results in our 300 cases (tables 1 and 2) were as follows:

1. *Two Hour Test.*—Of 98 cases of early pregnancy (one to three months) 33 false results were obtained in which pregnancy was not diagnosed. Of 30 cases of late pregnancy (four to nine months) we obtained 7 false results. In all, there were thus 40 mistakes in 128 pregnancies, a 31.2 per cent error. It must, however, be emphasized that whenever the two hour test was positive the result was correct. In other words, the two hour test can be used only if the result is positive, whereas negative results cannot be evaluated. Positive reactions were never obtained with the urine of nonpregnant women, which is obvious since the test is uncertain even in the presence of great amounts of chorionic gonadotropin in pregnancy. In the whole series of 300 cases tested, which comprised patients in various conditions, we had 45 false results, i. e. a 15 per cent error.

2. *Six Hour Test.*—The results with the six hour test were much better. Here we had 11 false results out of 300 cases, i. e. an error of 3.7 per cent. Unfortunately, the source of error is much greater if only the cases of pregnancy are considered. Here we found 6 false results in 98 cases of early pregnancy, and 3 mistakes in 30 cases of late pregnancy. This gives 9 erroneous results in 128 cases of pregnancy, an error of 7.8 per cent. The six hour test is very reliable if it is positive but is inconclusive when negative. We are now going to improve its reliability.

3. *Twenty-Four Hour Test.*—There was a very great improvement with the twenty-four hour test. In 98 cases of early pregnancy and 30 cases of late pregnancy all the tests proved correct. This would mean a precision of 100 per cent. On the other hand, we had 3 false results with nonpregnant patients. These were (*a*) a case of myoma, (*b*) a case of pseudomyxoma ovarii and (*c*) a case of corpus luteum persistens. It is known that in such cases even the ordinary hormone pregnancy test may be positive. Hence in 300 cases we had 3 false positive results, an error of 1 per cent.

For clinical purposes it is usually quite sufficient to have a precise result within twenty-four hours. It is only rarely that the result is required urgently on the same day. In these cases the six hour test and even the two hour test may be tried. In such cases it should be made clear that the two and six hour tests can be used only if they are positive. If they are negative, pregnancy cannot be excluded and the correct answer can be given only within twenty-four hours.

Technic.—Our routine technic is as follows: We use 3 infantile female rats, 3 to 5 weeks old, weighing 20 to 25 Gm., for every examination. They receive 4 cc. of urine each in two injections of 2 cc. at an interval of one hour. Injections are given subcutaneously into the neck. One rat is killed after six hours and the other two are killed in twenty-four hours. The reaction is positive if hyperemia appears in at least one ovary of 2 different rats. As a rule all ovaries react similarly. The rats are killed with ether, chloroform or illuminating gas, opened and the uterine cornua lifted with a forceps. The ovaries are often covered with fat. In this case they should be turned and the fat is carefully teased away, any lesion being avoided which may cause hemorrhage. The ovaries may be inspected in bright daylight, in direct sunlight or by electric light. Comparison should be made with the color of the spleen or kidney. If the reaction is positive the ovaries are slightly brighter than these organs, nearly strawberry red. The hyperemia should extend to the whole ovary and not only to single follicles. The operator should be able to distinguish red clearly.

HYDATIDIFORM MOLE AND CHORIONEPITHELIOMA

The ordinary hormone pregnancy test has obtained special significance in the diagnosis of pathologic pregnancy. Following the demonstration that in hydatidiform mole excretion of gonadotropic hormone is greatly increased,[19] the quantitative determination of chorionic gonadotropin in the urine has become of special importance for differential diagnosis of hydatidiform mole and chorionepithelioma. There are even certain types of malignant tumors of the testis which may be diagnosed by means of the urine.[20] This was the first demonstration of diagnosis of malignant tumors through the urine, and it has even been possible to determine by this means the type of tissue from which the tumor originated.

In 2 cases of hydatidiform mole and 1 of chorionepithelioma we compared the hyperemia hormone pregnancy test in the rat with the ordinary hormone

19. Zondek, B.: Endokrinologie **5**: 425, 1929. Meyer, R.: Zentralbl. f. Gynäk. **54**: 430, 1930.
20. Zondek, B.: Chirurg **2**: 1072, 1930; Klin. Wchnschr. **11**: 274, 1932.

pregnancy test in the mouse. The urine was given in diluted form.[21]

CASE 1.—*Hydatidiform mole.* The ordinary hormone pregnancy test showed follicle ripening and induction of vaginal estrus (anterior pituitary reaction I), 1,000,000 mouse units per liter of urine; hyperemization of the ovary and follicle hemorrhage, with formation of corpora lutea (anterior pituitary reactions II and III), 500,000 mouse units. The hyperemia hormone pregnancy test showed ovarian hyperemia (anterior pituitary reaction II), 500,000 rat units.

CASE 2.—*Hydatidiform mole.* The ordinary hormone pregnancy test showed follicle ripening and induction of vaginal estrus (anterior pituitary reaction I), 200,000 mouse units per liter of urine; hyperemization of the ovary and follicle hemorrhage, with formation of corpora lutea (anterior pituitary reaction II and III), 100,000 mouse units. The hyperemia hormone pregnancy test showed anterior pituitary reaction II, 200,000 rat units.

CASE 3.—*Chorionepithelioma.* The ordinary hormone pregnancy test showed follicle ripening and induction of vaginal estrus (anterior pituitary reaction I), 6,000,000 mouse units per liter of urine; hyperemization of the ovary and follicle hemorrhage, with formation of corpora lutea (anterior pituitary reactions II and III), 3,000,000 mouse units. The hyperemia hormone pregnancy test showed anterior pituitary reaction II, 3,000,000 rat units per liter of urine. In this case gonadotropin excretion was especially high because the patient had multiple metastases.

These examinations indicate that the hyperemia hormone pregnancy test may also be used for the diagnosis of hydatidiform mole and chorionepithelioma. Unfortunately, we have not yet been able to test more than 3 cases because of their relative rarity. It should be stressed, however, that in the case of chorionepithelioma we obtained a positive hyperemia hormone pregnancy test with only 0.0003 cc. of urine. For the diagnosis of hydatidiform mole the excessive excretion of the follicle stimulating hormone is of diagnostic value[22] and it is questionable whether the ordinary hormone pregnancy test can be dispensed with for this purpose.

IS THE HYPEREMIA TEST SUFFICIENT?

The hyperemia test in the rat is adequately accurate for the determination of pregnancy but is not sufficient for the examination of disturbed pregnancy (ruptured extrauterine pregnancy, threatened, incomplete and missed abortion). In these cases the titer of chorionic gonadotropin in the urine is on the decrease; the luteinizing hormone ("prolan B") is not detectable any more, whereas the follicle stimulating hormone ("prolan A") still is. From the presence of the follicle stimulating hormone the clinician can deduce that there is still some placental tissue in contact with the circulation. In table 1 are shown 4 cases of disturbed extrauterine pregnancy in which the A reaction was positive. This was reason enough for us to suspect a tumor protruding near the uterus to be an extrauterine pregnancy, which was confirmed by laparatomy (Z). Out of 13 cases of abortion 9 were A positive, which also proved to be of importance for diagnosis. Furthermore, it should be remembered that the presence of the follicle stimulating hormone is an important clue in cases of polyhormonal disturbances and malignant tumors. In hydatidiform mole and chorionepithelioma the same holds true, as already mentioned.[22]

In the light of our recent experience with the pregnancy test, the importance of knowing the history of the patient cannot be overemphasized. When it is a question of the simple determination of pregnancy, the hyperemia hormone pregnancy test in the rat, as described, is sufficient. If there is a suspicion of disturbed pregnancy, e. g. bleeding of uncertain cause in a woman, the ordinary hormone pregnancy test cannot be dispensed with. It is especially valuable in the diagnosis of disturbed extrauterine pregnancy and the differential diagnosis between bleeding from soft myoma and from disturbed intrauterine pregnancy.

We are at present developing the follicle stimulating hormone (A) test in the rat, so that in future we hope to be able to use the rat test also as an alternative in cases of disturbed pregnancy. We have for this purpose added 2 more rats to the 3 rats used for the six to twenty-four hour test. They are opened after four days. One receives 2 cc. of urine twice and the other 1 cc. twice administered at a one hour interval. They serve to check the six to twenty-four hour test and to determine excretion of follicle stimulating hormone. (The results with this technic have been based until now on only 80 patients.) When both rats give positive reactions for the luteinizing hormone (anterior pituitary reaction III) they confirm pregnancy in the patient, and when both are negative they confirm the absence of pregnancy. When both are positive for the follicle stimulating hormone only (vaginal estrus, anterior pituitary reaction I) the possibility is hinted at of functional disturbances (polyhormonal amenorrhea, climax), tumors and disturbed pregnancy (ruptured extrauterine pregnancy, threatened, missed or incomplete abortion). When the rat with the larger dose (2 cc. twice) is B positive and that with the smaller dose (1 cc. twice) is A positive but B negative, a significant decrease in the concentration of chorionic gonadotropin is indicated. This occurs mostly in cases of disturbed pregnancy, as mentioned, and occasionally in tumors. This finding should stimulate the clinician to make another proper examination of the patient.

SUMMARY

1. Chorionic gonadotropin brings on, in the ovary of rodents, the well known anterior pituitary reactions (I-III). The earliest of these reactions is hyperemia of the ovary of the infantile rat. Hyperemia occurs as early as two to six hours after injection, reaches its peak after twenty-four hours and disappears in forty-eight hours. Hyperemia is the first stage of anterior pituitary reaction II, its second stage being the follicle hemorrhage (blood dot).

2. Hyperemia of the ovary does not appear in all rodents in a similar way. The infantile rat is the best reactor, whereas the infantile mouse and rabbit cannot be used.

3. As regards the hyperemia effect (anterior pituitary reaction II) in the rat, the gonadotropic hormone from the anterior pituitary lobe is the most active, pregnant mare blood gonadotropin is the least active, and the activity of chorionic gonadotropin from pregnancy urine lies in between. With chorionic gonadotropin hyperemia may be produced with the same amount of hormone which evokes vaginal estrus; the amount used for luteinization is about three times as great.

4. Hyperemia is apparently evoked by the luteinizing hormone, while the follicle stimulating hormone seems to play a role as an augmenting factor.

21. In our animals the hyperemia unit (anterior pituitary reaction II in the rat after one injection) approximately equals the blood dot and luteinizing unit (anterior pituitary reactions II and III in the mouse after six injections), but it is possible that this relation differs with different strains of animals.

22. Zondek, B.: Gonadotropic Hormone in Diagnosis of Chorionepithelioma, J. A. M. A. **108**: 607 (Feb. 20) 1937; J. Obst. & Gynaec. Brit. Emp. **49**: 397, 1942.

5. The hyperemia hormone pregnancy test in the infantile rat may be used for the early determination of pregnancy. The time factor plays a decisive part. In the two hour test the reaction is extremely unreliable, so that pregnancy can be diagnosed in only 69 per cent of the cases and with the six hour test in 92.2 per cent, whereas the twenty-four hour test is reliable in 100 per cent of the positive cases. There may be, however, occasional positive results with the twenty-four hour test with nonpregnant patients (tumors). They bring the error in the twenty-four hour test to 1 per cent (tested in 300 cases). The two and six hour tests can be relied on if the result is positive. When it is negative, the result of the twenty-four hour test must be awaited.

6. The hyperemia test in the infantile rat is suitable in undisturbed pregnancies. In cases of disturbed pregnancy (ruptured extrauterine pregnancy, threatened, incomplete or missed abortion, hydatidiform mole and chorionepithelioma) the ordinary hormone pregnancy test cannot be dispensed with for the time being.

7. The hyperemia hormone pregnancy test in rats is based on the appearance of anterior pituitary reaction II, which is one of the decisive principles used in the ordinary hormone pregnancy test.

Clinical Notes, Suggestions and New Instruments

THE PREPARATION OF POTENT ANTI RH TYPING SERUMS BY INJECTION OF RH POSITIVE BLOOD INTO PREVIOUSLY ISOIMMUNIZED INDIVIDUALS

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The experience of the William Buchanan Blood, Plasma and Serum Center with routine Rh typing since May 1944 has led to the conviction that this additional routine service is essential for transfusions of maximum safety.[1] It also appears that infant mortality due to hemolytic disease of the newborn (erythroblastosis fetalis) can be decreased through the additional information acquired from routine Rh typing of all obstetric cases and newborn infants; also routine Rh typing should be available to military services, first, because in the great number of whole blood transfusions now being given there is increased opportunity for Rh negative individuals to be sensitized so that later transfusions may be dangerous and, second, the necessity for multiple transfusions following severe battle injuries increases the opportunities for isoimmunization with the Rh antigen and resultant transfusion accidents.

The chief problem in routine Rh typing is to secure a sufficient and continuing source of potent antiserums. Initially a routine Rh typing service was established in this center largely on the basis of 200 cc. of very high titer plasma obtained from the mother of an erythroblastotic child. With a titer of 1:640 this plasma was theoretically adequate to perform approximately 80,000 tests. Actually, demands from other institutions and quantities used for investigative purposes together with the steady drain of routine testing (over 8,000 tests to March 1945) indicated that some additional or more potent source of Rh antiserums was necessary. We believe that the injection of Rh positive cells in properly selected previously isoimmunized individuals as described in this report may answer this need.

The necessity for using human sources for Rh antiserums results from the fact that sufficiently potent serums are difficult to produce in animals, are small in quantity and, because of low titer, cannot be increased appreciably by dilution. Landsteiner and Wiener [2] first produced an antibody in rabbit serum by intravenous injection of Macacus rhesus erythrocytes. This antibody was designated anti-Rh. Later, Landsteiner and Wiener [3] described the production of antiserums by injection of Rhesus red cells into guinea pigs. Only occasional pigs produced serums of effective potency, and all workers attempting to obtain serum by injection of animals have had difficulty in obtaining high titer useful antiserums. Our own results with animals have thus far been equally disappointing. By contrast, human antiserums obtained from mothers of infants with hemolytic disease have often proved very satisfactory. In fact, even in the original case of isoimmunization reported by Levine and Stetson [4] the mother's serum could be used to differentiate between compatible and incompatible donors, 21 out of 104 being compatible. It seemed logical to go a step further and by intravenous injection of Rh positive cells to raise the titer of the serum from mothers delivered of erythroblastotic infants. This procedure could be used either shortly after delivery to produce higher titers or at later intervals to produce satisfactory antiserums through the anamnestic reaction. Obviously, the possible risks incurred by such blood donors had to be carefully weighed and the decision made in consultation with the patient on an individual basis.

REPORT OF CASES

CASE 1.—A white woman aged 22 of type A, Rh negative, was admitted to the obstetric service Dec. 10, 1944 with the history of an uneventful delivery of 1 previous normal boy eighteen months before (Rh positive by present tests). On the day of admission an apparently normal Rh positive male child was delivered. One day later this baby developed icterus with erythroblastosis but recovered after transfusions of Rh negative blood The mother showed Rh antibodies in a titer of 1:4 with a positive blocking test.[5] A series of small intravenous injections of Rh positive blood was started six days after delivery. The initial dose consisted of 1 cc. of the infant's cells (type A, Rh positive) in 1 cc. of citrate saline solution. Two days later the same procedure was repeated and a sample of blood was taken for titration. Positive agglutination was found at 1:8 dilution, doubtful at 1:16. Blocking antibodies were demonstrated, however, at 1:16 and doubtful at 1:32. An additional injection of 1 cc. of baby's blood was given on the next day and a titration one day later showed an antibody titer of 1:8 but no blocking antibody. Four days later (eight days after the initial blood injection) an injection of 4 cc. of Rh positive blood and 1 cc. of citrate saline solution was given in the morning. A moderate febrile reaction occurred the same afternoon with temperature maximum of 101 F. The blood for this last injection was not taken from the infant but from a person whose erythrocytes agglutinated most strongly with the antibodies already present in the patient's serum. A titration three days after this last injection showed a titer of 1:2,048 and a blocking antibody titer of 1:8 using type O, Rh positive cells of one of us (S. T. T.). A titration with different type A, Rh positive erythrocytes (E. B.) showed a

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From the William Buchanan Blood, Plasma and Serum Center of Baylor Hospital and the Department of Pathology, Southwestern Medical College.

1. Hill, J. M., and Haberman, Sol: Analysis of Routine Rh Typing in Large Maternity and Transfusion Service, to be published.

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titer of 1:512 with no blocking antibodies demonstrated with these red cells. Two days after this test (five days after the last and thirteen days after the initial injection) 500 cc. of blood was collected from this patient and then transfusion of 1,000 cc. of Rh negative blood was given to compensate for blood drawn and for a slight anemia.

CASE 2.—A white woman aged 29 of type A, Rh negative, was admitted to the obstetric service with the history of having had 1 normal male child approximately three years earlier. A full term Rh positive female infant was born jaundiced and anemic but responded well to transfusions of Rh negative blood and recovered. The mother showed antibodies in her serum at a dilution of 1:1,280. Sufficient blood was collected from the patient before leaving the hospital to yield 200 cc. of plasma. This plasma, having a specificity of approximately 85 per cent (i. e. this plasma agglutinates the erythrocytes of 85 per cent of the general population) was used as the basis for starting our routine Rh typing service.

The patient returned eighteen months later and testing of her serum showed that an anti-Rh titer of 1:64 was still present. Injections of Rh positive blood to produce a higher titer typing serum was agreed on after discussion of the procedure and its consequences with the volunteer. An initial intravenous injection of 2 cc. of type O, Rh positive cells (E. W.) mixed with 1 cc. of citrate saline solution was given. On the next day a similar dose of Rh positive, type O cells (S. T. T.) was given. A test titration of the fifth day showed a titer of 1:128 (against S. T. T. cells). On the eighth day a sample was taken for titration and 5 cc. of Rh positive blood (S. T. T.) mixed with 20 cc. of saline citrate solution was slowly given. No ill effects were noted. The serum from this sample titrated at 1:512 against known Rh_o' and Rh_o'' cells. Another test titration on the tenth day showed a titer of 1:640. Blood had to be collected on the twelfth day because the patient had to leave the city. At this time 750 cc. of blood was collected and replaced by a transfusion of 500 cc. of Rh negative blood without reaction. This blood yielded 325 cc. of serum with a titer of 1:2,560, which dropped to 1:2,048 (against known Rh_o', Rh_o'' and S. T. T. cells) after removal of anti-B agglutinins by absorption of B Rh negative cells. An additional 200 cc. of saline washings of the blood clot yielded a useful titer of 1:512. This serum has been dried in convenient small quantities by the adtevac process in glass ampules and vacuum sealed.

The antiserums from each of these volunteers was tested for specificity by typing a consecutive series of mothers and babies in the obstetric service. The serum from case 1 was run parallel with original plasma taken from case 2 following delivery, but before injection of Rh positive erythrocytes. From case 2 after injection of the positive cells the serum was also tested on 271 mothers and babies but not run parallel with the other serum and plasma. These results are shown in the accompanying table.

Results of Testing Antiserums for Specificity

	Total Blood Tested	Rh Negative	Rh Positive	Per Cent Reactivity
Case 1 serum	610	83	527	86.39
Case 2 plasma	610	96	514	84.26
Case 2 serum after injection of red blood cells	271	38	233	85.97

COMMENT

Because of the possible serious consequences of Rh isoimmunization, it is important to decide what criteria should be used in choosing volunteers for production of Rh typing serums by injection of Rh positive cells. First we believe that only those who have been previously isoimmunized (through pregnancy or prior transfusions) should be used. A woman once sensitized to the Rh antigen may find it impossible to have a normal child by an Rh positive husband even though sensitized long before, for example, by transfusions in early childhood. Of course either sex, if previously isoimmunized, faces severe, even fatal, reactions if given transfusions of Rh positive blood. The aforementioned risks which would be deliberately incurred by injecting Rh negative volunteers not previously sensitized probably are not justified even though it appears that a relatively small proportion of Rh negative people are capable of isoimmunization. On the other hand, little if any additional danger is added by increasing the antibody titer. These sensitized individuals in any event should be warned against ever receiving Rh positive blood by transfusion, and mothers who have had an erythroblastotic child or had antibodies in their serum have little chance of having additional normal Rh positive children. Later children, if Rh negative (by another husband or heterozygous husband), would not be affected regardless of anti-Rh titer. Of course, if routine Rh typing should be done universally, the risk of transfusion accidents would be largely eliminated.

In the light of these considerations, we believe that previously sensitized men and women volunteers who understand the essential consequences of the procedure both adverse and beneficial should be accepted for preparation of Rh antiserums as herein described. In the case of women it might be well to accept only those who already have children and especially those not desiring more.

If some risk is still incurred it may well be justified in view of the possible life saving service rendered. For example, the 325 cc. of serum from case 2 alone, because of its high titer, is capable of performing over one-fourth million tests if used at a conservative dilution of 1:40 and assuming 20 tests per cubic centimeter of serum. The problem of producing sufficient anti-Rh testing fluid for routine testing thus appears largely solved. In fact, steps have already been taken by the blood center to make routine Rh testing possible in the obstetric and transfusion services in all the main hospitals of Texas. Furthermore, the use of a strongly reacting testing fluid makes this admittedly delicate test easier to read correctly.

The results obtained by injection of such small amounts of Rh positive blood indicates that the Rh factor may behave as a reasonably strong antigen under suitable conditions. In both cases relatively small total doses of blood were used (7 cc. and 10 cc.) because of uncertainty about the effect on the patient. In view of the reaction in case 1 to 5 cc. we believe larger doses should be used with extreme caution, although the reaction may have been due to pyrogenic substances rather than to hemolysis. In choosing the red cells to inject it seems that the cells of the baby would be most certain to produce further antibodies. On the other hand it may be more difficult to obtain the babies' cells, and in addition these cells may be greatly diluted with transfused Rh negative blood if the infant has been treated for erythroblastosis. Under these circumstances the dosage would be difficult to determine. An alternative would be to use the father's cells if otherwise compatible or to use Rh positive erythrocytes which have been demonstrated to react most strongly with the antibodies already present in the serum of the mother (i. e. cells of same specificity, for example Rh_o'' cells for Rh_o'' antibodies).

In testing the titers of the Rh antiserums the same cells should be employed that were used as the antigen. For the determination of the end point of titration precise measurement of the dilution should be made, using accurate pipets or burets and starting the initial dilution at a fairly high value.

In addition to the value of a high titer in making more tests and clearer tests possible, it should be noted that such serums withstand the necessary manipulations of adsorption with red cells or neutralization with type specific substances without serious reduction of potency. This is important in producing a serum free of interfering anti-A, anti-B or other agglutinins. High titer Rh antiserums also present interesting possibilities for production of subtype antibodies by adsorption

of unwanted fractions by known suitable Rh positive erythrocytes. Furthermore, the choice of different Rh antigens (subtypes) for isoimmunization made possible by our procedure opens up new opportunities for producing specific subtype antiserums.

Because of the value of anti-Rh serum and since there is some evidence that a preservative such as merthiolate may interfere with its reactivity, potent Rh antiserums should be dried from the frozen state in small quantities so that the typing material need not be held in the fluid stage for any length of time.

PREVENTION OF UNINTENTIONAL ISOIMMUNIZATION OF THE RH NEGATIVE FEMALE POPULATION

PHILIP LEVINE, M.D., LINDEN, N. J.

The obstetric history of mothers of erythroblastotic infants reveals that this condition, as a rule, does not occur in the first born. Frequently the first one, two or more Rh + infants are normal. From the point of view of isoimmunization, it is clear that one or more pregnancies with Rh + offspring are required to induce a state of isoimmunization sufficiently intense to produce the hemolytic condition in the following Rh + infant.[1] In other words, the first one or more pregnancies serve the same preparatory function as repeated uneventful transfusions of an Rh — male patient with Rh + blood.

The study to be presented indicates the importance of prevention of the deliberate isoimmunization of the Rh — female population, including even the newborn infant, by transfusions with Rh + blood.[2] Evidence is produced to indicate that even the first born is frequently lost as a result of previous immunization by transfusions. The indications are that once an Rh — individual is immunized, that person remains immunized for the remainder of his or her natural lifetime.[3] Although the immediate evidence of isoimmunization, the presence of Rh antibodies, is evanescent, the tissues responsible for the producton of antibodies, i. e. the cells of the reticuloendothelial system, are capable of responding far more rapidly to the same immunizing stimulus even many years after the initial response. In other words, immune antibodies are demonstrable only for comparatively short periods in contrast to the immunized state, which is persistent for a period of many years and to all intents and purposes must be considered permanent.

Several examples of the long duration of the immunized state produced by several transfusions or by pregnancy or a combination of the two factors have been reported previously.[4] These cases were studied because of the unexpected occurrence of severe transfusion reactions. Recently I studied the blood of an Rh — woman aged 20 whose first pregnancy resulted in the most severe form of erythroblastosis fetalis, i. e. fetal hydrops. Because this severe condition in the first born is remarkably rare, it was suspected that the patient was immunized previously by transfusion. This could be verified because the patient at the age of 6 was transfused several times with her father's blood.

Accordingly, the vast material that I have studied in the past few years was analyzed for the frequency of erythroblastosis fetalis in the first born in two groups of cases: (1) women giving a history of transfusions preceding their first full term pregnancies with Rh + fetuses and (2) a control group not immunized previously by transfusions. These findings, limited to Rh — women, are presented in the accompanying table.

From the Ortho Research Foundation.

1. Levine, P.; Burnham, L.; Katzin, E. M., and Vogel, P.: Am. J. Obst. & Gynec. 42: 925, 1941.
2. Levine, P.: Human Fertil. 9: 65, 1944.
3. Levine, P.: Mechanism of Isoimmunization by Rh Factor of Red Blood Cells: Standardization of Anti-Rh Serums, Arch. Path. 37: 83 (Feb.) 1944.
4. Levine, P., and others, in Mudd, S., and Thalheimer, W.: Blood Substitutes and Blood Transfusion, Springfield, Ill., Charles C Thomas, 1942, p. 309. Weiss, Charles: California & West. Med. 60: 59, 1944. Levine.[3]

These findings indicate that erythroblastosis fetalis is almost twice as common in the group of Rh — women previously immunized by transfusions. Still more striking, however, is the high incidence of fetal death in the first born in the transfused group. Obviously the transfusions induced an immunized state of the antibody producing cells, so that many years later with the very first pregnancy there already was sufficient intrauterine blood destruction to produce fatal forms of erythroblastosis fetalis.

These findings support the recommendation that no transfusion be given to young women, girls or even female infants unless tests for Rh are carried out. All those found to be Rh — must receive Rh — blood. One or more transfusions of Rh + blood administered to an Rh — female infant may prevent her, many years later, from having one or more normal Rh + infants. On a theoretical basis, this possibility has already been mentioned.[5]

The question arises as to the mechanism responsible for erythroblastosis fetalis in the first born in the absence of previous transfusions. Presumably, this group of Rh negative mothers is selected because of their ready susceptibility to respond to antibody production. The possibility exists, however, that the immunization in these women may have been initiated many years previously by the common practice of administering blood intramuscularly, particularly to the newborn. Since the introduction of the use of vitamin K this procedure, by and large, has been abandoned. The objection may be raised that small quantities of blood will not immunize. There is, however, a good deal of evidence in immunologic literature to

Erythroblastosis Fetalis in the First Born of Rh Negative Women

	Transfusion History	
Severity of Disease	+	—
Mild	1	4
Severe	5	4
Fetal death	10	1
Number of cases	16	9

indicate that unbelievably minute amounts of blood or other antigens suffice to induce immunization. It has been calculated[3] that the passage of only 0.13 cc. of fetal blood is required to immunize the Rh — mother. Pregnancy and intramuscular injection of blood provide conditions favorable for immunization, i. e. minute quantities of blood acting over a long period.

In a sense, the conditions for isoimmunization are satisfied in every blood transfusion. It is known that transfused compatible blood survives for a period of one hundred to one hundred and fifty days. Because blood, at any particular time, consists of a red cell population of varying age, there is always a certain small amount of the older red blood cells ready for destruction and, hence, for immunization.

As a rule it is difficult to obtain a history of intramuscular injection of blood, but in view of its routine and indiscriminate practice in the past this procedure must be seriously considered as the source of isoimmunization in Rh — individuals, even in their infancy or their neonatal period. In short, it is necessary to avoid this form of therapy in Rh — girls or women unless Rh — blood is used.

Incidentally, the so-called biologic test to detect Rh incompatibility, as recommended recently, will also serve to immunize.[6]

The unintentional immunization of the Rh — female population by transfusion or intramuscular injection of Rh + blood can now be prevented. This simple measure by itself should reduce the incidence of erythroblastosis fetalis, especially in its more severe forms.

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6. Wiener, A. S.; Wexler, I. B., and Gamrin, E.: Hemolytic Disease of Fetus and Newborn Infant with Special Reference to Transfusion Therapy and Use of Biologic Test for Detecting Rh Sensitivity, Am. J. Dis. Child. 68: 317 (Nov.) 1944.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following article.

HOWARD A. CARTER, *Secretary.*

BODY MECHANICS AND POSTURE

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Physical medicine is a more correct term than physical therapy when such a subject as body mechanics is included. By body mechanics is meant both the static and the functional relationship between the parts that make up the body, and the body as a whole. The study of body mechanics is of as much value in prevention as in the cure of pathologic conditions of the body. The White House Conference on Child Health and Protection made the guarded statement that "it is reasonable to believe that 75 per cent of the youth of the United States exhibits grades of body mechanics which are imperfect." In zoology and botany one finds more definite information of the relationship of appearance and function. Every one can recognize a sick dog because of the dejected position of his body, and all understand when a plant is failing because of its appearance. Every one in the great army who combats human ailments must be interested in the prevention as well as in the cure of disease. Therefore every one should have some knowledge of body mechanics, because it has its application in all specialties.

Body mechanics may be discussed under the following headings:

I. The relationship of posture to health.
II. Evolution of Posture. (The development of our present body, the anthropology of the various systems and the phylogenesis of their functions, which must be analyzed by body mechanics in its broad sense)
III. Posture standards and treatment.
IV. Body mechanics in various specialties (orthopedics, pediatrics, obstetrics and gynecology, internal medicine).

I. RELATIONSHIP OF POSTURE TO HEALTH

Our body build is largely inherited, just as the shapes of our features. Our features cannot be changed, and neither can our body build However, the interrelations of the 200 bones or more which are joined together by ligaments and acted on by muscles are subject to the same mechanical laws and forces which control any other machine. The maintenance of body function, of health, of life itself is concerned with balance between antagonistic forces. Balance is the motivating force in good posture, if we lie down, walk, play baseball, ski or swim. When this balance is disturbed by fatigue, accidents, disease or occupation, the efficiency of the body as a machine is lowered. It may be said that physical laws applied to our body mechanics give the answer to the question if posture is related to physical health.

Even mental health is affected by posture. Our sense of well-being and our emotions are often mirrored in our posture. The psychologist William James once wrote that correct posture kept up the spirits and tended to banish fear and depressing thoughts. All artists, be their medium clay or oil, have always associated alertness with good posture and depression with a slouch.

There are many clinical evidences for the effect of poor body mechanics and health. It is true that we all know of persons with poor body mechanics enjoying apparently perfect health. It must be remembered that our body is wonderfully adjusted to compensate for partial deficiency and also that many persons are satisfied with second or third degree health. The medical profession was slow in accepting poor posture and poor health as one of cause and effect. In 1740 Nicholas Audry taught that many illnesses in children had their origin in imperfect body mechanics. A generation ago the foundation for our present conception of body mechanics and health was brought out by Goldthwait and continued by Osgood. All surveys of posture in our primary schools show less illness, as proved by absences among children taught good body mechanics. Similar surveys in our colleges indicate a definite correlation between good functional health and good body mechanics.

Internists report improvements in arthritic patients when their body mechanics is corrected.

Miller and Polak have shown a definite relationship between posture and health in patients with dysmenorrhea and backache.

Orthopedic surgeons have overwhelming evidence for the importance of body mechanics both as a preventive and as a curative agent. Foot strain, knee pain, backache and many other complaints come daily under their observation and may be eliminated or improved by correction of body mechanics.

II. EVOLUTION OF POSTURE

Comparative anatomy teaches much about the assumption of the erect posture, and to understand body mechanics, one has to consider the alterations that the human anatomy underwent when the body was changed from quadruped to biped. This alteration in posture caused very definite changes not only in the shape and actions of bones and muscles but also in the workings of the circulatory, digestive, endocrine and nervous systems. Further analysis disclosed changes in the histologic structure of the tissues and in the chemistry of the body.

(a) *The Skeleton.*—When strolling through a museum of natural history and viewing the skeletons of reptiles, birds, dogs, anthropoid apes and man one can easily visualize what kind of locomotion such a skeleton performed. The reptile's skeleton was made for swimming and crawling. The forelimbs were developed to raise the animal off the ground and into the air. The hind legs were developed together with the foreleg, and there was the quadruped. The anthropoid apes began climbing trees and holding the body erect at intervals, at least, and man represents the highest development in biped skeletons. The spine changes little, but the head and extremities show pronounced changes. The skull becomes bigger and heavier, especially the frontal and parietal bones. This heavier head is balanced on the cervical spine with the convexity forward. The scapulas are displaced downward, giving a longer neck with more mobility, which compensates for the fact that the eyes are directed forward. The keynote of construction in the shoulder and upper extremity is mobility and speed rather than support. The human clavicle is long in order to hold the shoulder girdle away from the sternum. Thereby the clavicle becomes parallel to the posterior ribs rather than to the lateral ribs as in the quadruped. The glenoid fossa is

small, allowing free movement of the humerus, and this movement is restricted and protected by the acromial process. The so-called carrying angle at the elbow, the slightly separated bones in the wrist and the separation of the thumb from the other fingers are characteristic of the human skeleton.

The biped thorax has its greatest diameter from side to side, with a wide costal angle. The first rib is almost horizontal, and the last rib is nearly vertical and may produce periosteal irritation with the transverse process of the vertebrae.

The spinal column, originally intended for swimming and crawling, presented a convexity posteriorly. The baby is born with a one curve spine, but when it can raise its head the cervical curve develops, and when it can stand the lumbar curve is formed. The sacral and coccygeal vertebrae help to reinforce the pelvis. The spine, with its strong vertebral bodies, its numerous processes and the intervertebral cushion-like disks, is a marvel of elasticity and strength. There are many variations of the spine, both as to number of vertebrae and as to degrees of the curves. They may be regarded as evolutionary progression or retrogression. Thus a lumbar spine of four vertebrae may be considered as a progression and the one curve spine in spondylitis as a retrogression. The force of gravity, transmitted through the spine, is received by the sacrum at an angle. The anterior surface of the sacrum is broader than the posterior surface, and therefore a certain amount of anterior-posterior motion is possible. However, any displacement between sacrum and iliac bone is questionable. The lumbosacral articulation is more commonly involved in pathologic conditions of the lower part of the back. Here a freely movable spine meets a rather rigid pelvic girdle. In the quadruped the sacrum and the ilium are long, narrow bones, while in the biped there are broad, flaring sacrum and iliac bones. These, together with ischial and pubic bones, support the viscera above, protect the reproductive organs within and serve as muscular attachment for the powerful walking muscles. A plane laid through the symphysis pubis and posterior superior iliac spine is at about 40 degrees with the vertical frontal plane and at about 50 degrees with the horizontal plane. The analyses of these planes are important when dealing with body mechanics, because the pelvis works as a double lever with the fulcrum in the hip joint, and any changes in these planes have an important bearing on the position of the spine.

The angle of the neck of the femur is depressed from 150 degrees in the quadruped to 125 degrees in adult man. The head and neck are rotated forward, so that on standing most of the head looks forward. The femur is bowed forward in man, and it was from the study of the histologic construction of the femur that Wolff evolved his law of functional adaptation. Most quadruped knees are held in flexion, while the human weight bearing knee supports the body weight in extension. The medial condyle of the femur is more distal than the lateral one, which projects forward slightly. This projection prevents the slipping of the patella when the quadriceps contracts. The line of gravity falls slightly to the outside of the middle of the knee joint as the result of the valgity. This is even more pronounced in knock-knees, while in bow legs gravity falls toward the median side. Knock-knees are more prone to give trouble than bow legs and often show ligamentous strains and patellar deviations.

It might be suspected that the change to the erect posture would be pronounced in the foot, which is the point of contact between the skeleton put on end and the ground. This is the case. The tarsal and metatarsal bones are in closer apposition than are the corresponding quadruped bones. The development of the horizontal and transverse arches are seen. The big toe is held in extension and close to the other toes, which are held in flexion. The inverted foot of the tree-climbing ape is now everted, and the heel, the outer edge of the sole, the distal ends of the metatarsals and the entire hallux are developed for weight bearing purposes.

(*b*) *The Muscular System.*—The changes in the skeleton are mainly determined by muscles. The aforementioned skeletal changes are therefore to be considered in the light of trophic stimuli of function.

The quadruped holds up his head by means of a powerful ligamentum nuchae, which is aided by strong posterior neck muscles. In the human being the skull is delicately balanced on the cervical spine, the ligamentum nuchae is rudimentary and the neck muscles act like guy ropes. It is easy to understnad that if the human construction of head balancing is forced to hold the head in the quadruped way an undue strain is put on the posterior neck muscles. This is what takes place when one sits in a slouching position with the chin touching the chest, and it will result in a myositis that is often encountered and not easily dealt with unless the position of the head is corrected.

The trapezius, the levator scapulae and the rhomboids help to hold the scapulas in place. When the shoulders are allowed to slide forward and down, pressure symptoms may develop from the cervicobrachial nerves and the blood vessels.

The development of the deltoid in man is related to the increased motion in the glenoid fossa. This has been obtained at the expense of power and stability. One recognizes this in the whole upper extremity. A phylogenic study of the upper extremities shows that abduction, external and internal rotation in the shoulder joint, supination and pronation in the forearm, and apposition of the thumb to the other fingers are more recent developments. It is also of interest to speculate on the fact that these phylogenically younger movements are the first ones lost and last ones regained in many pathologic conditions. These are probably examples of specific morbidity.

An analysis of the mechanics of the extensors and flexors of the wrist and fingers, and the supinators and pronators of the forearm, will give a better understanding of traumatic external epicondylitis and will produce better results in its prevention and treatment.

The most pronounced change in the hip, when the anthropoid is compared with man, is the development of the abductors and the extensors. The opposing adductors and flexors were stretched when the biped position was assumed. Certain check ligaments reinforce the hip joint, the strongest one being the Y ligament, which becomes taut in the erect position. The specific morbidity based on phylogenesis should produce a flexion-adduction deformity in the hip joint following injury and disease, and this is exactly what takes place, and the comparatively new motions of extension and abduction are lost.

The biped locomotion, with flexion-extension of hip and knee, requires a more specialized quadriceps muscle than is seen in the quadruped. This muscle is the keystone of good walking. The coordinated flexion in the

hip and extension of the knee are made possible by the union of the rectus femoris and the vastus medialis and lateralis into one tendon, which is kept taut by the vastus intermedius. Any atrophy or diminished tone of this important muscle, which frequently follows pathologic conditions of the femur, or the knee, should be counteracted as early as possible, or the convalescence will be a very long one.

The knee extension is checked by the hamstring muscles, gastrocnemii and the popliteal ligaments, which latter reinforce the capsule. Any motions but flexion and extension are prevented by the lateral ligaments, the external and internal menisci and the crucial ligaments. The continued sitting position often leads to shortened hamstrings and gastrocnemii. In biped walking the body weight must be lifted and the foot must push the body off the ground. For this purpose the plantar flexors of the toes and foot are well developed. The thirty-eight articulations of the foot, supported by numerous ligaments, the anterior-posterior and lateral arches, all activated by long, slender, quick action muscles and coordinated with movements in knee and hip, make the human gait a great advancement over the shuffling locomotion of the anthropoid ape. The everted human foot, held parallel to the ground by the peroneal muscles, is far different from the grasping inverted foot of the ape, which type of foot is, however, found in the newborn baby up to the age of walking. The extension and eversion of the foot are undoubtedly phylogenically younger movements, and these functions are usually the ones easily lost in paralysis and neuritis from alcohol or metallic poison.

(*c*) *The Gastrointestinal Tract.*—The spine being the main support of the viscera, it is evident that the change to an erect position will affect the organs concerned with the maintenance of nutrition. If several rings are held on a horizontal stick they will hang free from one another, but if the stick is brought to a vertical position the rings will crowd on one another at the lowest point. This is what takes place, to some extent, in the change from a quadruped to a biped posture.

The stomach is attached to the diaphragm at the cardia, and the pyloric end is fixed to the body wall. The liver is partly suspended from the diaphragm and the transverse colon indirectly by means of the mesocolon. A great load is therefore carried by the center of the diaphragm, which, at least partially, is held through the right pericardium by the continuation of the cervical fascia. This fascia is attached to the cervical spine and mastoid process. One can understand, therefore, how flexion of the head and neck relaxes the cervical fascia, causing a ptosis of the viscera in the upper abdomen with pressure exerted on the organs in the lower abdomen and pelvis. Thus it is of importance to carry the chin in and the head back.

The stomach is usually placed well under the ribs of the left thorax. The upper part of the abdomen is roomy, but the lower part is very narrow because of the dorsal and lumbar curves of the spine, which give the maximum room above and the necessary support below. In fact, the anterior surface of the fifth lumbar vertebra is nearer to the anterior surface of the body than it is to the posterior surface.

The spaces flanking the vertebral bodies are filled with the psoas and quadratus lumborum muscles, which adds to the formation of a pear shaped abdominal cavity. The axis of this cavity to the perpendicular line is about 30 degrees. The pelvic cavity, which is directed down and back, has an axis which shows an inclination of about 60 degrees with the perpendicular line. Thus the two cavities are at right angles to each other, which, of course, counteracts the pressure downward. It is in this pear shaped abdominal cavity that the viscera are suspended.

The liver, spleen and kidneys rest on shelves reinforced by adipose tissue and suspended by fibrous bands. The small and large intestine are, in the main, suspended; the other viscera are shelved. In quadrupeds the whole large intestine has a mesocolon. The human ascending and descending colon is usually retroperitoneal and only the transverse colon has a mesocolon, which is suspended from the stomach. However, the quadruped mesocolon persists in about 30 per cent of human intestines, and this adds to the crowding of the viscera. It is evident that any deficiency in the suspension or in the shelves will produce a ptosis and will increase the kinks in the stomach as well as in the small and large intestine; these will have an unfavorable influence, in turn, on the digestion, assimilation and evacuation of the gastrointestinal tract. The congestion that results in the lower abdomen and in the pelvis may add to the factors producing leukorrhea in the female and prostatitis in the male, as well as prolapse of the uterus and anus.

(*d*) *The Circulation.*—The experiment in which a rabbit, when held erect, died from hemorrhage into the splanchnic area suggested that the circulatory system must have undergone certain changes when the biped posture was assumed. In the quadruped body the heart forces the blood stream in horizontal arteries and downward into the extremities, and the only veins that must sustain the weight and pressure of a vertical column of blood are those of the extremities and the intercostal veins. Therefore these veins are provided with valves.

In the erect posture the circulation becomes vertical. One can easily comprehend the increased work that the biped position threw on the cardiac musculature when it is considered that much of our rest is taken in the sitting position, which does not materially alter the load of the vertical circulation on the heart. The valves remain in the intercostal veins, although they have become unnecessary. The lack of such valves in the portal vein may be one of the contributing factors in hemorrhoids, pelvic congestion and ascites.

In the erect position the top of the head is about 40 cm. above the level of the heart, whereas in the quadruped the highest point is only about 15 cm. above the heart. The 25 cm. difference in the blood column represents about one twenty-fifth of an atmosphere. This is a definite addition to the quadruped blood pressure in the left ventricle, and the human organism is as yet but imperfectly adapted to it.

In addition, the arterial pressure is increased by gravity in proportion to the depth below the level of the heart, a depth which varies in both biped and quadruped positions. The portal circulation in the quadruped is at practically the same level as the heart. However, when the biped posture is assumed, the veins of the portal circulation lie 15 to 25 cm. below the heart level and the pressure in these blood vessels is suddenly raised from 15 to 25 mm. of mercury. On account of the high capillary pressure in man there is a greater tendency to edema of the dependent parts than in similarly constituted quadrupeds. This tendency applies especially to the portal area, where the integument is loose, there is double circulation and there is less capillary support.

(*e*) *The Nervous System.*—Although we have seen how the stimulation of muscular contraction affects the bone production, the question of how the osteoblasts rearrange their alinement and production can be answered only by scientific speculation, because of our limited knowledge of biochemical and electrothermic processes. However, it can be assumed that the nervous system plays some part in this trophic change because of the absence of functional response in cases of paralysis. It is therefore necessary to consider the changes into higher specialization of the nervous tissue which made the erect posture possible.

Judging by a child's first efforts to stand and walk, it seems that the erect posture was initially a very conscious effort and that it became less so by force of habit. To keep the skeleton on end in addition to all the other fields of activity thrust on the nervous system in the biped posture required an enormous increase in the size and specialization of this system.

For our purpose, the nervous system may be studied in relation to balance and muscle tonus. Balance is maintained by vision, the semicircular canals, the cerebrum, the cerebellum, and the deep-muscle sense, and deficiency in any one of these will stimulate the remaining ones to increased activity. This accounts for the superior muscle sense of the blind and is the basis of Frankel's treatment of locomotor ataxia.

By muscle tonus is meant the slight persistent tension which is characteristic of a healthy muscle. This tonicity is of the greatest importance in the maintenance of good body mechanics. Our knowledge of muscle tonus is rather limited, but it can be safely stated that the brain and the spinal cord, as well as the impulses arising in the muscles themselves, take part in the control, production and maintenance of the muscle tonus.

The brain's share in maintaining the erect posture may be deduced from the fact that mental concentration is more likely to produce correct posture than the lethargic state of the mentally deficient, among whom the quadruped posture is approached.

Experimental physiology demonstrates that a spinal frog, when suspended, will not take the attitude that gravity would impress on it. If one hind limb is extended gently it will soon draw up and resume the familiar crouching position. This posture of the limb is therefore the result of impressions continually ascending its proprioceptive nerves and exciting a tonic activity, which predominates in certain definite muscles. These posture reflexes, as carried out by the spinal cord, are segmental responses. They determine the relation of the limb to the trunk and, to a lesser degree, of the four limbs to one another. Experiments by Sherrington show that they are reflex in nature and are confined to the so-called antigravity muscles, which maintain the erect posture.

There is no doubt that some primitive posture reflexes are retained in man. We may even assume two posture centers, one in the upper cervical region and the other in the lumbar region. If the patient sits in a relaxed position, throwing the head back in extreme extension of the cervical spine, and from this attitude flexes the head forward so that the chin is pulled in, the result will be that the upper part of the body will assume the correct posture; that is, the back will straighten out, the thorax will be elevated and the scapulas will slide back and down where they belong. It is also of interest to note the postural reflex in the lumbosacral region. If a patient, lying face down, is asked to extend one of the lower extremities with the knee straight, a slight internal rotation of the extremity as a whole will result, with the foot in inversion. These two postural reflexes are of importance in the treatment of faulty body mechanics.

There is another side to posture reflexes, which has been studied by Magnus and de Klein. This deals with plants as well as with animals and their growth in relation to the environment. These investigators have shown that plants orient themselves in regard to gravity along well defined laws. This orientation is called "geotropism" and these same geotropic reflexes, or righting reflexes, are responsible for the ability that animals have to restore themselves in erectness. The phenomenon of a cat always alighting on its feet when tossed in the air is a well known example of this righting reflex.

Thus, in the final analysis of posture one arrives at the postural tone, which Sherrington has defined as "the reactions in which the configuration of the body and its parts is preserved, in spite of forces tending to disturb them, by the activity of contractile tissues, these tissues then functioning statically." This is the basis of physical education, the fundamental truth of which has been forgotten in the search for new and sensational systems.

(*f*) *The Endocrine System.*—Closely associated with the nervous control of body mechanics are the endocrine organs. Study of pathologic conditions of the pituitary gland leads to the deduction that there is some control by this gland over the growth of bones. The pituitary disease called acromegaly, in which the response of the osseous tissue to external stimuli is much increased, forms a beautiful example of Wolff's law. The voluntarily most active parts of the body are the lower jaw, the hands and the feet, and these parts are much overdeveloped in patients suffering from acromegaly.

From similar observations it is known that the overactivity of the thyroid gland produces a slender body type and that diminished activity of the thyroid produces the stocky type of myxedema. The same considerations apply to the thymus, ovaries and testis, all of which, to a certain extent, determine growth and nutrition.

III. POSTURE STANDARDS AND TREATMENT

The human body cannot be standardized, and individuals therefore cannot be made to conform to any definite preconceived standard physically, mentally or spiritually. Two contrasting body types must be recognized. There is the slender, high strung body build, often referred to as the carnivorous type. The other extreme is the stocky, placid type, also known as the herbivorous type. In between are all grades of variation. The posture standards illustrated here can be obtained from the Children's Bureau, Department of Labor, Washington, D. C. Although photographs and x-rays are valuable, they are not always practical. The physical examination should note the following:

1. Drop a tape measure from the mastoid process over the acromial process; it should hang over the greater trochanter and external malleolus. Also drop a tape measure from the posterior process of the seventh cervical vertebra; it should hang midway between the buttocks, the knees and the malleolii.

2. With the patient placed with his back to the wall and the feet 1 inch away, there should be only slight curves in the cervical, dorsal and lumbar regions. The chin should be pulled in over the sternal notch. The sternum should be the farthest forward part of the body, with the costal angle wide. The lower abdomen should be flat. The lower extremities should be

properly alined with the pelvis and the trunk. The femur and tibia should be perfectly opposed in the knee and this maintained by proper muscle balance, favorable to the weight bearing lines which protect the joint mechanism of the feet.

3. The body in motion must also be examined. Let the patient walk about the room and also jump on the right and left foot alternately. This will give an idea of the patient's motor habits.

TREATMENT

The causes of poor body mechanics may be considered under overactivity, insufficient or improper food, weakness against gravity and inherited or acquired faulty positions or movements.

Overactivity.—The rational treatment of overwork is, of course, rest. Hugh Owen Thomas said, many years ago, "The urging need of our art is the fact that much of our surgery is too mechanical, our medical practice too chemical, and there is a hankering to interfere, which thwarts the inherent tendency to recovery possessed by all persons not actually dying." Complete rest position should be approached as much as practically possible. This can be accomplished only on a hard mattress, with no pillow or a very small one. A small pillow under the knees will relax the iliopsoas and produce the anatomic rest position in the lower back, hips and knees. This position will rest the balancing mechanism, which means that the nervous and muscular systems cease working at high speed and have a chance to recuperate. The circulation becomes horizontal, with less demand on the heart and blood pressure. Gastrointestinal distress is often relieved by the recumbent position, respiration is easier and slower, and there is less strain on ligaments and cartilages.

Diet.—The quantity and quality of the food intake correspond to the fuel fed to a machine. We cannot expect function of the body unless properly supplied with carbohydrates for energy, protein for repair, and fat for insulation, minerals, vitamins and so on. The mechanical efficiency of the human body corresponds very well with a machine. In untrained men it is about 20 per cent, in trained men 25 per cent, and in outstanding athletes 33 to 41 per cent.

Support.—Constitutional weakness due to many causes, such as exhausting disease, operation, occupation and environment, often needs support. This support is often necessary in the interim between rest therapy and following the period of exercises. The shoulders may have to be held in a corrected position or the arches raised by means of adequate and inoffensive mechanical apparatus. However, it must be remembered that any kind of support is only a temporary remedy, except in the very aged, and should be discarded as soon as the muscles have regained their tone.

Postural Exercises.—Therapeutics in any field of medicine must be directed against the cause in order to be successful. If this is remembered when one is dealing with faulty body mechanics, it must be realized that exercises are not always the answer to poor posture. However, when exercises are indicated, they must be picked with discrimination. It must be realized that every effort to change voluntarily the relative position of the parts of the body is made through the use of the motor habits, which are expressed in the body alinement. To change posture, motor habits must first be changed in the motor pathways in the nervous system. With this change a different muscular response, both for balance and for movement, will occur. This is best accomplished by slow and oft repeated movements and the visualization of stabilized relationships of the various parts of the body during movement. The principle of posture exercises is best expressed by Cochrane: "If proper posture be maintained by conscious effort for a short time, then the increase of reflex tonus obtained by such posture will serve to maintain the proper attitude without the patient's requiring to give the matter thought and attention." The earlier such posture teaching occurs, the better, since age intensifies muscular habits.

BODY MECHANICS AT DIFFERENT AGES

Preschool Age.—This includes infancy to beginning school age. The baby's parents should be instructed in the symmetrical and nondeforming positions of recumbency as well as in the proper positions of holding the baby. Careful examinations of the baby's head following moving objects, of the grasping reflex of the hands, the kicking reflex of the lower extremities, the efforts at sitting, creeping and standing, will disclose possible abnormalities in growth and function. Some educators maintain that we waste five years of our lives being housebroken when much instruction could be given the child. Be that as it may, it seems only rational to watch this age group for tendencies to faulty body mechanics present in the parents and institute preventive measures. The type of exercises recommended are based on the primitive posture reflexes as advanced by Dr. Haynes. These postural reflexes were developed in the central nervous system before the frontal lobe of the cerebrum learned to think for man. They are the accumulation of associated movements.

Body Mechanics in Children of 5 to 12.—This is the age in which posture consciousness should be taught. However, it should not be associated with punishment. Instead, one should make use of plays and games so that the child will think of good posture with pleasure rather than with penal apathy. With girls, good body mechanics should be discussed in relation to dancing or the proper wearing of clothes. With boys, it is best taught in relation to sports. It is easy to bring out good body mechanics and to correct postural defects when describing the proper use of the body in baseball, swimming, skating and other activities. By combining postural correction with activities, the abnormal stiffness that our forefathers associated with correct posture is avoided and the easy, relaxed carriage is produced. Whenever possible, the natural posture reflexes should be the basis for the postural exercises in this age group. Corrective positions during rest periods are also recommended.

Body Mechanics in Adolescence (second decade).—In this age group body mechanics should be taught in relation to health. The school physician, the school nurse and the biology teacher should be included with the gymnasium teacher in the posture program. Efficiency in athletics should be emphasized in its relation to good body mechanics. A certain amount of corrective training should be introduced, based on hygiene, prevention of future defects and efficiency. There is no reason why such postural habits should not be part of the adolescent life the same as the care of the teeth and the skin, which has been generally accepted.

Body Mechanics in Adult Life.—In this age group we encountered forces of occupation that may alter our body mechanics. It is wise to analyze possible damage done to our body by inactivity at a desk, by monotonous movements repeated throughout the day, and by faulty

positions maintained in relation to machines or other unnatural static or dynamic functions that are imposed on civilized man. It is most important to counteract possible postural, occupational defects by exercises or games which will bring into use such parts of the body as are inactive or stretched during occupation.

IV. BODY MECHANICS IN VARIOUS SPECIALTIES

(a) BODY MECHANICS IN ORTHOPEDICS

No specialty comes in closer contact with body mechanics than orthopedics. I will mention only a few:

In congenital torticollis that has persisted for several years the child gets into the habit of photographing his surroundings on a certain field of the retina. The consciousness of such pictures is related to the child's appreciation of his position to his surroundings. Geotropic reflexes are built up which give the child the impression of being straight when his head is actually crooked, and vice versa. Therefore the cutting of the shortened sternocleidomastoid muscle and the shortened cervical fascia is only the beginning of the treatment. The patient's motor habits, based on the photograph of the surroundings on the retina and its interpretation, must be reeducated. This is a refined point in body mechanics that is most important.

The lateral curvature of the spine of the idiopathic type should be treated as a postural deformity, and symmetrical exercises should be instituted and carried on till the patient reaches at least his sixteenth year. Special attention to the patient's general health, as indicated by his vital capacity, is most important.

The use of postural exercises in low back pain has been confused a great deal. The confusion is due to the fact that the same exercises have been prescribed for all pathologic conditions in the lower part of the back. It should be emphasized that the exercises should be specific and should be based on the pathologic changes present. Dealings with low back patients are facilitated by the following clinical classification:

GROUP 1.—A more or less severe tear may occur, producing a hemorrhage and muscle spasm. The muscles most involved are the quadratus lumborum, gluteus maximus and gluteus medius. A myositis is produced, by laymen called lumbago. The exercises should be preceded by relaxation and the movements should consist of gentle, rhythmic changes of position of the spine, often repeated, but without great effort.

GROUP 2.—There is instability of the lumbosacral region due to congenital defects, an increased lumbosacral angle, spondylolisthesis and other mechanical weaknesses of the fifth lumbar region. Here an attempt should be made to strengthen nature's corset, represented by the abdominal muscles and the gluteal muscles, and correct the posture relation between the pelvis and the spine. A typical exercise is the pelvic roll.

GROUP 3.—Any muscle imbalance in one part of the body will result in compensating imbalance in other parts. A pronated foot, short heel cord, contracted hamstrings or spasm of the tensor fasciae and erector spinae are examples. This requires careful analysis of the body mechanics. The exercises should stretch the shortened muscles, and their antagonists should have concentric movements.

GROUP 4.—This group includes the arthritic spine, by far the most common pathologic condition in the middle and old age group of patients. Included here are synovitis, or arthritis of the small joints of the spine, and also fibrositis along the spine. In the early stages of these conditions it seems rational to try to prevent freezing of the joint motions. This is done by active and passive separation of the articulations. Traction on the spine, flexion forward and sideways, but especially extension, lying, sitting and standing as tall as possible, are the principles used.

GROUP 5.—Here may be gathered such specific cases as fractures and subluxations, synovitis of the sacroiliac joints and rupture of the nucleus pulposus. In this group the treatment is usually specific, but exercises are often used in the convalescent stage and for symptomatic relief. Attention to the general body mechanics should be observed. The proper alinement of the various segments of the body should be checked and possible spasm and muscle shortening counteracted.

(b) BODY MECHANICS IN PEDIATRICS

Pediatricians are usually concerned with children's diet, heart and lungs, tonsils and the infectious diseases of childhood. Body mechanics is seldom considered. The more importance laid on prevention, the more the responsibility is laid on the physicians who guide the child through the early life. Modern civilization has imposed many hardships on the human being, and a child's activities suffer more than an adult's activities. The child has less resistance. Let us, therefore, be kind and understanding, instead of nagging and punishing when we analyze defects in our children. The cause of the child's poor posture should be carefully diagnosed. It may be poor eyesight, poor nutrition or fatigue from various causes, such as constitutional disease or overactivity. There might be inherited weakness. It is evident that the treatment should vary. Exercises are not always indicated. However, when exercises are indicated they should be made a pleasure for the child and not an ordeal. The postural examination should be included in the physical examination and the following facts should be realized:

The feet are the foundation for weight bearing in standing and walking, and any defect in them will influence the rest of the body. If the feet are the foundation and the legs the supporting structures for the pelvis, we have the same mechanics as that of a bridge. The load of transportation varies, and stresses and strains must be met. The load that this bridge carries is represented by the trunk, which is held upright by the spine. In order to support the spine firmly, the pelvis should be placed in good mechanical relation to the spine. The spine, shoulders and arms can be likened to a coat rack, of which the main stem is the spine, the transverse hangers are the shoulders and the hanging coats correspond to the arms. If the spine is correct, the shoulders and arms will fall into the proper position. The head should rest with ease on the spine. This mechanical posture of the skeleton is maintained by muscles, which receive their tone from the nervous system, which in turn depends on the glands and the general nutrition and health of the body.

(c) BODY MECHANICS IN OBSTETRICS AND GYNECOLOGY

The specialties of obstetrics and gynecology seem far from the interest of body mechanics. However, statistics show that of 1,000 cases coming to a gynecologic clinic with the complaint of backache only 18 per cent were due to gynecologic disease and 82 per cent were postural in origin.

Dr. C. I. Miller of the State University of Iowa College of Medicine has published a study of young women in relation to dysmenorrhea. Among young women with dysmenorrhea he found 21.7 per cent with

good posture and 78.3 per cent with poor posture. In the group without dysmenorrhea, 73.9 per cent had good posture and 26 per cent had poor body mechanics.

It is only rational to believe that the great strain put on body mechanics in the pregnant woman should merit more careful consideration. The center of gravity is altered during pregnancy, greater strain is put on the weight bearing extremities, physical activities are restricted, muscles are overstretched, the nutrition is unbalanced, and most of the body systems are put to severe tests. Therefore more thought should be given to the reconstruction of the delivered mother. It seems perfectly logical that child bearing should be carried out without permanent deformity to the body by prescribing postural corrections at the earliest date that these can be taken without danger of hemorrhage or fatigue. Special care should be taken to insure return of normal tone to abdominal muscles, and proper weight bearing of pelvis and spine.

(*d*) BODY MECHANICS IN MEDICINE

The internist has been slow in accepting the place of body mechanics in his armamentarium of cures.

However, overwhelming evidence has been presented by Pemberton, Swain and others that the arthritic patient must be taught the proper use of his body as a whole as well as the various joints. Chronically ill patients may be much improved by instruction in body mechanics. Many can be helped by special substitution movements or mass movement exercises.

Visceroptosis has received much attention from the point of view of body mechanics. Rest, support, diet and the proper instruction in posture and proper postural function are generally accepted now as the foundation for the management of these patients.

Much of our training of spastic hemiplegia depends on the application of body mechanics.

Brachial neuritis, the scalenus anticus syndrome or the cervical rib syndrome are often postural in origin and can be relieved by correcting the position of spine, head and scapulas.

CONCLUSION

Body mechanics, or posture, assumes a greater importance and a wider application when viewed in the light of the foreging discussion. Certain conclusions also may be drawn:

1. The relation between health and body mechanics is soundly based on physical laws and on physiology. There is increasingly strong clinical evidence of posture and health being the cause and effect in many conditions.

2. The physician must be trained in the anthropology and phylogenesis of anatomy and function, so that he can analyze mechanical defects and prescribe proper treatment.

3. The question of posture standards is not satisfactorily solved, but a certain amount of literature can be obtained from the Children's Bureau, Department of Labor, Washington, D. C.

4. There is a definite need of more interest and more understanding of body mechanics among pediatricians, school physicians, gynecologists and internists.

Humiliating statistics were revealed by the universal draft in World War I, and it will be interesting to see if our present physical examinations for the draft will show any improvement. It is a pleasure to testify to the fact that our men in the armed forces today show the carriage and alertness of efficiency after even a short training period.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

VINBARBITAL SODIUM.—Sodium-5-ethyl-5-(1-methyl-1-butenyl) barbiturate.

Actions and Uses.—The actions and uses of vinbarbital sodium are somewhat similar to those of a barbituric acid derivative, having a short induction period and a moderate duration of action. It is used as a hypnotic and sedative. Like other barbiturates, this compound may cause side effects. These include epigastric discomfort, nausea, dizziness, pallor, apprehension, incoordination, weakness, headache and "hangover," while adequate dosage frequently causes a fall in blood pressure.

Dosage.—As a sedative, 32 mg. repeated three to four times daily; as a sedative and hypnotic, 0.1 Gm. to 0.2 Gm.; as a preoperative hypnotic, 0.1 Gm. to 0.2 Gm.; in psychiatric cases, 0.1 Gm. to 0.4 Gm.; for obstetric sedation and amnesia, 0.2 Gm. to 0.4 Gm., with or without scopolamine. Children must be given correspondingly smaller doses.

Caution.—Unbuffered aqueous solutions of vinbarbital sodium are not stable but decompose on prolonged exposure to the air. The powder is hygroscopic, and if capsules are broken or exposed to high humidity the contents are affected by both moisture and carbon dioxide.

Vinbarbital sodium occurs as a white, odorless powder, possessing a bitter taste; soluble in alcohol and water; slightly soluble in ether and chloroform. A 1 per cent aqueous solution is alkaline to phenolphthalein and has a p_H between 8.5 and 9.5.

Tests and Standards.—

To 5 cc. of a 10 per cent solution of vinbarbital sodium slowly add 2 cc. of dilute hydrochloric acid; allow the precipitate to crystallize, filter, wash and dry at 90 C.: the melting point of the vinbarbital is 161 to 163 C.

Transfer 5 cc. portions of a 10 per cent solution of vinbarbital sodium to two test tubes and to one add 1 cc. of mercury bichloride solution: a white precipitate results, soluble in 10 cc. of ammonium hydroxide; to the other portion add 5 cc. of silver nitrate solution: a white precipitate results, soluble in 5 cc. of ammonium hydroxide.

Dissolve 0.1 Gm. of vinbarbital sodium in 10 cc. of distilled water, add 1 cc. of sodium hydroxide solution and 4 drops of potassium permanganate solution: a green color develops in twenty seconds; add 5 cc. of dilute hydrochloric acid: the solution turns pink and a brown precipitate appears. Boil 0.5 Gm. of vinbarbital sodium with 5 cc. of 25 per cent sodium hydroxide: ammonia is evolved.

Acidify 40 cc. of a 10 per cent solution of vinbarbital sodium with dilute nitric acid and filter; separate portions of 20 cc. each of the filtrate yield no opalescence with 1 cc. of silver nitrate solution (*chloride*): no turbidity with 1 cc. of barium nitrate solution (*sulfate*); no coloration or precipitation on saturation with hydrogen sulfide (*salts of heavy metals*).

Transfer about 3 Gm. of vinbarbital sodium, accurately weighed, to a glass stoppered flask, add 50 cc. of anhydrous ether and shake for ten minutes. Decant the supernatant liquid through a filter and again extract the residue with 15 and 10 cc. portions of ether. Evaporate the combined filtered extracts to dryness in a tared beaker on the steam bath: the residue does not exceed 0.5 per cent.

Transfer about 0.5 Gm. of vinbarbital sodium, accurately weighed, to a separator, add 30 cc. of water and 10 cc. of dilute hydrochloric acid. Extract with seven successive portions of ether, filter the combined ethereal extracts and evaporate in a tared dish in a warm stream of air: the 5-ethyl-5 (1-methyl-1-butenyl) barbituric acid content is not less than 89.5 per cent nor more than 92 per cent. Evaporate the aqueous residue to dryness, add 3 cc. of sulfuric acid and evaporate the excess acid. Repeat, using 1 cc. of acid and incinerate the residue: the sulfate ash is not less than 27.5 nor more than 29.5 per cent.

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SATURDAY, JULY 28, 1945

THE THERAPEUTIC USES OF RADIOACTIVE PHOSPHORUS

Radioactive phosphorus has now been employed experimentally in treatment for about six years. The earlier work on this subject has been previously discussed in these columns.[1] Now a fairly extensive experience with this form of therapy has accumulated, especially for the leukemias and polycythemia vera. Recently Warren[2] reported results in the third large group of patients treated by this means since 1940 with radioactive phosphorus, consisting of 81 cases of leukemia, myeloma, Hodgkin's disease and polycythemia vera. The radioactive phosphorus employed in his series was prepared either by bombardment by the cyclotron of red phosphorus placed in an external target chamber or by the bombardment of an iron phosphide probe placed in the deuteron stream of the cyclotron just inside the port. Most of the cases of leukemia subjected to treatment had failed to respond to or were known to be refractory to prior roentgen therapy. Some of them were far advanced cases. Harm did not result from the administration of radioactive phosphorus in the doses employed. Furthermore, a limited number of cases "have done better" than would be expected with the ordinary means of therapy. However, if extensive leukemic infiltration of the marrow is present and there is little normal hemopoiesis, nothing is gained by treatment which destroys the leukemic cells. Under those circumstances the effect is merely to change the leukemia to an aplastic anemia. The basal metabolic rate, Warren says, is one of the useful guides to progress of the disease. This reflects the activity of the leukemic process and may be an even better index during the course of therapy than is the peripheral white blood cell count. Radioactive phosphorus, Warren concludes, provides a safe means of internal irradiation of leukemic tissue. Most patients respond with clinical and hematologic improvement, but the treatment must be considered palliative rather than curative, as the ultimate prognosis of leukemia remains grave.

Radioactive phosphorus in the treatment of polycythemia vera may now be considered of established value. Not only Warren but Hall and his colleagues[3] and others have obtained good results in the use of radioactive phosphorus for this disease. Hall and his colleagues employed this therapy for 12 cases of polycythemia vera over a period of two and a half years. Satisfactory remissions were induced in 8 of the 12 cases and incomplete remissions occurred in 2. Although the results were unsatisfactory in the remaining 2 cases, these investigators believe that this was due to inadequate dosage. In the group in which satisfactory remissions were obtained, both clinical and hematologic improvement occurred. The symptoms attributable to polycythemia vera disappeared and remissions lasting from eighteen to twenty-six months were observed in the favorable cases; 6 of the remissions had lasted for more than a year. The results obtained, the ease of administration (intravenous), the absence of radiation sickness and toxic symptoms and the concentrated effect of the irradiation on the cells of the bone marrow, together with the fact that radioactivity disappears gradually and dosage can be adequately controlled, indicate that this method of treatment is superior to other methods employed in the past. Complications such as leukemia may be produced, and adequate observation is essential in order to prevent severe damage to the bone marrow.

At present it may be concluded that there is adequate evidence to accept the palliative effect of radioactive phosphorus in leukemia and some allied disorders; whether more than palliative effect can be obtained by subsequent investigations into dosages and other technics of administration must be considered doubtful. Although radioactive phosphorus does not bring about a complete cure for polycythemia vera, it can produce a long-lasting remission of the clinical and hematologic manifestations. When the exigencies of the war are past, an adequate supply of radioactive phosphorus probably will be available; the preparation, however, must be administered with great care and circumspection. Its careless use can bring about disorders as serious as those which it is designed to relieve.

1. Therapeutic Trials with Radioactive Phosphorus, editorial, J. A. M. A. **115**:2089 (Dec 14) 1940; Medical Applications of "Atom Smashing," current comment, **115**:862 (Sept 4) 1940; Therapeutic Use of Radioactive Substances, **121**:54 (Jan. 2) 1942

2. Warren, Shields: The Therapeutic Use of Radioactive Phosphorus, Am J. M. Sc. **209**:701 (June) 1945.

3. Hall, Byron E., and others: Radioactive Phosphorus in the Treatment of Polycythemia Vera Results and Hematologic Complications, Am J M Sc **209**:712 (June) 1945.

PHYSICIANS AND ADOPTIONS OF BABIES

In pioneer days the family physician was naturally the person with whom to discuss the adoption of a baby. He knew the unwanted babies. He was expected to maintain secrecy and to respect confidences. For many years the informal adoptions arranged by physicians were as satisfactory a way as could be found. Physicians have continued to function in this capacity. Here and there abuses have been observed, but the vast majority of physicians, in arranging adoptions, do so without profit to themselves and with a view only to the advantage of the baby, the real parents and the foster parents. Many nonmedical abuses have crept into the field of adoption. "Baby farms" and disreputable foster homes, in which unwanted babies were left and from which they are taken by foster parents, often profit both ways from such transactions; they charge mothers for "care" of the baby, often at prohibitive rates; they charge the foster parents all that the traffic can bear.

The control of illicit traffic in babies requires that all adoptions should be a matter of public concern. The state, in taking control, has developed certain general principles which have been republicized by the United States Children's Bureau.[1] Press releases include a comprehensive description of a desirable adoption law covering many points. The general principles which should govern adoption are set forth by the bureau as follows:

1. Adoption proceedings should be held before a local court accustomed to handling children's cases; petitioners for adoption should reside and be known locally.
2. The court should have the assistance of the state welfare department, which should be made a party to every adoption proceeding.
3. Consent to adoption should be obtained from natural parents or other persons or agency having legal responsibility.
4. Court hearings should be closed and records confidential.
5. A trial period of residence, preferably for one year in the adopted home, should be required prior to issuance of the final adoption decree.
6. Provision for removal of children from unsuitable homes should be made as well as provision for their care and guardianship after such removal.
7. All applicable statutes should assure the welfare of the child and the rights and obligations of the parents.

The children of unmarried mothers are particularly subject to possible abuses because of the desire to conceal the illegitimate birth, the emotional state of the mother at the time of birth and the consequent tendency to act rashly in a manner which will be regretted later.

The Children's Bureau declares [1] that not more than one fourth of the states have adoption laws which approximate the standards set forth, although within the last five years about forty states have improved their legislation in some respects.

In view of the increasing complexity of legal and sociologic implications involved in adoption state laws may eventually establish specialized agencies to supervise the adoption of children and the physician's role in that field will be restricted. Much of the abuse now present in the field can be minimized by the enactment and enforcement of adequate laws respecting child placement agencies.

1. U. S. Dept. of Labor, Children's Bureau, Washington, Press Release, Jan. 22, 1945.

"PSEUDODOXIA PEDIATRICA"

Under the heading "pseudodoxia pediatrica" Bakwin [1] calls attention to a number of doubtful practices in current use among pediatricians. The worst offender among these, he believes, is indiscriminate tonsillectomy. The American Child Health Association, some ten years ago, surveyed a group of 1,000 children 11 years of age from the public schools of New York City; 61 per cent had had their tonsils removed. The remaining 39 per cent were subjected to examination by a group of physicians who, in turn, selected 45 per cent of these for tonsillectomy and rejected the rest. The rejected children were reexamined by another group of physicians, who recommended for tonsillectomy 46 per cent of those remaining after the first examination. When the rejected children were examined a third time, a similar percentage was selected for tonsillectomy, so that after three examinations only 65 children remained who had not been recommended for the operation. Apparently the chance that a child would be recommended for operation depended principally on the physician rather than on the status of the child's health. In groups of children with severe dental caries and visual handicaps for which nothing had been done, about 60 per cent were submitted to tonsillectomy. Another operation often performed without sufficiently specific indications is myringotomy. The author showed at Bellevue Hospital, before the use of sulfonamide drugs, that the incidence of purulent otitis media in infants could be greatly reduced by limiting otoscopic examinations and adhering to stringent criteria for myringotomy.

We are rather proud of our record of deliveries of mothers in hospitals in the United States. Bakwin reminds us, however, that data are not available to prove that indiscriminate hospitalization for delivery has had a favorable influence on either maternal or neonatal mortality. There is material for thought in the report of the Frontier Nursing Service of Kentucky.

1. Bakwin, Harry: Pseudodoxia Pediatrica, New England J. Med. 232: 691 (June 14) 1945.

The service has reported a maternal mortality of 0.75 per thousand births in its first 4,000 deliveries, as compared with 5.6 for the white population of the United States of the same time. These deliveries were done in homes which were extremely poor. Operative deliveries were rare, and stillbirth and neonatal death rates did not differ significantly from those of the country as a whole.

Bakwin believes that hospitals are unsuited for the care of the newborn. The obstetric nurseries are crowded and expose the infants to epidemics, particularly those of diarrhea. Pneumonia, sepsis and other infections are not infrequent. These conditions are rare in the home. Recent studies suggest that the separation of mother and baby, as practiced in hospitals, is unnatural and unphysiologic. The system of bringing babies to their mothers only at fixed intervals and allowing them to remain for limited periods, he argues, is not conducive to proper breast feeding, especially during the first three weeks of life. Bakwin readily agrees that the hospital is the proper place for the delivery of selected patients when difficulties are anticipated, but he feels that some modification of the present system of indiscriminate delivery in hospitals should be made.

Among many fallacies resulting principally from rationalization without scientific check, those pertaining to the field of nutrition offer a fruitful field. Infants are fed vitamins, although there is not definite clinical evidence that deficiency diseases are common among children or that any benefit can be derived from the general use of vitamins except in the case of vitamins C and D in infancy. The major fallacy, Bakwin points out, is to think that the appetite cannot be trusted in the selection of a proper diet and that laboratory investigations have progressed to the stage where they can be trusted to make such a selection. He insists that eating should mean roasts, sauces, puddings or pies rather than calories, vitamins and minerals, and that if he was to choose between chef and dietitian he would choose the chef.

Explanation for the continuation of these practices, according to Bakwin, is the tendency to accept ideas rather than to question them and subject them to experiment and clinical control. The indifference of the academic pediatrician to the details of everyday practice, the type of training given to the future pediatrician and his orientation toward his practice are all factors. The physician often feels that he must do something; in his anxiety to act he frequently does too much to the detriment of both the child and the parent.

The iconoclast is not new in medical science. The continuous questioning of its own theories and practices is conspicuous in modern medicine. Iconoclasm serves a useful purpose. Let us remember that often the results serve to restore new faith in old methods, by placing them on firmer foundations.

Current Comment

THE ANTIRETICULAR CYTOTOXIC SERUM OF BOGOMOLETS IN THE TREATMENT OF RHEUMATISM

The therapeutic agent called the antireticular cytotoxic serum of Bogomolets (A C S) is based on the concept that the connective tissue of an organism contains a number of hitherto uninvestigated physiologic functions. The aim of the serum is to stimulate these functions and to intensify active immunity. The serum is produced by the immunization of horses with the cells of the spleen and bone marrow taken from a human corpse. The determination of the amount of cytotoxins in the serum obtained is important. The amount of cytotoxins in the serum of the immunized animal can be determined by applying a modification of the reaction of complement fixation (reaction of Bordet-Gengou); that is, by using an antigen for the reaction of complement fixation, the same antigen as is used for the immunization of the animal. The strength of the serum is determined by ascertaining the dilutions at which it still gives a complete fixation of the complement. Therapeutic serums are those which give a complement fixation in a dilution of not less than 1 : 100. The serum is injected subcutaneously in an isotonic solution in the dilution of 1 : 10. The stimulating dose of the diluted serum equals 0.3-1.0 cc. Small doses of cytotoxic serum have a stimulating effect; whereas large doses have an inhibitory effect. The reactivity of the physiologic system of connective tissue can be determined, according to Bogomolets, by a number of tests such as the dermal tests with trypan blue, blood morphology, the sedimentation speed of erythrocytes, the titer of the complement, the opsonic index and the phagocytic activity of the leukocytes. Among the numerous conditions in which the serum is supposed to exert a favorable effect is "rheumatism." In a report to the Empire Rheumatism Council on the action of this serum in 48 selected patients representing various types of "rheumatism," Francis Bach [1] states that his investigation does not support the claim that the antireticular cytotoxic serum of Bogomolets is a cure for "rheumatism." Definite subjective improvement was observed in only 7 of this group, while in another 7 there was slight improvement. Of the 3 cases of rheumatoid arthritis which showed definite improvement, there was a relapse two months later. Bach suggests that the type of the case and the stage in the pathologic process that has been used for this preliminary study are probably not those which Professor Bogomolets had in mind. In fact, when asked for an opinion regarding this report, Bogomolets stated that he has come to believe that his serum is suitable only in the acute phase of the rheumatic disease. Professor Strozhesko, one of Russia's prominent internists, in whose clinic the action of the serum in rheu-

1. Bach, Francis: A. C. S. Serum of Professor Bogomolets in the Treatment of Rheumatism, Ann. Rheumat. Dis. 4: 62 (March) 1945.

matism was studied, stated that the serum in stimulating doses produces the best effect with infectious diseases in what he calls the allergic period of their course. The efficiency of this serum in rheumatic conditions is at least doubtful. The burden of proof is still on the proponents.

THE GIBSON ISLAND CONFERENCES ON CHEMISTRY

The special research conferences on chemistry and its allied fields, held at Gibson Island under the auspices of the American Association for the Advancement of Science, are now in session. The recent conference on medicinal chemistry bore testimony to the current interest in antibiotics and their role in chemotherapy. Prospects for several competitors or collaborators with penicillin are encouraging. That the chemists have not abandoned the search for symptomatic remedies, however, was borne out by the interest shown in new analgesics, antispasmodics and antithyroid compounds. In the case of the chemotherapeutic agents as well as of the pharmacodynamic agents, great interest attaches to the relation of chemical structure to biologic activity. As was repeatedly brought out in the discussions, such relationships are important in directing the synthesis of new compounds but have a limited predictive value as to the merits of a new compound synthesized to specifications. As the testing and appraisal of new drugs is often more arduous and time consuming than their preparation there is a virtual log jam of new compounds awaiting tests and appraisal. Abbreviated "screening methods" are necessarily employed but could not be expected to be wholly satisfactory.

MEDICAL BOOK REVIEWS

The quality of reviews of books in the field of medicine in five representative medical journals has recently been evaluated.[1] The criteria by which the contents of the reviews were judged were discussion of author's qualifications and basis of his work; indication of whether the book is a reference book, textbook or manual; indication of the author's purpose in writing the book, his objectives and point of view; inclusion of subject matter covered, as well as scope of book; format, type, illustrations, plates and bibliographies; indication of manner of treatment, style of writing and effectiveness; indication of the accuracy of the author's statements, and inclusion of comparison with related books in the field or similar books by the same author. By rating the five journals from 0 to 5 on these criteria, it was found that THE JOURNAL, with an average of three or better on four different points, namely, purpose, subject, reliability and form, obtained the highest rating of the five periodicals with a total average score of 2.5. This study and its conclusions furnishes objective evidence of the reliability and value of the reviews published in THE JOURNAL.

1. Wilson, Julia E.: An Evaluation of Medical Book Reviews: A Preliminary Study, Bull. Am. Lib. A. 33: 305 (July) 1945.

INTELLIGENCE AND SEX

There is no difference in mean intelligence between boys and girls. This fact has been shown repeatedly by adequate studies of performance of boys and girls when subjected to modern methods of intelligence testing. There is, however, a real, i. e. statistically valid, difference in the degree of variance of intelligence between boys and girls. There are more boys at both extremes of intelligence—brighter and duller—than there are girls. Roberts,[1] in a thoughtful discussion of this subject, states that in the one thousand "cleverest" or "dullest" children out of ten thousand there are 534 boys to 466 girls, or a ratio of 115 boys to 100 girls. This variance increases as one approaches the extremes of intelligence. Thus in the final 0.1 per cent at the highest and lowest intelligence levels there are nearly twice as many boys as girls. That boys are so much more variable than girls in regard to general intelligence is one of the most curious facts in human biology, especially in view of the lack of difference in mean performance. There is no doubt as to the reality of the phenomenon. Roberts, probably correctly, eliminates any differential cause due to education during school or preschool life and concludes that the difference is almost certainly genetic, but in what manner this is brought about is at present completely obscured.

MORE HOME CANNING

Every indication points to the need for matching again this year the record set for home canning during 1944, when nearly one half of the total canned vegetables and two thirds of the canned fruits used by civilians were home canned. The War Food Administration has prepared numerous suggestions on means of disseminating information for the promotion of home canning. These include the use of radio, clubs, schools, churches and demonstration centers to interest the housewife in food preservation and to assist her in every way possible. The problems of home canning this year are further complicated by the necessary cut in the allotment of sugar for this purpose. This obstacle can be overcome in part by the use of numerous methods of preservation which require little or no sugar. Fruits may be kept from spoiling by processing without sugar or by substituting part corn syrup or honey. The drying of fruits in home built dehydrators does not require sugar. More pressure cookers are available this year, without priority, through regular commercial channels, for efficient canning of vegetables other than tomatoes. Instructions for the use of these canning procedures and equipment are provided in the many publications of the Department of Agriculture and the War Food Administration. The campaign to acquaint the public with the need for more canning and better canning is much to the point in view of the nation's food situation.

1. Roberts, J. A. F.: The Difference Between the Sexes in Dispersion of Intelligence, Brit. M. J. 1: 727 (May 26) 1945.

MEDICINE AND THE WAR

ARMY

56th PORTABLE SURGICAL HOSPITAL

The 56th Portable Surgical Hospital was recently recognized for superior and meritorious service while attached to the veteran 33d Infantry Division during the rugged fighting in the Benguet Mountains of northern Luzon. Commanded by Major Evan C. Reese of Stroudsburg, Pa., the 56th Portable Surgical Hospital was awarded the Meritorious Service Unit Plaque by Major Gen. P. W. Clarkson, commanding the 33d (Prairie) Division, which liberated Baguio. The citation stated that "the excellent care given patients has resulted in the saving of many lives and in returning many casualties to a full duty status. The 56th Portable Surgical Hospital achieved and maintained a high standard of military discipline throughout the entire Baguio campaign."

FIRST MEDICAL OFFICER TO BE DISCHARGED UNDER POINT SYSTEM

The Office of the Surgeon General stated recently that Major Wallace P. Ritchie, St. Paul, will be the first medical officer to leave the Army under the point discharge system. He has 121 points, having served thirty-three months overseas in England, North Africa and Italy. Dr. Ritchie graduated from Johns Hopkins University School of Medicine, Baltimore, in 1931 and entered the service Feb. 15, 1942.

GENERAL BURSTON OF AUSTRALIA IN THE UNITED STATES

Major Gen. S. Roy Burston, Director General of Medical Services of the Australian Military Force, was in Washington recently, where he conferred at the Office of the Surgeon General. He arrived in this country on an inspection trip during which he will visit military medical installations and medical foundations in the United States and Canada.

ARMY AWARDS AND COMMENDATIONS

Captain Herman Schneck

Capt. Herman Schneck, formerly of New York, was recently commended "for superior performance of duty and maintenance of medical facilities." The commendation read, in part, "You have imbued all members of this command with profound confidence in your ability, by skilful and efficient treatment of the many and varied cases that have developed here, and we all feel that we are indeed fortunate to be in such good hands. Recently pictures have been taken of the post dispensary and war building by photographers dispatched from department headquarters, with the intention of publishing them as models. . . . The undersigned is well aware of the poor facilities that existed at this post prior to your arrival, and it is desired that you receive full credit for the present condition of the medical facilities of this post, which have been so well liked by our superior headquarters and have caused this signal honor to be conferred on our command." Dr. Schneck graduated from the New York University College of Medicine, New York, in 1917 and entered the service Dec. 3, 1942.

Major Homer W. Humiston

Major Homer W. Humiston, formerly of Tacoma, Wash., was recently presented with the Bronze Star, accompanied by a citation "for meritorious service in connection with military operations against the enemy on Leyte, P. I., from Nov. 24 to Dec. 25, 1944. As assistant chief of the surgical service Major Humiston rendered a type of surgery to wounded soldiers and civilians that was outstanding. In addition to spending long hours in the surgery, he supervised the preoperative and serious postoperative wards in a manner that was worthy of merit. By his skill as a surgeon plus his devotion to the patients, Major Humiston saved the lives of many men as well as hastening the recovery of others less seriously injured." Dr. Humiston graduated from Harvard Medical School, Boston, in 1925 and entered the service Nov. 5, 1942.

Major Hildrus A. Poindexter

The Bronze Star was recently awarded to Major Hildrus A. Poindexter, formerly of Washington, D. C., "for meritorious service in support of military operations against the enemy at an island base in the Southwest Pacific Area. During the period of June 15, 1944 to Oct. 30, 1944 Major Poindexter not only acted in the capacity of an infantry division malariologist but also performed the additional duties of an island command malariologist. By his faithful, energetic, aggressive and skilful work on the problems of malaria control, the rate of malaria fever among members of the command was materially reduced Major Poindexter's services reflect credit on himself and on the military service." Dr. Poindexter graduated from Harvard Medical School, Boston, in 1929 and entered the service April 22, 1943.

Lieutenant Colonel Eugene F. Melaville

Lieut Col. Eugene F. Melaville, formerly of Rochester, N. Y., was recently awarded the Bronze Star for "meritorious achievement in connection with military operations against the enemy on Peleliu Island, Palau Group, from Oct. 4 to Nov. 27, 1944. In the absence of normal third echelon medical service, the facilities of the division clearing company and a portable surgical unit were combined to hospitalize wounded and sick of the division and attached units. . . . By his untiring effort and vigilant supervision, Colonel Melaville made a splendid contribution to the efficient hospitalization furnished the division in the Palau Islands." Dr. Melaville graduated from Washington University School of Medicine, St. Louis, in 1938 and entered the service July 1, 1942.

Captain Robert S. Hormell

In recognition of his "outstanding conduct in the performance of duty," Capt. Robert S. Hormell, formerly of Boston, was recently commended by Major Gen. R. G. Breene, U. S. Army, the citation reading that Captain Hormell, "by denying himself sleep and rest did, during the month of April, save the life of a colored soldier who was severely burned and injured in a gasoline explosion on April 4, 1943. For the first forty-eight hours following this accident this officer remained constantly at the side of the injured soldier, and as a result of his personal knowledge and skill and through his perseverance when the rest of the staff despaired of this soldier's life, the soldier's life was saved." Dr. Hormell graduated from Harvard Medical School, Boston, in 1939 and entered the service June 1, 1942.

Major Thomas R. White

A Distinguished Flying Cross was recently awarded to Major Thomas R. White, formerly of Redlands, Calif., for "extraordinary achievement while participating in a highly destructive raid on the Japanese mainland on April 18, 1942. These officers and enlisted men volunteered for this mission knowing full well that the chances of survival were extremely remote and executed their part in it with great skill and daring. This achievement reflects high credit on them and on the military service." Dr. White was also awarded the Silver Star and the Military Order of China. Dr. White graduated from Harvard Medical School, Boston, in 1937 and entered the service Aug. 15, 1941.

NAVY

PHYSICAL REQUIREMENTS FOR DUTY ABOARD SUBMARINE

Lieut. Comdr. J. J. Blanch, senior medical officer aboard a submarine tender in the Pacific, recently outlined the rigid physical requirements for duty aboard a submarine, as follows: The submarine man should be lean and agile so as not to take up too much space aboard the subs, which are very cramped for space. A slender person can also get around much easier. He must have 20/20 uncorrected vision and be able to hear a standard navy clock at 40 inches. He must not be afflicted with chronic throat trouble, nor must he have a fungous infection allergy. The sub man must meet special dental requirements, since there is no way of rendering dental aid while on patrol. A man suffering from claustrophobia does not qualify. A near-perfect physical specimen, who is cool and not easily perturbed during an emergency, is the type of man for the submarine service. Since the crew on a submarine is comparatively small, every man must be physically able to perform his job well under all circumstances. When submarines return to a tender following a patrol, the crew, after being examined physically, are sent to a rest camp for two weeks, during which time an emergency crew aboard the tender prepares the boat for action again.

NAVY AWARDS AND COMMENDATIONS

Commodore John Paul Owen

The Legion of Merit was recently awarded to Commodore John Paul Owen, formerly of Oak Grove, Mo., who was cited "for exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as medical officer in command of the Naval Hospital, Navy Yard, Mare Island, Calif., from Nov. 11, 1942 to March 1, 1945. Exercising sound judgment and outstanding technical ability, Commodore Owen rendered valiant service in carrying out the varied and complex details of his vital assignment, laboring tirelessly and with unceasing diligence in expanding his hospital to meet the demands of ever growing lists of casualties returned from battle fronts all over the world. In addition to his administrative duties at the hospital, he undertook the development of a plastic artificial limb which has been extensively recognized in medical and scientific fields and universally adopted as an orthopedic device of inestimable value in rehabilitating wounded men of all Allied Nations, supervising the manufacture of the new device on the premises. By his superior knowledge, expert professional skill and zealous devotion to this extremely vital task, Commodore Owen served as a constant inspiration to the returning veteran in resuming his normal place in society." Dr. Owen graduated from St. Louis University School of Medicine in 1913 and entered the service April 14, 1917.

Lieutenant Jack C. McCurdy

Lieut. Jack C. McCurdy, formerly of Marshall, Texas, was recently presented with the Navy Unit Commendation Ribbon for the First Provisional Marine Brigade in recent ceremonies at the Naval Air Station, Pensacola, Fla. He is now attending the School of Aviation Medicine in Pensacola preparatory to receiving the wings of a flight surgeon. Already the holder of a Navy Cross and the Purple Heart, Dr. McCurdy was attached to the First Provisional Marine Brigade for one year and was with it during the assault on Guam. It was during that period, from July 21 to Aug. 10, 1944, that the brigade won the Navy Unit Commendation. He won the Navy Cross for his action during the first day of the assault on Guam while he was attached to a Marine battalion. He was also wounded during the Guam battle. Dr. McCurdy graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1941 and entered the service Jan. 5, 1942.

MISCELLANEOUS

QUINACRINE HYDROCHLORIDE (ATABRINE) FOR CIVILIANS

The War Production Board recently announced that the military services have stated that a small percentage of veterans now being discharged from the services will require some form of antimalarial treatment during periods of relapse of this disease. Quinacrine hydrochloride (atabrine) is readily available in adequate supply to meet civilian requests for both oral and parenteral use, according to the War Production Board. Quinine may be obtained in ampule form for parenteral use when required, but it is not available for oral use. However, totaquine U. S. P., representing the total alkaloids of cinchona bark, is available for oral use in quantities sufficient to meet all requests for natural antimalarials.

Physicians and patients who require such medication should purchase their supplies from local druggists or other sources of pharmaceutical products. Occasionally local druggists, particularly those in the Northern sections of the country, may not have stocks of quinine ampules, totaquine or quinacrine hydrochloride (atabrine) on hand. Under such circumstances the druggists should be requested to obtain the desired items from wholesalers or from the manufacturers of these products, through their usual channels of distribution.

PHYSICIANS WITH THE VETERANS ADMINISTRATION

At the suggestion of the Secretary of War, the Administrator of Veterans Affairs has agreed that the Readjustment Regulations will be applicable to Medical Corps officers assigned to the Veterans Administration. When the critical adjusted service rating score has been formally announced, officers who are assigned to the Veterans Administration may be relieved from active duty the same as officers who are serving with the Army under these regulations. Attention is also called to the fact that any Medical Corps officer assigned to the Veterans Administration has the privilege to request relief from active duty under the provisions of section III or IV, War Department Circular 485, dated Dec. 29, 1944. If an officer submits a request for relief from active duty under section III, he must accompany his request with a statement from the executive officer, Procurement and Assignment Service, War Manpower Commission, showing the need for his services in a community.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, July 21, page 887)

CONNECTICUT

Norwich State Hospital, *Norwich.* Capacity, 2,600; admissions, 737. Dr. Riley H. Guthrie, Superintendent (4 residents—psychiatry, 3 disqualified for military service).

Waterbury Hospital, Waterbury. Capacity, 372; admissions, 8,402. Miss Aida E. Creer, R.N., Superintendent (interns, April and July; resident, April).

KENTUCKY

Louisville General Hospital, Louisville. Capacity, 587; admissions, 9,971. Dr. John W. Moore, Medical Director (assistant resident—pediatrics, disqualified for military service).

MASSACHUSETTS

Cambridge Hospital, Cambridge. Capacity, 272; admissions, 6,078. Dr. F. A. Washburn, Medical Director (interns; assistant resident, discharged medical officer).

NEW YORK

Goldwater Memorial Hospital, New York City. Capacity, 1,660; admissions, 1,676. Dr. C. G. Scherf, Medical Superintendent (resident).

Metropolitan Hospital, New York City. Capacity, 1,183; admissions, 8,838. Dr. Randolph A. Wyman, Medical Superintendent (interns, October 1).

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

July 23, 1945.

A National Science Foundation

Legislation embodying the Kilgore subcommittee recommendation for creation of a national science foundation to oversee research of government agencies, industries and private organizations will be introduced this week by Senators Kilgore of West Virginia, Johnson of Colorado and Pepper of Florida. A bill already drawn by the subcommittee on war mobilization provides for a $15,000 a year director and a seventeen member national defense board, including the heads of the War, Navy, Interior, Agriculture, Commerce, Labor and Justice departments and the Federal Security agencies. The Kilgore proposal, following issuance of the Bush report, which advocated a nine member board, would create a foundation to distribute federal funds for research in the weapons of war, health and medical care, advancement of the basic sciences and other activities. Under the Kilgore plan, funds would be allocated as follows: Twenty per cent of an annual appropriation, total to be determined by Congress from year to year, appropriated annually to each of three main branches: national defense, health and medical care, and basic sciences. Funds would also be allocated to research on natural resources, methods, products and processes of value to small business, and on peacetime uses for wartime research and wartime facilities. At least 50 per cent of each year's funds would be earmarked for nonprofit educational institutions and research foundations. They would be "free to conduct their research work in a manner which they think most productive, subject only to routine supervision and review by the foundation."

Better Artificial Limbs Requested for Servicemen

More intensive research on the development of better artificial limbs for servicemen was urged by Representative Rogers of Massachusetts in the House. She said that they are not getting the best artificial limbs that science could devise. Ranking minority member of the House Veterans Committee, long interested in medical legislation, Mrs. Rogers did not blame the Army entirely for failure to provide better appliances for veterans but said that the War Department had ample funds to do more than has been done. She commended the project started under the direction of Gen. Brehon B. Somervell, commanding general of the Army Service Forces. Mrs. Rogers reported conversations with amputees at Walter Reed Hospital who said that their artificial limbs were none too comfortable or practical. Representative Miller of Nebraska, a physician, agreed with Mrs. Rogers that the army amputee center was not making entirely satisfactory artificial limbs.

Research Laboratories Studying Better Artificial Limbs

Coincident with criticism by House members of artificial limbs now supplied to servicemen were reports of how research is being pressed in laboratories of General Motors, Northrop Aircraft and other war plants in an effort to make better artificial arms and legs. It is reported that some of the new technics and materials used in the production of airplanes will be used to help provide wounded soldiers and sailors with the best artificial limbs. A belated effort is now said to be under way to solve the problem that Dr. Paul E. Klopsteg of Northwestern University, head of the research program set up by the government's Office of Scientific Research and Development, said "should have had attention years ago." It is claimed here that the government did nothing until a few months ago because the artificial limb industry, which is soon to be investigated by a federal grand jury, had strongly opposed suggestions that the government foster such research. It took some effort to convince high government officials that the research was necessary, it is stated. The American Legion has charged that "the manufacturers have neither the resources nor the equipment to engage in extensive research engineering unless government agencies assist." To this charge, which was forwarded to Brig. Gen. Frank T. Hines, former head of the Veterans Administration, Chester O. Hadden of Denver, official of the Gaines Artificial Appliances firm and president of the Association of Artificial Limb Manufacturers of America, is reported to have replied that the legion resolution was not based on fact. He said that members of the industry spend "many thousands of dollars year after year" in research and that "there is absolutely no necessity for the allocation of any federal funds for research in this field at the present time."

A Broad Program of Scientific Research

Better health, more jobs in peacetime and the development of new weapons of war are objectives of a broad scale, publicly financed program of scientific research, urged by Dr. Vannevar Bush, director of the Office of Scientific Research and Development, in a report to President Truman. Representative Jennings Randolph and Senator Warren R. Magnuson have proposed a bill to implement the Bush report. The report recommends that Congress establish a National Research Foundation with five divisions to study specific fields of study. An initial $35,000,000 program is urged, with costs to rise as work increases, to finance research and provide 24,000 undergraduate scholarships and 900 graduate fellowships to augment the roll of scientists. The Bush report is based on the findings of four committees of specialists, drafted in response to a request to him by the late President on Nov. 17, 1944. Three specific recommendations in Dr. Bush's report are that the foundation be formed to develop scientific research, financially support basic research in nonprofit organizations, encourage scientific talent in American youth by offering scholarships and fellowships and promote long range research on military matters; that the foundation consist of nine members to be elected by the President and be responsible to him, to serve four years and without compensation, and that the foundation have five divisions: medical research, natural sciences, national defense, scientific personnel and education, and publications and scientific collaboration. In urging government support of scientific research, Dr. Bush said that at present there are forty separate agencies in the government carrying on various forms of scientific work. Since 1930, he said, funds spent by the government and by industry for scientific research had increased from $140,000,000 to $309,000,000 in 1940. In the same period colleges and universities raised their expenditures from $20,000,000 to $31,000,000, while money spent by research institutes dropped from $5,200,000 to $4,500,000.

Women Physicians to Have Important Postwar Role

Women physicians, who before the war constituted less than 5 per cent of the 165,000 physicians practicing in the United States, will have a larger part in filling postwar medical needs, according to the Women's Bureau of the Department of Labor. A bureau report said that the war has greatly increased the demand for women physicians, both for the army and navy and to replace doctors who have gone into the armed forces. Only four out of the seventy-seven approved medical schools in this country now refuse admission to women. While women have tended to specialize in pediatrics, psychiatry and public health, it is expected that they will expand into other medical fields, including medical research and teaching, after the war.

U. S. Navy Studies New Age-Service Discharge Plan

The U. S. Navy is considering a new, age-service point system under which older reserve officers and enlisted men will be discharged or released to inactive duty. An estimated 11,600 officers and 19,000 enlisted men would be eligible for return to civilian life under the system by next December. The minimum points required range from 53 to 57, depending on the service branch, and the new plan calls for computing a man's "service age" by allowing one point for each year of age, plus an additional point for each four months of active duty since September 1 when Germany invaded Poland.

Bureau of Information

SUMMARY SHEETS FORM INDIANA AND PENNSYLVANIA

Completed county summary sheets have been received from each county in Indiana through Mr. Thomas Hendricks, secretary of the Indiana State Medical Society, and from each county in Pennsylvania through Dr. Walter F Donaldson, secretary of the Medical Society of the State of Pennsylvania.

Pennsylvania

County [1]	Principal Cities	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [2]
Adams		37,079	14	2,649	13
	Gettysburg	5,916			
Centre		47,318	29	1,632	9
		6,226			
		5,304			
	Philipsburg	3,963			
Indiana		68,911	31	2,222	16
	Indiana	10,050			
	Blairsville	3,002			
	Clymer	3,082			
Lawrence		93,094	47	1,981	8
	New Castle	47 638			
	Ellwood City	13,123			
Lycoming		90,984	60	1,516	8
	Williamsport	44,300			
	S Williamsport	6,033			
	Jersey Shore	5,432			
McKean		48,347	25	1,974	5
	Bradford	17,091			
	Kane	6,133			
Monroe		26,840	23	1,167	8
	E Stroudsburg	6,404			
	Stroudsburg	6,186			
Perry		19,912	8	2,496	13
Snyder		18,427	9	2,047	21
	Selinsgrove	2,877			
Sullivan		6,048	3	2,016	10

Indiana

Adams		19,792	9	2,199	8
	Decatur	5,801			
Bartholomew		28,878	10	2,898	8
	Columbus	11,738			
Cass		34,266	12	2,856	7
	Logansport	20 177			
Clark		31,165	14	2,698	15
	Jeffersonville	11,493			
Dearborn		21,124	7	3,018	10
	Aurora	4,828			
	Lawrenceburg	4,413			
Hendricks		19,417	7	2,774	8
	Danville	2,003			
Lake		305,138	146	2,091	15
	Gary	111,719			
	Hammond	70,184			
	East Chicago	54,637			
Posey		18,461	4	4,615	9
	Mount Vernon	5,638			
Rush		17,299	6	2,883	6
	Rushville	5,060			
Shelby		24,284	11	2,206	9
	Shelbyville	10,791			

1 Bureau of Census, estimated population 1943
2 Bureau of Census, population 1940
3 Based on 1940 figures, American Telephone and Telegraph Company.

The accompanying table gives data from selected counties in each of these states. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities They are not included in computing physician population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities

Medical Legislation

MEDICAL BILLS IN CONGRESS

Scientific Research

Three bills have been introduced to promote the progress of science and the useful arts, to secure the national defense and to advance the national health, prosperity and welfare, S. 1285, introduced by Senator Magnuson, Washington, H. R. 3852, introduced by Representative Mills, Arkansas, and H. R. 3860, introduced by Representative Randolph, West Virginia. These bills undertake to effectuate the recommendations of the report submitted recently to President Truman by Dr. Vannevar Bush and other scientists who were requested by former President Roosevelt to suggest what the federal government should do to foster scientific research.

This legislation proposes to create a National Research Foundation to be composed of five divisions, including a Division of Medical Research. The foundation will be directed (*a*) to develop and promote a national policy for scientific research and scientific education; (*b*) to initiate and support basic scientific research and scientific development in the mathematical, physical and biologic sciences through contracts, grants or other forms of assistance; (*c*) to initiate and support scientific research and scientific development on matters relating to the national defense through contracts, grants or other forms of assistance; (*d*) to discover and develop scientific talent, particularly in American youth; (*e*) to grant scholarships and fellowships in the mathematical, physical and biologic sciences; (*f*) to foster the interchange of scientific information among scientists in this country and abroad; and (*g*) to correlate the foundation's scientific research and scientific development programs with those undertaken by public and private research groups.

The legislation would authorize to be appropriated annually such sums as may be necessary to carry out its provisions.

Industrial Health Hazards

Senator Johnston, South Carolina, for himself and Senator Ball, Minnesota, has introduced S. 1271, to provide for cooperation with state agencies administering labor laws and establishing and maintaining safe and proper working conditions in industry and in the preparation, promulgation and enforcement of regulations to control industrial health hazards. This bill is identical with the one introduced in the House of Representatives by Representative Norton, New Jersey, which is pending on the House calendar with a favorable committee report.

Official Notes

THERAPEUTIC TRIALS COMMITTEE

In the published statement of the October 1944 annual meeting of the Council on Pharmacy and Chemistry (THE JOURNAL, May 5, p. 29) announcement was made concerning the establishment of a Therapeutic Trials Committee. This committee has met in session on several occasions and on July 17 met with representatives of the American Drug Manufacturers Association and American Pharmaceutical Manufacturers Association to discuss procedure. In due time a formal announcement of the functions of this committee and the procedure by which it will serve will be published in THE JOURNAL.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

"Food Faddist" Arrested.—Paul O. Sampson, alleged food faddist, was arrested recently and booked at the Chico City Jail on four charges of violating the medical laws and the pure food laws of California. He was held in $2,000 bail and was finally released on personal recognizance to his attorney. Sampson was charged with violating the medical laws business and professional code for practicing a system of treating the sick without a license, newspapers reported.

Clair Turner Joins University of California.—Clair E. Turner, Dr.P.H., temporarily on leave from the Office of the Coordinator of Inter-American Affairs as health education officer, has been named in charge of the public health education program in the University of California School of Public Health, Berkeley, according to the University *Clip Sheet*. He will have the title of visiting professor of public health education. The course will be graduate in nature and will lead to the degree of master of public health.

Abortion Activities.—Newspapers reported June 12 the arraignment of Hester Ann Hesketh on a charge of murder in connection with the death of a young woman. It was stated that Mrs. Hesketh had admitted that she had performed from thirty to thirty-five abortions a week for the past two years and admitted too that she had been carrying on this activity since arriving in the state eighteen years ago. Her fees ranged from $25 to $75.——Clyde A. Pierson, D.O., San Bernardino, on May 25 was held legally convicted of abortion by the California fourth district court of appeals but the sentence to a prison term was cut in half, newspapers reported May 25. According to the opinion of a superior court judge, Pierson would have to serve one term of from two to five years and then serve a second term for the second and third counts combined, for which he was found guilty more than a year ago, it was stated. The appellate court decision stipulates that the conviction on two of the counts was not according to law. Pierson now has one conviction against him and must therefore serve one term. It was stated that this single conviction will be carried to the supreme court.——A chiropractor, Ramon S. Davis, on May 25 was being held by authorities in Los Angeles County for allegedly performing an illegal operation. Arresting authorities said that the chiropractor admitted performing the operation in a full confession, it was stated.

CONNECTICUT

Personal.—Dr. Creighton Barker, New Haven, secretary of the Connecticut State Medical Society, has been appointed a member of the board of trustees of the University of Connecticut, Storrs.——Joseph S. Fruton, Ph.D., associate in chemistry at the Rockefeller Institute for Medical Research, New York, has been appointed associate professor of physiologic chemistry at Yale University, effective July 1

Display Honors Dr. Winslow.—The Yale Medical Library has arranged a special exhibit in recognition of the services of Charles-Edward A. Winslow, Dr.P.H., senior member of the faculty of the Yale University School of Medicine, who was to retire in his position as professor of public health at the end of the recent school year (THE JOURNAL, March 31, p. 865). The exhibit includes early writings on hygiene beginning with Galen and a copy of the rare first edition of Sir John Harington's "Metamorphosis of Ajax," which described his invention of the water closet. Five display cases are devoted to Dr. Winslow's own writings.

DISTRICT OF COLUMBIA

Georgetown Opens Campaign for Funds.—Georgetown University Hospital has launched a campaign for funds to build a new institution. The campaign goal is $750,000, the same sum needed to supplement and guarantee a federal grant of $1,820,000 provided under the Lanham act for construction of the new building. The proposed hospital is to have 400 beds and will be erected adjacent to the university medical and dental schools. The new building will replace the old Georgetown University Hospital, which has a capacity of 241 beds and which was erected in 1898.

FLORIDA

Personal.—Dr. Hubert A. Barge, Miami, has been awarded the Algernon Sydney Sullivan medal of Mercer University, Macon, Ga. The medal is given annually to the most prominent alumnus of the school. According to the Jacksonville *Times-Union*, Dr. Barge, who graduated in 1918 at the school, has been instrumental in obtaining buildings and endowments valued at more than five million dollars to the university since 1934.——Dr. John S. McEwan, Orlando, has been appointed a member of the Florida Crippled Children's Commission to succeed Dr. Sanford C. Colley, Mount Dora, whose term expired.

ILLINOIS

Hospital Survey.—Governor Dwight Green has designated and authorized the state department of public health to carry on a survey of hospital facilities in the state of Illinois. Six persons representing the hospital field are to be appointed shortly by the governor and will be included in the overall advisory committee, which will consist of about forty members representative of labor and various civic organizations. A small technical subcommittee will be made up of hospital representatives and physicians. The development of the project is credited to the council on government relations of the Illinois Hospital Association.

Tumor Diagnostic Clinic Established.—A tumor diagnostic service has been organized at the Christian Welfare Hospital in East St. Louis to be conducted under the auspices of the state department of public health through its division of cancer control. The unit will provide a consultation service for practicing physicians of the area in the care of their suspected tumor cases. Similar services are now functioning under the auspices of the state department of health at the Memorial Hospital, Springfield; Burnham City Hospital, Champaign; St. Anthony's Hospital, Rockford, and the Research and Educational Hospitals of the University of Illinois College of Medicine at Chicago.

Ringworm of the Scalp Must Be Reported.—Dr. Roland R. Cross, director of the state department of public health, has announced that effective July 10 all cases of ringworm of the scalp occurring in Illinois must be reported to the official public health authority having local jurisdiction. Children infected with the disease shall be excluded from schools, theaters and public places until all lesions have healed. Placarding of homes and complete isolation will not be required, but disinfection of all towels, washcloths and head coverings of all articles used by patients will be enforced. All persons under 15 years of age that have been in contact with the patients should be inspected for evidence of the infection.

Chicago

Special Society Elections.—New officers of the Chicago Society of Allergy include Drs. John Peters, Oak Park, president, William A. Mowry, Madison, Wis., president-elect and Edward G. Tatge, Evanston, secretary-treasurer.——Drs. J. Daniel Willems was chosen president of the Chicago Society of Industrial Medicine and Surgery, Karl G. Rundstrom vice president and Frank P. Hammond secretary-treasurer.

Lectures on Health.—Dr. Harry M. Hedge, assistant professor of dermatology, Northwestern University Medical School, gave the first lecture July 18 in a summer lecture series given at the Museum of Science and Industry with the museum, the Chicago Medical Society and the Illinois State Medical Society cooperating. His subject was "Care of the Skin and Cosmetics." Dr. Chauncey C. Maher, associate professor of medicine, Northwestern, gave the second lecture July 25 on "High Blood Pressure." Others in the series include:

Dr. Emil D. W. Hauser, assistant professor of bone and joint surgery at Northwestern, Our Walk Through Life, August 1.

Dr. Leon Unger, assistant professor of medicine, Northwestern, Hay Fever and Prevention of Asthma, August 8.

Dr. Edward A. Piszczek, assistant professor of public health and preventive medicine, Loyola University School of Medicine, Infantile Paralysis, August 15.

Dr. H. William Elghammer, clinical professor of pediatrics at Loyola, Getting Along with Your Children, August 22.

Time Limit Extended for Hospital Trust.—The time in which the University of Chicago may build the projected Charles Gilman Smith Hospital for treatment of contagious diseases, without losing the income from a $500,000 trust fund left in 1907 by Mrs. Annie W. Durand for maintaining a wing of the institution, was extended July 10 for five years, or until June 28, 1950, by Judge Julius H. Miner in Circuit Court. According to the Chicago *Sun* the hospital, the construction of which was about to begin at the outbreak of the war, is to be built through the pooling of University of Chicago funds with funds from three estates: those of Mrs. Harriet G. Smith,

widow of Charles Gilman Smith; of Mrs. Durand, and of Robert McCormick, son of the late Harold F. McCormick and Edith Rockefeller McCormick. Mrs. Durand was the founder of the old Durand Hospital, at Flournoy and Wood streets, which was closed in 1933.

MARYLAND

Dr. Cameron Chosen Welfare Medical Care Officer.—Dr. William R. Cameron has been chosen assistant director of welfare for medical care, subject to approval by the city service commission, according to *Baltimore Health News*. Dr. Cameron, who has been serving with the U. S. Public Health Service as city health officer of Charlotte, N. C., formerly served as health officer for Hagerstown and Washington County. He was also director of the survey of medical care in the counties of Maryland. The welfare position is a newly created one.

MISSOURI

Representatives Pass Resolution for Physician.—The Missouri House of Representatives passed a resolution of respect on May 26 for Dr. George W. H. Presnell, mayor of Sikeston, who died May 26. The resolution eulogized Dr. Presnell for his service as alderman, mayor of Sikeston for three successive terms and his period of service as president of the Scott County Medical Society.

Appointments to State Board of Health.—Governor Phil M. Donnelly has made the following appointments to the state board of health for four year terms: Drs. George E. Knappenberger, Kansas City, to succeed Ira H. Lockwood, Kansas City; Frank H. Rose, Albany, to succeed John I. Byrne, St. Joseph, and Ralph A. Kinsella, St. Louis, to succeed Cleveland H. Shutt, St. Louis. Other members of the board include Drs. Robert M. James, Joplin, recently appointed state commissioner of health (THE JOURNAL, April 21, p. 1066); Charles H. Neilson, St. Louis; Howard B. Goodrich, Hannibal, and Hardin M. Henrickson, Poplar Bluff.

NEW YORK

Graduate Lectures.—Dr. Ellery G. Allen, Syracuse, will address a meeting of the staff of the Memorial Hospital of Greene County and the Greene County Medical Society in Catskill, September 27, on "Practical Considerations of Blood Dyscrasias." Dr. Ivan Hekimian, Buffalo, will address the two groups October 25 on "Practical Application of Hormonal Therapy." The meetings have been arranged by the council committee on public health and education of the state medical society.

New York City

Restrain Distribution of Spectrochrome.—The United States government was permitted on June 26 to restrain Dinshah P. Ghadiali, president of the Spectrochrome Institute of Malaga, N. J., from distributing his "all-curing machine" when an all woman jury returned a verdict in favor of the federal government in a civil action, according to the New York *Times*. Ghadiali was his own counsel and held that people can be healed by the spectrochrome machine through the use of colored lights. In summing up, assistant U. S. Attorney Morris K. Siegel said that Ghadiali "was a man preying upon the gullibility of people for his own personal profit. The federal government had taken action, he said, to stop gullible people from spending $90 for the purchase of the machine. The government has tried to show that this machine has no healing powers, but it was the imagination of many people that they were cured of their illnesses by submitting themselves to so-called treatment through this machine," Mr. Siegel stated.

Honor Memory of Lewis Stimson.—Dr. George J. Heuer, professor of surgery, Cornell University Medical College, has been appointed the first Lewis Atterbury Stimson professor of surgery, a position created under the will of Dr. Stimson's daughter, Miss Candace Stimson. The gift represents an endowment of more than $600,000 and will serve as a memorial to the first professor of surgery at Cornell, who held the position from 1898 to 1917, when he died. Coincidental with the announcement of the new professorship was one reporting the presentation of a portrait of Dr. Stimson to the college by Hon. Henry L. Stimson, Secretary of War, son of the late physician. Special ceremonies were held at the medical college to mark the presentation of the portrait and the endowment. Speakers included Dr. Lewis Atterbury Conner, a cousin of the late Dr. Stimson, Dr. Heuer and Dr. Philip M. Stimson. The late physician graduated at Bellevue Hospital Medical College in 1874. A personal friend of Pasteur, Dr. Stimson taught for many years as professor of physiology, anatomy and surgery at the University and Bellevue Hospital Medical College and in 1898 collaborated with the late Oliver H. Payne in founding the Cornell University Medical College.

Food Poisoning Traced to Cadmium Plated Pump.—The sudden illness of 5 persons after drinking strawberry soda at a soda fountain June 26 has been traced to the use of a cadmium plated syrup pump, according to the New York City Department of Health, July 12. All of the patients recovered. The New York City sanitary code forbids the use of cadmium on food utensils, refrigerator trays and similar items. Even a minute quantity of cadmium dissolved by the acid of fruit juice or syrup is capable of causing violent vomiting and severe distress. The investigation of the illness of the 5 persons, conducted by the health department, disclosed that all of the persons had become ill after drinking a strawberry soda made from syrup and carbonated water. No other foods had been eaten in common by any of the victims. The health department seized all pumps in the fountain for chemical examination, and it was found that the pump used for the strawberry syrup was cadmium plated. Syrup from the pump was also found to contain traces of the dangerous metal. Further investigation disclosed that the entire fountain unit containing the pump had not been used for eight years and had been placed in operation by the new owner of the fountain one week prior to the poisonings.

NORTH CAROLINA

G. M. Cooper Honored.—The woman's auxiliary to the Medical Society of the State of North Carolina recently named a bed at the Eastern North Carolina Sanatorium, Wilson, for Dr. George M. Cooper, Raleigh, assistant state health officer and director of the division of health education, state board of health.

Personal.—Dr. James A. Whitaker has resigned as health officer of Rocky Mount to join the staff of the Columbia Presbyterian Hospital, New York.——Dr. Louis G. Beall was recently named acting superintendent of the State Hospital at Morganton, succeeding Dr. John R. Saunders, resigned (THE JOURNAL, April 28, p. 1140).

OHIO

Personal.—Col. Harold Wellington Jones, M. C., librarian of the Army Medical Library, Washington, D. C., received the honorary degree of doctor of laws during the commencement of Western Reserve University, Cleveland, June 13.

New Departments Created at Western Reserve.—Through the division of the department of hygiene and bacteriology at Western Reserve University School of Medicine, Cleveland, two new departments have been created, the department of preventive medicine and public health and the department of bacteriology. Dr. James A. Doull, as head of the new department of preventive medicine and public health, will fill the newly created Elizabeth Severance Prentiss chair in preventive medicine. The department will be financed by an annual income from the Elizabeth Severance Prentiss Fund. An announcement from Western Reserve University states that the details of the organization of the department of bacteriology and the appointment of a director will be announced later. The department of hygiene and bacteriology at Western Reserve was established in 1910 as an offshoot of the department of pathology.

SOUTH CAROLINA

Personal.—Dr. Joseph I. Waring, Charleston, has been appointed by Governor Ransome J. Williams as a member of the state board of health to succeed Dr. Kenneth M. Lynch, Charleston, it is reported.

Dr. Rhame Resigns as Professor of Surgery.—Dr. Joseph Sumter Rhame has resigned as clinical professor of surgery at the Medical College of the State of South Carolina, Charleston. Dr. Rhame has been associated with the school since 1910.

License Revoked.—The South Carolina State Board of Medical Examiners reported on May 21 that the license to practice medicine or Dr. Perry M. Workman, Lyman, was revoked as of April 17 for violation of his probation on a narcotic charge.

Health Department Celebrates Twenty-Fifth Anniversary.—The Charleston County Health Department observed its twenty-fifth anniversary recently. Dr. Leon Banov, health officer, has held the position since the department was organ-

ized In 1926 the county and city health departments were merged and ten years later the city department was abolished, giving the county group charge of health for both the city and the county of Charleston

Society Incorporates—Creates New Foundation.—The Greenville County Medical Society at its meeting in June voted to incorporate The society also authorized the establishment of a trust fund to be known as the Medical Foundation Proceeds from the fund will be used for "scientific, educational and charitable purposes, including the promotion of the science of medicine, assisting medical students, the establishment of a medical library and the construction of a building for such purpose or purposes"

WASHINGTON

Emil Palmquist Named Health Commissioner of Seattle.—Dr Emil E Palmquist, health officer of King County, was on July 1 appointed commissioner of health for the city of Seattle Dr Ragnar T Westman has been acting city health commissioner on leave from the U S Public Health Service

Physicians Denied Injunction in Medical Society Suit.—On June 15 a temporary injunction by which they sought authority to practice in the Renton Hospital until trial of their court action was denied Drs John M Howell and Roy H Blender, Renton Superior Judge Robert M Jones refused to grant the temporary restraining order to prevent the physicians from being barred from practice in the hospital, and their attorney, Gerald De Garmo, is reported to have said that the judge's denial will be used as the basis for a motion for an advanced setting of the case on the superior court calendar, according to the Seattle *Times* The case was reported in THE JOURNAL, July 7, page 743, and involves a suit against the King County Medical Society and the King County Medical Service Corporation, both of which have been accused by the physicians of conspiring to acquire a "monopoly" for members of the society in practicing medicine in the county and to "eliminate competition" in furnishing medical and hospital services to the public on the prepayment or monthly payment plan

WEST VIRGINIA

Library of Public Health Education.—For the first time in the history of the West Virginia State Health Department a reference and lending library has been established in the bureau of public health education in line with similar action taken by the health departments of many other states For the present the library will be maintained for the use of the personnel of the state health department, but eventually it is planned to make the facilities available to the physicians in West Virginia

Changes in Division Heads of Health Department.—Dr Glenn A Carmichael, Butte, Mont, has been appointed director of the division of maternal and child hygiene of the West Virginia State Department of Health, succeeding Dr Lenore V L Patrick-Chipman, who resigned some months ago to engage in private practice at Williamstown, Ky (THE JOURNAL, June 24, 1944, p 589) Dr Norman G Angstadt, director of county health work, has been acting director of the division (THE JOURNAL, Oct 7, 1944, p 378) since Dr Chipman resigned —— Dr Robert L Smith, U S Public Health Service, has been appointed acting director of the bureau of tuberculosis to succeed Dr James T Duncan, resigned Dr Smith, who has been assistant director of the bureau since April, was connected with the division of tuberculosis control of the United States Public Health Service, Bethesda, Md, for two years before coming to West Virginia He recently completed a course in the school of public health at the University of Michigan Several divisions and bureaus of the state health department have moved to downtown Charleston to provide space for expanding agencies left at the capitol Twelve rooms have been rented in the Virginia Land Bank Building at the corner of Capitol and the Boulevard to house the bureau of venereal diseases, division of communicable diseases bureau of industrial hygiene, division of maternal and child hygiene, the nutrition consultant and the midwife consultant The division of industrial hygiene remains at 1584 East Washington Street while the bureau of tuberculosis has been moved to 1719 Washington Street The division of public health education is now located at 300½ Duffy Street having been moved from the capitol to provide more room for the division of vital statistics, the bureau of county health work and the division of finance

GENERAL

Leslie Dana Gold Medal Goes to William Zentmayer.—The Leslie Dana Gold Medal will be presented this year to Dr William Zentmayer, professor emeritus of diseases of the eye, University of Pennsylvania Graduate School of Medicine, Philadelphia The medal is awarded on the recommendation of the Association for Research in Ophthalmology and given to the recipient by the St Louis Society for the Blind Dr Zentmayer has, among other positions, served as president of the American Ophthalmological Society and chairman of the Section on Ophthalmology of the American Medical Association Conditions of the gold medal award set forth that it is to be made for "long meritorious service in the conservation of vision, in the prevention and cure of diseases dangerous to eyesight, research and instruction in ophthalmology and allied subjects, social service for the control of eye diseases, and special discoveries in the domain of general science or medicine of exceptional importance in conservation of vision"

Red Cross Chapters to Recruit Blood Donors for Civilians.—American Red Cross chapters throughout the nation will be permitted to recruit blood donors for civilians under a program announced by Mr Basil O'Connor, chairman of the American Red Cross Under this project any Red Cross chapter may take part in the operation of a donor center for civilians sponsored by a recognized medical or health agency The blood collected and the blood derivatives produced will be made available without cost to physicians, hospitals, clinics and patients This civilian program is entirely separate from the Blood Donor Service operated by the American Red Cross for the armed forces, it was stated, and chapters in the eleven metropolitan centers where the Red Cross is now recruiting donors for the Army and Navy will not participate in it These are Los Angeles, San Francisco, Oakland, Portland, Ore, San Diego, Chicago, New York, Brooklyn, Boston, Philadelphia and Washington Assistance in establishing standards and conducting a civilian program will be made available to chapters through the five Red Cross area offices The new project will be supervised by an advisory committee of specialists to be appointed

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended July 14 have been received from the division of public health methods, U S Public Health service, as follows

Maine	1	South Carolina	11
New Hampshire		Georgia	8
Vermont	1	Florida	1
Massachusetts	2	Kentucky	
Rhode Island		Tennessee	27
Connecticut	4	Alabama	6
New York	29	Mississippi	2
New Jersey	23	Arkansas	3
Pennsylvania	4	Louisiana	1
Ohio	10	Oklahoma	7
Indiana	1	Texas	45
Illinois	4	Montana	
Michigan	1	Idaho	1
Wisconsin	1	Wyoming	1
Minnesota		Colorado	1
Iowa	1	New Mexico	
Missouri	1	Arizona	
North Dakota		Utah	
South Dakota		Nevada	0
Nebraska		Washington	5
Kansas	5	Oregon	2
Delaware	1	California	22
Maryland	3		253
District of Columbia	6	Total	462
Virginia	7	1944	1 677
West Virginia	3	Total to date	1 752
North Carolina	2	Same period 1944	

Italian Medical Nutrition Mission—Dr James E Perkins, director of the division of communicable diseases, New York State Department of Health, Albany, began a leave of absence June 15 to go to Italy to serve on the Italian Medical Nutrition Mission, which is studying health problems that have developed in the country following the war and is aiding in the establishment of a program for their control Dr Perkins has been commissioned as a reserve officer for the purpose by the U S Public Health Service and assigned to the United Nations Relief and Rehabilitation Administration, under which the mission is operating Dr Perkins plans to be in Italy for three months as co-epidemiologist of the mission to continue activities which have been conducted over a similar period by Dr Ernest L Stebbins, health commissioner of New York City, who accompanied the first contingent which left in April and should be back in July The co directors of the mission are Drs Elmer L Severinghaus Madison, Wis and Maurice B Visscher, Minneapolis *Health News* of the New York State Department of Health reports that the work of the mission is being financed in part by two church organizations,

the Unitarian Service Committee and the Congregational Christian Service Committee. These agencies are furnishing much of the equipment and supplies and paying the salaries of many members of the mission.

Availability of Film.—The American College of Radiology announces that the production schedules in film allotments for the third quarter of the present year indicate that quotas for civilian physicians and hospitals have been appreciably increased. WPB allotments for civilian consumption of medical radiographic film during the last quarter of 1944 amounted to 9.2 million square feet. Owing to the fact that manufacturers were unable to meet these schedules, only 9 million square feet was actually shipped. In the first quarter of 1945, 9.7 million square feet was allotted for civilian consumption. Total shipments were 9.2 million square feet. Shipments for the second quarter of 1945 are not yet known, but it is undoubtedly somewhat less than the 9.4 million square feet allotted. For the third quarter of 1945, 10.6 million square feet has been allotted for civilian health services. If manufacturers are able to meet these schedules, radiologists should be able to obtain almost all the film they require, assuming that they effect all possible economies. The college estimates that 11 million square feet per quarter would meet minimum requirements of civilian physicians and hospitals. The allotment for the Army and Navy for the third quarter is not definitely known. For the army industrial program, 5 million square feet has been allotted for ordnance inspection. UNRRA will receive 500,000 square feet. The quota for FEA and Lend-Lease has been sharply reduced. It is estimated that about 24 million square feet of medical radiographic film will be produced during the third quarter. Radiologists who are unable to obtain sufficient film to maintain their services should continue to report their cases to the headquarters office of the college, 20 North Wacker Drive, Chicago 6. All such cases will be referred to the proper officials of the WPB.

Sugar Research Foundation Allots Grants.—More than $50,000 will be available for seven universities and laboratories by the Sugar Research Foundation, New York, according to an announcement July 16. The studies to be pursued under the new grants will seek new industrial uses of sugar and further explore the nutritional values of sugar. Eight of the projects call for allotments totaling $41,500. Specific use of the grants includes:

Dr. Hans Selye, associate professor of histology, McGill University Faculty of Medicine, Montreal, $10,000 for a three year study of the effects of diets in protecting animals from the effects of overactivity of the endocrine glands.

Dr. Israel M. Rabinowitch, associate professor of medicine at McGill, $10,000 for investigation of the use of sugars in human nutrition in health and in disease.

Gebhard Stegeman, Ph.D., professor of physical chemistry at the University of Pittsburgh, $7,000 to collate all existing data and carry out new measurements of the physical properties of sugar and sugar solutions for use by industrial chemists.

Frederick W. Zerban, Ph.D., and Louis Sattler, Ph.D., New York Sugar Trade Laboratory, New York, $4,000 for further investigation of the unfermentable constituents of molasses.

George R. Cowgill, Ph.D., professor of nutrition, Yale University School of Medicine, New Haven, $3,600 to survey the vitamin content of various products of the sugar industry at the point where they reach the market.

Leo T. Samuels, Ph.D., head of the biochemistry department at the University of Utah, Salt Lake City, $3,500 to study the capacity of animals to adjust themselves physiologically to various types of diets.

Heinz M. Wuest, Ph.D., Brooklyn Polytechnic Institute, $1,900 to study preparation of several compounds closely related to vitamin B_1 and study their effects on assay methods.

Walter D. Bonner, Ph.D., and Ralph F. Phillips, Ph.D., of the chemistry department at the University of Utah, $1,500 to study production of certain glucose derivatives directly from sugar and molasses.

Dr. Luther Emmett Holt Jr., New York, an additional $5,000 to continue his work on the synthesis of vitamins in the intestinal tract under the influence of various diets.

James M. Neill, Ph.D., professor of bacteriology and immunology, Cornell University Medical School, New York, renewal of a $4,500 grant.

LATIN AMERICA

Health Activities in Latin America.—*Maternal and Child Health Services in Rural Districts.*—The first of a proposed series of maternal and child health stations in the rural districts of Peru recently began to function in the town of Tingo Maria. The staff of the station consists of a graduate child health worker, a midwife and two assistants. Their work is chiefly educational, and most of it is done through visits to the homes of the rural workers. The child health worker and the midwife instruct the women in antepartum and infant care, in general hygiene and in ways of improving their families' living conditions.

Course on Phthisiology.—The first Argentine Congress on Phthisiology will be held in Buenos Aires in November, the exact dates to be determined later. The congress is to be sponsored by the Sociedad Argentina de Tisiologia with the cooperation of the National Department of Public Health against tuberculosis and of the societies against tuberculosis in the various provinces and hospitals of Argentina. Headquarters of the congress are located at Avenida Velez Sarsfield 405, Buenos Aires.

Health Center Named for General Dunham.—On April 6 the Health Center General Dunham was dedicated, according to the *Newsletter* of the Health and Sanitation Division of the Institute of Inter-American Affairs. The center was constructed by the Servicio Cooperativo Inter-Americano de Salud Publica in Asuncion, Paraguay, and named in honor of Gen. George C. Dunham, M. C., president of the Institute of Inter-American Affairs. General Dunham spoke at the dedication ceremonies.

School of Hygiene Dedicated.—The School of Hygiene, Santiago, Chile, organized in 1944 through the cooperative efforts of the University of Chile, the Rockefeller Foundation, the Bacteriological Institute and the U. S. Public Health Service, was opened May 11, according to the *Newsletter* of the Health and Sanitation Division of the Institute of Inter-American Affairs. The school was equipped and constructed by the Departamento Cooperativo Interamericano de Obras de Salubridad at a cost of $85,000. It will offer undergraduate and postgraduate courses leading to a degree of master of public health. Speakers at the opening included Dr. Theodore I. Gandy, chief of field party in Chile and head of the Departamento Cooperativo Interamericano de Obras de Salubridad; Nacianceno Romero, director of health; Eugenio Suarez, director of the Bacteriological Institute; Lewis W. Hackett, director of the Rockefeller Foundation for Rio de la Plata and the Andean region; Armando Larraguibel, dean of the school of medicine, University of Chile, and Hernan Romero, director of the school of hygiene.

Meeting of Academy of Surgery.—Three American physicians were among the eight new members accepted into the Mexican Academy of Surgery at a ceremony held on June 12 in the auditorium of the National University Faculty of Medicine, *Mexico City, in celebration of the twentieth anniversary of the* founding of the society. The Americans, who were titled as foreign correspondents of the academy, are Drs. Julius L. Spivack, Chicago, Chevalier L. Jackson, Philadelphia, and Paul H. Holinger, Chicago. The new Mexican members are Drs. Fernando Valdes Villareal, Donato Ramirez, Ignacio Cadena, Manuel Medina Gutierrez and Inocencio de Lara. Dr. Jose Torres Torija, permanent secretary of the organization, delivered the speech of welcome to the initiates.

Penicillin Distribution Changed.—Mexican patients are now able to obtain penicillin at any drugstore on their physician's prescription under a decision of the Mexican government to free the drug from all bureaucratic control. Up to now the supply has been controlled by the federal ministry of public health and public welfare and a committee of three physicians who were entrusted with its distribution to the profession. Since the quantity on hand is believed to be more than enough to satisfy the country's demand, the government has ordered it made available to the general public under medical supervision. A top retail price has also been fixed at 11.50 pesos (approximately $2.30) per hundred thousand units. Private practitioners are given a special price of 5 pesos per hundred thousand units of penicillin for office use, effective on July 1.

Health Films for Institute of Inter-American Affairs.—A series of ten animated health films entitled "Salud para las Americas" (Health for the Americas) has been produced by the Walt Disney Studios for the Institute of Inter-American Affairs. The first eight of these films were released during May and June and the last two will be released during September. The titles are "The Human Body," "What is Disease," "Tuberculosis," "Infant Care," "How Disease Travels," "Cleanliness Brings Health," "Hookworm," "Insects as Carriers of Disease," "Environmental Sanitation" and "Nutrition." Although contributions from many sources have gone into the final production, these ten animated films are primarily the work of Capt. Ryland R. Madison, S. C., and Dr. Janet W. Mackie of the institute and Mr. Ben Sharpsteen of Walt Disney Productions.

CORRECTION

Military Rank Omitted.—The military rank of Dr. Ronald L. Denton should have been included at the end of the communication to the editor on "Treatment of Erythroblastosis Fetalis" in THE JOURNAL, June 30, page 686, as follows: Surgeon Lieutenant Commander Ronald L. Denton, R. C. N. V. R.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 30, 1945.

The Future of Psychiatry

The Royal College of Physicians, the British Medical Association and the Royal Medico-Psychological Association during the past year have been formulating their views on the future of psychiatry. As these views are so similar, it was decided to publish them in a joint memorandum. This points out that in recent years psychiatry has been brought into increasingly close relation with general medicine. Historically psychiatry developed as the method of treatment of those whose mental illness necessitated segregation. It is now recognized that this distinction, however important socially, is medically irrelevant, for there is only a difference of degree between the majority of the patients in a mental hospital and the far more numerous sufferers from less severe mental disorders outside. The proportion of the general population requiring treatment in mental hospitals is 3.9 per thousand. But much more psychiatry needs to be done outside than inside these hospitals. At the same time psychiatry has shown that it has much to contribute to research into the causes and treatment of many forms of illness formerly regarded exclusively from the medical or surgical point of view.

The following recommendations are made: 1. Psychiatry is not a limited specialty. It permeates and influences general medicine, surgery, obstetrics and gynecology. Psychiatrists should be appointed to the staffs of general hospitals with status equal to that of other physicians and surgeons. 2. The mental health department of the health service of the future should be responsible for the organization of all medical work which is essentially psychiatric. 3. The psychiatrist is not concerned merely with fully developed mental disorders. The mental health service should include provision for prophylaxis of mental disorders over the widest field. 4. In the educational sphere psychiatric advice is essential for children showing neurosis, behavior disorder or mental defect. 5. In industry a full and efficient consultative psychiatric service should be available, which should work in close cooperation with the patient's doctor and the industrial medical officer. Psychiatrists should cooperate with industrial psychologists in the investigation of industrial fatigue and ill health, working hours and conditions, incentives, personnel management and the like. 6. Psychiatrists should cooperate in the work of vocational guidance and selection, an essential part of which is the assessment of personality and temperament. 7. Psychiatrists should take part in the rehabilitation of patients after accident or illness. This work should be carried out in close liaison with employers, workers' representatives and patients' doctors.

The Control of Science in Germany

In the House of Lords during a discussion on the prevention of scientific developments in Germany for the purpose of war Lord Vansittart said that unless this was done even more potent secret weapons would be produced. Provision should therefore be made to guard against granting permission to develop devices potentially dangerous. He advocated control of all German laboratories, university and industrial, through an intelligence service of the united nations. Lord Brabazon was more specific and discussed particularly the "directed missile" in the form of the flying and rocket bomb. He therefore suggested, as part of the peace organization, an international inspectorate with power to enter works anywhere in the world.

Lord Cherwell replied for the government. He said that a scientific committee had been appointed a year ago to consider the whole question of scientific research in Germany, and a preliminary report would soon be ready. Any proposals must be discussed with our allies. A scientific and technical staff had been attached to the headquarters of the Allied Expeditionary Forces to examine and control German activity in these fields.

The Increased Birth Rate

In surveying retrospectively the national health during five and a half years of war, Minister of Health Willink reported in the House of Commons that the birth rate had been rising since 1941 and last year was the highest since 1925 and within 1 per cent of full replacement. Not only had more babies been born but fewer had died. The chance of a baby being born dead was only three fourths of what it was six years ago, he said. Also fewer mothers were being lost in childbirth. All the vital statistics for mothers and children were the best this country had ever known.

THE NETHERLANDS

(From Our Regular Correspondent)

May 10, 1945.

Five Years of Enemy Occupation

Five years have passed since the invasion. Before the war the physicians were organized in the Maatschappy tot Bevordering der Geneeskunst (Society for the Advancement of Medicine). Very gradually the Germans tried to nazify the organization, with the result that 95 per cent of all the physicians joined the secret organization known as M. C. (Medical Contact). The central committee of this underground organization gave its directives in the closest contact with other underground organizations, the churches and so on, and in this way it became possible that, for instance, at the same hour in the whole country all the physicians removed the signs at their doorsteps in protest to the German attempt to incorporate them in the nazi "artsenkamer." The result was that the Germans failed completely in their attempts in all respects. The membership of M. C. and the other underground activities caused a great many deaths among us. Many had to "dive," as we called it, and this, combined with the closing of the universities since 1942, caused a considerable decrease in the number of physicians.

A great handicap was the loss of contact with the outside world. Only German medical literature was available, and so it happened that for many of us the first report of the existence of penicillin arrived by means of the British Broadcasting Company and pamphlets dropped by the Royal Air Force. The future, however, will give proof of the scientific activities of our medical community. In the field of intravenous therapy, in the treatment of fractures, in chest surgery, in the treatment of uremia, an x-ray device for a very exact localization of metal foreign bodies was either developed or adopted.

No official records are yet known as to the state of health of the population. Many data about deaths, births and domiciles were often deliberately falsified or destroyed. Public administration became chaotic, and it therefore becomes clear that, e. g. in the Hague, the number of fatal bombardment casualties is still a guess. It will take quite a long time before we can get at the exact data about the medical situation. Generally speaking there was an increase in tuberculosis and infectious diseases (especially diphtheria and scarlet fever). The increase in venereal diseases was evident despite the fact that only a limited number of women was involved. A strict control by the state hygienic authorities isolated a few cases of typhus and typhoid and protected the population effectively. Allied and enemy air action caused a great many casualties. The death rate of the newborn and young children increased also.

Our hospitals and sanatoriums did what they could, but they were greatly handicapped by the lack of personnel, equipment,

drugs, dressing material and instruments. At the outbreak of war we had a large store of food, drugs—for instance, insulin—but they were used for the Germans. Only the urgent cases could get hospital treatment. Temporary hospitals were erected for chronic patients. During 1944 and 1945 the food supply decreased sharply, with the result that especially in the large cities like Amsterdam, Rotterdam and the Hague the population starved. In the city of Amsterdam (750,000 inhabitants) a conservative estimate gives a mortality to the present of 10,000.

BOLIVIA

(From Our Regular Correspondent)

LA PAZ, July 6, 1945.

Hospital Facilities in Bolivia

Figures regarding hospital facilities in Bolivia recently were made available, the first since 1942. The present figures are based on those collected by the Vital Statistics Department of the Bolivian Health Ministry under the direction of Mr. Hubert E. Navarro, to be presented to this year's congress.

Under government control there are now operating thirty-six hospitals with a combined bed capacity of 3,347, against thirty-five such hospitals with a capacity of 3,236 beds in 1942. This means there are at present 1.12 beds available for every thousand inhabitants. The individual capacity of these hospitals varies between 550 beds, as in the La Paz General Hospital, and 5 beds. There are thirty-one general hospitals with a combined capacity of 2,779 beds, one hospital for the treatment of mentally ill with 236 beds, one children's hospital with 80 beds, two hospitals for cases of tuberculosis with a total of 210 beds, and an eye hospital with 33 beds.

There is a total of twenty privately owned hospitals with a combined capacity of 601 beds, representing 15.2 per cent of the total beds available. Of this number nine clinics are operated on a proprietary basis; one, caring especially for poor children and operating a free delivery service, is operated by a nonprofit organization.

No figures on admission rate, length of stay or similar statistics are available, or on the number of registered nurses, orderlies, laboratory technicians and other hospital personnel. The occupancy rate is probably rather high because of the relatively few hospital facilities, the public hospitals being therefore constantly fully occupied.

There are three schools for nursing education, two of them operating attached to public hospitals and one in connection with a private clinic, with a combined student enrolment of about 120 girls.

The general director of health, Dr. Debbe, is developing a program of new hospital facilities, including a leprosarium and expanding existing services. Some of these projects are helped through the coordinator's health program. There is a special project for starting free delivery stations all over the country.

Number of Physicians and Other Health Officers in Bolivia

Published by the Bolivian Health Ministry were figures concerning physicians, pharmacists and other health officers at work during the month of October 1944. An average of 1.48 physicians is available to take care of 10,000 inhabitants, an average of 6,810 inhabitants being attended by every registered doctor. There are large parts of the population distributed in such a manner over wide parts of the national territory that it would be difficult if not impossible to offer them any medical attention at all; this is especially true regarding the tropical regions of Beni and Pando, situated on the Brazilian border and covered mostly by bush, where the density of population is less than 1 per square kilometer, and the only ways of communication are the rivers and the airlines.

The total number of physicians and other registered health officers has greatly improved since 1942, when a similar survey was made. The number of physicians has increased from 471 in 1942 to 528 in 1944. Not included are the physicians, enrolled with the Bolivian armed forces, who attend civilians in places where no other physician is yet established. The health authorities also allowed some refugee physicians to work in places where no other licensed physician is available, locating them mostly in the tropical regions. Some help in public health work is also offered by institutions such as the Coordinator's Health Division, which is at present employing 2 to 3 doctors and some nurses right in the bush regions, as well as the Rockefeller Foundation, which for years, under the direction of Dr. Henry P. Carr has performed a most important sanitation work through its yellow fever, malaria and uncinariasis services.

Visitors to the United States

Dr. Guillermo Debbe, Bolivian surgeon and general director of health of the country, is going to visit the United States soon, following an invitation made by the coordinator's office. On his trip, planned also by the coordinator, Dr. Debbe will see especially establishments concerning preventive medicine, and he will be most interested in studying the details of organizing public health institutions and health authorities. He has been organizing in this country the existing public emergency service and the health department. On his way back he will also visit Mexico, Cuba, Venezuela and Peru.

Dr. Carlos Ferrufino, who has been general inspector of health in Bolivia, is to join the UNRRA displaced persons program. Dr. Ferrufino only recently returned from the United States, where he finished postgraduate studies on a scholarship at Harvard. He will leave soon for Washington, D. C., on his way to Europe.

Marriages

WILLIAM MERRILL CORRY WILHOIT, Quincy, Fla., to Miss Martha Elizabeth Watkins of Valdese, N. C., in Durham, N. C., June 23.

PHILIP VINCENT DAUGHERTY, Nashville, Tenn., to Miss Rosemary Rita Levitt of Villa Ridge, Ill., in St. Louis, June 4.

HIRAM BARRINGER VAN DEUSEN, Canandaigua, N. Y., to Miss Muriel Ehrich of Newark, N. J., recently.

RAMSAY GARRISON LATIMER, West Columbia, S. C., to Miss Jean Neuman Mehrtens of Charleston, June 16.

WELLINGTON B. STEWART, Evanston, Ill., to Miss Helen M. Zimmerman of Spencerport, N. Y., June 16.

JULIAN MULDROW DURANT, Alcolu, S. C., to Miss Marie Elizabeth Beckett of Beaufort, June 19.

LEEWAN ROBERT KELLAM, Culver, Ind., to Miss Emily Taylor Richardson of Raleigh, N. C., June 16.

BEVERLY C. CHATHAM, Greenville, Ky., to Miss Janet Johnson of Nashville, Tenn., June 20.

LEWIS GEORGE RICHARDS JR., Roanoke, Va., to Miss Dorothy Nelle Quinn of Lynchburg, June 23.

CHARLES A. DWYER JR., Houston, Texas, to Miss Virginia Dean of Hollywood, Calif., April 21.

THOMAS E. WYATT JR., Marshfield, Wis., to Miss Pauline M. Ciola in Fort Pierce, Fla., June 18.

HARVEY RAY ST. CLAIR to Miss Pauline Carroll Keller, both of Staunton, Va., June 23.

WILLIAM L. CHEEZEM JR., Andrews, S. C., to Miss Louise McBrayer of Columbia, June 9.

ROBERT LESLIE CRAIG, Honolulu, Hawaii, to Miss Rita Beryl Knight in Akron, Ohio, June 16.

PALUEL J. FLAGG, Yonkers, N. Y., to Miss Marcella V. Devlin in Harrison, June 27.

ALBERT STEPHAN TERZIAN to Miss Ellen Ruth Skilton, both of Philadelphia, June 15.

JACK DENIS FLYNN to Miss Stella Rosalie Valenti, both of Tampa, Fla., June 20.

Deaths

Alexander H. Beam, Cincinnati; Medical College of Ohio, Cincinnati, 1890; for many years associated with the Warren E. Richards Company, realtors, as sales manager and director; died May 7, aged 83, of carcinoma of the sigmoid and the descending colon.

Seth Douglas Beavers ⊕ Decatur, Ind.; Rush Medical College, Chicago, 1886; honorary member of the Indiana State Medical Association; died May 12, aged 84, of congestive heart disease and chronic myocarditis.

Julian Lee Birdsong, Hartford, Conn.; Johns Hopkins University School of Medicine, Baltimore, 1909; died in the Veterans Home, Rocky Hill, May 17, aged 69, of coronary occlusion.

Vernon Blythe, Paducah, Ky.; University and Bellevue Hospital Medical College, New York, 1900; member of the American Medical Association; served as a member of the state board of health; past president of the Southwestern Kentucky Medical Association; at one time secretary of the McCracken County Medical Society; served during World War I; formerly chairman of the municipal housing commission and past president of the board of education; died in the Illinois Central Hospital May 3, aged 68, of lobar pneumonia.

Nathan Leander Bourne ⊕ Decatur, Ill.; Barnes Medical College, St. Louis, 1903; served on the staffs of the Decatur and Macon County Hospital and St. Mary's Hospital; died May 17, aged 71, of circulatory failure.

Lemuel Brehaut, White Plains, N. Y.; University of the City of New York Medical Department, New York, 1887; died June 13, aged 83, of generalized arteriosclerosis.

Cecil Else Brous ⊕ Portland, Ore.; University of Oregon Medical School, Portland, 1913; died June 3, aged 55, of nephritis.

Charles Roscoe Buren, Princeton, Mo.; St. Louis College of Physicians and Surgeons, 1896; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; at one time associated with the Indian Service; died in Atlanta, Ga., June 8, aged 71, of coronary occlusion.

Roscoe Patrick Carney, Davenport, Iowa; St. Louis College of Physicians and Surgeons, 1911; served as president and secretary of the Scott County Medical Society; member of the American Medical Association, Iowa Sanatorium Association, American College of Chest Physicians and the American Trudeau Society; served as president of the alumni association of St. Ambrose College; for many years medical director of the Pine Knoll Sanatorium; on the staffs of the Mercy and St. Luke's hospitals; died in Firman Desloge Hospital, St. Louis, June 12, aged 60, of progressive pulmonary fibrosis, heart disease and terminal pneumonia.

Walter Scott Conn, Los Angeles; Chicago College of Medicine and Surgery, 1914; served during World War I; formerly associated with the U. S. Public Health Service Reserve; died May 10, aged 78, of heart disease.

George D. Counts ⊕ Wesley, Ark.; Marion-Sims College of Medicine, St. Louis, 1897; secretary of the Madison County Medical Society; on the staff of the Fayetteville City Hospital, Fayetteville; died April 18, aged 73, of carcinoma.

George L. G. Cramer, Owosso, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889; member of the American Medical Association; for many years county coroner; past president of the Shiawassee County Medical Society; past president of the Shiawassee County Conservation Association; instrumental in the founding and for many years active on the staff of the Memorial Hospital, serving for two years as chief of the staff; died April 3, aged 80.

Ernest Charles Dalton, St. Helens, Ore.; Willamette University Medical Department, Salem, 1905; formerly a contract surgeon in the U. S. Army; served on the Mexican border in 1916 and during World War I; died in St. Helens General Hospital May 16, aged 72, of cardiovascular disease.

John L. Daniels, Jefferson, Wis.; Milwaukee Medical College, 1905; for many years city physician; died May 16, aged 64, of arteriosclerosis and diabetes mellitus.

Willis Irving Dillingham, West New York, N. J.; Dearborn Medical College, Chicago, 1906; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; local school physician; died in Secaucus May 21, aged 76, of nephritis and arteriosclerosis.

George H. Ellis, Oilton, Okla.; Memphis (Tenn.) Hospital Medical College, 1903; served a term as mayor of Oilton; died in Stillwater, March 31, aged 73, of cardiac failure and carcinoma of the leg.

Alfred Eugene Ewing, McDonald, Ohio; Cleveland Medical College, 1896; member of the American Medical Association; surgeon for Carnegie-Illinois Steel Corporation; past president of the local school board; served as director of the Federal Bank and First National Bank in Girard; died May 23, aged 75, of coronary disease.

John Bartow Fattic, Anderson, Ind.; Medical College of Ohio, Cincinnati, 1884; member of the American Medical Association; directed the organization of a hospital unit during World War I, serving overseas as a major; later promoted to lieutenant colonel; for many years chief surgeon for the Indiana Union Traction Company, examiner for many insurance companies and member of the staff of St. John's Hospital, where he died May 10, aged 82, of cerebral hemorrhage.

John Vernon Ferrell, Eldorado, Ill.; Chicago College of Medicine and Surgery, 1917; member of the American Medical Association; served as president of the Saline County Medical Society; member and past president of the Eldorado Rotary Club; medical director and part owner of the Eldorado Hospital; died May 8, aged 55, of carcinoma of the liver.

Maynard A. Finley ⊕ Emporia, Kan.; St. Louis College of Physicians and Surgeons, 1897; died April 26, aged 75, of chronic nephritis.

Harvey John Flowers ⊕ Kilmichael, Miss.; Memphis (Tenn.) Hospital Medical College, 1897; died in West Point March 25, aged 73.

Ellen Bellows Foot, New Rochelle, N. Y.; Cornell University Medical College, New York, 1938; member of the American Medical Association; diplomate of the National Board of Medical Examiners; assistant professor of surgery (anesthesia) at her alma mater; served a residency at the Massachusetts General Hospital in Boston and the Presbyterian Hospital in New York; interned at the New York Hospital, New York, where she served as anesthetist in chief and where she died May 11, aged 32, of primary carcinoma of the liver.

Rodolphus Wickham Fuller ⊕ Grand Rapids, Mich.; Detroit College of Medicine, 1909; served as head physician at the Indiana State Reformatory Hospital, Pendleton, and on the staff at St. John's Hospital in Anderson; on the staffs of Blodgett Memorial and St. Mary's hospitals; died in the Butterworth Hospital April 29, aged 58, of coronary occlusion.

Adolph Otto Goldstein ⊕ Philadelphia; Medico-Chirurgical College of Philadelphia, 1906; associate in laryngology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; on the staffs of the Northern Liberties and St. Luke's hospitals; died in the Doctors Hospital May 19, aged 63, of coronary thrombosis.

Thurman Bishop Haas, McArthur, Ohio; Jefferson Medical College of Philadelphia, 1913; served overseas as a major in the medical corps of the U. S. Army during World War I; died March 15, aged 58.

Edward Eli Heiple, St. Louis; St. Louis University School of Medicine, 1914; member of the American Medical Association; on the staffs of the Alexian Brothers' and St. Anthony's hospitals; died in Jefferson Barracks, Mo., May 4, aged 56, of hypertensive and arteriosclerotic heart disease.

Beverly A. Henry, Anderson, S. C.; Atlanta (Ga.) Medical College, 1886; honorary member of the South Carolina Medical Association; member of the American Medical Association; served as president of the city chamber of commerce; died in the Anderson County Hospital April 4, aged 82, of coronary thrombosis.

Samuel Beck Herdman, Taylorville, Ill.; Rush Medical College, Chicago, 1909; served during World War I; fellow of the American College of Surgeons; chief surgeon for the Peabody Coal Company; past president of the Christian County Medical Society; on the staff of St. Vincent's Hospital; died May 18, aged 63, of cerebral hemorrhage.

Henry Leon Hirsch ⊕ Springfield, Mass.; Jefferson Medical College of Philadelphia, 1906; at one time member of the city school committee; served during World War I; died May 8, aged 60, of coronary thrombosis.

George Llewellyn Hoffman Sr., ⊕ Norristown, Pa.; Jefferson Medical College of Philadelphia, 1904; past president of the Montgomery County Medical Society; on the staffs of the Montgomery and Sacred Heart hospitals; formerly on the staff of the Graduate Hospital of the University of Pennsylvania, Philadelphia; veteran of the Spanish-American War; died May 17, aged 77, of coronary thrombosis.

Arcturus Lee Howard, Chevy Chase, Md.; Georgetown University School of Medicine, Washington, D. C., 1893; retired in 1940 as head of the business practice department of the District of Columbia high schools; served on the staff of the Emergency Hospital and Central Dispensary in Washington, D. C.; died May 31, aged 75, of uremia, cerebral hemorrhage and cardiovascular-renal disease.

Boyd Merrill Krout, Stockton, Calif.; Harvard Medical School, Boston, 1913; member of the American Medical Association; served overseas during World War I; formerly on the staff of the San Joaquin General Hospital in French Camp; assistant health officer of the San Joaquin health district, with which he had been connected since 1927; died May 4, aged 60.

Oscar Adair Lashley, Steubenville, Ohio; Ohio State University College of Medicine, Columbus, 1924; member of the Student Army Training Corps during World War I; secretary of the Jefferson County Medical Society, 1927-1928, and president in 1929; died March 20, aged 46.

George Emerson Learn, Hamburg, N. Y.; University of Buffalo School of Medicine, 1904; member of the American Medical Association; retired member of the Medical Society of the State of New York; at one time served as principal of Stevensville, Ont., schools; formerly health officer of Hamburg; died in Our Lady of Victory Hospital, Lackawanna, May 27, aged 73, of heart disease.

Ada Belle Blair Mackey, Altoona, Pa.; University of Pittsburgh School of Medicine, 1909; died in the Altoona Hospital April 15, aged 60, of carcinoma of the uterus.

Maximilian Malina, Chicago; Chicago College of Medicine and Surgery, 1911; on the staffs of the Walther Memorial and Norwegian American hospitals; died May 23, aged 63, of coronary insufficiency and chronic myocarditis.

Frank Lynn McCready ⊕ Sewickley, Pa.; University and Bellevue Hospital Medical College, New York, 1899; past president of the board of health of Sewickley; commissioned in the medical section of aerial photography, with rank of captain, during World War I; on the staff of the Sewickley Valley Hospital; died May 16, aged 71, of pneumonia.

Marvin Alford McDowell ⊕ Logansport, Ind.; Indiana University School of Medicine, Indianapolis, 1911; served during World War I; member of the American Psychiatric Association; on the staff of the Logansport State Hospital; died May 21, aged 66, of cerebral thrombosis.

Sherwin E. Mella ⊕ Kansas City, Mo.; University of Kansas School of Medicine, Kansas City, 1919; member of the American Academy of Dermatology and Syphilology; instructor in dermatology at the University of Kansas School of Medicine, Kansas City, Kan.; on the staffs of Menorah Hospital and St. Luke's Hospital, where he died May 18, aged 49, of coronary disease.

Henry Estes Merriam, Ithaca, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1894; retired member of the Medical Society of the State of New York; member of the American Medical Association; past president of the Tompkins County Medical Society; served during World War I; died in the Clifton Springs (N. Y.) Sanitarium June 25, aged 76, of cerebral hemorrhage.

Samuel Gibbs Milliken, Houston, Texas; University of Texas School of Medicine, Galveston, 1922; formerly adjunct professor of pathology at his alma mater; interned at the Peter Bent Brigham Hospital in Boston; served overseas during World War I; died March 23, aged 49, of bilateral pulmonary tuberculosis and toxic myocarditis.

Ben Parmenter, Mount Carmel, Ill.; Barnes Medical College, St. Louis, 1909; died May 10, aged 63, of heart disease.

Wallace Bernard Phillips, Gary, W. Va.; John A. Creighton Medical College, Omaha, 1916; died May 20, aged 52, of acute dilatation of the heart.

Walter Jewett Pinkerton ⊕ Ramsay, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; formerly mayor of Bessemer; physician for the Castile Mining Company; served on the staff of the Grand View Hospital in Ironwood; died May 9, aged 72, of carcinoma of the stomach.

William James Pinkerton ⊕ Omaha; Omaha Medical College, 1898; served during World War I; died in the Clarkson Memorial Hospital, April 15, aged 74, of bronchopneumonia and carcinoma of the urinary bladder.

William Warren Quinton ⊕ Major, U. S. Army, retired, Santa Barbara, Calif.; Columbia University College of Physicians and Surgeons, New York, 1892; entered the army as a first lieutenant on Oct. 26, 1893 and retired with rank of major in 1909 for disability in line of duty; died in St. Francis Hospital July 18, 1943, aged 73, of coronary sclerosis and arterial hypertension.

Emanuel M. Radlow, Cold Spring, N. Y.; Albertus-Universität Medizinische Fakultät, Königsberg, Prussia, Germany, 1901; died April 14, aged 68, of cerebral hemorrhage and chronic arteriosclerosis.

Sol E. Ravitz, Chicago; University of Nebraska College of Medicine, Omaha, 1920; clinical associate in dermatology and syphilology and secretary of the department, Loyola University School of Medicine; a member of the out-patient department of the dispensary of the Mercy Hospital; died May 19, aged 48, of coronary thrombosis.

Dean Stelle Rising ⊕ Kansas City, Mo.; University Medical College of Kansas City, Mo., 1910; on the staffs of St. Vincent's Hospital and St. Joseph's Hospital, where he died May 12, aged 61, of coronary thrombosis.

Martin M. Ritter, Los Angeles; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1892; served as chief of staff and at one time vice president of the staff of the Columbus Hospital in Chicago; died June 12, aged 82, of myocarditis.

Abraham Rosenberg ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1905; died May 26, aged 63, of heart disease.

Albie Jens Rosholt, La Crosse, Wis.; Rush Medical College, Chicago, 1908; member of the American Medical Association; secretary of the La Crosse County Medical Society; served during World War I; at one time county physician; for many years on the staffs of the La Crosse and St. Francis hospitals; formerly on the staff of the La Crosse Lutheran Hospital; director and at one time president of the State Bank of Rosholt; died in Sparta May 16, aged 66, of coronary occlusion.

Edwin Ross, St. Helens, Ore.; University of Oregon Medical School, Portland, 1894; for many years city health officer; served as bank president; died March 29, aged 80.

William F. Schaare ⊕ Chicago; College of Medicine and Surgery (Physio-Medical), Chicago, 1902; veteran of the Spanish-American War; served as national president of the 7th Army Corps Veterans' Association; died in River Forest June 19, aged 69, of cerebral hemorrhage.

J. H. Alfred Schulz, Milwaukee; Wisconsin College of Physicians and Surgeons, Milwaukee, 1903; died May 11, aged 74, of myocardial degeneration.

Henry Franklin Slifer, North Wales, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1876; at one time president of the Montgomery County Medical Society; emeritus professor of physiology at the Temple University School of Medicine, Philadelphia; at one time professor of physiology at the North Wales Academy and the Medico-Chirurgical College of Philadelphia; for many years a member of the school board; died April 2, aged 92.

Edwin Kirby Smith, McMinnville, Tenn.; George Washington University School of Medicine, Washington, D. C., 1927; member of the Medical Society of the District of Columbia and the American Medical Association; interned at the Garfield Memorial Hospital and the Children's Hospital in Washington, D. C.; served a residency at the Children's Hospital in Cincinnati; died June 21, aged 46, of heart disease.

Caleb S. Stone Sr., Seattle; Louisville (Ky.) Medical College, 1883; member of the American Medical Association and the Idaho State Medical Association; died May 31, aged 88, of uremia.

Edwin Wilfred Stubbs, Aurora, Ill.; Marion-Sims College of Medicine, St. Louis, 1897; served as county physician; examining physician for the draft board during World War I; died in the Copley Hospital May 26, aged 81, of coronary occlusion and generalized arteriosclerosis.

Ross Adams Switzer, McHenry, Miss.; Chattanooga (Tenn.) Medical College, 1902; member of the board of supervisors of Stone County for twenty-eight years, serving as president of the board at the time of his death; died May 1, aged 69.

Toyohiko Campbell Takami ⊕ Brooklyn; Cornell University Medical College, New York, 1906; on the staffs of the Cumberland and Prospect Heights hospitals; member of the board of the Long Island Biological Association of Cold Spring Harbor; died May 17, aged 70, of pneumonia.

Thomas Franklin Taylor, Monteagle, Tenn.; Vanderbilt University School of Medicine, Nashville, 1897; member of the American Medical Association; secretary of the Grundy County Medical Society; died April 24, aged 75, of carcinoma of the liver.

Thomas G. Taylor, Leaksville, N. C.; Kentucky School of Medicine, Louisville, 1877; served as mayor of Leaksville; died in the Leaksville General Hospital April 17, aged 88, of cerebral hemorrhage.

Walter Leon Teaby, Monterey, Calif.; College of Physicians and Surgeons of San Francisco, 1903; member of the American Medical Association; formerly associated with the U. S. Public Health Service; served as city councilman and as mayor of Monterey; died May 1, aged 73.

Joseph Abbott Thissell, Tupper Lake, N. Y.; Harvard Medical School, Boston, 1885; an organizer of the Tupper Lake Water Company, serving as first treasurer and president of that firm; instrumental in organizing the Tupper Lake National Bank and served as one of its first directors; for many years surgeon for the New York Central Railroad; served as medical examiner for the New York Life, Mutual Life and Prudential Insurance companies; died in the Mercy General Hospital May 13, aged 86, of pneumonia.

William Thomas Thorn, Marked Tree, Ark. (licensed in Arkansas in 1903); member of the American Medical Association; died in the Baptist Hospital, Memphis, Tenn., May 1, aged 72, of heart disease.

Edward Vincent Tolan ⊕ Pottsville, Pa.; Jefferson Medical College of Philadelphia, 1929; interned at Misericordia Hospital and served as resident physician at St. Christopher's Hospital for Children, both in Philadelphia; on the staffs of the Good Samaritan and Pottsville hospitals; died May 15, aged 40, of coronary occlusion.

Theodore Henry Trappe, New Athens, Ill.; St. Louis College of Physicians and Surgeons, 1910; member of the American Medical Association; died June 13, aged 66, of coronary disease.

Lloyd Herman Van Slyke, Black Earth, Wis.; Chicago College of Medicine and Surgery, 1916; served with a field hospital at Chateau Thierry, St. Mihiel and the Argonne in World War I; died in the Veterans Administration Facility, Wood, March 24, aged 53, of carcinoma.

William Conrad Wessel, Hermann, Mo.; Marion-Sims College of Medicine, St. Louis, 1899; served as local surgeon for the Missouri Pacific Railroad; died in State Hospital number 1, Fulton, April 11, aged 69, of cerebral hemorrhage.

William Kerr West ⊕ Hinsdale, Ill.; Detroit College of Medicine, 1889; member of the House of Delegates of the American Medical Association in 1905; fellow of the American College of Surgeons; for many years surgeon in the mines of the Copper Range Company in Painesdale, Mich.; on the staff of the Hinsdale Sanitarium and Hospital; died June 16, aged 79, of carcinoma of the prostate and cecum.

Allan Sinclair White, Racine, Wis.; Michigan College of Medicine and Surgery, Detroit, 1899; fellow of the American College of Surgeons; served on the staff of St. Joseph's Hospital in Rice Lake; died in June, aged 69.

Henry Bristol Wideman, Nevada, Ohio; University of Wooster Medical Department, Cleveland, 1893; member of the American Medical Association; served as coroner of Wyandot County; died April 5, aged 75, of heart disease.

John Lawrence Widmyer, Primos, Pa.; Medico-Chirurgical College of Philadelphia, 1901; member of the American Medical Association; on the staff of the Delaware County Hospital, Drexel Hill; died in the Fitzgerald Mercy Hospital, Lansdowne, April 10, aged 67, of coronary occlusion.

William Hall Wynne ⊕ Birmingham, Ala.; Birmingham Medical College, 1897; on the staffs of the Jefferson and Baptist hospitals; died May 28, aged 72, of heart disease.



LIEUT. ANTHONY SALVATORE GRECO
M. C., A. U. S., 1917-1944



LIEUT. THOMAS ROBERT TURINO
(MC), U.S.N.R., 1906-1944



CAPT. EDWARD L. YOUNG III
M. C., A. U. S., 1914-1945

KILLED IN ACTION

Anthony Salvatore Greco, Omaha; Creighton University School of Medicine, Omaha, 1941; interned at Creighton Memorial St. Joseph's Hospital; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 1, 1942; killed in action in Italy June 22, 1944, aged 27.

Thomas Robert Turino ⊕ Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1931; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; diplomate of the National Board of Medical Examiners; interned at the Brooklyn Hospital, where he served as associate gynecologist and obstetrician; commissioned a lieutenant in the medical corps of the U. S. Naval Reserve on Aug. 20, 1942; reported by the Navy as missing in action on July 18, 1943; presumptive date of death in the Pacific area July 19, 1944, aged 37.

Edward Lorraine Young III, Brookline, Mass.; Harvard Medical School, Boston, 1941; member of the American Medical Association; diplomate of the National Board of Medical Examiners; interned at the Massachusetts General Hospital, Boston; entered the medical corps, Army of the United States, as a first lieutenant on April 27, 1943; began active duty on May 8, 1943; promoted to captain; went overseas in March 1944, serving at a field hospital in the front line; killed in action in Germany March 24, aged 30.

Bureau of Investigation

ESTEP RUNS INTO GRIEF

"Mahatma" Apprehended in Mexico for Murder

In Memphis, where William Estep, also known as "Mahatma" and "Professor," has been styling himself "director" of the high-sounding Memphis Research Clinic, newspapers have reported that he was recently arrested in Mexico and held by Laredo, Texas, authorities for return to the Tennessee city to face a charge of second degree murder.

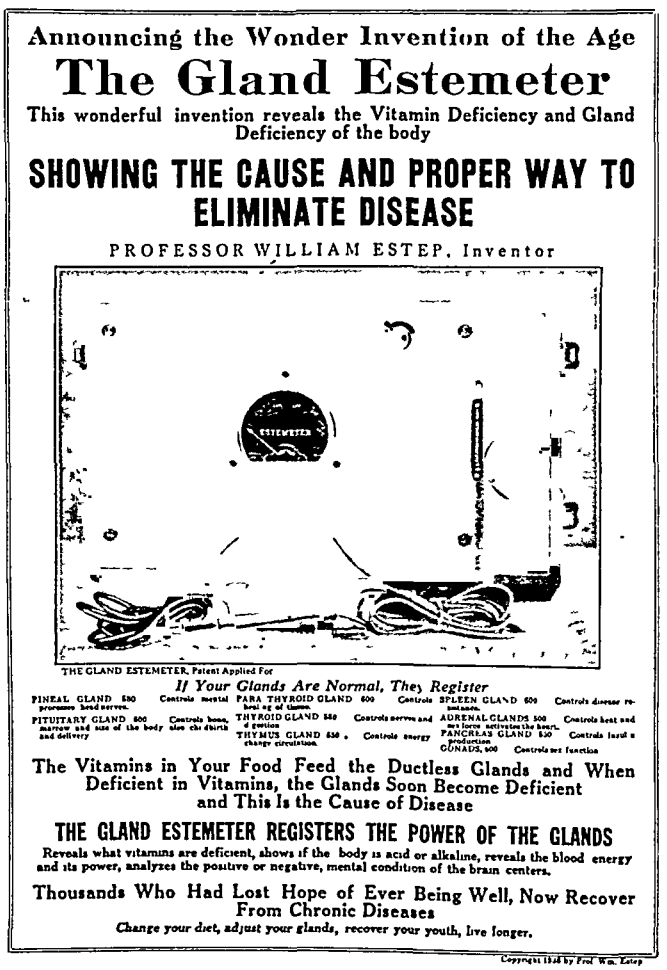
The earlier chapters of Estep's checkered career were last reviewed in this department of THE JOURNAL, Jan. 21, 1939, page 200. Briefly summarized, the article traced the "Mahatma's" career from 1930, when this Bureau first heard of him. In that year a Better Business Bureau bulletin reported that "Prof. Wm. E. Estep, proponent of 'Super Mind Science,' played Chicago in April. With the aid of a trained monkey and complimentary press notices, Estep attracted numerous followers to his 'free' lectures." Further, he claimed at that time to have degrees from two universities, whose existence investigation failed to substantiate. The bulletin further reported that a "Rev. Wm. Estep" had a record in Los Angeles, where he had been arrested in November 1923, following a raid on his "Spiritualistic Temple" and had been fined $250 when found guilty of obtaining money by false pretenses; that a follower and convert of Estep stated that the "Mahatma" took in $40,000 through his Chicago meetings, and that a plumber's assistant who had signed up for Estep's "Success Course" in Chicago, on the promise that it would make him a successful business man, had caused Estep's arrest when the course failed to touch on business. The case was dismissed in court when Estep made restitution.

Another bulletin from the same source reported shortly thereafter that Estep was accused of racketeering in his home town, Detroit, together with his wife and three other persons, in selling memberships at $40, including a supposed life insurance benefit to members under 50, in an alleged fraternity, the "Order of Temple Builders."

THE JOURNAL article showed that Estep's advertising represented that he was "the only American to ever qualify to become a mahatma. He was sponsored by Swami Ram Karan Dass, India's most noted Master Prophet"

Also there was the report from Kansas City, Mo., that Estep had been selling literature published by the Positive Christianity Publications, Washington, D. C., and taking $100 fees for courses leading to a degree that he called MS.D. (Doctor of Metaphysics), and that in 1938 he had incorporated a concern in Kansas City known as the Gland Estemeter Corporation, which, according to a newspaper notice, was, among other things, "to build, equip and maintain institutions for the treatment and care of the sick; to manufacture and sell Prof. Estep's 'Gland Estemeter' (patent applied for) . . . to deal in health foods; to deal in and dispose of such real and personal property and securities as are necessary to the conduct of said business . . ." THE JOURNAL article went on to state that an advertising folder on the Estemeter "indicates such blatant ignorance that it is astounding that any one would ever bother putting it into type. Still harder to believe is the idea that it could induce the prospect to purchase one of these machines, the reported cost of which is $250 (price not mentioned in folder)." The device was supposed to register various ductless glands according to "points" which would indicate their condition, and in accompanying literature Estep referred to the "wonderful" discovery of Dr. Albert Abrams, of whose preposterous quackery Estep was a disciple.

In June 1941 the Federal Trade Commission reported that its findings were that the Estemeter is incapable of detecting or disclosing improper or abnormal functioning of the glands and possesses no value in diagnosing diseases or conditions of the body, Estep's claims notwithstanding. The Commission therefore ordered Estep and his concern to discontinue the misrepresentations that had been made for the device. This case was briefly abstracted in THE JOURNAL Jan. 17, 1942, page 246.



This "Wonder Invention of the Age" was Estep's stock in trade a few years ago.

In November 1942 newspapers reported that Estep and some associates had been arrested in Pensacola, Fla., following indictment charging mail fraud and violation of the Securities Act of 1933. The charges were said to have followed the sale of stock in Estep's Rainbo and Trinity Gold Mines. In this connection it was brought out that Estep allegedly had represented that one of the followers of his Church of Positive Christianity and Supermind Science Cult had seen a "vision" that revealed a mountain of gold in Utah, which Estep proceeded to exploit. According to the Pensacola (Fla.) *News* of Sept. 6, 1944 Estep was found guilty in this case in December 1942 but, on appeal, his conviction was reversed.

In April 1945 a Memphis newspaper reported that William Estep, who had been enjoined from the practice of medicine in his Vita-Ray Clinic at Pensacola, Fla., had gone to Tennessee and opened the "Memphis Research Clinic," which he advertised as an "X-ray clinic for chronic diseases." The Memphis paper further reported that Estep's Florida license as a naturopathic physician had been revoked Nov. 23, 1942 by the Florida State Board of Medical Examiners, on the ground that it had been obtained fraudulently from the late Dr. George A. Munch, secretary of the old Eclectic Board, who served a sentence in federal prison for using the mails to defraud. It appears, however, that Estep entered an appeal before the Florida Supreme Court and that this is still pending.

In his latest escapade, according to a Memphis paper, Estep fled that place for Kansas City, Mo., whence he made his way to Mexico and was apprehended on May 31 in Monterrey. He was charged with murder in the second degree, resulting from the unlawful administration of certain drugs to a Negro woman, which resulted in her death. After the return of the first indict-

ment, according to the report, he fled from the jurisdiction of the court, forfeiting a bond of $1,500. While in Kansas City, it is said, he gave lectures on "health foods" until May 1, when he made a "quick exit," leaving a hotel bill unpaid. It is reported that when Estep came to Memphis he purchased property and recorded a Tennessee license as a "naturopathic physician" on January 15, but that after his clashes with the law the Tennessee State Board of Naturopathic Examiners had revoked his license.

These are the "Mahatma's" present difficulties. Will he see the light and abandon his long career in quackery? Probably not, unless some agency of government places him where any amount of mind science fails to return the cash of the credulous.

Correspondence

AN AMERICAN MEDICAL ASSOCIATION FILM SERVICE

To the Editor:—In five recent articles in American and British journals, various authors have called attention to the important developments in health teaching and medical training films which are bound to occur in the postwar period.

REASONS FOR SLOW DEVELOPMENT IN PAST

The motion picture has been slow in establishing a place for itself in the field of medical teaching. In the first place, this device with its limited eye and ear approach has had to compete with bedside teaching and laboratory teaching with their multiplicity of approaches. In the second place, medical teachers have made such extended use of actual specimens, photographs, teaching charts, lantern slides, cross sections and models in illustrating their lectures and have illustrated their textbooks and articles so lavishly that the need for the motion picture has not been apparent.

In the field of medicine, therefore, the use of the motion picture has had to be selective and with due deference to other methods of education, which in their place have proved to be more thorough and more effective. Some of the considerations on which selection has been based in applying the motion picture to medical and health teaching follow:

1. Films may often be used to advantage in introducing a new subject to a group. We may think of an orientation film of this type as utilizing the principle of taking a traveler up on the hilltop to give him an overall view and sense of direction before he enters the forest below and attempts to make his way through the trackless waste. The film so used has a real place in our medical schools.

2. Films may be helpful in demonstrating new principles, new technics and new apparatus to groups that are already familiar with the basic problems in the particular field. Used in this way as a means of keeping busy practitioners in touch with the latest developments in medicine, the film would appear to offer very attractive possibilities.

3. Where technicians must be trained for a specific task with a minimum of basic scientific training in order to save time and expense, films can often be made to do for such workers what would otherwise require extensive courses. For example, a film showing how carelessness with regard to aseptic technic in the operating room can cause postoperative infection may do for the Navy hospital corpsman much that a course in bacteriology does for the doctor in creating a respect for aseptic technic.

4. In the fields of school health education, college health education and public health condition, where the need is not for detailed knowledge but rather for a general, overall knowledge of hygiene, preventive medicine and public health in order to improve living habits and make for intelligent support of public health measures, motion pictures have an important part to play.

PROBABILITY OF RAPID DEVELOPMENT IN FUTURE

The experience of both the Army and the Navy in training medical technicians to meet their military duties, in preparing medical personnel for combating tropical diseases new to them and in warning line personnel as to the necessary precautions they must take if they are to avoid the diseases of the occupied areas has proved beyond any shadow of doubt the value of medical training and health teaching films. So convincing has been the demonstration that it is a generally accepted fact that the postwar period will see a tremendous increase in the production of health teaching and medical training films.

It is obvious, however, that unless a central clearing house for this type of film is established there is bound to be wasteful duplication of effort, poorly planned production and, in many instances, even complete misapplication of the film approach.

THE URGENT NEED

There is an immediate and urgent need for the establishment of a central film service for health teaching and medical training films which shall review, describe and catalogue (but not evaluate) all films already produced in these fields, list all medical films in the process of production and act as requesting, sponsoring and supervising authority for the production of medical films.

WHO SHOULD MEET THE NEED?

It is thinkable that this centralized film service for health teaching and medical training films should be set up (*a*) as an educational activity and therefore a part of the National Education Association; (*b*) as a scientific activity and therefore a part of the American Association for the Advancement of Science, (*c*) as a medical activity and therefore a part of the American Medical Association, (*d*) as a public health activity and therefore a part of the American Public Health Association or the U. S. Public Health Service and (*e*) as a motion picture production activity and therefore a function of the entertainment film industry or of the industrial film producers.

In considering these various groups as sponsors for a medical film service, the following facts should be given careful consideration:

Though educational theory and technic enter importantly into the production of both health teaching and medical training films, the medical subject matter rather than the educational approach would seem to be the dominating factor; both education and science cover such wide fields that practical organization and comprehensive coverage would appear difficult, if not impossible, under the sponsorship of either of these widely flung groups; the American Public Health Association and the U. S. Public Health Service are concerned almost entirely with preventive medicine and would therefore have little interest in the medical training films, though great interest in the health teaching films; there is but little profit in the production of medical films, so that if producers of entertainment or industrial films enter the medical film field they will probably do so only in a half-hearted way and as a minor part of their interest; whoever sponsors a central medical film service should have funds and facilities sufficient to provide films that will meet the needs of physicians, nurses and medical technicians both in training and in service.

In my judgment the American Medical Association is in the best position to serve as the central agency for the promotion and utilization of health teaching and medical training films.

D. F. Smiley, Lieutenant Commander (MC), U.S.N.R.

This communication has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this communication are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

THE PHYSICIAN AND THE SELECTIVE SERVICE SYSTEM

To the Editor:—In retiring from Selective Service, after serving as chief of the Medical Division during the last four and one-half years, I have received literally dozens of letters complimenting us on what has been accomplished. Most of these letters, I note, came from physicians. In reading them and in thinking over the situation, it seems to me that the shoe really should be placed on the other foot. Hence I am writing to express the gratitude of the Medical Division of Selective Service to the 35,000 doctors and 10,000 dentists who have contributed so liberally of their time, effort and skill in handling the medical problems of the registrants.

No other group of people in the nation have given more liberally of themselves in the war than have these professional people. That was the opinion expressed by the late President Roosevelt at one of his wartime conferences.

The Medical Division of Selective Service in National Headquarters in Washington has enjoyed the complete support of the director, Major Gen. Lewis B. Hershey. It has had also the strong support and superlative leadership from the three Surgeons General of the Army, Navy and Public Health Service, from all the state headquarters and especially from all the state medical officers. The physicians attached to the 6,443 local boards, the consultants on the 660 medical advisory boards supplied all the demands made on them. They met fully and completely the nation's needs in the procurement of manpower for the fighting forces.

Such service should not be taken for granted nor should it be passed over without acknowledgment. Medicine has done a grand job in this war in Selective Service as well as in the Medical Corps of the Army, Navy and Public Health Service.

In leaving Selective Service I wish to express to all the civilian physicians and dentists in the Selective Service System my personal appreciation and that of the Medical Division at National Headquarters for the wholehearted service they have rendered throughout the last four and one-half years.

L. G. ROWNTREE, M.D.
Selective Service System,
Washington, D. C.

FEMALE INFERTILITY

To the Editor:—The communication from Dr. Roy J. Hefferman (THE JOURNAL, June 23) attempting to add another etiologic factor to the subject of female infertility has failed to furnish a rational biologic relationship between "voluntary sterility" and the direct impairment of the human reproductive organs. His warning against the use of contraceptives by newly married couples may be of considerable significance from the point of view of dogmatic theology, for sentimental justification or for some indefinite sociologic reasons. However, it lacks the establishment of a definite physiologic explanation for the alleged causation of a pathologic condition of the pelvic organs.

The pelvic pathologic conditions such as ovarian cysts, fibroids, endocervicitis and endometriosis enumerated by the correspondent are conditions present in sterile and in fertile females. This has been the observation of numerous gynecologists. The mere finding of pelvic pathologic conditions in women who have practiced "voluntary sterility" does not, logically or scientifically, justify the conclusion that this pathologic condition was the effect of the contraceptive practice. The assertion that "planned sterility by the use of contraceptives" constitutes a primary etiologic factor in the causation of pelvic pathologic conditions, with subsequent permanent sterility, or female infertility, is not borne out by clinical observation and is contrary to the biologic concept of organic changes.

DAVID DEUTSCHMAN, M.D., New York.

EPIDEMIC PLEURODYNIA

To the Editor:—I read with great interest the editorial in THE JOURNAL June 16 on the subject of epidemic pleurodynia. Reference is made to the apparent lack of microscopic studies of the affected tissues in these patients. In the late summer of 1935 I had an opportunity to see several of these patients at the Cincinnati General Hospital. One of these patients, a woman intern, had a small section of the latissimus dorsi muscle removed in the surgical service of the late Dr. Mont R. Reid. Microscopic study of this apparently affected muscle did not show any morphologic changes. These findings were reported in the *American Journal of the Medical Sciences* **191**:673 (May) 1936. At that time this appeared to be the first such study which had been made.

MELL B. WELBORN, M.D., Evansville, Ind.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, July 21, page 900.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: January. Sec., Dr. B. R. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS:* *Medical.* Little Rock, Sept. 20-21. Sec., Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, Nov. 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral.* Los Angeles, Aug. 11. *Written.* Los Angeles, Aug. 13-16. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, Sept. 10. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

ILLINOIS: Chicago, Oct. 9-11. Supt. of Registration, Department of Registration & Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

LOUISIANA: New Orlears, Aug. 16-18. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MARYLAND: *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEVADA: *Reciprocity.* Carson City, Aug. 6. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO:* Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 1-4. Sec., Dr. Jacob L. Lochner, Education Bldg., Albany.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

WISCONSIN:* Madison, Jan. 8-10. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Oct. 1-2. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, Sept. 5-6. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Oct. 13. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 22-23. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 3. Sec., Dr. J. F. Conn, Box 655, DeLand.

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Oct. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

RHODE ISLAND: Providence, Aug. 15. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: December. Sec., Dr. J. D. Alway, Aberdeen.

TENNESSEE: Memphis, Sept. 24-25. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Madison, Sept. 22. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee 3.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Harrison Narcotic Drug Act: Illegal Issuance by Physician of Narcotic Prescriptions to Addict.—An indictment was returned to the district court of the United States, eastern district, New York, charging in six counts that Abdallah, who was licensed to practice medicine in New York, had violated a section of the federal narcotic drug laws [26 U. S. C. A. Internal Revenue Code, section 2554 (a)] by selling morphine to an addict without a written order on a form issued for that purpose by the Secretary of the Treasury. At the trial the government presented evidence that a stated agent of the United States Narcotic Squad made several trips to the vicinity of Abdallah's office with a drug addict; that on each occasion the agent searched the addict thoroughly, found nothing on him, and then gave him money; that each time the addict visited Abdallah and returned to the agent with a prescription or prescriptions for morphine, in combination with ephedrine, which prescriptions were promptly turned over to the agent; and that the agent on each occasion then drove the addict to the vicinity of a certain pharmacy, where the prescriptions were filled. The amount of the prescriptions varied with the amount of money given by the agent to the addict. There were six of these transactions from March 10 to March 30, 1943, and each transaction was the subject of a different count of the indictment. On the last three transactions Abdallah gave the addict several postdated prescriptions. There was evidence that Abdallha examined the addict at least once, and that the addict complained to him of asthma, that during the course of the examination the physician made the addict strip to the waist, and that the addict had needle marks on his arm, which the physician must have noticed and which ought to have put him on guard as to the addiction of his purported patient. The addict testified that the physician accused him of being an addict but nevertheless issued the prescription; and that the physician warned him not to fill the prescriptions with one druggist, not to carry the bottles on his person, and to tear the labels off the bottles and that the physician urged him to supply a friend in whose name future prescriptions could be made out. There was further evidence that the addict never had asthma and that the physician was well aware that morphine is not a specific remedy and should be used only in extreme cases to quiet a person with loss of sleep and then only with great caution. The evidence was undisputed that the addict obtained twelve prescriptions for morphine from the physician on six visits within a period of twenty days. On the addict's last visit to the physician he was given marked money, which the physician turned over to narcotic agents when they subsequently arrested him. After his arrest he could not produce any record showing the names of patients for whom he had prescribed narcotics. In lieu of the records he attempted to introduce at the trial his diary, but this showed discrepancies from the prescriptions presented in evidence by the government. The jury found the physician guilty on the three counts of the indictment covering the last three transactions between the physician and the addict in which the physician had given the addict several postdated prescriptions. The jury found the physician not guilty with respect to the first three counts, with respect to transactions in which single prescriptions had been issued to the addict. The physician then appealed to the circuit court of appeals, second circuit.

The government contended, in line with the holding by the circuit court of appeals, second circuit, in *United States* v. *Lindenfeld*, 142 F. (2d) 829, certiorari denied 65 S. Ct. 89, that Abdallah by his course of conduct had removed himself from the protection of a section of the federal narcotic laws [26 U. S. C. A. Internal Revenue Code, section 2554 (c) (1)], which excepts from the general prohibitions of the law distribution of narcotic drugs "by a physician . . . in the course of his professional practice only." Abdallah urged the court to reconsider its holding in the Lindenfeld case that the question as to whether the defendant comes within the exception was one of fact as to his good faith, for the jury to decide, and contended that there must be a consent or conspiracy between the physician and the druggist filling the prescription in order to render the physician's acts unlawful. The court, however, refused to reconsider its prior decision in the Lindenfeld case and in effect sustained the contention of the government and refused to entertain Abdallah's contention.

From the evidence, continued the court, the jury in the trial court was clearly entitled to infer Abdallah's bad faith. As a matter of fact, the jury seems to have exercised discrimination in its verdict, giving Abdallah the benefit of all possible doubt on the first three counts of the indictment, which charged the illegal issuance of a single prescription at a time, while finding him guilty on the last three counts, charging the issuance of several postdated prescriptions at a time, where bad faith seems undeniable. The physician contended, however, that the government failed to prove the filling of the prescriptions by a druggist, which he argued was a necessary element of the sale of narcotics as here charged. The evidence, answered the court, is contradictory as to whether or not the druggist filled the prescriptions according to directions, including ephedrine sulfate and milk sugar, or as to whether or not the addict obtained pure morphine sulfate instead. But as long as acquisition of the opiate as a result of the prescription is shown, we think it cannot excuse the wrongful act of the physician that the druggist did not fulfil the directions precisely or even took advantage of the opportunity to expand the illegal traffic. In either event the prescription is the instrument leading to the completion of the crime. Obviously the interest of the druggist is to obtain a seemingly legitimate basis for rapid depletion of his morphine stock and the physician has furnished him that opportunity by his prescription, whether it is followed to the letter or not. With its purpose thus fulfilled, the crime is complete.

The physician urged, however, that the crime here charged was completed through the agency of a decoy and detective, whose acts cannot be imputed to him so as to render him guilty of the offense charged, citing *People* v. *Lanzit*, 70 Cal. App. 498, 233 P. 816; *Dalton* v. *State*, 113 Ga. 1037, 39 S. E. 468; *State* v. *Decker*, 321 Mo. 1163, 14 S. W. (2d) 617; *Williams* v. *Georgia*, 55 Ga. 391; and *DeMayo* v. *United States*, 8 Cir., 32 F. (2d) 472. We need not consider, said the court, how far the principle urged by Abdallah may be soundly pressed, since all that the cases cited by the physician stand for is that acts done by a detective in building up the commission of an offense cannot be imputed to a defendant. They do not determine or limit the participants in steps leading to the completion of the offense once it is shown to have been committed. Here the crucial act was committed once the prescriptions were issued. The filling of the prescriptions merely carries the act to the final point where it becomes punishable as the crime in question. Thus the administering of poison may not constitute murder until the victim perishes; but once this occurs the act of administering constitutes the offense. The crucial act of the issuance of the prescriptions was one not performed by the detective or the addict, but by the defendant of his own volition and intent.

This holding, continued the court, disposes of an objection by the physician to his conviction on the last count for issuing prescriptions which were not filled until after his arrest. Nor do we find merit in a further contention by the physician as to entrapment. As was said in *United States* v. *Lindenfeld*, supra:

> Entrapment exists only when the government agents induce and originate the criminal intent of a defendant; there is none where the criminal intent is already present, and the agents merely afford the opportunity for the commission of a crime.

Despite the physician's claim of having been duped by the addict, the instructions given by the court to the jury and the jury's verdict negative the existence of the defense.

Finally, the defendant objected to the admission in evidence of 115 prescriptions for narcotics issued by him and found on a spot check of drug stores in the neighborhood of his office. These prescriptions, said the court, were competent and relevant evidence on the question of the physician's good faith and as such they are not barred, even if they tended to establish offenses other than the one with which the defendant was charged. The judgment of conviction was accordingly affirmed. —*United States v. Abdallah, 149 F. (2d) 219 (1945).*

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

15:123-164 (April) 1945

*Human Chronic Toxoplasmosis. W. J. Tomlinson.—p. 123.
*Fatality Due to Transfusion of Unpooled Plasma. E. C. Alberton. —p. 128.
Further Studies on Specific Streptococcal Antibody-Antigen Reactions in Poliomyelitis. E. C. Rosenow.—p. 135.
Unusual Carrier State. A. G. Hulett and H. Rubin.—p. 152.
Megakaryocytes and Blood Platelets. F. Levy.—p. 154.
Teratoma of Liver in an Infant. P. H. Hartz and A. van der Sar. —p. 159.

Human Chronic Toxoplasmosis.—The literature reveals that 13 cases of toxoplasma infection have been diagnosed at necropsy, and 3 clinical cases have been diagnosed by recovery of the parasites from cerebrospinal fluid. Weinman, in a study of immunity in experimental toxoplasmosis, found that chronic toxoplasmosis in animals produced a different picture from the acute disease. Human chronic toxoplasmosis has not been demonstrated. While reviewing the necropsy material on sickle cell anemia, Tomlinson found an instance of chronic toxoplasmosis in a British West Indian Negro girl aged 10 years 8 months, who died of sickle cell anemia in the Canal Zone and who had no symptoms referable to toxoplasma infection. The case therefore represents the first reported case of chronic, asymptomatic human toxoplasmosis. Toxoplasma parasites were found in pseudocysts throughout the brain and in aggregates within myocardial fibers. They were not accompanied by inflammatory changes or necrosis.

Fatality Due to Transfusion of Unpooled Plasma.—Alberton reports a fatality following the use of unpooled plasma in which the cause of death was proved to be hemolytic reaction due to blood group incompatibility. The patient was a woman aged 77 who underwent a gastric resection for carcinoma of the stomach. A blood transfusion had to be stopped after 150 cc. of blood had been given. A transfusion of plasma was started two days later, but after only 100 cc. had been given the patient complained of severe lumbar pain. The patient rapidly became ashen gray and cyanotic. The transfusion was stopped with the first symptoms, and supportive measures were started. She died several hours later. The unpooled incompatible plasma saline mixture which had been infused was found to contain anti-A agglutinins active in a dilution of 1:2,048 (± 1:4,096). The patient had group A cells of average sensitivity. On the basis of this report the theoretical objections to the use of unpooled plasma are proved to have factual foundation. Unpooled plasma should be given only to homologous type recipients when the titer of agglutinins is not known.

American Journal of Diseases of Children, Chicago

69:267-338 (May) 1945

Progeria: Clinical, Metabolic and Pathologic Studies on a Patient. N. B. Talbot, A. M. Butler, E. L. Pratt, E. A. MacLachlan and J. Tannheimer.—p. 267.
Pyodermic Myiasis in Children: Observations, with Special Reference to Törsalo. L. Goldman.—p. 280.
Sulfathiazole Ointment for Prevention and Treatment of Pyodermas of Newborn Infants: Results Obtained with Five per Cent Sulfathiazole in an Oil in Water Type Emulsion Base. C. A. Weymuller and Elizabeth J. Ittner.—p. 283.
Amyotonia Congenita (Oppenheim): Report of 5 Cases with Necropsy; Discussion of Relationship Between Amyotonia Congenita, Werdnig-Hoffmann Disease, Neonatal Poliomyelitis and Muscular Dystrophy. W. F. Burdick, Dorothy V. Whipple and W. Freeman.—p. 295.

American J. of Obstetrics and Gynecology, St. Louis

49:603-718 (May) 1945

Total Abdominal Hysterectomy: Observations Based on Series of 1,925 Patients. W. F. Mengert and R. Stoltz.—p. 603.
*End Results in Treatment of Cervicitis. D. Findley.—p. 614.
Sex Precocity, Virilism, Adrenal Cortical Tumor. J. P. Pratt and R. L. Schaeffer.—p. 623.
Habitual Abortion. J. K. Quigley.—p. 633.
Duplication of Right Kidney Pelvis and Ureter with Extravesical Ureteral Opening. R. J. Moe.—p. 641.
Postmenopausal Pruritus Vulvae. B. L. Cinberg.—p. 647.
Penicillin Treatment of Sulfonamide Resistant Gonococcal Infections in Female. A. Cohn, H. C. Taylor Jr. and I. Grunstein.—p. 657.
Transmission of Penicillin Through Placenta: Preliminary Report. A. M. Hutter and J. Parks.—p. 663.
Action of Veratrone on Blood Pressure, Urine Volume and Urea Clearance in Toxemias of Pregnancy. J. R. Willson.—p. 665.
Thiamine Status During Pregnancy. A. C. Siddall and J. W. Mull. —p. 672.
Carcinoma of Ovary Treated Preoperatively with Deep X-Rays: Report of 3 Cases. T. J. Parks.—p. 676.
*Gangrene of Extremity in Newborn Child. M. D. Steiner.—p. 686.
Adenoacanthoma of Ovary: G. F. Melody, R. L. Faulkner and S. J. Stone.—p. 691.
Omphalocele (Amniocele): Its Anatomy and Etiology in Relation to Hernias of Umbilicus and Umbilical Cord. L. Margulies.—p. 695.
Rectal Maneuver for Placental Delivery, with Observations on Rectal Palpation in Third Stage. E. M. Greenberg.—p. 700.
Differential Diagnosis Between Fetal and Maternal Heart Rate. M. Berlind.—p. 703.

Treatment of Cervicitis.—Findley's observations are based on 240 cases of chronic cervicitis treated by the three generally accepted methods of electrosurgery: actual or nasal tip cauterization, electrocoagulation and conization. Microscopic studies were made before treatment and after healing was clinically complete. The average rates of healing were the same with all three methods. The percentage of satisfactory results was greatest after electrocoagulation, second after conization and least following cauterization. There was little difference between coagulation and conization in the terminal microscopic picture. Fibrous tissue reaction was low in both procedures, although slightly greater following cauterization. Complications most commonly encountered were hemorrhage, stenosis and pyometra and were most frequently seen following conization. Hemorrhage usually occurs from the tenth to the fifteenth day at the time of separation of the slough. Stenosis, with resultant pyometra may be largely prevented by repeated dilation of the cervical canal. Carcinoma was discovered in 2 unsuspected cases out of 240 examined. Internal menstrual tampons were found to interfere with proper healing. Their use is to be condemned.

Gangrene of Extremity in Newborn Child.—Steiner observed gangrene of the upper left extremity in an infant born fifty hours after rupture of the membranes and two hours after the onset of labor. At delivery the affected extremity was found prolapsed between the cranium and the bony pelvis. Conservative therapy was ineffective and amputation was necessary on the eleventh day of life. To date, 42 similar cases have been reported in the literature. Trauma is the most likely cause of the condition.

American Journal of Pathology, Ann Arbor, Mich.

21:387-566 (May) 1945

Pathology of Trench Foot. N. B. Friedman.—p. 387.
Intranuclear Inclusions in Panleukopenia of Cats: Correlation with Pathogenesis of Disease and Comparison with Inclusions of Herpes, B Virus, Yellow Fever and Burns. A. M. Lucas and W. H. Riser. —p. 435.
Sarcosporidiosis or Toxoplasmosis in Man and Guinea Pig. B. H. Kean and R. G. Grocott.—p. 467.
Healed or Arrested Pulmonary Coccidioidomycosis: Correlation of Coccidioidin Skin Tests with Autopsy Findings. E. M. Butt and A. M. Hoffman.—p. 485.
Subacute Bacterial (Streptococcus Viridans) Pulmonary Endarteritis. A. E. Rhoden.—p. 507.
Acute Diffuse Demyelinating Encephalopathy: Report of 2 Cases. M. Friedman.—p. 519.
Regression Produced in Murphy Lymphosarcoma by Injection of Heterologous Antibodies. A. Nettleship.—p. 527.
Diagnosis of Granuloma Venereum from Frozen Sections Stained with Polychrome Methylene Blue. G. Margolis.—p. 543.
Arterial Occlusions Produced by Emboli from Eroded Aortic Atheromatous Plaques. C. M. Flory.—p. 549.

American Journal of Tropical Medicine, Baltimore

25:75-176 (March) 1945

Epidemiologic Aspects of Infectious Hepatitis in the U. S. Army. D. W. Walker.—p. 75.
*The Syndrome Tropical Eosinophilia and Microfilaria. A. van der Sar and H. Hartz.—p. 83.
*Heterophile Agglutinins and Cold Autohemagglutinins in Schistosomiasis, Filariasis, Malaria and Leprosy. G. J. Dammin and T. H. Weller. —p. 97.
Localization of Trivalent Radioactive Antimony Following Intravenous Administration to Dogs Infected with Dirofilaria Immitis. F. J. Brady, A. H. Lawton, D. B. Cowie, H. L. Andrews, A. T. Ness and G. E. Ogden.—p. 103.
Comparative Yields of Endameba Histolytica Organism t from Soluble and Insoluble Ingredients of Egg White in Freshly Prepared and Stored Medium. C. W. Rees and Lucy V. Reardon.—p. 109.
Immunity Reaction in Experimental Relapsing Fever. Y. P. Chen, S. H. Zia and H. H. Anderson.—p. 115.
Studies in Experimental Systemic Mycosis: 1. Systemic Chromomycosis (Chromoblastomycosis) in Mice: Preliminary Study. B. Levy and B. Black-Schaffer.—p. 117.
Observations on Microfilaria of Onchocerca Volvulus with Silver Stains. W. McKee.—p. 129.
Studies on the Microfilarial Periodicity of Litomosoides Carinii, Filariid Parasite of the Cotton Rat. S. D. Bell Jr. and H. W. Brown.—p. 137.
Experimental Studies and Critical Considerations Regarding the Life Cycle of Trypanosoma Cruzi. G. Elkeles.—p. 141.
Factors Influencing the Uneven Distribution of Aedes Aegypti in Texas Cities. A. C. Chandler.—p. 145.
Immunization Against Malaria: Unsuccessful Attempts to Increase Resistance of Ducklings to Plasmodium Lophurae Infections by Previous Injections of Materials Containing the Forssman Antigen. H. R. Jacobs.—p. 151.
Study of Effective Flight Range, Density and Seasonal Fluctuations in the Abundance of Anopheles Quadrimaculatus Say in Delaware. C. B. Huffaker and R. C. Back.—p. 155.
Toxoplasmosis Mistaken for Histoplasmosis in a Cat. H. D. Melenry. —p. 163.

Tropical Eosinophilia and Microfilaria.—Van der Sar and Hartz report 3 cases of tropical eosinophilia. In 1 case microfilariae could be demonstrated in the eosinophilic abscesses and infiltrate in the enlarged axillary lymph nodes. The symptoms disappeared after treatment with oxophenarsine hydrochloride. In a second case there was myeloid metaplasia of an axillary lymph node, consisting almost exclusively of eosinophilic myelocytes. In a fourth case which came to necropsy after an automobile accident hypereosinophilia of the blood and the liver was present; the spleen was enlarged and the subcapsular pulp contained enormous numbers of eosinophilic leukocytes and microfilariae. Eosinophilia was also found in the members of the family. In the last twenty-five years numerous publications have appeared concerning the occurrence of a hyperleukocytosis with hypereosinophilia, concurring clinically with enlargement of superficial lymph nodes, occasionally enlarged spleen and attacks of asthmatic bronchitis. Roentgenologically small bronchopneumonic foci could be demonstrated in some cases. Reports by Giffin in 1919, Aubertin and Giroux in 1921, Armand-Delille and Pierredon in 1927, Valledor and others in Cuba in 1939 and by Myers and Kouwenaar in the Netherlands East Indies in 1939 demonstrated the relationship between tropical eosinophilia and filariasis. The observations of the authors have demonstrated the relationship between tropical eosinophilia and filariasis and have reopened the discussion of the treatment of filariasis with arsenic.

Agglutinins and Autohemagglutinins in Tropical Diseases.—Heterophile agglutinin and cold autohemagglutinin titers were determined by Dammin and Weller in 123 cases of schistosomiasis, 104 cases of filariasis, 40 untreated cases of malaria and 18 cases of leprosy. In schistosomiasis, 4.9 per cent had heterophile agglutinin titers over 1:32, in filariasis 13 per cent had titers above 1:32, and of the malaria cases 5 per cent had titers above 1:32; in no case was the titer higher than 1:128. In the small group of blood specimens from patients with leprosy 4 showed a heterophile agglutinin titer of 1:128. Of 12 patients with malaria given quinine, 9 had a titer of 1:32 or lower and 3 a titer of 1:64. In 285 blood specimens, cold autohemagglutinins in a titer of 1:10 or higher could not be demonstrated in 279, or 97 per cent. The data indicate that heterophile antibody titers of clinical significance are not frequent in schistosomiasis, filariasis and malaria. From the results obtained no conclusions may be reached as to whether Wuchereria bancrofti and Schistosomum mansoni contain a heterophile antigen which at some stage in the disease process might produce significant antibody titers. It is possible that a titer of 1:64 in the 13 filariasis plasma specimens might represent such a stage of activity.

Archives of Dermatology and Syphilology, Chicago

51:295-358 (May) 1945

Hemangioendothelioma of Skin. Marcus R. Caro and C. H. Stubenrauch Jr.—p. 295.
Exfoliative Dermatitis Due to Sulfathiazole: Report of Case Characterized by Recurrent Attacks with Beau's Lines and Alopecia. M. J. Cook.—p. 305.
Roentgen Ray Therapy of Mycosis Fungoides. O. S. Levin and H. T. Behrman.—p. 307.
Some Phases of Vitamin Therapy in Dermatology. M. E. Obermayer and K. Frost.—p. 309.
Nitritoid Reaction Following Tryparsamide Therapy: Report of Case. L. J. Underwood.—p. 313.
Spread of Dermatitis Venenata by Vesicle Contents. A. G. Pratt and E. F. Corson.—p. 316.
Primary Tuberculous Complex of Skin: Occurrence in Woman Aged Sixty-Four.—p. 317.
Kaposi's Sarcoma and Lymphatic Leukemia: Report of Case with Histologic Evidence of Two Diseases in Same Lesion. W. Sachs and Margaret Gray.—p. 325.
*Cutaneous and Articular Manifestations in Lymphogranuloma Venereum: Activation of Disease by Frei Test. J. B. Hickam.—p. 330.
*Cutaneous Diphtheria as Military Problem: Review of Literature, with Report of Case. M. H. Saffron.—p. 337.

Cutaneous and Articular Manifestations in Lymphogranuloma Venereum.—The articular manifestations of lymphogranuloma venereum fall into one of three clinical categories: 1. Arthralgia with migratory pains in the joints, usually fleeting and without objective evidence of articular disease, is of common occurrence in the early weeks of the infection. 2. There may be acute polyarthritis with painful swelling of the joints, redness and increased temperature of the overlying skin. 3. Chronic recurrent polyarthritis with effusion is a third articular manifestation. There may be recurrent episodes of effusion into joints, but these do not result in deformity or permanent impairment of function. The wide variety of cutaneous lesions occurring in lymphogranuloma venereum are generalized or limited to the region especially affected by the virus. In the latter group belong the ulcerative disorders classified by Wien and Perlstein as (1) simple ulceration of the skin, (2) ulceration secondary to involvement of lymph nodes and (3) ulceration developing on an esthiomene. The generalized cutaneous lesions are either erythema nodosum or erythema multiforme. Hickam presents the histories of 4 patients with lymphogranuloma venereum. The articular manifestations in these patients resembled those described by other authors except for the additional presence of acute tenosynovitis and bursitis with effusion. All forms of involvement subsided rapidly. A generalized pustular eruption occurred in 3 patients. In 2 patients it was thought to be evoked by the intradermal Frei test with chick embryo antigen (lygranum). Two patients had severe reactions to the Frei test with an exacerbation of certain of the manifestations of the disease. It is suggested that the preparation of chick embryo antigen be diluted for use for patients whose disease appears to be in an active stage.

Cutaneous Diphtheria.—Diphtheritic infection of the skin has been noted with considerable frequency among the armed forces. It exists in two forms: a rare, acute variety almost invariably associated with faucial or nasal diphtheria, consisting of a solitary lesion which may develop on an intact or previously abraded site, and a chronic form characterized by multiple indolent lesions, which occasionally develop from the acute type but more commonly result from superinfection by Corynebacterium diphtheriae of preexisting dermatoses such as pyodermas, scabies and fungous infections. The treatment consists in the use of diphtheria antitoxin in fairly large doses. Saffron reports the case of a soldier aged 31 who had an acute faucial and cutaneous diphtheria. Thirty thousand units of diphtheria antitoxin was given intramuscularly on the first day and 28,000 units the following day. The axillary lesion was treated by local wet applications of 2,500 units of penicillin every three hours. The temperature had fallen to normal within twenty-four hours, and the throat cleared completely within seven days. Pain and swelling disappeared in the axillary region within forty-eight hours, but the lesion healed slowly. The membrane

disappeared after a few days, but the necrotic base persisted and eighteen days were required for complete healing. This is the first reported instance of local use of penicillin in cutaneous diphtheria.

Archives of Pathology, Chicago

39:281-350 (May) 1945

Chronic Exudative and Indurative Pneumonia Due to Inhalation of Shellac. E. F. Hirsch and H. B. Russell.—p. 281.
Diffuse Meningeal Fibroblastoma of Brain and Spinal Cord: Report of 3 Cases. S. R. Haythorn, W. Shapera and H. C. Stewart.—p. 287.
Morphologic Studies of Rats Deprived of Essential Amino Acids: I. Phenylalanine. M. E. Maun, W. M. Cahill and Ruth M. Davis. —p. 294.
*Pathology of Anaphylaxis Due to Sulfonamide Drugs. B. Black-Schaffer.—p. 301.
Primary Systemic Amyloidosis. S. Lindsay and W. F. Knorp.—p. 315.
Proliferation of Muscle Cells in Myometrium of Nonpregnant Uterus. P. H. Hartz.—p. 323.
Periarteritis Nodosa-like Lesions in Rats Fed Thiouracil. D. Marine and E. J. Baumann.—p. 325.
Neoplastic Diseases of Human Hypophysis. J. E. Kraus.—p. 343.

Pathology of Anaphylaxis Due to Sulfonamide Drugs.—The universal use of sulfonamide compounds and the discovery that they can act as antigens capable of eliciting fatal reactions have for the first time made possible the study of a large number of relatively slow but fatal anaphylactic reactions. Black-Schaffer describes the lesions discovered in 5 cases of anaphylactic death following therapeutic use of sulfonamide compounds. The basic lesion, as in experimental protein anaphylaxis, is necrotizing fibrinoid arteritis of the smaller vessels. The cellular exudate is monocytic in composition. The reticuloendothelial system is hyperplastic; in the spleen, the lymph nodes and the marrow the sinusoids may be crowded with macrophages showing phagocytosis of erythrocytes and leukocytes. This phenomenon may be the morphologic expression of the addition of some substance to the blood cells (conjugated sulfonamide group?) that renders them "foreign." The possibility that these homologous "foreign cells" may elicit the production of antibodies is suggested and may account for the hemolytic anemia, the leukopenia and the agranulocytosis. The available evidence indicates that the nephrosis in cases of reaction to treatment with sulfonamide compounds is a form of anaphylactic renal reaction. The identity of the lesions with those produced in a few human subjects and many animals by known species-foreign proteins, the knowledge that the sulfonamide compounds may convert homologous proteins into allergens and the fact that characteristic clinical syndromes follow the administration of the drugs constitute sufficient evidence to justify the concept of the anaphylactic nature of the lesions described.

Arkansas Medical Society Journal, Fort Smith

41:245-262 (May) 1945

Plea for Conservatism in Management of Acute Cardiac Crises. A. T. Barr.—p. 245.
Modern Concepts of Cardiovascular Disease: Hypertension as Viewed from Its Surgical Treatment (Part II). C. T. Chamberlain.—p. 248.

42:1-28 (June) 1945

Penicillin in Medicine. F. W. Harris.—p. 1.
Modern Concepts of Cardiovascular Disease. C. T. Chamberlain.—p. 6.

Bulletin of Johns Hopkins Hospital, Baltimore

76:155-177 (April) 1945

*Report of Case of Idiopathic Congenital (and Probably Familial) Methemoglobinemia. A. Graybiel, J. L. Lilienthal Jr. and R. L. Riley. —p. 155.
Report of Case of Acute Interstitial Fibrosis of Lungs. H. Eder, C. Van Zandt Hawn and G. Thorn.—p. 163.

Idiopathic Congenital Methemoglobinemia.—Graybiel and his associates report the history of a boy who had been blue at birth and had remained so. He was troubled with fatigue and shortness of breath. At the age of 17 he left school and began to do light work. His diet was adequate and contained relatively large amounts of ascorbic acid. He had never taken drugs known to cause cyanosis or pigmentation. The family history revealed that a cousin also had been blue at birth and had died at 14. Examination revealed that the youth, now 19, had intense cyanosis of the ears, tongue, lips and especially the gingival margins of the gums. The scleral vessels were dark blue, and the retinal arteries and veins appeared almost black. A sample of arterial blood was chocolate colored. Tests indicated that 38 per cent of the circulating blood pigment could not combine with carbon monoxide and presumably was methemoglobin. This presumption was confirmed by spectroscopic analysis. The patient was given 100 mg. of ascorbic acid and 0.6 Gm. of sodium bicarbonate three times daily by mouth. Four days later the patient's scleras appeared to be less injected and the lips slightly less cyanotic; the methemoglobin percentage, determined by the carbon monoxide method, had fallen. Later the daily dose of ascorbic acid and of sodium bicarbonate was doubled and after nineteen days of treatment the methemoglobin concentration had fallen from 8.1 Gm. to 1.7 Gm. and the normal hemoglobin had increased from 13.1 Gm. to 15.8 Gm. Exercise tolerance tests showed great improvement in the capacity for hard physical work. The striking clinical feature of this case of idiopathic congenital methemoglobinemia was the intense cyanosis, which was out of proportion to the other clinical aspects. Attention is drawn to the features which are common to both idiopathic methemoglobinemia and congenital heart disease with cyanosis. Simple inspection of a drop of the patient's blood may provide the differential clue. It is likely that some cyanotic patients now regarded as having congenital heart disease have, in fact, methemoglobinemia. Ascorbic acid, a biologic reducing substance, is capable of converting methemoglobin to normal hemoglobin in vivo.

Diseases of Chest, Chicago

11:203-296 (May-June) 1945. Partial Index

Segments of Lungs from Standpoint of Surgical Procedures. B. Blades. —p. 203.
Diasone in Treatment of Pulmonary Tuberculosis. K. H. Pfuetze and Marjorie Pyle.—p. 213.
*Present Status of Chemotherapy in Tuberculosis from the Clinical Standpoint. K. H. Pfuetze.—p. 220.
Tuberculosis of Nasopharynx: Its Frequent Incidence and Clinical Significance. A. R. Hollender and P. B. Szanto.—p. 227.
Irreversible Allergy in Nontuberculous Diseases of Chest. M. B. Cohen. —p. 236.
Surgical Closure of Patent Ductus Arteriosus. J. W. Nixon.—p. 241.
Pulmonary Embolism. L. N. Katz.—p. 249.
Tuberculosis and Pregnancy. A. MacDowell.—p. 256.
Tuberculosis Problem and Organization of Tuberculosis Campaign in Venezuela. J. I. Baldo.—p. 259.
Symposium: Tuberculosis in World War II. C. M. Hendricks.—p. 266.

Chemotherapy of Tuberculosis.—Pfuetze reviews experiences with several sulfonamides in the treatment of tuberculosis. Promin, though probably of value in some cases, is too toxic for widespread general use. Diasone, though less toxic than promin, clinically falls far short of original expectations. Promizole, which is much less toxic than either of the other two, is still under clinical investigation, thus precluding accurate evaluation at this time.

Iowa State Medical Society Journal, Des Moines

35:165-210 (May) 1945

One Man's Opinion. M. C. Hennessy.—p. 165.
Medical Management of Uncomplicated Peptic Ulcer. W. D. Paul and C. Rhomberg.—p. 167.
Hypersensitivity and Other Toxic Reactions to Sulfonamides. J. E. Flynn.—p. 185.
Use of Penicillin and Sulfadiazine Locally in Oral Infections: Preliminary Report. A. C. Woofter and O. E. Hoffman.—p. 189.

35:211-246 (June) 1945

Therapeutic Agents in Treatment of Glaucoma. W. N. Hahn.—p. 211.
Incidence, Prognosis and Curability of Malignant Lesions: Brief Review. C. F. Dixon.—p. 215.
*Administration of Penicillin by Mouth in Combination with Aluminum Dihydroxy Aminoacetate. W. D. Paul, C. Rhomberg, A. P. McKee and J. W. Pichette.—p. 219.
Thrombosis of Hepatic Veins (Chiari's Disease): Case. J. E. Flynn. —p. 221.

Penicillin by Mouth with Aluminum Dihydroxy Aminoacetate.—Paul and his associates say that recently the new aluminum buffer antacid aluminum dihydroxy aminoacetate (Alglyn) has been investigated at the University of Iowa Hospital. This is a combination of aluminum with aminoacetic acid containing 18.3 per cent aluminum and 9.3 per cent nitrogen. The aminoacetic acid causes rapid buffering action, while the aluminum gives a prolonged effect. The authors used oral

medication with penicillin and aluminum dihydroxy aminoacetate in the treatment of 16 patients with gonorrhea and 1 with sinusitis complicating scarlet fever. The patients with gonorrhea were given 100,000 to 300,000 units of penicillin, while a woman aged 24 showed clinical and bacteriologic cure with only 100,000 units of penicillin given as a single dose. Within two hours gonococci could no longer be cultured from the cervix. A youth aged 19, who developed acute sinusitis during the course of scarlet fever and could not tolerate sulfadiazine, made a prompt clinical recovery after 320,000 units of penicillin in divided doses was given. Alglyn, because of its immediate and prolonged buffering action, is a satisfactory antacid to combine with penicillin for oral administration.

Journal of Bone and Joint Surgery, Boston

27:179-360 (April) 1945

*Development of Sarcoma in Bone Subjected to Roentgen or Radium Irradiation. C. H. Hatcher.—p. 179.

*Treatment of Benign Giant Cell Tumors by Resection or Excision and Bone Grafting. H. W. Meyerding.—p. 196.

Evaluation of Estimated Percentage of Growth from Distal Epiphysial Line. I. E. Hendryson.—p. 208.

Adhesive Capsulitis of Shoulder: Study of Pathologic Findings in Periarthritis of Shoulder. J. S. Neviaser.—p. 211.

*Results of Modern Methods of Treatment of Poliomyelitis. R. W. Johnson Jr.—p. 223.

Bullet Fractures of Long Bones. H. E. Branch.—p. 227.

Intervertebral Disk: Its Microscopic Anatomy and Pathology: Part II. Changes in Intervertebral Disk Concomitant with Age. M. B. Coventry, R. K. Ghormley and J. W. Kernohan.—p. 233.

Uncovertebral Osteophytes and Osteochondrosis of Cervical Spine. E. Lyon.—p. 248.

Results of Epiphyseodesis and Femoral Shortening in Relation to Equalization of Limb Length. R. Straub, T. C. Thompson and P. D. Wilson.—p. 254.

Closed Manipulation for Reduction of Fractures of Neck of Radius in Children. R. R. Goldenberg.—p. 267.

Wire Fixation in Acromioclavicular Dislocation. F. A. Bloom.—p. 273.

Surgical Approaches to Knee Joint. L. C. Abbott and W. F. Carpenter. —p. 277.

Adjustable Casts in Treatment of Joint Deformities. F. W. Rhinelander and Marian W. Ropes.—p. 311.

Research Work on More Precise Method of Determining Muscle Strength in Poliomyelitis Patients: New Muscle Tester. A. A. Schmier.—p. 317.

Regeneration of Patella: Case Report. W. P. Corriero, C. Aquavella. —p. 326.

Treatment of Fractures of Olecranon by Fixation with Stainless Steel Screws. P. H. Harmon.—p. 328.

Multiple Rib Fractures Treated with Drinker Respirator: Case Report. K. Hagen.—p. 330.

Retrospective Commentary on Campaign for Establishment of Positive Standard of Treatment for Fracture of Neck of Femur. R. Whitman. —p. 334.

Development of Bone Sarcoma Following Irradiation.—The literature contains reports of 24 patients who developed bone sarcoma following exposure to x-rays or radium. Seventeen of these tumors resulted from roentgen therapy for tuberculous arthritis. One followed similar treatment for acute arthritis. In 6 cases bone sarcoma followed exposure to radium. Hatcher reports histories of 3 patients in whom irradiation appears to have been responsible for the development of bone sarcoma. In each of these cases the tumor arose in normal bone which had been in the field of irradiation directed toward earlier independent tumors. Two are chondrosarcomas and 1 is a fibrosarcoma with tumor cartilage. In all cases except 1 the amount of irradiation was large and was administered in fractional doses over a long period. The interval between irradiation and recognition of irradiation-produced sarcoma is long. The median time in reported cases is six years.

Excision and Bone Grafting in Benign Giant Cell Tumors.—Meyerding reports 40 cases of benign giant cell tumor of bone in which excision of the tumor and bone grafting were employed. A history of injury was elicited in 23 cases. The average duration of symptoms before operation was 23.5 months. Treatment prior to consultation and operation at the clinic had consisted of immobilization, diathermy, elimination of foci of infection, arthritis vaccines, aspiration, irradiation, excision and irradiation, and excision and bone grafting. In 2 of the cases a diagnosis of sarcoma had been made and amputation had been advised. Diagnosis of benign giant cell tumor usually can be made on the basis of the history and the clinical and roentgenographic findings. Close cooperation between the pathologist and the surgeon at the time of the operation is essential. The differential diagnosis of benign giant cell tumor and malignant giant cell sarcoma cannot be made on the basis of roentgenographic interpretation alone. Adequate exposure and the removal of a block of tissue will make possible microscopic examination. Should there be doubt that the lesion is benign, the wound should be closed and the pathologist given additional time. This sometimes is necessary in cases in which a previous operation has been performed, in cases in which irradiation has been employed and in cases in which the tumor is infected; it is rarely necessary if previous treatment has not been given. Curettage of a giant cell tumor should consist of a complete excision. Usually the graft is taken from the tibia, fibula, ilium or a sound portion of the involved bone. The best results are obtained in cases in which the cavity is packed firmly with autogenous bone, and when complete rest is assured by a plaster of paris cast. In cases in which the tumor is situated in the region of the knee or the ankle, weight bearing should be avoided until the roentgenographic examination discloses sufficient deposition of bone to stand the stress and strain. Good functional results were obtained in 38 of the 40 cases. Excision of the tumor and bone grafting is a safe procedure in properly selected cases, and it tends to prevent deformity and disability.

Treatment of Poliomyelitis.—Johnson recommends in the acute stage bed rest, sedation for restlessness and pain and half-shell plaster molds or "Toronto" type splints for paralyzed, weakened or tender extremities in positions of relaxation. Frequent checks are made of muscle power. Hyperesthesia or muscle tenderness is also checked. Except in the encephalitic type, the author has not had clinical evidence of spasticity in the paralyzed extremities. Stiff necks and backs are usual in the early days, but they tend to disappear spontaneously. Radiant heat is administered intermittently as a stimulant to local circulation. In the convalescent period gentle massage is administered to the paralyzed or weakened groups and is increased slowly in depth and force as soon as hypersensitivity permits. Limited passive motion is begun in joints where muscle power is below 50 per cent, and active motion is started in an increasing range as the muscles grow in strength. Graduated exercises are given for weakened muscles. Patients who seem destined to have some disability are turned from invalidism and self pity toward an attitude of adaptability and compensation. In the wards the children help one another to achieve this end. Ward patients do much better in this respect than patients in private rooms. Later, underwater exercise in pools is used. The benefit of a crusade of the Sister Kenny type is that it makes us reexamine our own therapeutic procedures. Johnson has remained unimpressed by the claims of superiority of the Sister Kenny treatment. Patients are not cured, they recover; and the author rates recovery not in case units, because misleading statistics are produced in this way. The proper unit is the weakened and paralyzed muscle, and recovery is judged on final muscle power as compared with the original degree of paralysis. The record of each muscle is kept separately. For this analysis the author has selected ten commonly paralyzed and important muscles: gluteus maximus, gluteus medius, quadriceps, hamstrings, gastrocnemius, tibialis anterior, deltoid, biceps humeri, triceps brachi and opponens pollicis. Figures shown in tables concern 64 patients. The paralyzed muscle units reported are 350 in the lower extremity and 106 in the upper extremity. All muscles should have three months of careful and painstaking protection and treatment comparable to that given in peripheral nerve lesions. At the end of such a three months regimen a prognosis of recovery can be arrived at, for the muscles can then be differentiated into three categories: (*a*) Those which have not recovered to a point of 30 per cent of power in three months. No return of useful power is to be expected, and these make up the permanently paralyzed extremities. (*b*) Those which by this time have 80 per cent or more power and can be counted on to function satisfactorily without further treatment except general supervision. (*c*) The group which has demonstrated some return of

power and has a three month level of 30 to 75 per cent. These have potentiality for further recovery to a point where useful function can be restored. These cases are the important ones as far as further active treatment is concerned. No appreciable recovery continues beyond eighteen months even under ideal conditions, but untreated or inadequately treated cases have been salvaged by this regimen as late as six to ten years after the acute attack, indicating a previous nerve recovery which had been masked or nullified by the overstretching or overfatigue of the muscle or by opposing contracture.

Journal of Neurophysiology, Springfield, Ill.

8:137-217 (May) 1945

Cholinesterases in Sympathetic Fibers and Ganglia. C. H. Sawyer and W. H. Hollinshead.—p. 137.
Changes in Brain Potentials During Convulsions Induced by Oxygen Under Pressure. R. Cohn and I. Gersh.—p. 155.
Electroencephalographic Changes Following Head Injuries in Dogs. R. S. Dow, G. Ulett and A. Tunturi.—p. 161.
Sensory-Motor Nerve Crosses in Rat. P. Weiss and M. V. Edds Jr. —p. 173.
Color Receptors of Mammalian Retina. R. Granit.—p. 195.
Effect of Temperature on Artificial Synapse Formed by Cut End of Mammalian Nerve. R. Granit and C. R. Skoglund.—p. 211.

Journal of Nutrition, Philadelphia

29:289-364 (May) 1945

Existence of Microbiologically Inactive "Folic Acid"-like Material Possessing Vitamin Activity in Rat. L. D. Wright, Helen R. Skeggs, A. D. Welch, K. L. Sprague and P. A. Mattis.—p. 289.
Mitotic Activity and Wound Healing in Corneal Epithelium of Vitamin A Deficient Rats. J. S. Friedenwald, W. Buschke and Mary Ellen Morris.—p. 299.
*Studies on Comparative Nutritive Value of Fats: VI. Growth and Reproduction Over Ten Generations on Sherman Diet B Where Butterfat Was Replaced by Margarine Fat. H. J. Deuel Jr., Lois F. Hallman and E. Movitt, with technical assistance of Evelyn Brown. —p. 309.
*Composition of Typical Mexican Foods. R. Cravioto B., E. E. Lockhart, R. K. Anderson, F. De P. Miranda and R. S. Harris, with technical assistance of Estela Aguilar and others.—p. 317.
Study of Nicotinic Acid Restriction in Man. A. P. Briggs, S. A. Singal and V. P. Sydenstricker.—p. 331.
Effect of Level of Protein in Diet on Utilization of Vitamin A. Marie Dye, Ione Batemen and Thelma Porter.—p. 341.
Nutritive Value of Fatty Acids of Butter Including Their Effect on Utilization of Carotene. Elizabeth F. Brown and W. R. Bloor.—p. 349.
*Effect of Atabrine on Thiamine Deficiency in Young Rat. D. M. Hegsted, J. M. McKibbin and F. J. Stare.—p. 361.

Margarine in Diet of Rats.—Deuel and his associates report observations on reproduction and growth rate in ten generations of rats fed with a modification of the Sherman diet B in which butterfat has been replaced by margarine fat fortified with vitamin A. The growth rate considerably exceeded that obtained with animals on the stock diet and progressively improved with the later generations. A vegetable fat such as that contained in a margarine can serve adequately in place of butterfat for growth and reproduction on a diet otherwise nutritionally satisfactory.

Composition of Typical Mexican Foods.—Cravioto B. and his associates analyzed 112 samples of food from Mexico for the content of carotene, thiamine, riboflavin, niacin, ascorbic acid, calcium, phosphorus, iron, nitrogen, ash and total solids. Many of these foods were analyzed for the first time. The kinds and nutritional qualities of the foods of Mexico are so different from those of the United States that the nutrition program in Mexico should be based on the nutrient content of Mexican foods. Many Mexican foods are richer in specific nutrients than foods in the United States. It is probable that the Mexican diet is more adequate in ascorbic acid, thiamine, phosphorus and calcium than in riboflavin, niacin and quality protein.

Effect of Atabrine on Thiamine Deficiency.—According to Hegsted and his associates previous studies on the relation of nutrition to the tolerance of atabrine by rats led to the demonstration of a "choline-like" or "choline sparing" action of atabrine. Addition of atabrine to a thiamine deficient diet for rats delayed loss of weight, onset of symptoms and death. Low levels of thiamine produced greater gains in animals receiving atabrine than in controls. Atabrine thus has a "thiamine sparing" action.

Journal of Urology, Baltimore

53:507-646 (April) 1945

Possible Usefulness of Estrogens and Aluminum Hydroxide Gels in Management of Renal Stone. E. Shorr.—p. 507.
Arteriography in Renal and Abdominal Conditions. O. A. Nelson. —p. 521.
Treatment of Ureteral Calculi: Report of 504 Cases in Which the Councill Stone Extractor and Dilator was Used. W. A. Councill. —p. 534.
Excretory Cystourethrograms. J. W. Draper and J. G. Siceluff.—p. 539.
Transurethral Resection in Treatment of True and Pseudo Cord Bladder. J. L. Emmett.—p. 545.
Operations for Urinary Control of Neurogenic Bladders. R. E. Van Duzen.—p. 565.
Treatment of Urinary Incontinence in Vesical Paralysis. R. E. Hanlon. —p. 572.
Thrombin (Topical) as Hemostatic Aid in Prostatic Surgery. V. J. O'Conor.—p. 584.
Evaluation of Thrombin Following Transurethral Resection: Study of 40 Consecutive Cases. A. Palomo.—p. 590.
Advances of Technic of Transurethral Prostatic Resection. L. H. Rodriguez Diaz.—p. 594.
Operation for Undescended Testicle: Report of Cases. J. K. Ormond, R. M. Cothran and J. A. Singiser.—p. 602.
Use of Penicillin in Treatment of Urogenital Infections: Clinical Study of 509 Gonococcal and 26 Nongonococcal Infections of Urogenital Tract. L. R. Reynolds and H. M. Weyrauch.—p. 614.
Use of Penicillin in Sulfonamide Resistant Gonorrhea in Male. S. L. Raines, G. S. Barrett and Jesse M. Galt.—p. 630.
Penicillin Treatment of Sulfonamide Resistant Gonorrhea. L. H. Doolittle and H. B. Marshall.—p. 634.

Military Surgeon, Washington, D. C.

96:377-456 (May) 1945. Partial Index

Convalescence and Rehabilitation in General Hospital in Tropics. H. N. Neu and F. K. Urban.—p. 377.
Medical Problems of Air Warfare. M. S. White.—p. 385.
Military Aspects of Acute Rheumatic Fever. W. P. Holbrook, A. C. Van Ravenswaay.—p. 388.
Inspection of Fresh Meat and Meat Food Products and Dairy Products. S. C. Dildine.—p. 391.
Restoration of Functions of Limbs. A. N. Leontiev.—p. 397.
Medical Problems Encountered in Field Hospital on Saipan-Tinian Operations. C. L. Saint.—p. 399.
Caldwell-Luc Operation for Chronic Suppurative Maxillary Sinusitis of Traumatic Origin. G. W. Christiansen and J. L. Bradley.—p. 406.
Experiences and Progress in Treatment of Gonorrhea in Army General Hospital Overseas, 1942-1944. J. H. Harrison, T. W. Botsford and B. E. Trichel.—p. 416
Management of Pilonidal Disease. P. B. Van Dyke.—p. 420.
Pilonidal Cyst: Excision and Primary Wound Closure. R. C. Alley and C. O. Richey.—p. 422.
Complications of Staphylococcus Sepsis: Treatment by Intrapleural and Intrapericardiac Injections of Sulfa Compounds. I. L. Applebaum. —p. 424.
Nicola Operation. H. G. Kunz.—p. 429.

Nebraska State Medical Journal, Lincoln

30:157-188 (May) 1945

State Rheumatic Fever Program for Children. J. A. Henske.—p. 160.
Public Health Aspect of Rheumatic Fever. E. J. Kirk.—p. 165.
Recent Advances in Rheumatic Fever. J. M. Thomas.—p. 167.
Role of Electrocardiogram in Diagnosis and Prognosis of Heart Disease. M. C. Andersen.—p. 169.
Subacute Bacterial Endocarditis Treated with Penicillin and Dicumarol. G. H. Misko.—p. 171.
Treatment of Burns: General Care of Burned Patient. H. N. Harkins. —p. 175.

New England Journal of Medicine, Boston

232:491-520 (May 3) 1945

*Cardinal Manifestations of Paroxysmal Tachycardia: I. Anginal Pain. L. Wolff.—p. 491.
Modification of Old and Simple Method of Treating Rectal Prolapse. G. Van S. Smith.—p. 495.
Radioulnar Synosteosis of Traumatic Origin: Report of Case. H. G. Lee.—p. 498.
Scarlet Fever. C. Wesselhoeft and L. Weinstein.—p. 500.

Pain in Paroxysmal Tachycardia.—Wolff analyzes the clinical data of 253 cases of paroxysmal tachycardia with reference to the occurrence of chest pain. It occurred in 16 per cent of the cases in this series. Anginal pain is invariably provoked by paroxysms of rapid heart action in patients with angina pectoris, provided the ventricular rate is 150 (the critical level) or more. In the great majority of cases in which paroxysmal tachycardia induces anginal pain, coronary heart disease, usually with angina pectoris, is present. The association of anginal pain and paroxysmal tachycardia with ventricular rates under 150 or regardless of the rate in patients without a history of angina pectoris suggests various diagnostic possibilities,

both cardiac and noncardiac. Paroxysmal tachycardia does not always enhance the pain of acute myocardial infarction. The failure of paroxysmal tachycardia to induce pain does not exclude the presence of coronary heart disease, acute, recent or old myocardial infarction or angina pectoris in the past.

New Orleans Medical and Surgical Journal

97:433-478 (April) 1945

Atypical Amebic Colitis. D. N. Silverman and A. Leslie.—p. 435.
Diagnosis and Treatment of Acute Diarrheal Disorders. J. Watt.—p. 438.
Comparison of Incidence and Treatment of Meningitis Over Ten Year Period. H. E. Rollings and J. H. Musser.—p. 445.
Effects of Inadequate Ascorbic Acid Intake. H. R. Hyslop.—p. 452.
Pathogenesis of Hypertension. W. P. Sloan Jr.—p. 457.

97:479-520 (May) 1945

Health Department of the Future: Discussion of Some Problems. J. C. Geiger.—p. 479.
Some Problems of Pediatric Gynecology. B. B. Weinstein.—p. 495.
Gall Stone Ileus. G. McHardy and D. C. Browne.—p. 501.
Intestinal Obstruction Following Use of Cotton: Report of 2 Cases. V. D'Ingianni.—p. 503.

New York State Journal of Medicine, New York

45:929-1040 (May 1) 1945

*Gastric Mucosal Atrophy and Carcinoma of Stomach. A. P. Stout.—p. 973.
Observations on Use of New Material for Cholecystography (Priodax): Preliminary Report. L. C. Collins and R. Golden.—p. 978.
Presbycardia, or Aging of Myocardium. W. Dock.—p. 983.
Vesicovaginal Fistula and Its Surgical Management. V. S. Counseller.—p. 987.
*Surgical Treatment of Chronic Constrictive Pericarditis. G. J. Heuer and H. J. Stewart.—p. 993.
General Résumé of Hematologic Disorders. E. G. Allen.—p. 999.

Mucosal Atrophy and Carcinoma of Stomach.—In the laboratory of Surgical Pathology, Columbia University, a number of surgically resected stomachs were treated by opening along the greater curvature, pinning out on a cork board, fixing in Bouin's fluid, and taking ten or more sections from different areas according to a definite plan. There were thus made available multiple sections from 150 stomachs, 50 with gastric carcinoma, 50 with gastric ulcer and 50 without gastric ulcer or carcinoma which were removed because of duodenal ulcer. The study revealed that mucosal atrophy may appear as early as the third decade and is found with increasing frequency and extent in the succeeding decades of life. In comparable groups of stomachs mucosal atrophy is found in a larger number and tends to be more widespread in those with cancer than in those without cancer. But when one tries to find actual progression from altered mucosal glands, gastric or intestinal in type, cystic or not, distorted or regular, it is realized that it is impossible to tell when there is juxtaposition of carcinoma and mucosal gland, whether the carcinoma is invading the gland or developing from its epithelial cells. In occasional stomachs with carcinomas multiple sections from various areas failed to show epithelial changes in some, while others showed only minimal changes. While atrophy of the gastric mucosal epithelium and cyst formation were present to a greater degree and in larger numbers in stomachs with carcinomas than in comparable stomachs without cancer, the exact relationship between these two conditions remained undetermined.

Surgical Treatment of Chronic Constrictive Pericarditis.—*In a series of* 18 cases reported by Heuer and Stewart enlargement of the liver was present in all, ascites in 15, edema of the extremities in 11 and pleural effusion in 8. Dyspnea on exertion or at rest was present in 17 and cyanosis in 14. Distention of the peripheral veins and an increase in venous pressure were present in all patients. The diagnosis of chronic constrictive pericarditis should be considered in patients with signs of congestive heart failure, in the absence of the common causes of this condition. The disease is commonly confused with mitral stenosis, cirrhosis of the liver, polyserositis and nutritional or other edemas. Tricuspid disease and mediastinal tumors may occasionally be wrongly diagnosed. All of the 18 patients were subjected to the operation of pericardiectomy. The authors stress the importance of preoperative treatment and careful attention to details in the operative procedure. They have performed 19 operations on 18 patients without a postoperative mortality. Seven patients are classified as cured over periods varying from one and a half to eight and a half years. Three patients more recently operated on have shown such improvement as to warrant the expectation of a cure. Four patients are greatly improved over periods of from three to six and one-half years. One patient is moderately improved and is living six years after operations. Four patients were not improved by the operation. Of these 1 is living seven years after operation and 3 have died.

North Carolina Medical Journal, Winston-Salem

6:229-264 (May) 1945

Meeting the Future of Medicine. C. S. Keefer.—p. 229.
Baccalaureate Sermon: The Beloved Physician. J. R. Cunningham.—p. 232.
Rupture of Uterus Subsequent to Cesarean Section, with Report of 3 Cases. H. L. Brockmann.—p. 234.
Chronic Headaches. J. R. Williams Jr.—p. 239.
Occurrence of Myasthenia Gravis in Patient with Multiple Sclerosis: Report of Case. L. H. Margolis and R. W. Graves.—p. 243.
Congenital and Hereditary Abnormalities of Extraocular Muscles. J. W. White.—p. 244.

Ohio State Medical Journal, Columbus

41:393-488 (May) 1945

Present Status of Prostatic Problem. H. L. Kretschmer.—p. 417.
Case of Osteomyelitis Treated with Penicillin with Unusual Bacteriologic Findings. W. G. Myers and Florence Lenahan.—p. 422.
Penicillin Therapy of Gonorrhea. H. E. Christman.—p. 426.
Final Diagnosis: Ruptured Appendicular Artery in Femoral Hernia. F. H. Newton.—p. 429.
Clinical Application of Blood Cholesterol Determination. R. G. Lehman.—p. 430.
When Should Poliomyelitis Patient Be Splinted? C. H. Heyman.—p. 432.
Multiple Venous Thromboses with Associated Carcinoma of Pancreas. E. B. Ferris and R. J. Ritterhoff.—p. 437.

Public Health Reports, Washington, D. C.

60:545-576 (May 18) 1945

Seroprophylaxis in Experimental Rabies. K. Habel.—p. 545.
*Tests of Epidemic Typhus Vaccines. R. Donovick and R. W. G. Wyckoff.—p. 560.

Tests for Epidemic Typhus Vaccines.—According to Donovick and Wyckoff the most direct laboratory method of testing epidemic typhus vaccine is one in which the immunity of vaccinated guinea pigs is challenged by injecting enough infectious tissue to produce typical guinea pig typhus in control animals. This test is hard to use routinely because it requires several weeks to carry out. Bengtson and Topping's development of the complement fixation test for typhus gives one of several other feasible ways for evaluating typhus vaccine. The authors compared the complement fixing antibody titers and results of protection tests on guinea pigs injected with many different typhus vaccines. Results of these two tests run parallel in the sense that vaccines which show an especially high degree of protective power also induce a particularly high average complement fixing antibody titer. Present typhus vaccines are superior to those prepared a year ago.

Union Médicale du Canada, Montreal

74:573-720 (May) 1945

Surgical Treatment of Chronic Polyarthritis. J. E. Samson.—p. 578.
Clinical Observations on Treatment of Wounds by Oxalic Acid: Action of Oxalic Acid on Hair Growth. H. Debidour-Monrad and J. Lassner.—p. 589.
Nonspecific Ulcerative Colitis. J. LeSage.—p. 593.
Case of Bronchopneumonia Treated by Bronchoscopic Drainage. V. Latraverse and A. Guilbeault.—p. 597.
Simplified Procedure of Osteosynthesis. G. Saint-Onge.—p. 599.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

53:135-162 (May) 1945

Trichomoniasis. R. B. Greenblatt.—p. 135.
Cesarean Sections in Oakland—1943. T. F. Bell.—p. 139.
Inversion of Uterus: Attending Physician's Responsibility for Immediate Replacement. C. W. Barrett.—p. 146.
Madura Foot. F. E. Clough.—p. 153.
Cleft Foot: Case Report. A. Gottlieb.—p. 157.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Heart Journal, London

7:1-56 (Jan.) 1945

*Patent Ductus Arteriosus and Its Surgical Treatment. A. R. Gilchrist. —p. 1.
Cardiac Manifestations in Case of Tuberous Sclerosis. F. P. Duras. —p. 37.
Cor Triloculare Biauriculare: Unusual Adult Heart. J. B. Mehta and R. F. L. Hewlett.—p. 41.
Unusual Case of A-V Nodal Rhythm with Varying A-V Block. E. Simonson and N. Enzer.—p. 45.
Pericarditis and Complete Heart Block During Thiouracil Therapy. C. W. C. Bain.—p. 49.
Advanced Mitral Stenosis at Three Years Old. R. S. Johnson and D. Lewes.—p. 52.

Patent Ductus Arteriosus.—Of 28 consecutive patients with patent ductus arteriosus, operation on 14 was judged unnecessary or undesirable. Two died, 1 from intercurrent infection and 1 from subacute bacterial endarteritis. Slight deterioration in physical capacity was observed in 3. Two women married and have borne families without undue distress. In 1 patient, a boy of 6, the ductus closed spontaneously. Distinct improvement in the general health and physical capacity was observed in 6 of the 14 patients submitted to surgery. Four obtained less benefit than anticipated, chiefly because complete obliteration of the ductus was not always obtained. Two patients died after operation. Gilchrist puts emphasis on the value of repeated x-ray examinations in the diagnosis of the condition. Two patients operated on because of bacterial endarteritis died. Death in each instance was attributed to massive pulmonary collapse. The selection of patients for surgery demands careful consideration. The main factors to bear in mind are the age of the patient and the degree of cardiac embarrassment. In general, the younger patient should be accepted for surgery when symptoms are minimal, in the hope that by ductal occlusion the child may grow and develop normally. In older patients, on account of the increasing operative hazards, surgery can be justified only when symptoms, being more severe, warrant the risk. In the presence of an infected ductus, ligation should be undertaken without delay at any age.

British Journal of Industrial Medicine, London

2:1-64 (Jan.) 1945

Prevention of Accidents. H. M. Vernon.—p. 1.
*Clinical Effects of Use of Pneumatic Tools. D. Hunter, A. I. G. McLaughlin and K. M. A. Perry.—p. 10.
Methyl Bromide Poisoning: Account of 4 Recent Cases. C. A. Clarke, C. G. Roworth and H. E. Holling.—p. 17.
Methyl Bromide Intoxication. H. Wyers.—p. 24.
Methyl Bromide Burns. E. C. B. Butler, K. M. A. Perry and J. R. F. Williams.—p. 30.
Radiographic and Histologic Appearances of Rat Lung After Intratracheal Injection of Rouge (Fe_2O_3, Iron Peroxide). H. E. Harding. —p. 32.
Absorptiometric Method for Estimation of Atmosphere Benzene in Presence of Xylene and Toluene. R. Milton.—p. 36.
Estimation of Chloroform, Carbon Tetrachloride and Trichlorethylene in Blood. S. Habgood and Joan F. Powell.—p. 39.
Psychiatric Advice in Industry. A. Lewis, E. H. Capel, D. Elizabeth Bunbury and R. Fraser.—p. 41.

Clinical Effects of Use of Pneumatic Tools.—Hunter and his associates review observation on 286 workers who used pneumatic tools. White fingers were found in 48 riveters, 27 caulkers and 77 fettlers. The syndrome usually developed after they had been on the work for from two to five years. It occurred most frequently among workers who were using tools with a vibration rate of 2,000 to 3,000 a minute. The condition occurred most often in cold weather, and cold is probably a precipitating factor. White fingers rarely caused gross disability, but in 3 cases the condition was severe enough to make the men change their occupation. Arthritic changes were rare and there was no convincing evidence that they can be brought about solely by the use of pneumatic tools. The possibility, however, cannot be completely dismissed. Small areas of decalcification or bone cysts in the carpal bones were found in 35 riveters, 14 caulkers, 51 fettlers and 19 holders-up. This condition may be caused by repeated trauma, but it is not confined to workers who use pneumatic tools. The cysts cause no disability, and there is no evidence that they predispose to arthritis or fracture. Ulnar paresis was found in 3 cases, but only 1 case of Dupuytren's contracture was found in 286 workers. Bruising on the dorsum of the hand occurs in riveters when driving rivets in a vertical direction.

British Journal of Ophthalmology, London

29:169-220 (April) 1945

Electrical Cataract: Notes on Case and Review of Literature. A. L. Adam and M. Klein.—p. 169.
Effect of Ascorbic Acid on Occurrence of Hyphemia After Cataract Extraction. I. Mann and A. Pirie.—p. 175.
Aberrant Optic Nerve Fibers Found Between Retina and Hexagonal Cells. A. Loewenstein.—p. 180.
Effect of Detergent on Penetration of Sodium Sulfacetamide (Albucid Soluble) into Ocular Tissues. M. Ginsburg and J. M. Robson.—p. 185.
Modification and Extension of McReynolds' Operation for Pterygium. L. Staz.—p. 193.
Self-Inflicted Conjunctivitis: Account of Cases Produced by Jequirity and Castor Oil Seeds. E. J. Somerset.—p. 196.
Intraocular Foreign Bodies. W. O. Lodge.—p. 205.

British Journal of Surgery, Bristol

32:337-440 (Jan.) 1945

Wounds of Colon. B. C. N. Morgan.—p. 337.
Plasticity of Bone. J. F. Brailsford.—p. 345.
*Congenital Deficiency of Pericardium Associated with Bronchogenic Cyst. N. L. Rusby and T. H. Sellors.—p. 357.
Acute Appendicitis and Appendix Mass. A. G. McPherson and J. B. Kinmonth.—p. 365.
Stenosis of Small Intestine from Cicatrization of Isolated Inflammatory Lesions. M. Paul.—p. 371.
Carcinoma of Esophagus: Resection and Esophagogastrostomy. V. C. Thompson.—p. 377.
Preliminary Report on Use of Whole Skin Grafts as Substitute for Fascial Sutures in Treatment of Hernias. G. B. Mair.—p. 381.
Complete Rupture of Pancreas. J. F. Curr.—p. 386.
Ischemic Damage in Peripheral Stump of Divided Nerve. H. J. Seddon and W. Holmes.—p. 389.
Case of Traumatic Diaphragmatic Hernia. H. Reid.—p. 391.
Operation for Removal of Carcinoma of Esophagus with Presternal Esophagogastrostomy. H. Taylor.—p. 394.
Bilateral Renal Carcinoma. H. G. Hanley.—p. 399.
Traumatic Ischemia of Peripheral Nerves, with Observations on Volkmann's Ischemic Contracture. A. R. Parkes.—p. 403.
Retained Intraventricular Foreign Body. J. M. Small.—p. 414.
Aseptic Anastomosis in Gastrectomy. C. A. Pannett.—p. 418.
Right Retroperitoneal Diaphragmatic Hernia. N. R. Barrett.—p. 421.
*Control of Hospital Infection of Wounds. R. E. O. Williams, Barbara Clayton-Cooper, T. W. Howat and A. A. Miles.—p. 425.

Congenital Deficiency of Pericardium with Bronchogenic Cyst.—A girl aged 19 had partial deficiency of the pericardium associated with a solitary bronchogenic cyst, both on the left side. Rusby and Sellors review the literature relating to pericardial deficiency and show that theirs is the eightieth case placed on record, the third to be recognized during life and the only one carefully studied at operation. The symptoms of which the patient complained can be attributed to the lung cyst, which was removed. An uneventful recovery followed, and good health has been enjoyed since operation. The authors contend that the association of a lung cyst with a partial left-sided deficiency of pericardium lends weight to the view that the latter defect is the result of abnormal development with premature atrophy of the left duct of Cuvier. The name given to this condition by Keith, patency of the iter venosum, is believed to be accurate, and it possesses the added advantage of according well with the nomenclature in current use for other developmental abnormalities of the cardiovascular system.

Control of Hospital Infection of Wounds.—Williams and his associates undertook a survey in order to extend the observations of the effects of a revised dressing technic on the incidence of added hospital infection. As in previous investigations, the survey was made in terms of Streptococcus pyogenes, but these observations differ from them in that the authors examined wounds and personnel for the presence of Staphylococcus aureus as well and tried to assess the magnitude of the reservoirs of both these infecting organisms in the environment. During a control observation period of ten weeks the added infection rate per wound-week at risk in a surgical ward dealing mainly with septic wounds of the hands was

13.9 per cent for Streptococcus pyogenes and 100 per cent for Staphylococcus aureus. During a test period of twenty-six weeks, after the adoption of a revised wound dressing technic, the added infection rates were 0.75 per cent for Streptococcus pyogenes and 17.8 per cent for Staphylococcus aureus. The carrier and infection rates for the two organisms in the noses, throats and wounds of the patients and in the noses and throats of the nursing staff were similar in both periods. The number of wound weeks at risk was higher in the test than in the control period. The reduction in added infection may therefore be attributed to the revision of the dressing technic.

Practitioner, London

154:193-272 (April) 1945. Partial Index

Motor Driving Tests. D. J. A. Kerr.—p. 195.
Medical Standards of Fitness for Driving. H. A. Dunlop.—p. 201.
Alcohol and Road Accidents. S. Smith.—p. 205.
Abdominal Injuries Arising from Road Accidents. C. Noon.—p. 227.
Road Accidents: Some Medicolegal Problems. D. H. Kitchin.—p. 248.
Detection of Free Fluid in Abdomen. G. Ovens.—p. 256.

Revista Chilena de Pediatria, Santiago

16:97-167 (Feb.) 1945. Partial Index

*Anatomicopathologic Verification of Atelectasis in Epituberculosis in Children. G. Llodra and A. Guzmán.—p. 97.
Mediastinal Syndrome and Leukemia. J. Meneghello, H. Niemeyer and R. Eberhard.—p. 153.

Atelectasis in Epituberculosis of Children.—Llodra and Guzmán performed necropsies on 17 children with a clinical history of epituberculosis who died from accidents, from nontuberculous disease or from extrapulmonary tuberculosis. Pulmonary atelectasis was found to be the pathologic basis of epituberculosis in all cases. Atelectasis was recent in some cases and chronic in others. It was caused in some by constriction of the bronchi the result of compression by enlarged regional lymph nodes and in others by partial obstruction of the bronchi by local accumulation of tuberculous exudate. Old atelectasis manifested by foci of pulmonary induration was frequently associated with bronchiectasis.

Deutsche medizinische Wochenschrift, Leipzig

70:409-431 (July 21) 1944. Partial Index

Pain and Reflex Symptoms of Disease. K. Hansen.—p. 409.
Wartime Diet of Patients With Diabetes Mellitus and Dosage of Insulin. G. Katsch.—p. 413.
*Secondary Effects of Atabrine on Central Nervous System. H. Vollmer and H. Liebig.—p. 415.
Examination of Metabolism of Patients with Typhus. K. H. Schäfer. —p. 417.
Analeptic with Depot Effect. Heim.—p. 420.
*Treatment of Scarlet Fever with Convalescent Blood.—P. Klein.—p. 422.

Atabrine and Nervous System.—Experiments on rabbits and cats revealed certain secondary effects on the central nervous system of these animals. Psychosis and motor excitement were caused by suicidal attempts with large doses of atabrine (1.9 to 9 Gm.). Vollmer and Liebig report 4 recurrent cases of tertian malaria in which secondary effects on the central nervous system were observed. The occurrence of these reactions was in contrast to the opinion of other authors, who believed that reactions of this type do not result from the administration of therapeutic doses of the drug. The incidence (4 in 450 cases) was low. Psychosis resulted in 3 cases from intramuscular injection of atabrine, and psychosis associated with bulbar paralysis and flaccid paralysis of the lower extremities in 1 case. The aforementioned disturbances were of short duration. There were no irreversible cases.

Convalescent Blood Treatment of Scarlet Fever.—Klein obtained gratifying results from transfusion of convalescent blood in 34 severe toxic cases selected from 450 cases of scarlet fever. Mild and medium severe cases do not require this type of treatment. One transfusion was given to 28 patients, 2 transfusions to 5 and 4 transfusions to 1 patient. The amount of blood transfused varied from 110 to 300 cc., the usual amount being 220 cc. to 280 cc. In the majority of the cases the transfusion was given in the acute stage of the disease after the fourth day but not later than the tenth day. Good results were obtained likewise in 2 cases in which the transfusion was performed on the thirty-fifth day of the disease. The donors were convalescent after the third week of the disease. A pronounced improvement in the general condition is followed by a drop in temperature and decrease in pulse rate. The rash loses its color and desquamation sets in earlier, but these results are of minor importance. Complications occur in spite of the treatment. There is no danger of serum sickness, and the transfusion may be repeated as often as necessary. One cc. of racemic ephedrine administered at the start of the transfusion proved effective in preventing shock. A blood bank for stored convalescent blood is suggested. Good results obtained from transfusion of normal blood in 7 cases of scarlet fever suggest that normal blood may be used instead of convalescent blood when the latter cannot be obtained.

Klinische Wochenschrift, Berlin

23:1-44 (Jan. 22) 1944. Partial Index

Vegetative Systems of Brain Stem in Pathogenesis of Psychic Disturbances. M. Rosenfeld.—p. 1.
Part Played by Inhibition (Checking of Growth of Germs) in Entire Procedure of Combating Microbia. H. Dold.—p. 5.
Problem of Prevention of Growth in Vivo and in Vitro. K. Nikolai von Kaulla.—p. 8.
Typhus in Immunized Persons. H. Schulten.—p. 12.
Investigation on Usefulness of Synthetic Fat in Diet of Persons with Diabetes Mellitus and with Diseases of Stomach and of Liver. G. Kabelitz.—p. 13.
*Importance of Lymphatic Tissues (Thymus, Spleen, Lymph Nodes) in Pathogenesis of Tetany in Infants. A. Nitschke.—p. 16.

Lymphatic Tissue and Tetany of Infants.—Nitschke produced in rabbits the characteristic syndrome of tetany by injecting the precipitates of urine of 9 infants with tetany. The syndrome was manifested by adynamia, lowering of the blood calcium level, electric hyperexcitability and cramps. Recovery of the infants from clinical spasmophilia followed administration of irradiated ergosterol, but prolonged excretion of tetany producing substance in the urine continued for three to four weeks thereafter. Injection of urinary precipitates of 5 normal infants into rabbits did not produce lowering of the blood calcium level in the animals. The effects on the rabbits of the injection of urinary precipitates from infants with tetany resembled in its clinical aspect and the time of appearance of the symptoms and their duration the effects of administering extracts of thymus, spleen and lymph nodes previously reported by the author. This suggests that the two effects were caused by the same chemical substance. The new observations seem to prove the concept previously advanced that the lymphatic system is to be considered as an endocrine unity which produces, when hyperfunctioning, the clinical picture of tetany by its antagonistic effect on the parathyroids.

Acta Chirurgica Scandinavica, Stockholm

90:1-88 (April 29) 1944

Urinary Lithiasis in Childhood. C. C. W. Smith.—p. 1.
Bloodless Reduction, Under Roentgenologic Control, of Acute Volvulus of Sigmoid Flexure. F. Nørgaard.—p. 17.
Transpapillary Duodenal Drainage of Choledochus. C. van Gelderen. —p. 27.
*Value of Determination of Citric Acid in Blood Serum for Differential Diagnosis in Diseases of Liver and Bile Passages. L. Hagelstam. —p. 37.
Surgical Treatment of Pylorospasm. A. Bardy.—p. 71.
*Significance of Blood Group Characteristics in Serum and Plasma Transfusions. K. Halvorsen.—p. 80.

Citric Acid in Serum in Hepatic and Biliary Diseases.—Sjöströms demonstrated in 1937 that the determination of the citric acid content in the blood serum is of aid in the diagnosis of diseases of the liver and the bile passages. The enzymatic chemical method of Thunberg is used for the determination of the citric acid. Hagelstam describes experiences with the Thunberg method. On the basis of studies on healthy persons he considers 24.35 micrograms per cubic centimeter the normal mean and 28 micrograms the normal maximum. Studies on patients with hepatitis revealed increased values in all severe cases. In the cases in which galactose epinephrine or Takata tests were conducted concurrently with the citric acid test the latter was found to be twice as sensitive as the galactose and Takata tests, while the epinephrine test showed the same sensitivity as the citric acid test. In patients with

stenosis of the common bile duct all but 1 showed normal values. Many patients with diseases of the gallbladder exhibited increased citric acid values. The author concludes that the citric acid test is of great value in differentiating between hepatitis and obstructive jaundice.

Blood Group Characteristics in Serum and Plasma Transfusions.—Halvorsen stresses that, in producing serum and plasma for therapeutic use, consideration must be taken of the blood group characteristics, and an attempt should be made to prepare a serum which is as free of these as possible. By mixing in suitable proportions, it is possible to prepare serums which are practically free of both anti-A and anti-B agglutinins as well as of antigens (agglutinogens) A and B. If citrated blood is used, the proportions 2 O, 1 A, 1 B will give a mixed plasma which is free of isoagglutinins and contains little antigen A and B regardless of the agglutinin titer of the individual components. If only serum or plasma is mixed, a mixture of equal parts of A and B serum or plasma with an isoagglutinin titer of 64 to 128 will be practically free of both isoagglutinins and antigen A and B. About half of the A donors and one third of the B donors can be expected to lie within this titer range.

Acta Psychiatrica et Neurologica, Copenhagen

19:1-411 (No. 1-2) 1944. Partial Index

Tentorial and Paratransversal Meningiomas J. Arnvig.—p. 11.
Differential Diagnosis Between Acoustic Neurinoma and Meningioma of Posterior Face of Petrous Bone. C. C. Bager.—p. 23.
Value of Ophthalmodynamometry ad Modum Bailliart in Intracranial Tumors. M. Bardram and H. P. Neerdam.—p. 33.
*Cervical Disk Prolapse. B. Broager.—p. 45
A New Approach for the Removal of Tumors of Third Ventricle. E. Busch.—p. 57.
Studies on Chronic Subdural Hematoma. Erna Christensen.—p. 69.
Meningiomas of the Falx. S. Ethelberg.—p. 149.
Contracture of Iliotibial Fascia in Sciatic Pain. K. Jespersen.—p. 195.
*Electrocoagulation of Gasserian Ganglion by the Kirschner Method. B. Oddsson.—p. 293.

Cervical Disk Prolapse.—In 5 of 285 patients with vertebral disk prolapse, the involved disk was in the cervical region: in 3 cases it was the sixth cervical intravertebral disk, in 1 case the fifth and in 1 case the fourth intravertebral disk. Four of the patients were men between the ages of 33 and 50, and 1 was a woman aged 46. The history revealed traumatic injury to the spinal cord in 3 of the 5 cases. Pain was the most common initial symptom. Only 1 of the patients had quadriplegia; 2 patients presented unilateral radicular paresis and atrophy, 1 of them with inferior paraparesis; 1 patient had inferior paraparesis only, and 1 had normal neurologic findings. The Brown-Séquard syndrome was present in 1 case. Sphincter disturbances were present in 1 case. X-ray examination revealed narrowing of the involved intravertebral space in 3; in all 5 a typical spondylosis deformans with osteophytes was demonstrated in the cervical spine, most pronounced at the level of the ruptured disk. Iodized oil myelography showed nothing characteristic of disk prolapse. A partial block was found in 2 cases and a total block was seen in 2. The three distinct syndromes described by Stookey as typical of cervical disk prolapse may be useful if the differential diagnosis is difficult between a small cervical disk prolapse and a case of intrinsic disease of the cord. But if the disk prolapse is large the syndromes of Stookey will not be of any help in the differential diagnosis between intraspinal tumor and disk prolapse. The history of a specific traumatic injury to the cervical spine combined with signs of an intraspinal tumor in this region should be suggestive of a cervical disk prolapse. These symptoms, combined with x-ray signs of localized spondylosis deformans of the cervical spine, and especially narrowing of an intravertebral space, would also point to disk prolapse.

Electrocoagulation of Gasserian Ganglion.—In the neurosurgical department of Rigshospitalet in Copenhagen 85 patients with trigeminal neuralgia have been treated during the last six years with electrocoagulation of the gasserian ganglion by the Kirschner method. The location of the foramen ovale having been found percutaneously with an apparatus specially designed by Kirschner, the ganglion is punctured with a trocar; the stylet is removed and a cautery probe is introduced with which the ganglion is electrocoagulated. The operation takes a few minutes. The patients were between the ages of 19 and 92. There were 54 women and 32 men. The duration of the neuralgia was on an average six years, the longest thirty years and the shortest three months. The right side was affected in 55 cases, the left in 28 cases; 3 cases were bilateral, 74 patients had major and 12 had atypical trigeminal neuralgia. Primary relief of symptoms was obtained in 66 cases, the remaining 20 having to undergo other treatment. The longest follow-up was fifty-one months, the shortest three months. The follow-up revealed that 25 patients were relieved of pain and 7 were substantially improved; 13 patients had a recurrence, which in most cases yielded to a repeated electrocoagulation. There were no fatal cases. The best results, both as to primary relief of symptoms and as to prevention of recurrence, were obtained in trigeminal neuralgia of the third division. Oddsson suggests that most patients with major trigeminal neuralgia should be treated with temporal retrogasserian neurotomy. If the patient is not likely to stand the operation, alcoholic injection or neurexeresis may be carried out in neuralgia of the first and second divisions, while in neuralgia of the third and perhaps also of the second division electrocoagulation of Kirschner should be performed. In special cases section of the sensory root alongside the pons by Dandy's subcerebellar route may be considered, but it seems likely that this operation will be superseded by the tractotomy of Sjöqvist, which has definite advantages.

Nordisk Medicin, Stockholm

21:245-316 (Feb. 11) 1944

Preparations of Different Infusions and Indications for Their Application. O. Wilander.—p. 245.
New Colloid Solutions for Infusion. A. Grönwall and B. Ingelman.—p. 247.
*Bone Changes in Diseases of Blood: Review. T. K. With.—p. 249.

Hospitalstidende

Myelography with Abrodil. J. Nordentoft.—p. 255.

Hygiea

*Neurologic Symptoms in Arthritis Deformans Humeroscapularis. K. Mårtensson.—p. 271.

Bone Changes in Diseases of Blood.—Characteristic bone changes in Cooley's erythroblastic anemia, sickle cell anemia and hereditary jaundice are seen almost exclusively in children and most often and in a most accentuated form in the cranium. In acute leukosis, where the bone symptoms are more important than in chronic leukosis, they may cause pain in the joints suggestive of rheumatic fever. In other forms of acute leukosis Baty and Vogt's symptom often occurs at an early stage and the x-ray appearance may establish the diagnosis before the typical blood picture appears. Relatively grave changes which simulate spondylitis may be seen in both children and adults. The bone marrow in aleukemic myeloid splenomegaly may be hyperplastic, apparently normal or fibrotic. Myelosclerosis is most often accompanied by osteosclerosis. The process need not affect the entire bony system. In lymphogranulomatosis maligna the hematogenic type of bone changes can be diagnosed by bone biopsy. In the local forms with involvement of the bone marrow the processes are usually destructive, but they may be sclerotic. In lymphogranulomatosis benigna there are cystoid clarifications in the small bones of the hands and feet; the joints are as a rule intact. In Gaucher's disease the specific tissue is always found in the bone marrow. In the long bones it may by its growth distend the bone. In Hand-Schuller-Christian's disease multiple bone defects constitute a cardinal symptom. Karscher's is the only general work on bone changes in disease of the blood; however, he considers them only from the radiologic point of view.

Neurologic Symptoms in Humeroscapular Arthrosis Deformans.—Mårtensson finds that in this disease pain and muscle hyperalgesia are due to irritation of the sensory end apparatus of the joints; transmission of pain takes place in the region of the fifth or sixth cervical segment or eventually both. Section of the affected sensory root may in suitable cases overcome the pain and lessen, perhaps even overcome, the limitation of movement.

Book Notices

Bronchial Asthma. By Leon Unger, B.S., M.D., F.A.C.P., Assistant Professor, Department of Medicine, Northwestern University Medical School, Chicago. Introduction by Morris Fishbein, M.D., Editor, Journal of the American Medical Association, Chicago. Cloth. Price, $9. Pp. 724, with illustrations. Springfield, Ill., & Baltimore: Charles C Thomas, 1945.

This is a comprehensive treatise on the subject of bronchial asthma. It includes an excellent discussion of the clinical phases of asthma and goes into a minute consideration of the allergic factors involved in its production. The clinical section of the book takes up the history, terminology, etiology, pathology, symptomatology, direct and differential diagnosis and treatment of bronchial asthma. These chapters are thorough and complete and include an excellent bibliography. The chapter on treatment should be of great practical value to the clinician, including as it does all known forms of therapy for this condition. Much that appears in the book should interest the physician who has already devoted some time and effort to the study of allergy. The laboratory section contains much useful information such as methods of preparation of extracts and the technic of pollen counts. The third part of the book is a compilation of detailed information on the sources of various allergens, elimination diets, instructions to patients and "patent medicines" used in asthma. The book is written in an easy, flowing style. It is well documented. The publishers did an excellent job with the format and the printing. The illustrations are instructive and helpful. The book should be of value to the internist as well as the allergist. It is a good clinical treatise on the subject of bronchial asthma and will make a valuable addition to one's medical library.

Primate Malaria. By S. D. Aberle, M.D. Issued by the Office of Medical Information (under grant of the Johnson & Johnson Research Foundation) March 1945. National Research Council, Division of Medical Sciences. Paper. Pp. 171, with 12 plates. Washington, D. C., 1945.

This monograph, which was issued by the Office of Medical Information of the National Research Council, is designed to give research workers a concise review and ready reference to the work published on the malaria of primates, exclusive of man. It has been prepared in association with the chairman, Dr. Robert S. Loeb, and the secretary, Dr. George A. Carden Jr., of the Board for the Coordination of Malarial Studies. Each section has been compiled with the aid of one or more of the American workers in the field of primate malaria.

There are nine main sections. The first section, on parasites, hosts, vectors and transmission of parasites, is largely contained in five extensive tables, which include such subjects as the prevalence of natural malarial infections, lists of species of primate malarial parasites with their natural and experimental hosts, classifications of hosts and parasites and transmissibility of the parasites. The second section consists of a brief account of the metabolism of Plasmodium knowlesi. The third section gives a summary of the course of various infections, with special reference to the stages of the infection, development of the parasitemia, hematology and body temperature. The fourth section, on the chemotherapy of primate malaria, consists chiefly of two extensive tables, the first of which (table 7) is a summary of the preparations used in treating primate malaria with the results of the treatments and the second of which (table 8) gives a review of each paper from which the previous summary table is constructed and includes the dosage of drug, method of treatment and antimalarial activity. The fifth section, on immunity, is a review of both the humoral and the cellular aspects. The seventh section deals with both microscopic and gross pathology. The eighth section, on morphology, consists of plates, including a reproduction in color of Gonder and von Berenberg-Gossler's description of Plasmodium kochi, a series of black and white plates showing the morphology and asexual cycles of Plasmodium cynomolgi, Plasmodium inui, Plasmodium knowlesi and Plasmodium brasilianum, a plate from Taliaferro and Cannon showing the phagocytic reactions during immunity to P. brasilianum and four plates from Taliaferro and Mulligan illustrating the histopathology of infections with P. knowlesi and P. cynomolgi. The eighth section is a description, classification and a key for identifying the macaques, written by Remington Kellogg. The final section is a bibliography consisting of 456 references. It is complete through Oct. 1, 1944 and indicates, besides the original publication, reprints and reviews which occur in the *Tropical Diseases Bulletin* and *Biological Abstracts*.

This monograph is one of the most important research tools that has appeared in the field. It is not written for general reading but has most of the material, either condensed to a minimum of writing or put in the form of tables. The various collaborators give the work undoubted authority. The bibliography is unquestionably the most extensive yet compiled for the subject. In addition, the author has had access to and referred to much of the unpublished work supported by the Committee on Medical Research of the Office of Scientific Research and Development. Reproduction of the monograph itself is noteworthy. The text has been printed directly from typewritten material by a planograph method. Both the text and the illustrations are excellent.

Discovery of the Elements. By Mary Elvira Weeks. Fifth edition. Cloth. Price, $4. Pp. 578, with illustrations. Easton, Pa.: Journal of Chemical Education, 1945.

Regardless of specialty, every one active in scientific fields is interested in various phases of history. The discovery of the elements provides no exception, and physicians, chemists and others should enjoy many sections in this book. It is the sort of thing which is useful in any library but will have added value in the libraries of teachers, research workers and the like. Included are twenty-seven chapters of discussions ranging from elements known to the ancient world to individual elements such as chromium, tungsten, tellurium and selenium, the inert gases, radioactive elements and more recently discovered elements. The index is adequate. There is a good appendix on chronology, a list of the chemical elements with their atomic number, symbol and 1943 atomic weight and an excellent list of illustrations. In fact, there are 349 illustrations. Many people regard the elements as comparatively recent discoveries, and yet some of the substances now recognized as chemical elements have been known and used since earliest history. This book brings that history up to date by adequate illustration and frequent quotation. It is revealing to pore over these quotations when one considers the periods in which they were offered.

Electroencephalograms of Normal Children. By Charles E. Henry, Brush Foundation and Department of Anatomy, Western Reserve University School of Medicine, Cleveland. Monographs of the Society for Research in Child Development, Volume IX, No. 3 (Serial No. 39). Paper. Pp. 71, with 13 illustrations. Washington, D. C.: Society for Research in Child Development, National Research Council, 1944.

Successive electroencephalographic records were made of 95 presumably normal children over a period of from five to eight years. A single record was made also of 540 "normal" children between the ages of 4 and 19. In the majority of cases rates stabilize by the eighth year, with a frequency between nine and eleven per second. Females tend to have faster alpha frequencies than males and a larger proportion of low voltage fast records. Correlation between frequence and intelligence could not be demonstrated. In a group of 583 "normal" children 5 per cent had abnormal and 6.9 per cent questionably abnormal records, although some of these were found to be normal a year later. This is a complete detailed study made under the auspices of the Brush Foundation, a valuable reference and example for persons interested in electroencephalography or in the development of children.

The Relation Between Illumination and Visual Efficiency—the Effect of Brightness Contrast. By H. C. Weston. Medical Research Council, Industrial Health Research Board, Report No 87. Paper. Price, 9d Pp. 35, with illustrations. London: His Majesty's Stationery Office, 1945.

This is a report of the Industrial Health Research Board of the British Medical Research Council dealing with the effect of characteristics such as size, contrast and brightness on the facility with which objects can be seen. It is highly technical and presents most interesting experimental work and conclusions that are of interest mainly to psychologists, physicists and physiologists. Clinical applications are not included in this brochure.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PROPHYLAXIS OF OPHTHALMIA NEONATORUM

To the Editor:—With the advent of newer forms of chemotherapy the time is proper for reassessing the merits of the Credé treatment in the prophylaxis of ophthalmia neonatorum. Several weeks ago I saw a newborn infant which, although it had received at birth an instillation of a 1 per cent solution of silver nitrate, developed gonorrheal ophthalmia. The infant was given sulfadiazine therapy by mouth, 1 grain per pound of body weight, and within four days was clinically and bacteriologically free from the disease. Since silver nitrate prophylaxis occasionally fails to prevent gonorrheal ophthalmia, and since it often produces a pronounced chemical conjunctivitis, would not a 1 per cent solution of sodium sulfadiazine or a solution of penicillin 200 Oxford units per cubic centimeter be of more value in prophylactic therapy? The latter chemotherapeutic agents are certainly less irritating than the silver nitrate solution.

Henry Rascoff, M.D., Brooklyn.

To the Editor:—Recently I have had 2 cases of gonorrheal ophthalmia in which 1 per cent silver nitrate solution in wax ampules was used. In using this solution should it be washed out immediately with isotonic solution of sodium chloride or should it be left in for a period of time? Should this procedure be left to the nurse in charge or should it always be done by the doctor? Is there any other solution more effective?

B. L. Lingeman, M.D., Crawfordsville, Ind.

ANSWER.—1. The Credé method of prophylaxis has been time tested since it was first advocated in 1880 and has proved to be remarkably effective in reducing the incidence of gonorrheal ophthalmia. It is still the standard procedure required by law in most states and should not be abandoned until certain proof of superior performance by a substitute method has been established. Its occasional failure can be attributed in most cases to faulty application or, in a few instances, to exceptionally prolonged labor which allows actual bacterial invasion of the conjunctiva to take place prior to birth. The chemical conjunctivitis produced by single-drop instillation of a 1 per cent solution of silver nitrate is of minor importance and should not militate against this use of the drug.

Single instillations of a 1 per cent solution of sodium sulfadiazine or a solution of penicillin (200 Oxford units per cubic centimeter) could not be expected to prove effective, as both agents require prolonged action to effect sterilization. In ointment form, however, effective concentrations can be maintained for from four to six hours, so that single instillations of 5 per cent sulfadiazine or 5 per cent sulfathiazole ointments, or of sodium penicillin ointment (500-1,000 Oxford units per cubic centimeter) or, preferably, three or four instillations of these preparations at four to six hour intervals, would be effective theoretically. The low tear production in infants during the first few weeks of life reduces the factor of dilution, which notably interferes with the local action of sulfonamide or penicillin in the adult eye. Oral administration of a total of 20 grains (1.3 Gm.) of sulfathiazole over a three day period, as recommended by Gleich, Blumberg and Mason (*Am. J. Dis. Child.* **67**:472 [June] 1944) would certainly be effective but would seem to introduce unnecessarily the risk of sulfonamide toxicity. The occasional occurrence of sulfonamide and penicillin resistant strains of gonococci would be a further complicating factor.

The sulfonamides would have the advantage of providing prophylaxis also against inclusion blennorrhea, which is the most important type of nongonococcic ophthalmia neonatorum and is not prevented by the Credé method. Penicillin is known to be inactive against this disease. The possibility of sensitizing the infants to the sulfonamides or to penicillin should receive consideration but would probably occur so exceptionally as to be insignificant. Final conclusions must await publication of the several research projects known to be in progress.

2. When 1 per cent silver nitrate is used, neutralization is unnecessary. Credé originally employed 2 per cent silver nitrate, and if this strength is used neutralization with isotonic solution of sodium chloride after an interval of a few seconds is advised. The instillation of silver nitrate should invariably be done by the physician, or at least supervised by him, to make certain that the drop reaches and spreads over the entire conjunctival and corneal surface. There is as yet no other solution known to be more effective as a prophylaxis against gonorrheal ophthalmia.

CONTROL OF TICKS IN TROPICAL MEXICO

To the Editor:—A patient and a group of friends have purchased land in Chiapas, Mexico. One difficulty at the camp which causes trouble every year is described by the patient as follows: "We are on the edge of the cattle country, and the grass and brush are full of ticks, some almost too small to be seen and others like small spiders. There are both hard and soft ticks. Almost every time we go out of the camp we return with our skin peppered with them. We detick at every opportunity, but still we get hundreds of bites. They spoiled our dispositions for the first month or two. Some of us are now developing a sort of immunity, but others are having real trouble. One girl has big festering sores, almost boils, all over her legs. Her whole legs swell and pain her; she has had some fever from them and has been really laid up for about three weeks. Usually we have small vesicles form and harden so that they itch like chickenpox. The glands in the groins swell and become tender." What can be suggested for this group?

Louis L. Sherman, M.D., Oakland, Calif.

ANSWER.—Serious annoyance from ticks is encountered in many parts of the tropics. The species which causes most of the annoyance in tropical Mexico is probably the Cayenne tick known scientifically as Amblyomma cajennense. The small specimens mentioned are seed ticks, the ones "like small spiders" are nymphs, and the larger ones are the adults, males and females. The latter engorge with blood of various wild and domestic animals, becoming as large as the end of the little finger, and then drop off and deposit five or six thousand eggs on the ground and die. The eggs soon hatch into seed ticks.

There is no very satisfactory way of eliminating these pests from an area that is frequented by livestock or wild animals that serve as hosts. Excluding such animals and keeping the grass and underbrush closely cut will ultimately materially reduce the numbers of the pests. Some control can also be effected by spraying around habitations and along paths and roadways with a solution containing 4 teaspoons of a 40 per cent solution of nicotine sulfate, ½0 ounce of soap and 2 ounces of sodium fluoride to 1 gallon of water. This spray will cause some burning of foliage. Much protection of the individual can be obtained by dressing to exclude the ticks. This involves wearing trousers inside high top shoes and having tightly closed flies on trousers and shirts. A rag soaked in kerosene and tied about the top of the shoes helps keep them off. Certain repellents have value in protecting individuals, but these are not at present available to civilians since the supplies are being devoted entirely to military uses.

MORPHINE AS A CAUSE OF DEATH

To the Editor:—Is there any record of hypersensitivity to morphine administered hypodermically in ¼ grain dosage? Is there record of such a dose's causing death by respiratory paralysis in adults? What is the smallest dose of morphine, administered hypodermically, known to cause death?

M.D., North Carolina.

ANSWER.—There is a considerable variation in the sensitiveness with which individuals react to morphine. Some individuals require much smaller doses of morphine to produce a given result than do others. This could be considered as a hypersensitivity to a usual dose. Elderly persons tolerate morphine poorly. A quarter of a grain of morphine is the usual dose used for an adult, although the official dose is smaller.

Reports of death by respiratory paralysis in adults caused by ¼ grain of morphine have not been found. However, if the respiration was much embarrassed from other causes, the morphine could conceivably aggravate the condition.

The average fatal dose of morphine in man is stated to be about 0.005 Gm. per kilogram of weight. There does not appear to be any record of the smallest dose of morphine administered hypodermically which is known to cause death.

SENSITIVITY TO SULFATHIAZOLE

To the Editor:—Is it reasonable to assign an acute flare-up of dormant phlebitis of the leg as a toxic reaction to the local use of sulfathiazole ointment? If there is a causal relationship, would it be a toxic manifestation or an allergic reaction? A patient sustained second degree burns of two fingers, and sulfathiazole ointment was applied. He subsequently developed a skin reaction of the extremities and also an acute exacerbation of a previously existing phlebitis in the leg. My review of the literature does not indicate phlebitis as an encountered complication following the use of the sulfonamides.

M.D., New York.

ANSWER.—It is to be assumed that the "skin reaction" of the extremities was a manifestation of hypersensitivity to sulfathiazole. It is difficult to interpret the genesis of the exacerbation of the phlebitis. While vascular lesions have occurred as a result of sensitivity to the sulfonamides, such as periarteritis nodosa, the appearance of thrombophlebitis has not been recorded. Therefore one cannot state that the phlebitis described in this case was a manifestation of sulfonamide sensitivity or toxicity.

PSEUDOBULBAR PALSY

To the Editor:—A white woman, aged 57, widowed, presents extreme dysarthria, mildly ataxic gait, emotional instability and moderate mental deterioration. These symptoms have been developing during the past two or three years, becoming progressively worse. Her father died at 74 from pneumonia; her mother is living at the age of 100; a brother died in a state hospital at the age of 62; the diagnosis was chronic bulbar paralysis with psychosis. He had had a neurologic condition for four or five years before his death. It is stated that the father and the father's mother were afflicted with a condition similar to the brother's. The patient has two normal children and one feebleminded child. This patient's serologic reaction, including a spinal fluid examination, is entirely normal. Her neurologic examination reveals an ataxic gait; she walks with a wide base; she has no cooperation for walking a straight line and on the heels and toes; Fournier tests were negative. Coordination: Romberg negative; FF & FN tests fairly well done; no decomposition of movement; no asynergia; no adiadokocinesis. Abnormal movements: none. Reflexes: Biceps, triceps, wrist 3 plus and equal, patellars 4 plus; abdominals not elicited; Babinski present on left, questionable on right. No clonus obtained. Muscular system: a moderate amount of muscular hypertonicity is present; there are no localized atrophies and no diminution of strength in the extremities. Sensory: negative so far as could be determined. Cranial nerves: I, olfactory sense normal. II, fundi normal. III, IV, VI, eye movements normal, no nystagmus, pupils slightly irregular, react to a limited extent to light. V, weakness of mouth muscles and muscles of mastication not observable; corneal reflex present. VII, no evidence of facial paralysis. VIII, hearing normal. IX, X, pharyngeal reflex present, no paralysis of uvula. XI, able to rotate head and raise shoulders. XII, speech definitely impaired; seems unable to protrude tongue. Positive neurologic findings: 1. Muscular hypertonicity with increased deep reflexes. 2. Babinski, absent abdominals. 3. Ataxic gait. 4. Pronounced speech defect. 5. Emotional instability. There is nothing remarkable about the patient's mental condition except for a moderate forgetfulness and dementia. What are the diagnostic possibilities? She does not seem to fall into any of the well recognized neurologic syndromes. It seems that multiple sclerosis is a possibility, but her age and the fact that multiple sclerosis does not tend to be familial or hereditary are against this diagnosis. She does not show the typical symptoms of progressive bulbar palsy or pseudobulbar palsy. Amyotrophic lateral sclerosis, syringomyelia and spastic spinal paralysis can be ruled out. She does not have a cerebellar syndrome. Any suggestions that you may have as to the diagnosis will be appreciated.

M.D., Ohio.

ANSWER.—In this case the dysarthria without loss of pharyngeal reflexes would seem to justify classifying the syndrome in the general category of pseudobulbar palsy. The dysarthria is undoubtedly due to bilateral supranuclear lesions of the lower cranial nerves. Such lesions often interrupt corticospinal and cerebellar pathways also, producing unilateral and bilateral rigidity and ataxia. Disturbances of emotional expression are usually present if the degeneration is widespread and are attributed to lesions of the thalamus. Such a syndrome may be produced by a number of destructive processes, of which arteriosclerosis is the most common and seems the most likely in this instance. What is extremely unusual is the familial incidence. A cursory examination of the literature has not revealed any similar groups of cases.

TOXICITY OF ISOPROPYL ALCOHOL

To the Editor:—Can isopropyl alcohol be injected in small amounts intravenously and not be toxic? I understand that when used in 98 per cent strength this alcohol is as antiseptic as 70 per cent ethyl alcohol. The reason the question is asked is that I give intravenous injections of different drugs in which I have used ethyl alcohol to sterilize the syringes and needles. I have never been concerned with the small amount of ethyl alcohol that might cling to the needle or syringe and be injected. Can I use isopropyl alcohol in the same manner?

Perry Sperber, M.D., Providence, R. I.

ANSWER.—Since no specific information on this question could be found in published literature, some animal experiments were undertaken with the following results. Isopropyl alcohol differs from ethyl alcohol in that the bactericidal effects of the former increase steadily as its concentration approaches 100 per cent, whereas the maximal bactericidal strength of ethyl alcohol is 70 per cent by weight (Price, P. B.: Ethyl Alcohol as a Germicide, *Arch. Surg.* **38**:528 [March] 1939). In vitro, pure (99 per cent) isopropyl alcohol is a strong precipitant of plasma protein, its coagulating effect being greater than that of 95 per cent ethyl alcohol and much greater than that of 70 per cent ethyl alcohol. Dilutions of isopropyl alcohol as weak as 20 per cent cause perceptible clouding of plasma. Even small amounts of pure isopropyl alcohol cause prompt coagulation of tissues. Less than 0.1 cc. of isopropyl alcohol injected intradermally into a dog's abdomen produced a small area of necrosis which eventually sloughed, leaving a sluggish ulcer. Graded amounts of isopropyl alcohol, 0.2, 0.4, 0.6 and 0.8 cc., injected subcutaneously, produced deep necrosing ulcerations of graded sizes which showed relatively little progress toward healing in three weeks. Less than 0.1 cc. of the alcohol injected into the wall of the exposed femoral vein immediately produced a spot of coagulation in the wall, inviting secondary hemorrhage. When 0.5 cc. of isopropyl alcohol was injected into the femoral vein of a large dog, a clot developed in the lumen, plugging the vein; when the animal was killed half an hour later, most of the clot had disappeared and the vein was patent but the embolus could not be found. Intra-arterial injection of as little as 0.5 cc. of isopropyl alcohol caused perceptible hemolysis in the circulating blood of a large dog, but no other toxic effects were observed after injection of 2 cc. The inference to be drawn from these experiments is that isopropyl alcohol, used in the manner indicated in the query, is not without danger and is not to be recommended.

PATENT DUCTUS ARTERIOSUS

To the Editor:—In a so-called blue baby that continues to be more or less cyanotic, is it possible to determine whether the condition is due to a patent ductus arteriosus or to some other heart condition? If the ductus arteriosus is patent can a young child be operated on? What are the chances of success? What surgeons do this type of work and where are they located? As a rule is it better to have such an operation done when the child is a few months old or to wait longer? What are the chances of such an infant's surviving if left alone?

Charles L. Entner, M.D., Connersville, Ind.

ANSWER.—Patent ductus arteriosus, unless complicated by other congenital cardiac lesions, rarely if ever causes cyanosis in infants. If a patent ductus arteriosus is present, a loud continuous "machinery" murmur should be audible in the second left interspace, and the diastolic blood pressure may be unusually low with a normal systolic blood pressure. The operative treatment of patent ductus arteriosus in cases uncomplicated by other congenital defects has been successful in recent years since the pioneer work of Dr. Robert Gross of the Children's Hospital in Boston. However, since cyanosis is present in the patient under consideration, there is little likelihood that an uncomplicated patent ductus arteriosus exists. Careful physical examination of the heart, x-ray examination of the chest and an electrocardiogram should help to clarify the diagnosis. The optimum time for operation seems to be in early childhood at the age of 4 to 6 years, although ligation has been done in adult life. The average duration of life in Abbott's series of patients not operated on was twenty-four years.

HEREDITY OF ACHONDROPLASIA

To the Editor:—Recently a patient was delivered of an achondroplastic dwarf. There had been one previous pregnancy with a normal delivery and a normal child. There is no family history of achondroplastic dwarfs. What are the possibilities—and if possible the percentage chance—of the patient's having a future achondroplastic dwarf?

M.D., California.

ANSWER.—Achondroplasia may appear as a mutation in a family, there being no previous history of the condition. Usually, however, the condition is hereditary and when so it is inherited as a single mendelian dominant. Its chance of occurring increases appreciably with the increasing age of the parents. It has been reported in five generations of a Mormon family. Of 22 offspring of the first dwarf in this pedigree, by two wives, 7 individuals were affected. Six of these persons married, and of their 49 children 24 showed the trait. The normal persons in this pedigree did not give rise to any affected offspring.

The percentage chance that normal parents of an achondroplastic dwarf will have another affected child cannot be stated. In general, however, the parents of a congenitally malformed child are twenty to twenty-five times more likely to give rise to another defective child than are parents all of whose children have been normally developed. Furthermore, if 2 children in a family exhibit congenital defects, there is a 50 per cent chance that the same defect will reappear in a subsequently born brother or sister.

VITAMIN E AND ARTHRITIS

To the Editor:—What therapeutic value has vitamin E in the treatment of fibrositis, arthritis, myositis and allied conditions?

Edwin P. Bickler, M.D., Milwaukee.

ANSWER.—As far as human beings are concerned there is no proof of value of vitamin E for these disorders at the present time.

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DERMATOSES OF THE HANDS

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The various "eczematoid" dermatoses which begin on the hands and remain limited primarily to the hands and lower part of the arms constitute about 10 per cent of the cutaneous disturbances seen in private practice or a dermatologic clinic. These dermatoses as a group have been discussed and classified by Chipman,[1] Andrews and Barnes,[2] Ayres and Anderson,[3] Wise and Wolf,[4] Davidson and Birt[5] and Stokes, Lee and Johnson.[6] Single types of dermatoses belonging to this group have been investigated and frequently discussed. Engman,[7] Fordyce[8] and Sutton[9] described infectious eczematoid dermatitis. Pollitzer[10] discussed a condition which he called "recurrent eczematoid affection of the hands" and differentiated this condition from nummular eczema. Mitchell[11] emphasized the role played by streptococci in producing dermatoses of the hands. Williams[12] considered the relationship between hand dermatoses (ids) and active fungous infections of the feet. Barber[13] described a pustular dermatosis which he called pustular psoriasis. Andrews and Machacek[14] also described a pustular dermatosis but associated this disturbance with a bacterial infection of some organ other than the skin and called the cutaneous disturbance pustular bacterid. Jordan, Dolce and Osborne[15] discussed housewives' eczema. Goldman[16] made an interesting study of autonomic nervous system reactions in cheiropompholyx. Epstein[17] reported on the direct fungous infections of the hands. Gross[18] used vitamin A in the treatment of nummular eczema. Hopkins and Burky[19] have discussed autosensitization as a causal factor in chronic eczemas of the hands.

In spite of this extensive investigation no agreement now exists as to nomenclature, etiology or therapy of these "eczematoid" dermatoses. Is it not true that a patient will have a dermatosis of the hands which will be called contact dermatitis of unknown etiology by one dermatologist and dermatomycosis by another, or cheiropompholyx by one and dermatophytid by another? The clinical appearances of nummular eczema—a good descriptive term—and infectious eczematoid dermatitis are not easily distinguished. The terms pustular psoriasis and pustular bacterid may apply to the same clinical entity, but both terminologies are still used by the dermatologists. Only for specific acquired hypersensitivity and dermatomycosis has the etiology positively been established. A good response to one type of therapy may be obtained by one dermatologist while the same therapy fails when used by another.

Three years ago it was decided to study this group of patients. Since that time we have examined 475 patients, nearly all new patients and constituting about 9 per cent of the total new patients of the clinic. They included practically all of the new patients with "eczematoid" dermatoses of the hands admitted to this clinic. Three hundred and ten of these cases have been seen on three or more occasions.

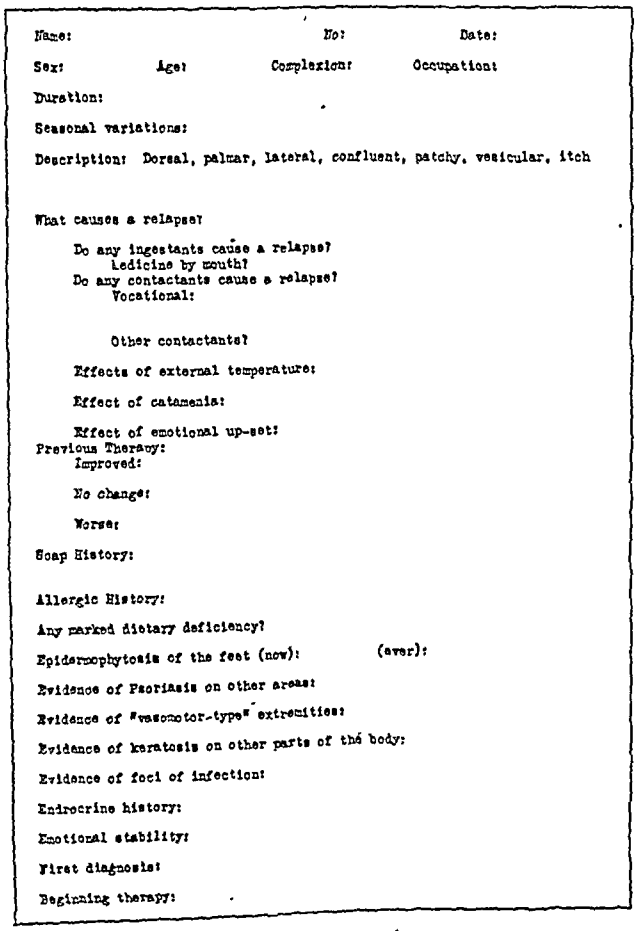
This study differs from previous investigations in the following ways: All of the data reported here were obtained specifically for this study, i. e. no recorded data taken previous to the start of the work are included. Each patient was seen on each visit by one of us (I. H. B.) and by one of the other authors. In over 90 per cent of the cases the original therapy consisted only of boric acid soaks, a soapless regimen and a mild soothing ointment, such as boric acid ointment or Lassar's paste.

We began this study with a distinct appreciation of the difficulty in making a definite diagnosis and deter-

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2. Andrews, G. C., and Barnes, M. C.: Pustular Bacterids and Allied Conditions, South. M. J. **34**: 1260-1266 (Dec.) 1941.
3. Ayres, S., and Anderson, N. P.: So-Called Fungous Infections of the Hand, California & West. Med. **56**: 63-66 (Feb.) 1942.
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7. Engman, M. F.: An Infectious Form of an Eczematoid Dermatitis, Am. Med. **4**: 769-773 (Nov. 15) 1902.
8. Fordyce, J. A.: Infectious Eczematoid Dermatitis: Possible Influence of Anaphylaxis in Skin Reactions, J. Cutan. Dis. **29**: 129-137 (March) 1911.
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14. Andrews, G. C., and Machacek, G. F.: Pustular Bacterids of the Hands and Feet, Arch. Dermat. & Syph. **32**: 837-847 (Dec.) 1935.
15. Jordan, J. W.; Dolce, F. A., and Osborne, E. D.: Dermatitis of the Hands of Housewives: Role of Soaps in Its Etiology and Methods of Its Prevention, J. A. M. A. **115**: 1001-1006 (Sept. 21) 1940.
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17. Epstein, E.: Dermatophytosis of the Hands: Diagnosis and Prognosis, Arch. Dermat. & Syph. **45**: 1113-1124 (June) 1942.
18. Gross, P.: Nummular Eczema: Its Clinical Picture and Successful Therapy, Arch. Dermat. & Syph. **44**: 1060-1077 (Dec.) 1941.
19. Hopkins, H. H., and Burky, E. L.: Cutaneous Autosensitization: Role of Staphylococci in Chronic Eczema of the Hands, Arch. Dermat. & Syph. **49**: 124-127 (Feb.) 1944.

mining the etiology in these cases. We realized the confusion existing over terms. The overemphasis on fungous etiology during the past two decades was recognized, but we expected to find cases in which a fungus was the causal agent. We expected to find specific acquired hypersensitivities or occupational dermatoses and patients for whom the use of soap was the major causal factor. The clinical observations and laboratory findings which have been obtained and which are being presented have supported none of these etiologic concepts or primary causes and have led us to search for other causal factors. We have returned to a school of thought which began nearly fifty years ago, led by Unna,[20] namely the importance of bacterial invasion as a causal factor in many of the "eczematoid"



Name: No: Date:

Sex: Age: Complexion: Occupation:

Duration:

Seasonal variations:

Description: Dorsal, palmar, lateral, confluent, patchy, vesicular, itch

What causes a relapse?

Do any ingestants cause a relapse?
Medicine by mouth?
Do any contactants cause a relapse?
Vocational:

Other contactants?

Effects of external temperature:

Effect of catamenia:

Effect of emotional upset:

Previous Therapy:
Improved:

No change:

Worse:

Soap History:

Allergic History:

Any marked dietary deficiency?

Epidermophytosis of the feet (now): (ever):

Evidence of Psoriasis on other areas:

Evidence of "vasomotor-type" extremities:

Evidence of keratosis on other parts of the body:

Evidence of foci of infection:

Endocrine history:

Emotional stability:

First diagnosis:

Beginning therapy:

Fig. 1.—Questionnaire.

dermatoses. It is our opinion now that many of the cutaneous disturbances of the hands which are being called dermatomycosis, dermatophytid, contact dermatitis, housewives' eczema, dermatitis due to soap, neurodermite, nummular eczema or bacterid should be more correctly called infectious eczematoid dermatitis.

DATA FROM THE PATIENTS' HISTORIES

On the patient's first visit to the clinic a complete history of his cutaneous disturbance was taken which followed the questionnaire shown in figure 1. With this questionnaire it was hoped to learn the patient's own impressions about his eruption. Unfortunately in many of the long-standing cases these impressions were appreciably colored by statements made by friends, druggists or previously consulted physicians. Nevertheless the data thus obtained are of interest.

Of the 475 patients 329 were females and 146 males. The age distribution is shown in table 1. Two hundred and thirty-nine of the patients had had an intermittent eruption for longer than one year. One patient reported having had an eruption most of the time during the past forty years. Among those who had had a dermatitis for more than one year, 94 patients thought their dermatitis was worse during cold months, 45 worse during the warm months and 92 said that they had observed no seasonal difference.

With regard to occupation there has been some selection by the admitting office of the clinic, which interviewed the patient before he was examined by a doctor. If there is some evidence that the dermatitis is of occupational origin and therefore compensable, the patient is not admitted to the clinic. Over half of our patients had frequent contact with water and an alkaline substance, usually soap. This group is shown in table 2.

CLINICAL APPEARANCE

There has been a great variation in the type, arrangement, distribution and extent of the lesions seen in these patients. Some of them showed a minimum of involvement with a few scattered vesicles on the lateral aspects of one or more fingers; others showed a generalized, erythematous, papulovesicular eruption covering almost the entire area of both hands and at times extending onto the forearms. Some patients came to the clinic during the early acute phase of their eruption, others only after the acute phase had subsided and a dry, scaly, fissured eruption remained. If the patient is in the latter phase and has lesions primarily on the palms or on the knuckles, it is difficult to distinguish an "eczematoid" dermatitis from psoriasis.

The most frequent site for the beginning of the eruption seems to be the lateral and dorsal aspects of the fingers. It may be unilateral or bilateral. It usually starts as a patchy eruption and may or may not become confluent and diffuse. One of the first symptoms is pruritus. There is usually a peripheral extension of the patches, with a tendency toward a concentration of the vesicles at the edges of the lesions. Rupture of the vesicles results in serous exudation and the formation of crusts. Pustules are infrequently seen. There may be a tendency for the center of the lesion to clear, but, with an exacerbation, vesicles again appear in the center. The lesions often extend onto the palmar aspects of the fingers and onto the thenar and hypothenar eminences and flexor surfaces of the wrists. When the lesions appear on the palms, the vesicles seem deeper and thicker walled and there is a tendency toward "undermining" at the edges of the lesions.

An erythematous, vesicular dermatitis which has been diffuse from the onset and which covers the entire dorsa of both hands and extends onto the dorsal and flexor surfaces of the wrists is less frequently seen. An eruption characterized by deep, single, thick-walled vesicles diffusely scattered over the palms is rarely seen.

Almost all the patients who had had a dermatosis for longer than a few days reported alternate relapses and remissions, a relapse often occurring before a previous eruption had entirely cleared. There was no definite periodicity in many of the patients, except perhaps in some of the females who reported relapses coincident with the menses. Sometimes relapses would occur

20. Unna, P. G.: Histopathology of the Diseases of the Skin, Edinburgh, Wm. F. Clay, 1896, pp. 190 195.

every few days; at a later time the same patient might report having had a remission lasting several weeks or months.

Relatively severe pruritus is a complaint of many of these patients. The clinical picture is frequently distorted because of pronounced excoriations. Scratching is probably an important form of minor trauma which helps to keep the infection active.

LABORATORY DATA

Microscopic examination and culture on Sabouraud's medium of scales from hand lesions were made on all patients during the early months of the study. When no pathogenic, filamentous fungus was found in the first 135 cases, we became discouraged and did not continue routine culture of hand lesions on all patients. Throughout the entire study cultures were taken in selected cases when the presence of a filamentous fungus was suspected by one of us. In only 1 case was a pathogenic fungus found by microscopic and cultural examination of the hand lesions. If we had made a thorough search for filamentous fungi on the hands of every patient at various stages of his disease, more of these patients might have been shown to have dermatomycosis, but we believe that it is a rare disease of the hands.

Reports have shown that dermatophytes can frequently be cultured from superficial scales or macerated skin between the toes even when there are no subjective symptoms. We believe that extensive hand lesions are seldom "id" reactions secondary to such minor primary fungous infection of the feet. Consequently fungus studies were made only on those patients who gave a history of periodic exacerbations of foot lesions which seemed to bear some relationship to the hand lesions. The presence of an active fungous infection of the feet was confirmed in only a few instances. There were undoubtedly more active fungous infections of the feet among these 475 patients than were found by cultural study. They were missed by not making a more intensive fungus search of all cases. Only 88 patients when asked about "athlete's foot" said that they had had such a condition in the past but had none now; 33 patients said they were having their first "attack of athlete's foot" at the time of their first visit; 35 patients said they had active lesions when seen in our clinic and had had similar lesions in the past.

During recent months about 100 of these hand lesions have been cultured on plain beef extract agar and blood agar. The lesions were sponged with 70 per cent alcohol, allowed to dry, crusts or tops of vesicles were removed with sterile forceps (pustules were avoided) and the serous exudate was transferred to the agar slants with sterile, dry swabs. A large percentage of these lesions showed an abundant growth of pure culture Staphylococcus aureus, a finding which will be discussed at greater length in a later section of this paper.

Patch tests were made primarily to learn more about the reaction of the patients' skin to soap. For this purpose the pure fatty acids commonly found in soaps and the sodium salts of these fatty acids were used. We attempted to patch test as many of the patients as would return to the clinic for this purpose, but undoubtedly the importance of the tests was stressed for those patients in whom the history seemed to indicate some relationship between the use of soap and the dermatitis. Thus, this is not an entirely unselected group of patients but is weighted in favor of those who might be expected to have soap irritable skin.

In general the results of these patch tests confirm earlier statements by Lane and Blank [21] that soap rarely produces a specific acquired hypersensitivity. We feel that although the patch test was originally intended only as a test for specific acquired hypersensitivity the results of tests on 2 individuals to a series of fatty acids and soaps may give some indication of the relative soap irritability of these 2 individuals. We plan to present this point of view with the detailed results of the patch tests in a later paper. Suffice it to say at this time that among 215 patients tested 117 seemed not to have soap irritable skins; 58 appeared to have skins which would be irritated if considerable soap was used; only 29 would have been irritated by small amounts of soap. The results were indefinite in 11 patients.

PATHOGENESIS

An analysis of the data obtained from the patients' histories and laboratory studies does not support many of the diagnoses which are most frequently made for these various "eczematoid" lesions of the hands. In an attempt to clarify the confusion existing as to etiology and diagnosis, the following hypothesis is offered as an explanation of the pathogenesis of a large proportion of these dermatoses. Before going into the details of this hypothesis we wish to comment on three diagnoses which are frequently offered for this group of cases.

TABLE 1.—*Age Distribution of All Patients*

Age, Years	Number
0 to 10	4
11 to 20	79
21 to 30	135
31 to 40	105
41 to 50	79
51 to 60	50
Over 60	23

TABLE 2.—*Occupation of Patients Who Were Frequently in Contact with Water and an Alkaline Substance*

Occupation	Number
[illegible]	207
[illegible]	18
[illegible]	11
[illegible]	9
[illegible]	8
Cement workers	3
Total	256

A large percentage of the patients who had consulted a physician before coming to our clinic reported that they had been told that their cutaneous disturbance was the "same as athlete's foot." Recent reports in the dermatologic literature and our cultural data and clinical impressions indicate, however, that dermatomycosis of the hands is rare. Also in a relatively small percentage of the cases could we get any satisfactory history of a definite relationship between lesions on the feet and lesions on the hands, and seldom could we demonstrate a fungus in the foot lesions. We believe, therefore, that only a few of the eruptions on the hands are direct fungous infections of the hand or "id" reactions to fungous infections of the feet.

Over half of the patients fall into a group in which the hands are in frequent contact with water and soap or water and some other alkali. It seems logical to us to assume that if an aqueous solution which comes in

21. Lane, C. G., and Blank, I. H.: Cutaneous Detergents, J. A. M. A. 118: 804-817 (March 7) 1942.

contact with the entire hand causes a dermatitis the lesions would be generalized over the entire area with which the solution comes in contact, with the possible exception of the palms, which have a much thicker epidermis. Contact with such solutions probably does not cause a patchy dermatitis of the dorsal surface. In over 390 patients, or 80 per cent of this group, a history was given of the dermatitis being definitely patchy at the onset and in many instances it remained patchy. The data from the soap patch tests tend to confirm the impression that soap is not the primary causal factor in many of these. It is probable, however, that soap may be an important complicating factor, as will be discussed in more detail later.

There can be no doubt that a dermatitis limited primarily to the hands may be caused by a specific acquired hypersensitivity. This is frequently seen in certain occupations. The aforementioned selection of the patients has eliminated most of these cases from this series. It is our opinion, however, that a dermatitis of the hands is often erroneously called a specific acquired hypersensitivity even after a careful search for the causative agent has failed to find one. These dermatoses are too often diagnosed as "contact dermatitis of unknown etiology." When no allergen can be found after careful search it is possible that these dermatoses are not specific acquired hypersensitivities but that they are caused by some factor other than an external contactant.

Thus, it is our opinion that direct invasion of the hands or feet by a filamentous fungus, the use of soap and water, and contact with a specific allergen are less frequent causes of this type of eruption of the hands at the time the patients present themselves to the physician than is now generally supposed. What other causes may be considered for such dermatoses?

Various other factors of interest were found in a study of these patients. Many of them gave a history of frequently having "cold, clammy" hands. For many the excitement of a visit to the doctor is sufficient to cause their hands to become cold and moist. Some have noticed that their eruption recurs when they are under an emotional strain. Many women have observed relapses at the time of menstruation, either just before or during this period. It is common for housewives to report frequent relapses when they use excess soap and water, especially during cold weather. Some relapses occur coincident with an active infection in some other body organ or tissue.

Our cultural investigations have shown an abundance of Staphylococcus aureus in many of these lesions, often when no pustules are evident. There is no reason to believe at this time that this organism is different from the staphylococcus found among the resident flora of the normal unbroken skin, though no thorough bacteriologic study has yet been made of the organisms which have been isolated. Cultures from the lesions show the staphylococcus to be present in much greater numbers than is the case when cultures are made from the normal skin. Also the cultures frequently seem to be a single type of organism; cultures from normal skin as a rule show numerous types of micro-organisms.

Thus, we have observed in these patients various factors, such as vasomotor instability and relapses with menses or with the use of excessive amounts of soap and water, which have led other investigators to refer to these cutaneous disturbances as different diseases—neurodermite, endocrine imbalance, soap dermatitis, bacterid. We have also observed that Staphylococcus aureus is frequently present in large numbers in these lesions. Instead of considering these various factors and the presence of the bacteria entirely unrelated, we believe them to be related and to be multiple causal factors of a single disease entity.

We believe that the explanation of these cases lies in the interaction of these several factors. There may develop first an eruption of the hands from any of a number of causes; it may be a true contact dermatitis, dermatomycosis, dermatophytid or other dermatosis; the skin may suffer mechanical or thermal trauma. Any one of these cutaneous disturbances, together with one or more of the following factors—excessive use of soap and water, vasomotor instability, trauma, menstruation, hot or cold weather, the presence of an infection in some other organ or tissue—alters the relationship between the host and the normal resident flora of the patient's skin. These micro-organisms of the resident flora, probably of low virulence, invade the skin. Subsequently a sensitization to some bacterial decomposition product may or may not develop. From this point the eruption progresses primarily because of the invasion of the bacteria and, even if the causal agent of the original cutaneous disturbance is withdrawn, the eruption persists and perhaps extends or even changes its character. It may become a chronic affair, recurring either because of an original initiating factor or because of bacterial invasion resulting from the alteration in the host micro-organism relationship and aided by any one factor or combination of the aforementioned factors—soap and water, vasomotor instability, trauma, menstruation, hot or cold weather and focus of infection. This hypothesis is shown diagrammatically in figure 2.

We believe that the term infectious eczematoid dermatitis applies to this group better than any other term. The name infectious eczematoid dermatitis suggested by Engman [7] has been selected because it is the only one of all the names given to the "eczematoid" dermatoses of the hands which implies a bacterial invasion of the skin. Our concept of the etiology does not differ appreciably from Engman's original concept except that we believe not only that the disease is a distinct entity developing after infection or infected trauma but that it frequently develops secondarily to some other eruption.

In the foregoing discussion of the pathogenesis of the eczematoid dermatoses of the hands, no claim is made that we are presenting a new concept. Stokes, Lee and Johnson [6] have implied similar etiology for their "contact-infective and infective-allergenic dermatitis." Hopkins and Burkey [10] have described a similar etiology without reference to possible preexisting dermatoses.

The clinical appearance of the dermatoses seen during our study has varied a great deal and many eruptions have been called infectious eczematoid dermatitis by us which would not, in all probability, be classified as such according to the present day concept of the disease. Engman,[7] however, originally described a wide variety of lesions. He said:

1. The initial and earliest lesion may be a vesicle, pustule, erythematous, scaly or crusted point or plaque.

2. The vesicles are not so closely placed and are larger than those seen in an acute symmetrical vesicular eczema.

3. There is no symmetry of arrangement of the lesions, except when thus accidentally inoculated.

4. It occurs in patches, usually not involving a large area of surface in a single patch. When the disease begins as vesicles, they soon break to form a scaly patch which extends in the usual manner. New foci may begin as a cluster of vesicles

5. The patches are circumscribed with sharply defined borders. The epidermis at the periphery is usually undermined, split up, detached or raised; the two latter events being caused by perceptible or imperceptible serous or seropurulent fluid, which may, if it contains much fibrous material, instantly form a thin ridgelike crust about the periphery, while if in larger amounts and more fluid, drops of it can be pressed out from under the raised epidermis.

6. The disease increases by peripheral extension of the patches and the formation of new ones by autoinoculation.

7. The exposed parts are most frequently affected.

8. There is no attempt at central involution.

This describes fairly well the large percentage of the hand lesions which we have placed in this group. We feel that a somewhat greater variety of lesions may be included. The lesions seen by us did not all have "sharply defined borders"; some of them showed quite indefinite scattered vesicles. The undermining of the periphery seemed to occur more frequently when the lesions were palmar than when they were dorsal. In some cases there was an "attempt at central involution." It seems probable that there is a wide variation in the clinical appearance of the lesions because of variation in cutaneous characteristics, the varying immunity of the individual and differences in the virulence of the organism. The varying responses of the skin to infections by Treponema pallidum and Mycobacterium tuberculosis form a striking parallel to the varying responses of the skin to infections by staphylococci. With further study it is probable that this large group for which we have selected the term infectious eczematoid dermatitis can be subdivided into several types.

DIAGNOSIS

We do not wish to imply that the cutaneous disturbances listed in figure 2 necessarily become infectious eczematoid dermatitis. They may remain uncomplicated by bacterial invasion, but in studying this series of cases we have been impressed by the large percentage of cases which fall in this infectious eczematoid dermatitis classification. Usually it is impossible to determine the original cause of the eruption. It is our opinion that seldom does the physician see the original cutaneous disturbance or have the opportunity of making a diagnosis in the early stages of the eruption. In only 48 of our 475 cases was the eruption of less than one month's duration when the patient made his first visit to the clinic.

A sharp distinction must be drawn between infectious eczematoid dermatitis as here described and a dermatitis with secondary infection. The accepted concept of a secondarily infected dermatitis is an infection of the underlying tissue with pustulation, edema and at times lymphangitis, lymphadenopathy and fever. The invasion of micro-organisms of low virulence in infectious eczematoid dermatitis is superficial and seldom causes pustulation, edema or fever.

We have taken the liberty of suggesting an expansion of the concept of infectious eczematoid dermatitis, a term already widely used, rather than presenting an entirely new name for this group, since simplification of nomenclature is always desirable. There has been some discussion of dermatitis repens and acrodermatitis continua as the same disease, and it seems possible that these cases may be considered as a variety of infectious eczematoid dermatitis and explained on the same basis. The term nummular eczema as a disease should probably be discontinued and used simply as a descriptive term. The diagnosis of pustular psoriasis and neurodermite usually should be reserved for cases with other manifestations of these diseases. In the interest of simplification we suggest that cheiropompholyx and dyshidrosis should be replaced by pompholyx. We have made the following diagnoses in this group of cutaneous disturbances of the hands and have listed them in the approximate order of frequency of occurrence.

1. Infectious eczematoid dermatitis.
2. Contact dermatitis:
   (*a*) Nonspecific acquired hypersensitivity.
   (*b*) Specific acquired hypersensitivity.
3. Dermatophytid.
4. Bacterid.
5. Psoriasis.
6. Atopic dermatitis.
7. Pompholyx.
8. Dietary insufficiency.
9. Dermatomycosis.

An example of nonspecific acquired hypersensitivity would be a dermatitis due to soap. Dermatophytid applies to those patients who have a proved active

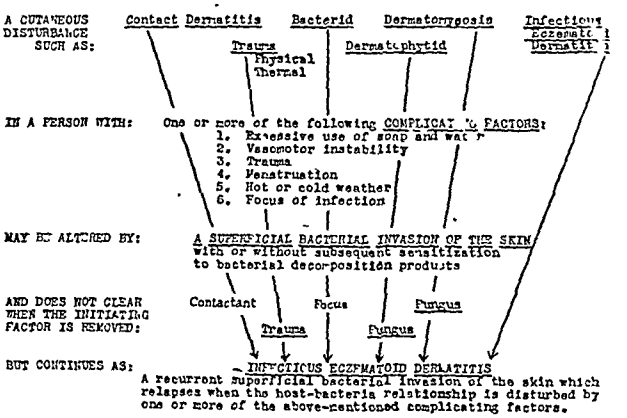


Fig. 2.—Diagram of hypothesis.

fungous infection on some area of skin other than the hands and whose hand lesions show a remission subsequent to a remission of the active fungous infection. Bacterid is similarly retained for patients with a known focus of infection but little or no direct bacterial invasion of the skin of the hands. Pompholyx implies deep, single, thick-walled, sago-grain vesicles uniformly scattered over hyperhidrotic palms, which often involute without desquamating. Pellagra is an example of dietary insufficiency. Dermatomycosis applies only to cases in which active infection of the hands by a filamentous fungus can be proved.

THERAPY

Many of the persons visiting our clinic for the first time present a superimposed dermatitis caused by self-chosen or druggist or physician recommended therapy. Most patients believe their dermatitis to be "athlete's foot" and have applied strong, irritating fungicides. Many others have been told that soap and water is bad for their hands and have faithfully avoided all contact with water, including any type of therapy employing aqueous solutions (soaks or compresses). If these dermatoses are thought to be of contact origin, much time and effort are often wasted in an unsuccessful hunt for the contactant.

In over 90 per cent of our cases the initial therapy consisted of boric acid soaks or compresses during the acute phase and a mild lubricating ointment such as boric acid ointment or Lassar's paste during the dry, fissured, desquamating phase. Boric acid soaks have proved as efficacious as potassium permanganate or Burow's solution. A soapless regimen was recommended whenever possible because it is felt that soap is an added irritant and that it predisposes to further bacterial invasion. The response to such therapy when conscientiously carried out by the patients is satisfactory in a large majority of the cases. It is not doubted that other similar mild antiseptic therapy will accomplish the same purpose.

Such mild therapy does not prevent recurrences. According to our hypothesis there is a recurrence when the host-micro-organism relationship is so changed as to permit a reinvasion of the skin by the micro-organisms. This may occur if the immunity of the host is lowered or if the micro-organisms become more invasive. If the host has been sensitized by earlier therapy or as a result of a previous infection, the clinical course of the recurrence may differ from the course of a reinfection in a nonsensitized host. Prevention of a recurrence might be accomplished either by making the micro-organism less invasive or by increasing the resistance of the host.

Attempts at alteration of the micro-organism by local application of various types of bactericides and bacteriostatic agents, including the sulfonamide drugs, have not been encouraging.

Changes in the host have been attempted along several lines. Systemic administration of sulfonamide drugs and injections of staphylococcus toxoid have been occasionally satisfactory, though they often fail to prevent recurrences. Elimination of a focal infection occasionally proves helpful. Results from the alterations of vasomotor reactions by use of such vasodilators as nicotinic acid have not been encouraging up to now. No attempts at endocrine therapy have been made. We do not yet know a satisfactory method for preventing recurrences.

Bacteriologic studies of the micro-organisms are continuing. Further studies in the elimination of various factors which may predispose to bacterial invasion are in progress. Alteration of the host-micro-organism relationship seems to offer more promise for preventing recurrences than does any form of local therapy.

SUMMARY

1. Four hundred and seventy-five cases of "eczematoid" dermatoses of the hands have been surveyed in the last three years.

2. In very few of the cases was it possible to confirm the diagnosis of dermatomycosis, dermatophytid, contact dermatitis or soap dermatitis.

3. A large number of these patients have shown recurrent attacks of a papular, vesicular and crusted eruption, limited primarily to the hands.

4. The following hypothesis is presented as an explanation of the pathogenesis of the disease entity appearing in this group of patients:

(*a*) There are various inciting factors.

(*b*) There may be several complicating factors: excessive soap and water, vasomotor instability, trauma, menstruation, hot or cold weather or focus of infection.

(*c*) There occurs an alteration of host-bacteria relationship.

(*d*) There may be a superficial bacterial invasion of the skin, with or without sensitization.

(*e*) The inciting factor may be removed but the eruption may persist as infectious eczematoid dermatitis, a recurrent superficial invasion of the skin by bacteria of low virulence which relapses when the host-bacteria relationship is disturbed by one or more of the aforementioned complicating factors.

5. In the acute phases, mild antiseptic soaks or compresses and a soapless regimen have proved successful.

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ABSTRACT OF DISCUSSION

DR. JOSEPH V. KLAUDER, Philadelphia: It is difficult to express the causation of eczema in the term of a single cause. We know that the reactivity of the skin is dependent on the interrelation of many causes resulting in a common picture—eczematization. In a general way the hypothesis presented constitutes the evolution of an eczematous dermatitis. There are certain phases of the authors' hypothesis which I would like to discuss: Are their premises, from which it was concluded that infectious eczematous dermatitis was the most frequently encountered dermatitis of the hands, valid? How much significance is to be attached to the demonstration of Staphylococcus aureus? Does the failure to demonstrate fungi in one examination either by culture or by microscopic examination invalidate the diagnosis of dermatomycosis? No mention was made of mosaic fungi or of the intracutaneous test with trichophytin in the diagnosis of dermatomycosis. I see more patients with what I conceive clinically to be dermatomycosis and eczematized tinea than infectious eczematous dermatitis. Should the finding of Staphylococcus aureus invalidate the clinical concept? Does not this revert back to my original statement of how interrelated and complicated is the cause of eczema? How is an eczematous dermatitis to be visualized, classified and taught to students: as eczematization or as clinical concepts of different phases in its evolution?

DR. FRANCIS E. SENEAR, Chicago: Frequently Dr. Oliver and I see a patient who has been seen by one of our colleagues with a question as to whether or not it is an industrial dermatitis. In such instances it is usually a question as to whether it is contact dermatitis or eczematoid dermatitis. We are accustomed to call each other in without saying anything as to the question in the case. I find almost invariably that we agree with each other and do not agree with the man who previously saw the case. Now I wish that Dr. Lane had time to describe a little better just exactly the clinical characteristics of the picture which he has in mind as being explained on the basis of bacterial infection. I know that at the University of Illinois, I think perhaps as a legacy from Dr. Wile, we were for a long time accustomed to speak of many of these patients with a patchy type of dermatitis as having infectious eczematous dermatitis. I know that in another clinic in the city they were accustomed to speak of the condition as eczematoid dermatitis. Owing to the confusion with the Engman type of infectious eczematoid dermatitis, visitors in our clinic didn't know what we were talking about, or I think rather felt that we didn't know what we were talking about, in that we were not differentiating these from the Engman conception and as the term nummular eczema, though of long standing, became better recognized, we changed over to the use of that term. I feel, as does Dr. Lane, that in certain of these cases—in which the lesions are patchy, the patches are for the most part sharply circumscribed, there is great variation in the size and depth and in the type of the primary lesion, there is peripheral extension, often with central involution, partial or complete, and occasionally a tendency to undermining of the scale at the periphery of the lesion—conditions are present which can be compared to those in other dermatoses which are accepted as being definitely due to some type of local infection. We have a question of employer liability constantly with us and, as Dr. Lane has pointed out, as we all know from constant clinical experience, many of these patients, even when they get away from contact

with the primary irritant, continue to have recurrent attacks of this type of sharply defined, patchy dermatitis. The constant occurrence of certain features in these cases of acrodermatitis, some of them only in the severe types—such things as the early and severe involvement of the nail, the changes in the finger tips to produce conical stumps, the radiating pain, the extreme resistance to treatment, the occasional occurrence of mucous membrane lesions—would make it improbable that that particular group should be included in this suggested increased conception of infectious eczematoid dermatitis.

DR. GEORGE C. ANDREWS, New York: The study by Dr. Lane and his associates coincides closely with one which Dr. Barnes and I made about two years ago that was reported before the Southern Medical Association, and published in the *Southern Medical Journal* in December 1941. We analyzed a series of 200 cases of recalcitrant pustular and vesicular eruptions of the palms and soles. The only difference between their statistics and ours is that they took 500 consecutive cases whereas we took only those recalcitrant cases which we saw for as many as ten or more visits. We did not take the simple cases. We ended up by finding that in 36 per cent of our cases we could not find the cause, no matter how we studied them or what we did. In our series we found that only 25 per cent of these cases were positive for fungi on the feet. There were only 5 per cent with fungous infections of the hands. We found that about 8 per cent were what we considered bacterial infections of the hands. I agree with Dr. Lane on the importance of nervousness and of various emotional strains in these conditions. Our feelings are like Dr. Lane's concerning complications. We often have cases which start as one thing and then develop a secondary bacterial infection or some other sensitization. The importance of cultures showing large amounts of hemolytic staphylococci is rightly stressed. I have found it best in some cases to give moderate doses of sulfadiazine. I usually give 2 Gm. a day for four days. It is surprising how many will clear up completely of their trouble. Of course, some do not, but it certainly shows the importance of secondary bacterial infection in these conditions. I believe some of these patients develop a sensitization to our remedies, simple remedies, which lead to the persistence of the trouble, and that also must be considered.

DR. LLOYD W. KETRON, Baltimore: Every effort should be made to classify eruptions on the hands as manifestations of one of the common diseases before attempting to create a new dermatosis which limits itself to this particular portion of the body. Those of us who have practiced a great many years have frequently seen patients with dry or vesicular eruptions on the fingers and hands that were difficult to classify. Some of these patients later returned with eczematous eruptions on other portions of the body, such as seborrheic dermatitis, which would make one feel that perhaps the rash on the hands had been a manifestation of this disease. Some diseases do tend to limit their activities to certain parts of the body, but most of them may at times occur at almost any place; for example, such disorders as lupus erythematosus, which particularly involves the face, may at times affect the hands, and I am sure that if it should occur in this location alone, diagnosis would be quite difficult.

COMMANDER MARION B. SULZBERGER (MC), U.S.N.R.: It is easy to confuse different dermatologic entities with one another when they occur on the hands. This is probably because there is something about the site, and the trauma and exposures of the site, and the anatomic and physiologic relationships in that site which cause the different eruptions to resemble one another. Nevertheless, if one takes 100 cases, I believe that one can, with a fair amount of care and skill and experience, cull out some of them. When all the certain diagnoses have been established there always remains a large residual group of undiagnosed cases. And what are all these—these which we variously call eczematoid dermatitis or dermatophytid or dyshidrosis or eczema? Most of those terms don't mean anything to me. We do know that they are almost all made worse by certain things. The picture is one of a vesicular dermatitis or a vesiculopustular and papular dermatitis which is often chronically recurrent and which is generally made worse by different "trigger" factors, including physical factors (heat, cold, moisture), nervous and emotional upsets, the presence of distant foci of infection of the skin or elsewhere (particularly the tonsils), occasionally by certain foods or drugs; a dermatosis which is often irritated by local effects of agents from the outer world (soap-caustics and allergens, micro-organisms and the like). I would like to suggest consideration of the possibility of a virus, herpetic virus, which is notoriously activated by the mentioned trigger factors. This possibility should be strongly considered in relation to nummular eczema. In undiagnosed recurrent vesicular eruptions of the hands it might be fruitful to investigate carefully in the direction of possible herpetic infection. Perhaps the results would account for at least some of the cases. However, I am convinced that many of these cases are of composite etiology, in which there are many links to the chain of the causation; and for this reason sometimes cure can be effected and the chain can be broken by simply striking out one of the links of the chain of causes.

DR. C. GUY LANE, Boston: Perhaps we have not made much progress with the condition, but I do hope that by continually discussing it we shall progress and do something for persons who have this recurrent papular, vesicular and pustular dermatitis of the hands. These cases which we have been studying have probably been more or less unconsciously selected. For example, in our hospital anything which seems to be an occupational case is picked out at the admitting office and is referred to one of the younger men on the staff, so that we rarely get them in the clinic unless they have been passed by the admitting office. There has been an unconscious selection with regard to soap cases because Dr. Blank and I have been interested in these detergents and I think we have been more apt to lay disturbances to soap perhaps than is justifiable. There may be also an unconscious selection in regard to some of the fungous cases. Some of the acute contact dermatitis cases have undoubtedly been assigned to other staff physicians rather than to some one of the four authors. There has been a great variation in clinical appearance. We have no way at the present time of standardizing the clinical picture of this group, but I believe that perhaps we can pick out certain types and classify them later on. We can only suggest grouping them under some such heading as infectious eczematoid dermatitis and then perhaps later on divide them into several classes or types. I agree with Dr. Klauder that our diagnosis of fungous infections of the hands should be limited to those cases in which we have definite microscopic or cultural evidence. I think in that general the same thing is true with regard to the specific acquired hypersensitivity, namely, that we need to prove them. I agree with Dr. Andrews that at least in 36 per cent of our cases the cause was not known. We have suggested the hypothesis to explain some of these cases. There are undoubtedly more complicating factors than were listed under the heading of complicating factors. We inserted in the chart those few items, but I believe that there are probably a large number of others which can act as the trigger mechanism in disturbing the host bacteria relationship.

The Cornerstone of Modern Medicine.—The first man who really knew the human body in an exact and complete fashion was Andreas Vesalius. Truly the foundation of modern medicine was his great seven volume work "The Anatomy of the Human Body" ("De Humani Corporis Fabrica"), first published in 1543, the same year that greeted Copernicus' "Revolutions of the Heavenly Bodies." Vesalius was born in Brussels; studied—with dissatisfaction, as he relates in the introduction to "The Anatomy" given here—at Paris; became professor of anatomy at Padua, where he observed with his own eyes and dissected with his own hand, sometimes—tradition says—getting material by cutting down from their gibbets the hanged bodies of condemned criminals. The opposition of authorities, chiefly ecclesiastical, eventually drove him to Spain, where he served the Emperor Charles V, to whom "The Anatomy" is dedicated. —The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co., Inc., 1945.

CARBON TETRACHLORIDE POISONING

A PRELIMINARY REPORT ON THE USE OF METHIONINE IN HEPATITIS

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A recent experience with carbon tetrachloride gave me the opportunity to make use of methionine as a therapeutic aid. The value of this drug has been suggested by animal experiments reported by György [1] and by Miller and Whipple.[2] The first clinical use was reported by Beattie and his associates,[3] who described its use in a case of carbon tetrachloride poisoning. This paper was discussed in an editorial [4] in THE JOURNAL. I believe that this has been the first opportunity to treat a group of cases of acute hepatitis with methionine in this country. It is felt that in the first case death was very likely and that methionine should be considered as having been instrumental in the recovery of the patient.

Carbon tetrachloride has been well known as a toxic chemical for many years but there has been a tendency to treat its dangerous properties somewhat lightly. I believe that the occasional report of cases such as this are valuable in that they serve to remind us of the danger of some of our everyday chemicals.

Carbon tetrachloride is capable of producing toxic results through skin absorption, through ingestion and by inhalation of the vapor. The mode of entrance of the drug appears to have little to do with the results produced except that the acute poisoning is almost always due to ingestion or to the breathing of an atmosphere highly contaminated by the vapor. The patients who were the subject of this report were employed at an operation where rags were saturated with carbon tetrachloride and were wiped over a hot land mine. The mine was hot enough to vaporize the carbon tetrachloride immediately. There was not sufficient heat to produce phosgene. The operation moved fast so that a tremendous amount of the chemical was vaporized in a closed room having no mechanical ventilation. Unfortunately no exact measurement of the concentration of the vapor is available. It is known, however, that the concentration of acetone under similar conditions was over 2,000 parts per million. This serves to give some indication of the exposure but is less than was present in the carbon tetrachloride. These people were exposed for from one to two hours. The highest concentrations permissible in workrooms are usually given as from 50 to 100 parts per million. A delayed fatal type of poisoning with death in from one to two weeks was described by Schutz [5] following a single inhalation of high concentrations. He mentioned the symptoms of nausea, headache, vomiting, fever, cramping, unconsciousness, cyanosis, jaundice, dyspnea and coma, all of which were seen in 1 or more of these patients.

In all of my cases there were early symptoms during the time of exposure, but none of these were very severe and all of the employees worked about six hours after the exposure. They all returned to their homes at the end of the shift. The early symptoms were described as a sense of drunkenness, as if too much alcohol had been ingested. There was a sense of faintness, dizziness, headache, nausea and vomiting, cough, and cramping pain in the abdomen; all the patients complained of a very unpleasant odor. Most of them went to the first aid station during the shift, where they took an alkali, and only 1 felt bad enough to lie down for an hour or two. All the patients went to the door after a short exposure, as they had a desire to "get some fresh air." After they returned to their homes they began feeling much worse on the following day, and nausea and vomiting were the principal symptoms. Visual disturbance as described by Wirtschafter [6] was not found. There were some who had attacks of dizziness and weakness, and 2 patients said that they lost consciousness for short periods. One patient became much worse on the fourth day after exposure and was taken to a local hospital, where she died within a few hours. It was stated that she became dyspneic and died from respiratory embarrassment. She had a good urinary output during her illness, and a urinalysis done shortly before death showed no evidence of kidney damage. Autopsy was done but not all of the organs were examined. Unfortunately sections of the kidney were not submitted to the pathologist. The liver was reported as being extremely large, but the weight was not given. Examination of the sections was reported by Dr. W. R. Mathews of the Shreveport Charity Hospital as follows:

> The sections of the liver show almost total necrosis. The process is uniformly central, extending out from the central veins in a uniform fashion finally to involve all of the lobule except a thin zone of cells at the periphery. Even the latter show severe degenerative change, characterized by vacuolation and increased granularity of the cytoplasm and pyknosis and karyolysis of the nuclei in many instances. In the central necrotic areas, involving most and occasionally all of every lobule, only the débris of necrotic liver cells, Kupffer's cells, blood and the scaffolding element of the hepatic parenchyma remains. No evidence of regeneration of bile ducts or hepatic cells is present, nor is there any cellular inflammatory reaction. The occasional leukocyte noted in the necrotic areas is not more than would be expected to be present in the blood. The lymphocytic infiltration in the portal canals is not more than one sees routinely in sections of the liver and may be assumed to have been present prior to the onset of the acute necrosis.

Another patient had the usual early symptoms but was well enough to return to work on the following day. She continued at work for about one week, after which she remained at home and was not seen by a physician until she developed a fatal pulmonary hemorrhage at the end of fourteen days after exposure. Again the autopsy was only partial and was done after the body had been embalmed for four or five days. No petechiae were seen, and there was no jaundice. There were no pleural adhesions, and the cut section of the lung showed no gross cause for her fatal hemorrhage. Examination of the heart and aorta was not made.

From the Medical Department of the Louisiana Ordnance Plant.

1. György, Paul: Experimental Hepatic Injury, Am. J. Clin. Path. 14: 67 (Feb.) 1944.
2. Miller, L. L., and Whipple, G. H.: Methionine and Cystine: Specific Protein Factors [illegible] Liver Injury in Protein-Depleted Dogs, Am. [illegible] 1940; Liver Injury, Liver Protection and [illegible] and Steele, C. W.: Studies on Hepatic [illegible] etrachloride Poisoning Treated with Casein Digest and Methionine, Brit. M. J. 1: 209 (Feb. 12) 1944.
3. Beattie, J.; Hei[illegible]
4. Successful Treatment of Carbon Tetrachloride Poisoning, editorial, J. A. M. A. 124: 925 (March 25) 1944.
5. Schutz, H.: Arch. f. Gewerbepath. u. Gewerbehyg. 8: 469, 1938; cited by Lehman, K. B., and Flury, F.: Toxicology and Hygiene of Industrial Solvents, Baltimore, Williams & Wilkins Company, 1943, p. 149.
6. Wirtschafter, Z. T.: Toxic Amblyopia and Accompanying Physiological Disturbances in Carbon Tetrachloride Intoxication, Am. J. Pub. Health 23: 1035 (Oct.) 1933.

The stomach contained no blood, and there was no gross change in the stomach or intestine. The liver was slightly enlarged and showed a mottled yellow surface. The sections were reported by Dr. Mathews as follows:

Sections of the liver show diffuse central necrosis that involves from one third to a half or more of the lobule. Not infrequently the process in adjacent lobules meets, and occasionally a small area of liver cells shows complete encirclement of what appears chiefly to be collapsed stromal element. In such areas a few fibroblasts may be present, and the same holds true for an occasional central area; but this change certainly is not conspicuous. A fair number of lymphocytes and a few polymorphonuclear leukocytes are present in the necrotic area. Immediately surrounding the central veins a fairly thick zone of collagenous connective tissue is noted, which represents condensation of this element normally present rather than productive reaction. The hepatic cells remaining show pronounced degenerative change. The cytoplasm is vacuolated and granular and the nuclei stain poorly and frequently not at all. Colonies of bacteria, exciting no inflammatory reaction, are sparsely scattered throughout the section. There is no evidence of bile duct regeneration.

The kidneys were enlarged but the weight was not given. The sections were described as follows:

There is acute diffuse pyelonephritis characterized by small cortical abscesses, more or less focal acute cellular inflammatory reaction not yet developed to abscess stage, involving glomeruli, tubules and interstitial tissue; and accumulation of pus in dilated tubules which usually show atrophy or loss of lining cells. There is also diffuse congestion, interstitial edema and severe degenerative changes in the tubular epithelium. None of the sections available for study show the pelvic lining. Gram's stain reveals small and large colonies of negative bacilli, which apparently vary rather widely in size. Some are slender, resembling colon bacilli, while others are thick and attain considerable length or are short and plump. The presence of such colonies of bacteria in the midst of the abscesses and cellular inflammatory reaction is interpreted as evidence of etiologic significance.

The findings indicate the expected change in the liver following carbon tetrachloride exposure. Whether or not this damage precipitated the infectious process in the kidney and what it had to do with the pulmonary hemorrhage is open to conjecture. It is known that a few months prior to her illness the patient was reported as having a loud blowing systolic murmur over the whole precordium.

Six other patients were seen at this hospital. These had icterus indexes from 2.7 to 285 on admission. The most seriously ill patient had an icterus index that reached 344. She was extremely ill and her liver was felt four fingerbreadths below the umbilicus. The liver was soft and tender. She received 68 Gm. of methionine during her hospitalization, and it is believed that this was the most important factor in the outcome. All of these patients were given methionine as well as intravenous glucose solution and were fed a high protein, high carbohydrate, low fat diet, which was given through an indwelling duodenal tube. A mixture of milk (3,000 cc.), powdered skimmed milk (180 Gm.), banana powder (150 Gm.), sugar (300 Gm.), cod liver oil (30 cc.) and brewers' yeast (12 tablets) was suggested and was used. This was given in equally divided portions every two to three hours through a duodenal tube. After twenty-four hours of this mixture all of the patients developed a troublesome diarrhea. The mixture was stopped and paregoric relieved the diarrhea. These patients demonstrated some evidence of kidney damage and in case 2 the nonprotein nitrogen reached 377.8 mg. per hundred cubic centimeters. This patient had generalized edema, oliguria and convulsions, and her urinalysis revealed albumin, red cells and casts. Thirty days after exposure the nonprotein nitrogen had returned to 33 mg. per hundred cubic centimeters and there were no symptoms except poor vision in the right eye. Ophthalmic examination showed no retinal pathologic condition. The laboratory examinations in this group are summarized in the accompanying table. The histories of the 2 patients showing the typical pictures of kidney and liver involvement are summarized:

REPORT OF CASES

CASE 1.—L. J., a Negro woman aged 38, was engaged in cleaning land mines on the night of Nov. 30, 1944, when carbon tetrachloride was introduced into the operation. The patient continued at her work for about one hour but stated that she began feeling dizzy and nauseated shortly after she began using the material. She went to the first aid station, where she was given an alkali, and she then returned to her work and completed the shift. She stayed at her home until December 5. During that time she was nauseated and vomited frequently. She stated that she frequently lost consciousness for short periods. There was also dizziness and headaches,

Laboratory Examinations

Case No.	Icterus Index	Hanger Cephalin Flocculation Test	Blood Nonprotein Nitrogen	Urinary Bile	Urinary Casts	Urinary White Cells per H. P. Field	Urinary Red Cells per H. P. Field	Urinary Albumin
1	344	++++	63.8	++++	++	10-12	1-3	+++
2	16.6	++++	377.8	+	++++	15-20	125-150	++++
3	8.4	+++	.....	0	0	0	0	0
4	20.0	++++	133.6	0	+++	12-15	8-10	++
5	8.4	+++	41.4	Trace	0	2-5	Occ.	0
6	4.6	+++	31.6	0	0	Occ.	0	0

and later the patient became irrational. On December 5 she was seen by her family physician, who sent her to this hospital.

On admission the patient was deeply jaundiced and extremely dehydrated. She vomited almost continuously, was alternately talking at random and comatose, and in general appeared to be at the point of death. Her mucous membranes were pale and quite yellow. The liver was felt four fingerbreadths below the umbilicus and was soft and tender.

Treatment with intravenous glucose solution was begun immediately. An indwelling duodenal tube was passed and a diet having a high protein, high carbohydrate and low fat content was given by tube every few hours. Methionine in doses of 2 Gm. was given every four hours.

On admission the urinalysis showed a 3 plus test for albumin, a decreased urobilinogen, 4 plus bile and an occasional red and white cell but no casts. Examination of the peripheral blood showed 2,430,000 red cells, with 8 Gm. of hemoglobin. The total white cell count was 18,400, and the differential revealed 27 degenerated polymorphonuclears, 5 band cells, 58 segmented polymorphonuclears, 5 lymphocytes, 1 eosinophil, 1 basophil and 3 monocytes. Three normoblasts were seen per hundred white cells. There were moderate anisocytosis and slight diffuse polychromatophilia. The platelet count was 236,000. The icterus index was 285.6. Two days later the icterus index reached 344.7. A Hanger cephalin flocculation test was 4 plus in twenty-four hours.

The patient remained weak and complained of shortness of breath, a smothering sensation and a sense of tightness in the chest. This was believed to be due to her anemia, and a transfusion of whole blood was given. She continued to improve rapidly after that, and on December 9 her icterus index was 117. By December 21, or sixteen days after admission to the hospital, the icterus index was 33. The size of the liver

decreased rapidly during the time she showed her clinical improvement, so that by the time she left the hospital on December 21 the liver edge could be felt about 1 cm. below the rib cage. Her urinary output was good during the course of her hospital stay, but on December 14 the nonprotein nitrogen was 68.8 mg. per hundred cubic centimeters. This value returned to normal by the time of discharge. The urine showed many casts during hospitalization but returned to normal in the following weeks. On Jan. 16, 1945 the icterus index was 11.3 and the patient was feeling quite well. It is interesting to note that the Hanger flocculation test returned to normal on this same date.

What the picture holds for this woman is open to question. With the tremendous amount of damage that she must have had it is not too unlikely that a toxic cirrhosis may develop.

CASE 2.—A Negro woman aged 30, obese, gave a history of early symptoms and working conditions parallel to that of case 1. She stated that she vomited every time she took food or drink. She saw her family doctor on Dec. 3, 1944, who advised rest and a diet. On December 5 she was brought to this hospital. She was quite dehydrated, and there was some edema of the eyelids. There was a yellow tinge to the scleras, and the liver edge was palpable about 3 cm. below the rib margin. Vomiting was almost continuous, and the patient complained of cramping abdominal pain.

The Hanger cephalin flocculation test was 4 plus and the icterus index was 16.8 There were 3,910,000 red cells, with 13.3 Gm. of hemoglobin. The white cell count was 10,200 and the differential count was 75 polymorphonuclears, 20 lymphocytes, 2 eosinophils, 2 basophils and 1 monocyte. There was slight anisocytosis and poikilocytosis but no polychromatophilia. The platelet count was 282,000.

The treatment consisted of intravenous glucose, diet similar to case 1 and methionine. Early in her disease our supply of methionine was low and all of it was being given to patient 1. During that period Stearn's amino acid preparation was given to the patient in 50 cc. doses every four hours.

Vomiting and diarrhea were troublesome during the patient's entire illness. The urinary output was scanty, but unfortunately her intake and output of fluids were not recorded. The edema of her face became more prominent and on her fourth hospital day she complained of more abdominal cramping, severe headache and persistent hiccup. The following day she had two convulsions and complained of headache and blurring of vision. She had an incontinence of urine and feces and the following day had two more convulsions. Treatment at this time consisted of intravenous hypertonic glucose and sedation. The blood pressure at this time was 160/106. The blood nonprotein nitrogen was 377.8 mg. per hundred cubic centimeters and the urinalysis showed many red and white cells, casts and 4 plus albumin. Her urinary output increased following this episode and exceeded the intake for the next week. She felt better and her nonprotein nitrogen was 33.2 mg. per hundred cubic centimeters on Jan. 1, 1945. Her icterus index in the meantime had returned to 5.4. The patient has continued to improve and at present shows no evidence of her illness except some blurring of vision in the right eye.

COMMENT

There were no untoward reactions to methionine in this group, and the only indication we had for stopping the drug was recovery of the patients.

The pronounced difference in susceptibility to carbon tetrachloride seen in this group is interesting, as all of the patients had about the same exposure. In this connection it should be pointed out that all of the patients were Negroes who lived in a rural community. These people are known to eat a protein deficient diet and one that is usually high in fats. Likewise the occasional case of fatal poisoning by a relatively small amount of carbon tetrachloride is probably best explained on the basis of nutritional deficiency, particularly of certain proteins. This is suggested by the case reported by Horrocks [7] of a Filipino boy aged 8 years who was said to live on a diet consisting mainly of rice and who had a fatal termination after ingestion of only 0.431 cc. of carbon tetrachloride.

The effect of certain proteins in preventing liver damage has been shown conclusively to depend on the presence of methionine or cystine. When cystine is present in the absence of methionine it is necessary that choline also be present in the diet. This has led György [1] to suggest that choline and cystine are necessary for the synthesis of a third substance which is possibly methionine. Cystine or choline alone was unable to prevent the development of hepatic damage in György's animals. Cystine without choline or methionine is said by György to aggravate a cirrhosis, and the administration of large doses of cystine may in a short time produce liver necrosis and a cirrhosis of the Laënnec type.

Most of the reports concern the use of these dietary factors in the prevention of liver damage and little thought has been given to their use as therapeutic aids once the damage has been done. Miller and Whipple [8] gave methionine to dogs after exposure to chloroform and found that they could be protected up to four hours after exposure. As noted by György,[1] their experimental conditions were especially severe.

It is possible also to theorize on the likelihood of a dietary factor influencing the production of the tubular necrosis of the kidney seen in these cases of carbon tetrachloride poisoning as well as that seen in the so-called hepatorenal syndrome of other diseases. György [1] mentions milder forms of necrotizing nephrosis in combination with hepatic necrosis which were produced simultaneously in animals by purely dietary means. This does not, however, help to explain why one person demonstrates the predominantly renal syndrome and another shows the greatest pathologic change in the liver.

The results in this small group of cases are at least suggestive of the clinical value of methionine in certain types of liver damage. We have also treated a rather large number of patients having trinitrotoluene hepatitis with methionine and are encouraged to find no fatalities in this group. One patient with epidemic hepatitis was given methionine, and it was felt that improvement began soon after administration of the drug.

The United States Public Health Service [9] reports the use of methionine in protecting weanling rats maintained on a protein deficient diet against otherwise severely intoxicating doses of dichloroethane.

We believe that these clinical findings offer support to the experimental work concerning the importance of certain dietary factors in the prevention and treatment of liver damage. Much more detailed clinical work is necessary before the last word can be said about the value of methionine in liver disease. It is hoped that this work will prompt other clinicians to report their observations concerning methionine.

Box 1162.

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8. Miller, L. L., and Whipple, G. H.: Liver Injury, Liver Protection and Sulfur Metabolism, J. Exper. Med. 76: 421 (Nov.) 1942.

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ACUTE INFECTIOUS HEPATITIS IN THE MEDITERRANEAN THEATER

INCLUDING ACUTE HEPATITIS WITHOUT JAUNDICE

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For many years prior to this war infectious hepatitis was considered to be a relatively infrequent and unimportant disease. During the last four years, however, cases have been appearing in increasing numbers in both civilians [1] and military personnel in various parts of the world. This has afforded opportunity for the study of large groups of cases and has led to a reawakening of interest in the disease among both investigators and clinicians.

Our own interest in this condition began in 1942 when two of us (M. H. B. and R. B. C.) participated [2] in an official investigation of the so-called "postvaccinal" hepatitis at Fort Custer, Michigan. At that time an extensive clinical and laboratory study was carried out on over 2,000 individuals who were recipients of yellow fever vaccine, 700 of whom were hospitalized with jaundice. This experience subsequently proved most valuable when we were given the opportunity of observing infectious hepatitis occurring in the Mediterranean theater.

Beginning in February 1944 we conducted an organized study of the disease as it occurred in our troops in the Mediterranean theater. From this work it has become apparent that many of our older concepts, especially regarding diagnosis, duration and treatment, must be altered. In view of the increasing frequency of various forms of the disease in this country, both among civilians and among military personnel, it is pertinent at this time to present some of our findings.

MATERIAL

As a result of the foresight of the Surgeon's office, Mediterranean Theater of Operations, a broad program was instituted for the investigation of hepatitis. Observations from all parts of the theater and on various aspects of the disease were correlated and integrated from a central office. This involved the cooperative efforts of many individuals, to whom much credit is due. As the nucleus of the program an intensive clinical and laboratory study of the problem was conducted by us in a group of hospitals located close to special laboratory facilities. The present paper is based largely on data obtained from this source.

One thousand one hundred and seventy-two unselected cases of hepatitis were personally examined and studied between February and November 1944. Four hundred and thirty-one of these were carefully followed throughout their course until discharged from the hospital either to duty or to the United States. These cases were selected only to the extent that their hospital stay coincided with the study period.

Various control observations and special studies concerning specific aspects of the disease were carried out on other groups of cases totaling several thousand. In addition we were able to observe the disease as seen in different parts of the theater. This is of importance, since early cases tend to predominate in the forward areas whereas the chronic cases accumulate in the rear.

METHODS

The graduated exercise tolerance test consisted of a ten day program of increasing exercise beginning with a 1 mile hike on the first day and ending with a 4 mile hike, fifteen minutes of calisthenics and forty minutes of volley ball on each of the last three days. Jogging was ordered frequently during hikes, and jumping types of calisthenics were stressed. For patients who had not been in bed, only the last three days of the foregoing routine were employed. Cases were examined daily in the morning before exercise in order to note the effects of the previous day's activities. It is important to make the examinations at the same time of day, as the liver is usually larger in the afternoon than in the morning. If the liver becomes enlarged and tender the test is considered to be positive or abnormal. Where the liver is already enlarged, further increase in size may not occur but definite tenderness develops. An increase in symptoms and laboratory evidence of liver dysfunction is important and should be taken into consideration, but interpretation of the test as positive should not be made on this basis alone.

Laboratory data presented in this paper were obtained under the supervision of one of us (F. W. A.), assuring uniformity.

Sulfobromophthalein.—The 5 mg. per kilogram dose was employed. Dye retention of 3 per cent or more in one hour was considered abnormal. In addition, either a thirty or a forty-five minute sample was drawn for comparison. Visual readings were frequently checked photometrically.

Acetone Icterus Index.—The value of this method [3] lies in the elimination of hemolysis as a confusing factor. The serum is extracted with equal parts of acetone and the latter read against the usual standards. Eight or more is definitely abnormal.

Methylene Blue Urine Test.[4]—This test was performed by adding 0.25 per cent aqueous solution of methylene blue chloride to 5 cc. of urine drop by drop, employing a medicine dropper delivering 19 to 21 drops per cubic centimeter. If a green color develops and persists after the addition of 3 drops but turns to blue after 4 drops, the test is mildly positive. If the green persists after 4 drops or more it is definitely positive. Unpublished data suggest that this is a sensitive test for bilirubin, although the mechanism is not yet entirely clear. Of 1,267 normal controls, 99.1 per cent gave normal results. In the only tests over 4 drops (4 cases) jaundice developed in three days.

The Surgeon's office, Mtoupa, offered the opportunity and supplied the facilities to carry on this work. The medical officers, nurses and other military personnel made the investigation possible.

1. Stowman, Knud: The Epidemic Outlook in Europe, J. A. M. A. **128**: 185 (May 19) 1945.

2. Other members of the board were Major K. F. Bennett, M. C., Major A. E. De Groat, M. C., Major H A Davenport, M. C., and Major F. W. Fitz, M. C.

3. Newburger, Robert A.: Determination of the Icteric Index by the Acetone Method, J. Lab. & Clin. Med. **22**: 1192, 1937.

4. Franke, K.: Methylenblau, ein einfaches sehr empfindliches Reagens zum Nachweis von Bilirubin, Med. Klin. **27**: 94, 1931. Myers, C. P.: Use of Methylene Blue in Testing for Bilirubin in Urine, J. Indust. Hyg. & Toxicol. **27**: 52 (Feb.) 1945.

The cephalin cholesterol flocculation test was performed as described by Hanger.[5] Bodansky's [6] method was used for alkaline serum phosphatase. Standard methods were employed for routine procedures.

ETIOLOGY AND PATHOLOGY

Havens, Paul and Van Rooyen [7] have recently summarized our knowledge concerning etiology. The disease is probably caused by a filtrable virus. Oral, subcutaneous and intravenous modes of transmission have been reasonably established. Transmission by droplet infection has not been clearly proved. Although an insect vector is a possibility, as yet none has been incriminated. It is probable that in the Mediterranean theater spread of the disease has been chiefly by the enteric route. Elsewhere, pooled plasma and serum and blood transfusions may play a more important role. Inadequately disinfected needles and syringes may also be a means of transmitting the disease.

The pathologic picture as seen in fatal cases, in patients with hepatitis accidentally killed and in liver biopsies will be described elsewhere by others. Suffice it to say that the essential lesion is involvement of the

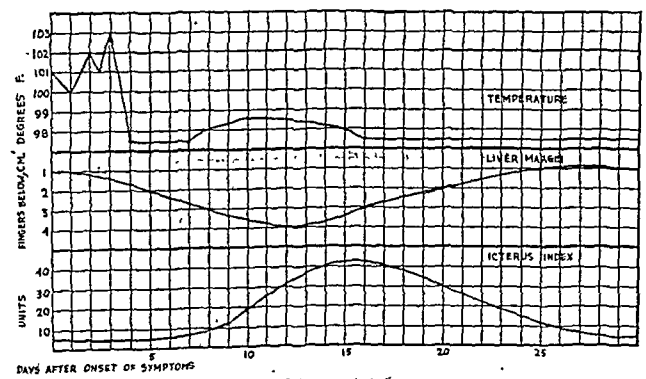


Chart 1.—Schematic representation of the course of a typical case of acute hepatitis with jaundice.

parenchymal cells of the liver, with an inflammatory exudate in the periportal areas. Lymphadenopathy is usually present.

CLINICAL PICTURE AND COURSE

It is probable that infectious hepatitis, like many virus infections, should be looked on as a systemic disease with a predilection for the liver. Thus there is evidence from various sources, clinical, pathologic and roentgenologic, suggesting involvement of the lymph glands, the bowel and the pancreas. It is quite possible that under certain circumstances many of the symptoms ordinarily attributed to the liver, such as those arising in the gastrointestinal tract, may be the result of extrahepatic lesions.

Infectious hepatitis as seen in the Mediterranean theater presents a sufficiently characteristic clinical picture, except at the onset, so that the diagnosis can usually be established by the experienced observer on purely clinical grounds. The course and severity are, however, quite variable. In the typical case there is a prodromal period of acute symptoms, without jaundice and without enlargement of the liver. This is followed by an acute icteric stage with enlargement and tenderness of the liver. Finally there is a convalescent stage with a disappearance of symptoms and jaundice and a return of the liver to normal size. Occasionally recovery is so protracted that the condition can be termed "chronic" hepatitis. By this term is meant persistence of the disease for more than three months. It is not to be inferred that the pathologic condition of the liver is permanent in nature. This important variety of the disease will be dealt with in a subsequent paper. Acute hepatitis without jaundice runs an essentially similar course but for purposes of clarity will be discussed separately.

Prodromal or Preicteric Stage.—A definite prodromal stage occurs in 83 per cent of cases of acute hepatitis with jaundice. The onset of symptoms precedes the appearance of jaundice by from one to three weeks in 50 per cent, from four to six days in 20 per cent and by three days in 13 per cent. The remaining 17 per cent cannot be said to have a definite prodromal stage, since jaundice appears within two days of onset. In general, the more serious cases fall into this last group.

The prodromal period is initiated by an acute febrile onset in well over 80 per cent of cases. The temperature is usually elevated to between 100 and 103 F. and is associated with chilly sensations, but shaking chills are rare. Characteristic symptoms are malaise, headache, lassitude, abdominal discomfort and anorexia. There may be considerable generalized muscular aching and a more severe headache than would be expected with the degree of fever. Lassitude is usually present and rather severe. The abdominal discomfort consists of mild distention, intestinal cramps associated with flatulence and right upper quadrant distress. It is very characteristic for the latter symptom to be aggravated by exercise or by jolting, as produced by a rough automobile ride. Transient loose stools frequently occur at the onset. The anorexia is usually followed by nausea and often vomiting within the first three days. Other symptoms less commonly seen are somnolence, mild rhinitis and labial herpes. Urticaria and arthralgia are rare prodromal symptoms.

Characteristically these acute symptoms last for about three or four days and are followed by a relatively symptom free and afebrile interval of five to ten days' duration. Jaundice is then ushered in by a recurrence of fever and acute symptoms. This is shown schematically in chart 1.

Physical findings during the preicteric stage of the disease are not striking and are often inconclusive. The liver is usually tender but not enlarged at the onset. Enlargement generally develops, however, prior to the appearance of jaundice. Liver tenderness is best elicited by fist percussion, using a jarring rather than a sharp blow over the right lower ribs. A small well localized dime sized (18 mm.) area of tenderness in the right costovertebral angle or in the eleventh intercostal space at the lateral border of the erector spinae muscle is also a reliable sign of liver inflammation. This is probably due (as suggested by Lieut. Col. E. C. Spalding, M. C.) to the apposition of nonperitonealized liver to the posterior abdominal wall in this region. Splenomegaly when present is most suggestive but is found in only 10 to 15 per cent of cases. One of the most constant and helpful early findings is

5. Hanger, F. M.: Serological Differentiation of Obstructive from Hepatogenous Jaundice by Flocculation of Cephalin-Cholesterol Emulsions, J. Clin. Investigation **18**: 261, 1939.
6. Bodansky, A.: Phosphatase Studies: Determination of Serum Phosphatase: Factors Influencing Accuracy of Determination, J. Biol. Chem. **101**: 93, 1933.
7. Havens, W. P., Jr.; Paul, J. R., and Van Rooyen, C. E.: Human Transmission of Infective Hepatitis by the Oral Route, Lancet **1**: 202 (Feb. 17) 1945.

lymphadenopathy. Typically a soft, slightly tender, lima bean sized gland is found along the posterior border of the sternocleidomastoid muscle low in the neck.

Acute Stage With Jaundice.—As jaundice appears, or perhaps a day or two before it becomes clinically evident, there is a recurrence of fever, usually milder than at the onset. A sharp aggravation of gastrointestinal symptoms, lassitude and somnolence occurs simultaneously. In cases without a true prodromal period this constitutes the onset of the disease. Occasionally the onset is insidious and practically afebrile to the extent that jaundice is the first evidence of illness.

An important finding that may be seen at this stage is right upper or right lower abdominal pain with associated tenderness and spasm of the abdominal wall simulating an acute condition of the abdomen. Such cases may mistakenly lead to operation for acute appendicitis, acute cholecystitis or even ruptured peptic ulcer. The diagnosis is particularly difficult in cases in which jaundice has not yet appeared. Suspicion should be aroused by a large and tender liver, which is almost invariably present.

During this period of rising icterus the patient is quite uncomfortable and unhappy. Nausea and abdominal discomfort are much in evidence. Clay colored stools and pruritus are unusual. Characteristically the maximum elevation of icterus is reached quickly in from three to seven days, and coincidentally the fever abates and abrupt symptomatic improvement occurs. The reappearance of appetite and the improvement in general sense of well being is especially striking.

Shortly after reaching a maximum, the icteric level begins to decrease. The duration of this defervescent period is variable, depending particularly on the maximum height of the icterus, the type of treatment employed and the fluid intake. In a general way it provides an index of the rate of recovery from the disease. The usual total duration of jaundice is between two and four weeks but may vary from a few days to three months or more. Symptoms during this period consist of gas, intestinal cramps, intermittent loose stools, fat intolerance, anorexia, headache and lassitude. These symptoms, with the exception of fat intolerance, should all gradually disappear roughly coincidental with the clearing of jaundice; persistence suggests continued activity of the hepatitis as discussed in the next section.

In a small group of cases the jaundice continues to increase rapidly or persists at high levels and the picture of acute liver failure develops. The patient becomes irrational and then comatose, and death usually ensues. Hemorrhagic phenomena are common. The actual case fatality rate was low, being 1.8 per thousand. In general, fatal cases fall into two groups, those that have an acute massive liver cell necrosis and die within four to ten days of onset and those that have a severe, persistent infection over a long period, up to two or three months. In the latter group there is usually some factor present which interferes with recovery, such as intercurrent infection or lack of adequate treatment. For example, a patient remains at work or on duty while jaundiced. Owing to the lack of rest and proper diet, he is unable to throw off the infection. Finally the liver damage becomes progressively worse until liver failure supervenes.

During the acute stage the liver is typically enlarged and tender. In patients that make a rapid recovery these findings disappear promptly, well in advance of the jaundice. In other cases only the tenderness decreases, the enlargement persisting for from one to many months. This has important prognostic significance, as will be shown later. It is important to remember that in a few cases no enlargement of the liver is apparent on physical examination at any time, especially when strict bed rest is enforced. This may be misleading, since the liver will almost invariably become enlarged if the patient is allowed to exercise.

Other physical findings are lymphadenopathy and splenomegaly as seen in the prodromal period. These tend to disappear within one to two weeks. Cases in which acute liver failure develop may or may not present a demonstrable progressive decrease in liver size.

Acute Stage Without Jaundice.—In a certain number of cases clinical jaundice fails to develop although in all other respects the clinical picture is the same. This form of the disease we have called acute hepatitis without jaundice. With proper management these cases run a shorter and milder course than those with jaundice. However, owing to obvious diagnostic difficulties the condition is often unrecognized, treatment is inadequate and either the liver lesion becomes more severe and jaundice develops or it persists without improvement for many months. Recognition is also important because of the obvious epidemiologic implications.

The frequency of this form of the disease in the Mediterranean theater is not accurately known, but judging from the evidence at hand it is probably at least as common as acute hepatitis with jaundice. It is of interest in this regard that studies of postvaccinal hepatitis made by two of us (M. H. B. and R. B. C.) at Fort Custer, Michigan, in 1942 showed that there were approximately two and one-half times as many cases without jaundice as with jaundice. Specifically there were 5,277 men at the post who had received yellow fever vaccine lot No. 368 in February 1942. Eleven per cent of these developed jaundice and were hospitalized. An additional 25 per cent developed, in the absence of icterus and after the same incubation period, symptoms and physical and laboratory findings identical in nature but milder in degree to those cases with jaundice. These data were obtained from examination of random samples, totaling 1,279 individuals, of the remaining nonhospitalized, supposedly well personnel.

Careful studies in approximately 100 cases of acute hepatitis without jaundice in the Mediterranean theater have shown clearly that this is a mild nonicteric form of acute infectious hepatitis. Chemical determinations of the serum bilirubin have not been abnormal in any of these particular cases but it cannot, of course, be stated that there was no disturbance of bile pigment metabolism at any time. In fact, it is probable that many cases presented such a disturbance but of such a mild and transient nature that it escaped detection. So, for practical purposes, they can be considered to be nonicteric.

The onset of this form of hepatitis is similar to that of acute hepatitis with jaundice. Enlargement of the liver usually appears after a week. Anorexia is present, but nausea and vomiting are not as evident as in the presence of jaundice. In the absence of an enlarged and tender liver the diagnosis is uncertain, but exercise will almost always make this finding evident.

Further proof of the identity of this form of hepatitis and of that with jaundice is offered by a comparison of the Hanger and sulfobromophthalein tests (chart 2). It will be noted that the curves are quite similar, abnormal tests being fewer in number and present for a shorter period of the disease in the nonicteric cases. Similar findings were obtained in the case of alkaline serum phosphatase and serum globulin.

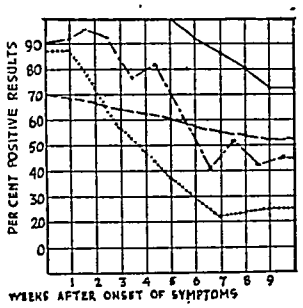


Chart 2.—Comparison of findings in acute hepatitis without jaundice (47 cases) with those in acute hepatitis with jaundice (171 cases) showing the percentage of positive results obtained each week. For the sulfobromophthalein test 3 per cent retention in one hour (5 mg. per kilogram) was taken as abnormal. Note the similarity of the curves. Solid line, sulfobromophthalein test in acute hepatitis with jaundice; broken line, sulfobromophthalein test in acute hepatitis without jaundice; line of dashes and dots, Hanger test in acute hepatitis with jaundice; dotted line, Hanger test in acute hepatitis without jaundice. Note that no sulfobromophthalein tests were done in the presence of clinical jaundice.

Convalescent Stage.—It was first noted in 1942 during our study of postvaccinal hepatitis that, although patients might appear to be recovered and nonicteric while at bed rest, when allowed to be ambulatory and especially when allowed to exercise they would not infrequently develop a recurrence of symptoms, physical findings and occasionally even jaundice. This obviously is a matter of great importance, especially in the Army, where a man discharged from the hospital must be prepared to return at once to the rigors of combat duty. Consequently the effect of exercise both on the patient and on the disease has received most careful study. Over 450 "exercise tolerance tests" have been run in various stages and types of hepatitis and the results studied from both the clinical and the laboratory point of view. Briefly, it has been found that, as long as activity of the hepatitis is present, exercise will increase the physical findings, the symptoms and the laboratory evidence of liver dysfunction. For practical purposes the development of a large and tender liver has been taken as evidence of an abnormal test. The actual effect of exercise in the individual case depends, on the one hand, on the degree of activity of the hepatitis and, on the other hand, on the severity and duration of the exercise. Exercise induced findings characteristically persist for from a few days to many weeks and constitute a true relapse of the disease. In some cases jaundice may recur, and the relapse may run a much more severe and prolonged course than the primary attack (chart 3). When the hepatitis is less active or when the exercise taken is milder, either the disease may reach a steady state and neither improve nor progress, or gradual recovery may occur. Recovery is delayed by exercise and promoted by rest.

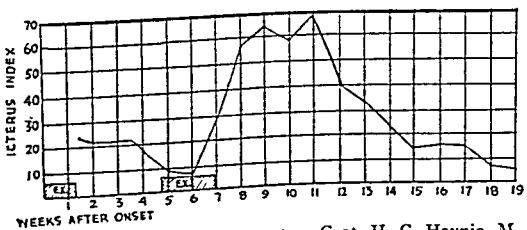


Chart 3 (C. M., aged 20 years, courtesy Capt. H. C. Haynie, M. C.).—Acute hepatitis with jaundice, showing icteric relapse caused by exercise. This patient was allowed to work in the ward from the fifth to the seventh week. Although nonicteric, active hepatitis was obviously still present. Note the severity and duration of the relapse compared to the primary attack.

Thus the effect of exercise must be considered in the evaluation of clinical recovery. Or, in other words, the absence of jaundice, symptoms and abnormal physical findings while the patient is at bed rest cannot be accepted as final evidence of clinical recovery; only when these abnormal findings remain absent after exercise can the physician be certain. This reaction is essentially analogous to the febrile response to exercise of the patient with tuberculosis or to hematuria in convalescent acute glomerular nephritis. Because of these special features, the convalescent period has been set aside for discussion as a separate stage of the disease.

In the Mediterranean theater the average case of acute hepatitis with jaundice requires from six to eight weeks of hospitalization (chart 4). This includes three to five weeks of bed rest followed by seven to ten days on an ambulatory status and finally seven to ten days of exercise. For civilian practice this program could be modified by substituting work for the exercise. Whether the other periods could be shortened is a matter of clinical judgment.

Employing a graduated exercise tolerance test as a final criterion of clinical recovery, it is found that in many cases of hepatitis recovery has not occurred even after three months of hospitalization. This group represents approximately 10 per cent of cases. It is probable that they have been largely overlooked in the past.

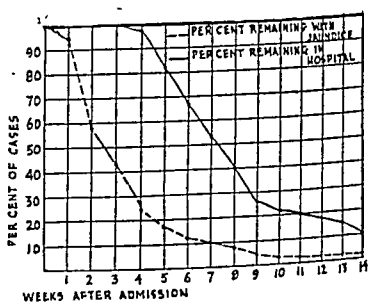


Chart 4.—Duration of elevated icterus index (acetone) and of total hospitalization in an unselected group of 78 cases of acute hepatitis with jaundice. The onset of jaundice was within three days of admission in 84 per cent. Broken line, per cent remaining with jaundice. Solid line, per cent remaining in the hospital.

LABORATORY FINDINGS

Prodromal Stage.—The laboratory findings at onset are variable, especially in those cases with a prolonged prodromal period. At present no really diagnostic tests are available, although several tests allow of a presumptive diagnosis.

A mild leukopenia is usually present associated with 5 to 20 per cent of atypical lymphocytes similar to those of infectious mononucleosis.[8] Occasionally these cells may reach 60 per cent of the total leukocytes. This is one of the earliest and most constant findings. Heterophile antibodies have always been absent on repeated examinations. The erythrocyte sedimentation rate is normal or moderately elevated.

Serum bilirubin as measured by the quantitative van den Bergh, acetone icterus index[3] or ordinary icterus index is usually normal unless jaundice is imminent. How frequently the qualitative van den Bergh shows a prompt direct reaction under such circumstances is not known, but there is suggestive evidence that it may be a significant and early finding. Bilirubinuria as indicated by the methylene blue test may or may not be present but usually appears one to three days prior to jaundice. Urobilinogen determinations have not been of value in our hands both because of variable results and because other acute febrile conditions may produce a positive test. However, we have

8. Minot, G. R., and Jones, C. M.: Infectious Jaundice, Boston M. & S. J. 189: 531 (Oct. 18) 1923.

had only a limited experience with Watson's newest method.[9]

Certain special tests have been found valuable, especially the cephalin cholesterol flocculation of Hanger. This is positive in 50 to 75 per cent of cases at this stage. The sulfobromophthalein dye retention and the alkaline phosphatase are also frequently abnormal.

Acute Icteric Stage.—The duration of elevated icterus is shown in chart 4. The only other determination of practical value at this stage is the prothrombin time.[10] A poor prognosis is indicated by an increase in the prothrombin time especially if there is no response to vitamin K therapy. The sedimentation rate is usually normal in the presence of jaundice.

Many other interesting laboratory observations have been made. The Hanger test and serum alkaline phosphatase are abnormal in over 90 per cent of cases during the first few weeks of the disease. The sulfobromophthalein test was positive in all cases tested during the first five weeks (chart 2). The serum globulin[11] was elevated over 2.5 Gm. per hundred cubic centimeters in more than 60 per cent of cases during the first two weeks, while the serum albumin was below 4.0 Gm. per hundred cubic centimeters in only 30 per cent. The serum amylase[12] tended to be low (below 60 units, Somogyi) during the first two weeks of illness and abnormally high (over 180 units) in the third and fourth weeks. The colloidal gold test[13] was usually positive during jaundice. Urobilinogen was often absent from the urine for a few days during the period of rising icterus and then appeared in abnormal amounts.

Acute Hepatitis Without Jaundice.—In the absence of jaundice, laboratory findings assume increased importance. In our cases of this type there was no laboratory evidence of increased bilirubin in the blood or urine during the period of observation, although such evidence may have been present prior to hospitalization.

The sulfobromophthalein dye retention is abnormal (over 2 per cent in one hour) in 94 per cent of cases and constitutes our most reliable test (chart 2). The Hanger test is positive in 53 per cent of cases, but many were not tested during the early stage of the disease, when the test is most likely to be positive. The alkaline phosphatase, serum globulin and amylase all are abnormal in a somewhat smaller percentage of cases than in acute hepatitis with jaundice.

Convalescent Stage.—The laboratory findings that have clinical significance during convalescence are relatively few. They are the serum bilirubin, the qualitative van den Bergh and the sulfobromophthalein dye retention. A serum bilirubin as determined by the quantitative van den Bergh of over 2.0 mg. or an icterus index of over 20 or a prompt direct qualitative van den Bergh especially in the presence of a total serum bilirubin of over 1.0 mg. is usually indicative of active hepatitis. Similarly a sulfobromophthalein dye retention of more than 10 per cent in one hour or about 16 per cent in forty-five minutes is almost always associated with activity. Values in the range of 6 to 9 per cent in one hour or 8 to 16 per cent in forty-five minutes are very suggestive of activity.

Positive Hanger tests, alkaline phosphatase values over 4.0 units and elevated sedimentation rates are not necessarily indicative of activity in this stage of the disease.

The oral hippuric acid liver function test[14] in our hands has shown practically no correlation with the clinical condition of the patient. Thus the test frequently gave relatively normal results during the acute stage and very low results in the convalescent period. Furthermore, the oral administration of aminoacetic acid in the form of gelatin just prior to the test resulted in a normal hippuric acid excretion in 153 out of 156 cases. Dietary factors were probably too prominent to permit use of this test as a measure of liver function.

DIAGNOSIS

The problems of diagnosis are quite different with each stage of the disease and must be treated accordingly.

Prodromal or Preicteric Stage.—This picture simulates that of any acute febrile illness, and diagnosis except during an epidemic is at best tentative. It is usually necessary to await the appearance of an enlarged tender liver or of jaundice before the diagnosis can be established. Upper respiratory infections, atypical pneumonia, acute enteritis or dysentery, influenza and malaria are the most common differential conditions.

In early cases without hepatomegaly suspicion should be aroused by percussion tenderness over the liver and by tenderness in the right costovertebral angle. This finding, associated with low cervical adenopathy, characteristic symptoms and the presence of other cases in the neighborhood should lead to further investigation. The blood picture is usually helpful. The presence of bilirubinuria, bilirubinemia or splenomegaly is, of course, very suggestive. A positive Hanger test or a strong sulfobromophthalein dye retention also provides valuable evidence.

It must be remembered in employing these or other tests that there are nonspecific toxic liver changes in many febrile states with associated transient liver dysfunction, so that there is at present no test which is specific for infectious hepatitis. Further, we have discussed only those laboratory procedures with which we have had experience and do not wish to imply that better tests may not be available.

If there is reasonable suspicion of infectious hepatitis and other conditions have been excluded as far as possible, it is necessary to wait until jaundice or hepatomegaly develops before being certain of the diagnosis. In the event that these signs fail to appear it is necessary to get the patient up and allow him to exercise. When this is done within two weeks of onset, one is safe in assuming that the liver will become enlarged and tender if infectious hepatitis has been present.

Acute Icteric Stage.—The diagnosis in the presence of jaundice resolves itself into a discussion of the causes of icterus which need not be taken up here. In regard to the simulated picture of an acute condition of the abdomen it is important to remember that the liver is probably always enlarged and tender.

Acute Hepatitis Without Jaundice.—This diagnosis can be made in the presence of an enlarged and tender liver which persists for four or five days or more

9. Watson, C. J.; Schwartz, S.; Sborov, V., and Bertie, E.: Studies of Urobilinogen: V. A Simple Method for the Quantitative Recording of the Ehrlich Reaction as Carried Out with Urine and Feces, Am. J. Clin. Path. **14**: 605 (Dec.) 1944.

10. Quick, A. J.: Prothrombin in Hemophilia and Obstructive Jaundice, J. Biol. Chem. **109**: 73, 1935.

11. Greenberg, D. M.: Colorimetric Determinations of Serum Proteins, J. Biol. Chem. **82**: 545, 1929.

12. Somogyi, M.: Analysis of Diastatic Split Products of Starch, J. Biol Chem. **124**: 179, 1938.

13. Gray, S. J.: The Colloidal Gold Reaction of Blood Serum in Disease of the Liver, Arch. Int. Med. **65**: 524 (March) 1940.

14. Quick, A. J.: Clinical Value of the Test for Hippuric Acid in Cases of Disease of the Liver, Arch. Int. Med. **57**: 544 (March) 1936.

and is associated with the symptoms previously described. If there is doubt regarding the liver findings, the exercise tolerance test should be employed.

Laboratory evidence of liver dysfunction is more reliable here than in the prodromal period because fever is usually absent during most of the acute stage. In addition to the clinical findings, either a positive sulfobromophthalein or a positive Hanger test should be obtained. Laboratory tests alone cannot be relied on to make the diagnosis, since a number of other conditions, notably malaria and atypical pneumonia, can be associated with similar laboratory findings.

MANAGEMENT

The cardinal principles in the management of acute infectious hepatitis are early and adequate rest and proper diet. We have very strong evidence that early and reasonably complete bed rest for an adequate period will decrease the severity and shorten the duration of the disease and decrease the percentage of cases with delayed convalescence. We have also found that a high protein (200 Gm.), low fat (40 Gm.) and high carbohydrate (400 Gm.) diet has a similar effect. On the basis of experimental evidence [15] it appears probable that the high protein constituent of this diet, especially beef, milk and cheese, is the most important therapeutic factor. The importance of a low fat intake is still in dispute. Carbohydrates should be present in large amounts. There is no evidence that excessive amounts of vitamins are desirable; on the contrary, too much vitamin B_1 may be harmful.[15] One to 3 mg. daily by mouth is adequate. Alcohol is contraindicated during all stages of active hepatitis.

In the prodromal stage the first consideration is to establish the diagnosis and to put the patient to bed with the aforementioned diet. Treatment is otherwise symptomatic. It is desirable to examine the urine and blood repeatedly for evidence of approaching jaundice.

Treatment in the acute stage with jaundice may be complicated by nausea and vomiting. This is best controlled by maintaining a fluid intake of 3,000 cc. daily. If adequate fluids cannot be tolerated orally, they should be given by vein. Ten per cent glucose in water is probably the best form, or 5 per cent glucose in saline if vomiting is troublesome. In severe cases, especially when the protein intake is low, intravenous plasma or whole blood is desirable. Two plasma units a day provides adequate and suitable protective protein. If hemorrhagic phenomena occur or if the plasma prothrombin level is low, vitamin K should be administered parenterally in doses of 2 to 4 mg. Whole blood transfusions are the most reliable method of counteracting hemorrhage of serious nature.

For abdominal cramps or pain, belladonna or atropine should be used. Morphine is to be avoided, as these patients overreact to the usual doses. This is also true to a lesser extent of the barbiturates. Bile salts are contraindicated because of possible toxic effects on a damaged liver.

In the convalescent stage, management is most important. The following criteria have been successfully employed in the Mediterranean theater to determine when the patient can be allowed out of bed:

1. At least three weeks of bed rest.

2. Liver normal size on physical examination or, if slightly enlarged, it must be definitely nontender.

3. Absence of symptoms, especially lassitude and anorexia.

4. Normal level of serum bilirubin for one week or, if slightly elevated (under 2.0 mg. per hundred cubic centimeters or icterus index under 16) absence of a prompt direct qualitative van den Bergh reaction.

5. Other laboratory tests. It is desirable to have the sulfobromophthalein dye retention under 10 per cent in one hour, and best to have it under 6 per cent. It is preferable but not necessary to have a normal Hanger test and normal alkaline serum phosphatase.

If only one of these criteria has not been met it is best to allow one more week in bed before getting the patient up. If while ambulatory the liver becomes definitely larger and tender, or if already enlarged it becomes more tender, further bed rest is indicated. When findings are questionable it is safe to proceed with the ambulatory regimen until they become either positive or negative. In civilian practice if patients are allowed to return to work after being out of bed for seven to ten days they should be reexamined after ten to fourteen days to make sure that the liver is not enlarged and tender.

PROGNOSIS

The immediate prognosis in infectious hepatitis is in general excellent. However, since therapeutic measures become progressively less effective as acute liver failure develops, it is important to recognize early those features which suggest a serious course. The disease is liable to be more severe in the presence of a past history of infectious hepatitis within several years, exposure to carbon tetrachloride or other liver poisons, chronic alcoholism or in persons over 40 years of age.

Caution should be employed and treatment intensified in cases in which the bilirubinemia continues to increase or persists at high levels for ten days or more and is associated with nausea and vomiting. Persistence in spite of adequate treatment of moderate levels of serum bilirubin (5 to 10 mg. per hundred cubic centimeters) associated with severe anorexia and nausea for three weeks or more has a similar significance. A serious prognosis is not warranted unless the patient becomes disoriented or irrational. Recovery may occur even after coma has developed. Hemorrhagic phenomena and a decidedly prolonged prothrombin time that fails to respond to vitamin K is a serious sign.

The prognosis as to duration of illness and the development of chronic hepatitis or relapse is difficult to predict. In general, patients that have a severe acute attack, a very high serum bilirubin (15 mg. per hundred cubic centimeters or more) or show any of the features that are significant in the immediate prognosis are more likely to have a prolonged illness. A relapse is consistently associated with a prolonged course (chart 3). Data regarding the final outcome will be presented in a subsequent paper.

COMMENT

Certain relatively new features of infectious hepatitis have been presented. One of the more important is the deleterious effect of exercise and the beneficial effect of rest. Both reactions are of great diagnostic importance as well as having obvious therapeutic implications. Owing to the longer duration of this disease than peviously recognized and the persistence of activity of the hepatitis after disappearance of icterus, the value of the exercise effect in estimating the degree of recovery has also become apparent. Thus this whole relationship is perhaps the most constant feature of infectious hepatitis in all stages.

15. György, P.: Experimental Hepatic Injury, Am. J. Clin. Path. 14: 67 (Feb.) 1944. Himsworth, H. P., and Glynn, L. E.: Toxipathic and Trophopathic Hepatitis, Lancet 1: 457 (April 8) 1944.

Data substantiating the therapeutic effectiveness of dietary measures cannot be presented here. However, the results are convincing, although as yet we cannot be certain which factor, the high protein, low fat or better caloric intake is the most important. There is ample experimental evidence that the first factor is quite important.

Early treatment is certainly desirable, yet care must be taken not to make the diagnosis of infectious hepatitis indiscriminately else many patients with transient illnesses may be unnecessarily invalided. Regarding the criteria for recovery, it should be remembered that even though patients are permitted to be up and permitted to return to work before these criteria are met, most will go on to recovery. However, recovery will require much longer and during this time partial disability and inefficiency will be present as well as an increased risk of relapse or chronicity.

It cannot be definitely stated whether this disease is identical with so-called catarrhal jaundice as seen in civilian practice. However, from a clinical point of view it seems to be very similar. Although it would appear to be a more serious condition in the army overseas than among civilians in the United States, this is probably only in part due to circumstances incident to combat but is also the result of a failure to recognize the duration of the disease and the clinical picture associated with the sequelae by civilian physicians.

SUMMARY

1. The course of acute infectious hepatitis is usually characterized by an acute febrile nonicteric prodromal stage of one to two weeks' duration followed by the acute icteric stage. The convalescent stage is treated separately because of certain special features.

2. The condition of acute hepatitis without jaundice is a milder form of the icteric disease. This type of hepatitis, which is probably as common as that with jaundice, is important because inadequate treatment may result in the development of chronic hepatitis and also because of the epidemiologic implications.

3. The fundamental effect of exercise in producing relapse has led to the use of an exercise tolerance test for purposes of diagnosis and for the determination of recovery. If active hepatitis is present in any stage of the disease, exercise will result in an enlarged and tender liver which persists for several days or weeks.

4. Early and reasonably strict bed rest of adequate duration and a high protein diet are the fundamental therapeutic measures and will result in shortening the course of the disease and decreasing the incidence of chronic hepatitis. The disappearance of jaundice is not necessarily an indication of recovery.

5. The average case of infectious hepatitis requires from six to eight weeks for recovery. From 5 to 10 per cent are still not clinically well at the end of three months.

Most Distinguished Arab Physician.—Perhaps the most distinguished Arab physician who subscribed to the pneumatic and the anima oculi theories of Galen was Avicenna (Abu Ali al Husain ibn Sina, 980-1037 A. D.). His medical work "The Cannon" (Qanun) served as a textbook longer than almost any other book in the history of medicine. It was used as late as 1650 in the universities of Montpellier and Louvain.—Gordon, Benjamin Lee: The Romance of Medicine, Philadelphia, F. A. Davis Company, 1944.

CERTAIN DEFECTS OF A NATIONWIDE PLAN FOR PROVISION OF ADEQUATE MEDICAL CARE

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A nationwide plan for provision of medical care is embodied in the Wagner-Murray Bill S. 1050, which has been presented to Congress for consideration. The American Public Health Association has formulated a policy, "A National Program for Medical Care," [1] and the Committee of 29 on Research in Medical Economics presented the "Principles of a Nationwide Health Program" [2] in December 1944. These plans are of such great personal interest to every individual and family in the nation that they deserve most careful thought.

These plans have been under active consideration by sociologists, economists, labor organizations, public health workers and the medical profession for several years. The discussions have in many instances been acrimonious and often injudicious. For the most part the discussions have been conducted by groups who may be under suspicion of having a certain amount of bias. The majority of contributors have been the public health officials who would probably be the group to administer the plans; the sociologists, professional and amateurs, who are presumed to know just what is wrong with our social system and have a precise remedy for its correction; and the representatives of organized medicine, who are directly concerned because physicians are the key personnel in any plan for provision of medical care.

Very little attention has been given, as yet, to the opinion of those who are to be the recipients of this service. A few public opinion polls have been taken, but the analyses of the results have been ambiguous. "Wouldn't you like to have better and cheaper medical care than you are receiving at present?" "Why are you mad at doctors?" "Don't you think hospital charges are exorbitant?" "Would you rather choose your own doctor or would you be willing to accept any physician that might be available?" Public opinion polls of this general tenor have not been very enlightening.

The three plans for nationwide medical care that have been mentioned have the great merit that they present a positive, definite, detailed outline of administrative procedures that are committed to a clearcut course of action. They all prescribe a system of nationwide, compulsory, contributory medical insurance which will be collected and administered by the federal government. The plans are the result of a great deal of careful thought and preparation by very capable men who have devoted their lives to a consideration of health promotion of the people and who understand the components of adequate medical care.

These men would be the first to admit that all the plans for a nationwide compulsory, contributory system for provision of medical care have certain inherent defects which should be thoroughly discussed and fully

1. Preliminary Report on a National Program for Medical Care, Am. J. Pub. Health 34: 984, 1944.
2. Principles of a Nationwide Health Program, Report of the Health Program Conference of the Committee on Research in Medical Economics, New York, 1944.

understood before they are accepted by the people that they are intended to benefit.

The bitter remembrance of the last great national fiasco in hasty social reform, which was initiated largely because the people did not understand the full implication and significance of the national prohibition act, is still too keenly felt to warrant ill considered action in other matters of nationwide social policy.

If these plans have any defects, let us consider them. We may then determine whether or not the benefits that they will provide will greatly outweigh the sacrifices that they will entail.

INFRINGEMENT ON LOCAL SELF GOVERNMENT

Many thoughtful people are of the opinion that a nationwide plan for provision of medical care has a fundamental defect in that it represents an encroachment on local self government, and, unless proper safeguards are taken, that it will undermine the very foundation stones on which our nation was built. All people instinctively desire security and long for the very best social conditions that can be obtained for themselves and for their families. But most of us are unwilling to possess these benefits at the cost of personal freedom.

The issue is a simple and straightforward one. May I present it, not from the point of view of the practicing physician or the public health administrator, but from the point of view of a recipient of these services. As far as I can interpret the thinking of the average American, I encounter the following trend of thought:

How much individual freedom am I willing to sacrifice in order to obtain security? And in sacrificing that freedom am I sure that I shall reap the full benefits of individual and community security?

Is it not true that the ideas of security at any cost have been imposed on us by those who have come from, or borrowed their ideas and social philosophy from, those European nations which have preferred security to freedom? Our traditions have been to permit as much freedom to the individual as is possible, as far as the exercise of this freedom does not interfere with the rights of others and does not produce a community hazard or jeopardize the security of all. There is a real danger, of course, that in our demand for individual freedom we may foolhardily sacrifice all opportunity for individual, family and community security.

On the other hand, if we demand security at any cost, then it is obvious to most of us that we shall pay too high a price for it. Our democratic traditions have required the maintenance of the principle of local autonomy in community government. We have all understood the quite obvious and very important advantages that would accrue under a system of government by benevolent centralized authorization.

But a benevolent, paternalistic, all powerful, gracious, all wise and generous centralized government is our conception of God in his Heaven. This idealistic Paradise is supposed to be reserved to us for a life to come. As long as we remain on earth and must follow natural laws, we feel very deeply and instinctively that the individual rights of personal choice, together with local autonomy in determination of communitywide governmental and social policies, is a basic individual and community right.

It is much more than a matter of financing, organization or administration. In such simple matters as provision for medical care the principle lies much deeper than a desire to have a physician of one's own choosing or to select some one hospital or some method of therapy that appeals to our individual sense of the appropriate. We may believe, for example, that Christian science is not an effective therapeutic procedure, but we shall defend the right of a man to choose these procedures if he so desires and as far as this choice does not represent an infringement on community security.

As Havens[3] has pointed out, social security, and economic security as well, is a state of mind. No centralized government, no institution, no individual should assume the authority, nor should they be allowed the power to provide security for the individual if such security is offered at the expense of personal freedom. Such a security should be refused and spurned with scorn. This is the security of the Israelites in the land of Egypt, or the security given the Negro on his master's plantation in the South.

The aged, the helpless and the infirm should be given security by the community as a matter of course. But the young, virile, aggressive, ambitious, inventive individual, community or state does not ask for or desire a nationwide, comprehensive, beneficent, compulsory, paternalistic system of social and economic security that is planned by a few men—no matter how wise, how socially minded or how public spirited they may be.

The average man feels instinctively that systems of social security should grow slowly, from below upward, developing out of the social conscience of the mass, rather than be imposed from above downward. There lies deep in the heart of every man a profound and wholesome distrust of the pontifical, perfectly well meaning, self-assumed certainty of omnipotence with which these plans are presented. This innate feeling of distrust is the result of a certainty that no individual or group of individuals has the knowledge to formulate or the talent to administer a completely comprehensive plan for provision for medical care for the whole nation of over 130 million people, on a compulsory, contributory basis, no matter how well grounded they may be in social theory. How can such a plan be flexible enough to meet the fundamental requirements of every community and the needs of each individual and still retain the principles of personal freedom and the maintenance of the democratic principles that are the very basis for the American mode of life?

THE UNITED STATES IS A DIVERSE NATION

One of the major difficulties with a uniform, centrally administered nationwide plan for medical care of all the people is that we are not a homogeneous, but a diverse, people. The United States consists of forty-eight widely different and quite independent governmental units. They vary enormously in area, population, economic status, type of industry, traditions and culture. A medical plan that would be suitable for one section of the country would be quite unsuited to another. This is an additional reason why no nationwide plan could be devised which would be flexible enough to suit all situations equally well.

LIMITATIONS OF FEDERAL FUNCTIONS

As long as our Constitution stands, each state is a sovereign power, and the federal government possesses only those governmental functions that are expressly

3. Havens, R. D.: The Burden of Incertitude, Rochester, N. Y., University of Rochester Press, 1944.

granted to it by the states. Many states are quite unwilling to sacrifice the principle of local self government in relation to provision of medical facilities for all for the obvious advantages of a centrally administered, compulsory, nationwide plan.

Each type of governmental authority—federal, state or local—has certain functions which it is best fitted to administer. For example, the federal government is obviously best fitted to administer public health matters that are of international significance or of interstate concern. But other governmental services are supplied best by the local community. Let us take a very simple example: The local community in which I reside supplies my family with an adequate and excellent supply of water. It is true that the local water supply system is under the supervision of the division of sanitary engineering of the state board of health, and the quality of the water conforms to the national standard for interstate carriers, but the administration of the service is a local responsibility. If the state board of health should attempt to administer our local water supply system, it would be both costly and inefficient. If the federal government was to assume responsibility for administration of the water supply service of our town, I am perfectly certain that my family would be thirsty a good part of the time.

THE PURSE DETERMINES THE POLICY

Each of the plans presented to us provides for a certain component of local autonomy in administration. But each plan also provides that the collection of funds, and therefore disbursement of funds as well, shall be a primary function of the federal government. Now it is an axiom of any administrative unit—be it family, small business firm, corporation or community—that "the purse determines the policy." Thus any autonomy that might be granted by the federal health agency to a local community would be the autonomy of a child who receives his allowance from his father each Saturday, on the basis of a week's good behavior.

COMPARISON OF COMPULSORY, CONTRIBUTORY MEDICAL CARE WITH COMPULSORY EDUCATION

Dr. Alan Gregg, a member of the Committee of *29*, has drawn the analogy between a compulsory, contributory plan of medical care and communitywide provision for compulsory education which we have all accepted as a basic ingredient of community life. This analogy is an excellent one, and we are quite willing to accept it.

But it must be remembered that our compulsory educational system was not imposed on us from above by the federal government, on a nationwide basis.

The great secret of success of our educational system is that it is an outgrowth of the conscious desires of the great mass of the people. It emerged slowly, through many years of trial. Always it has maintained the basic feature of local autonomy and local community determination of policy. State standards have been of great value in the improvement of the system. State subsidies to less favored communities are an essential part of the plan. The federal government has been of assistance in promotion of nationwide standards of education. But the principle of local community responsibility for schools is the very keystone of the plan, whereas a federally sponsored and administered plan would be certain to fail.

LOCAL AUTONOMY IS ESSENTIAL IN ANY SYSTEM FOR COMPREHENSIVE MEDICAL SERVICE

The majority of the people who have given this question due consideration believe that the most satisfactory system for development of adequate medical services for the United States as a whole is the much less comprehensive, but much sounder, system of slow evolutional development, on a local community basis, of statewide programs that are framed to meet the needs of each local and state situation. Minimum standards of adequacy of medical care may be provided by the federal government, and federal government subsidy may be provided as grants-in-aid to states, during the developmental stages of these plans. Formulation of nationwide standards and administration of federal subsidies are the function of the United States Public Health Service, the Children's Bureau or, better still, a separate National Department of Public Health with a cabinet member at its head.

This system was used with success in the gradual development of full time local health departments under the Social Security Act and was successful in meeting each particular need in each area in the country.

A STATEWIDE MASTER PLAN

A comprehensive master plan might be formulated by each state, so drawn as to meet its own requirements. The advice of the United States Public Health Service and other federal agencies should be sought in drawing up these plans. But the basis of each plan should be that primary responsibility for administration of the program must rest with the local community. It would be anticipated, of course, that each local community would develop its plan under state guidance.

Not only determination of policy, but the financing of each plan, should be a local responsibility. Supplementary aid may be furnished by the state where the particular situation requires such assistance.

It must be admitted that the evolution of plans for improvement in medical services on a local autonomy basis is discouragingly slow. It does not keep pace with advances in medical science or with improvements in technic of administration. But it must be remembered that the evolution of social structure under the principles of democratic government is a slow, tedious, discouraging, painful process. Yet somehow, despite all its faults, we like it.

This, in my opinion, is an interpretation of the *feeling* of the average thoughtful American in relation to provision of adequate medical care for the family and the community.

He is quite willing to promote any plan which will be of real benefit to the health and welfare of his family and his community but is quite unwilling to accept a revolutionary, nationwide program of social betterment that has not gone through the fire of long, extensive, careful test under a great variety of conditions.

Most important of all, he is unwilling to surrender the principle of local community autonomy and to delegate authority to the federal government for the control and administration of such a personal and intimate matter as medical care of himself and his family.

1300 York Avenue.

FRACTURE OF THE SHAFT OF THE FEMUR IN ADULTS

EVALUATION OF METHODS OF TREATMENT

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Fracture of the shaft of the femur is the cause of prolonged total disability and all too frequently of a severe permanent disability. Because of the long period of total disability and the severe economic burden imposed by this injury there have been constant efforts to develop methods of treatment which will shorten enforced recumbency and thus lighten the financial strain of this injury. The objectives of these technics have been to effect recovery in the shortest possible time and at minimal cost.

My purpose in this paper is not to criticize any technic or procedure as that technic is practiced by its originators or employed by those highly skilled in its use but rather to show the results which accrue from the promiscuous use of procedures which require high skill and special armamentarium in the hands of an average group of surgeons. The stanchest champion of internal fixation of fractures of long bones in this country has clearly, emphatically and consistently warned against the general use of this method by those unskilled in its application or restricted as to facilities for its employment.[1]

This study is based on the observation of 47 patients treated in many different army hospitals by many different surgeons. I did not initiate the treatment of any, but all patients were cared for ultimately by me. They all had closed fractures of the shaft of the femur. None had compound fractures. The patients were all men between the ages of 18 and 40 who were in excellent physical condition and in whom the healing process would be expected to be optimum. Excellent hospital facilities, prompt attention and splendid general care were available for all.

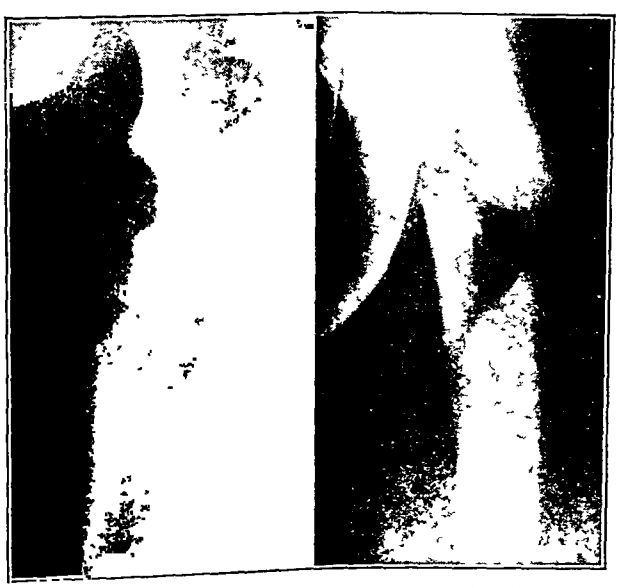


Fig. 1.—Appearance of fracture of upper third of shaft of femur three months after injury. Poor position of fragments, good alinement, callus

Twenty-three patients were treated by some form of suspension traction, usually skeletal traction applied with a Kirchner wire, but in a few patients by a larger pin of the Steinmann type.



Fig. 2.—Six months after injury, bony union

Seventeen patients were subjected to open reduction and internal fixation with plate and screws. In the group of 17 patients treated by open reduction and plating this treatment was elected by the surgeon for 10 patients. In 7 patients it was resorted to only after a trial of more conservative measures, in the surgeon's opinion, had failed to result in satisfactory position of the fragments.

It is to be remarked here that absolute end to end apposition of the fractured fragments is not a necessary requisite for a good result or even for bony union of a fracture. While an anatomic reduction should be striven for, the failure of any method to attain a perfect x-ray reduction does not justify a change to a more radical procedure, provided there is good alinement, negligible shortening and reasonable contact of the fragments. The only condition which makes open reduction positively indicated is the certainty or well founded suspicion that soft tissue is interposed between the fragments (figs. 1, 2 and 3).

Seven patients were treated by means of external skeletal fixation, with use of one of the many mechanical devices for this type of treatment.

The average period of time elapsing between the injury and the date of evaluation was twelve months. The shortest period of follow-up was six and one-half months. The longest period of follow-up was twenty-four months. In all instances in which the period of follow-up was less than one year this was due to the fact that recovery had been adequate for the patients to be discharged from medical supervision and returned to their duties.

1. Murray, C. R.: Primary Operative Fixation in Fractures of the Long Bones in Adults, Am. J. Surg. 51:739-747 (March) 1941; The Status of Fracture Treatment in the Field of Surgery, Surg., Gynec. & Obst. 62:433-434 (Feb., no. 2A) 1936

To determine the efficiency of these three types of treatment, the following factors in each method were examined and compared:

1. The period of absolute recumbency of the patient
2. The total necessary period of protection of the fracture.
3. The time required for roentgen evidence of bony union.
4. The status of the joints of the extremity.
5. The degree of shortening of the leg
6. The degree of muscular atrophy of the thigh
7. The complications arising from each method of treatment
8. The secondary operative procedures which resulted from complications in each type of treatment

The results obtained in the following groups of patients are the product of what may be considered a median cross section of the surgical talent of the nation. It is felt, therefore, that these results may be considered representative of the results to be expected in the hands of the average surgeon. They are claimed to be neither better nor worse.

PERIOD OF ABSOLUTE RECUMBENCY

By the period of absolute recumbency is meant the time each patient was confined to bed. In this time are included all days of bed recumbency made necessary by complications arising directly from the method of treatment. This is a figure of importance from the economic point of view as during this period the patient needs at least nursing care. For the patient in traction it necessitates hospitalization. For the patient in a cast nursing care at home might suffice.

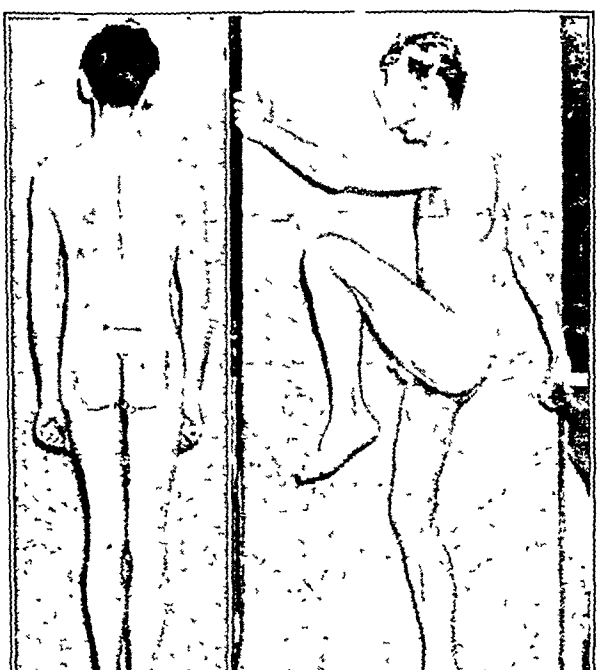


Fig. 3.—Patient whose roentgenograms are shown in figures 1 and 2 seven months after injury. *A*, no shortening, no pelvic tilt or scoliosis, *B*, good motion in joints

The shortest period of total recumbency occurred in a patient treated by external skeletal fixation. This was seventy days, as compared to seventy-seven days for internal fixation and ninety days for traction. However, the seventy day period was far from the rule and was the interval of recumbency in only 1 case. The longest period of recumbency, 365 days, occurred in a patient treated by internal fixation and was closely followed in a patient treated by external skeletal fixation who was in bed 326 days. Each of these prolonged periods of bed recumbency was made necessary by

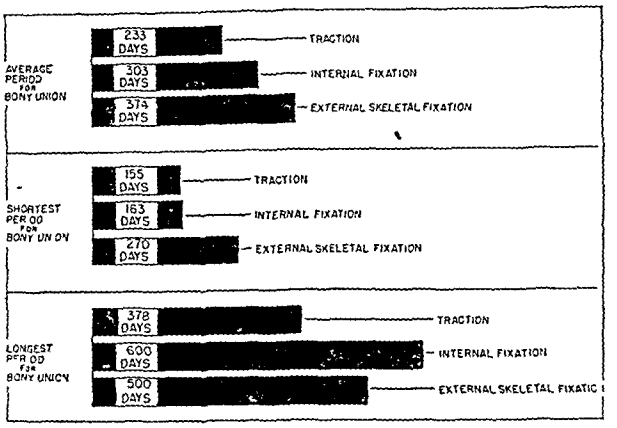


Fig. 4.—Time required for x-ray evidence of bony union.

complications arising directly from the type of treatment. The patient whose femur was plated developed a pseudarthrosis which necessitated a bone graft. The patient treated by external skeletal fixation had a delayed union and osteomyelitis about multiple pin holes, which required a squestrectomy. The longest period of time any patient treated by traction was confined to bed was 193 days, a total invalidism significantly shorter than by either of the other methods.

The average period of recumbency for patients treated by internal fixation was 185 days, by external skeletal fixation 168 days and by traction 145 days. The enforced recumbency in the group treated by traction and by internal fixation needs no explanation. It is the time during which the patient was suspended in a splint or was confined in a cast. The period of bed

TABLE 1.—*Period of Absolute Recumbency*

Length of Period	Traction (42 Patients)	Internal Fixation (Plate) (17 Patients)	External Skeletal Fixation (7 Patients)
Average period	145 days	185 days	168 days
Shortest period	90 days	77 days	70 days
Longest period	193 days	365 days	326 days

recumbency in patients treated by a method designed to produce early ambulation, that is, external skeletal fixation, needs clarification. This unduly long period was due to the fact that 5 of the 7 patients treated in this manner required supplementary treatment either by a cast or by traction. Removal of the pins and apparatus in over half the cases was necessitated because of infection about the pin sites, before the fracture was solid enough to permit ambulation in a brace, without danger of angulation. A small part of this long period of recumbency in patients treated by external skeletal fixation may be attributed to inexperience in the method and to a lack of the courage to have the individual on his feet, on the part of the surgeon.

TOTAL NECESSARY PERIOD OF PROTECTION

The total necessary period of protection is the number of days which intervened between the injury and the time the patient was able to bear full weight without

brace or crutches. All this time the patient is of little or no economic value and is never entirely independent in his activities because weight cannot be unguardedly borne on the extremity.

TABLE 2.—*Total Period of Protection*

Length of Period	Traction (23 Patients)	Internal Fixation (Plate) (17 Patients)	External Skeletal Fixation (7 Patients)
Average period	219 days	266 days	370 days
Shortest period	144 days	150 days	251 days
Longest period	367 days	637 days	665 days

The shortest individual total period of protection was in a patient treated by traction. This period was 144 days. In the group treated by internal fixation the shortest period of total protection was only slightly longer, 150 days. The shortest time in the group treated by external skeletal fixation was 251 days, a great increase of partial disability. The longest single period of total protection also occurred in this group and was 665 days. In the group treated by internal fixation 1 patient was not bearing weight unprotected until 637 days after injury. This was again the result of a complication which necessitated a bone graft. Of all patients treated by traction the longest any individual required protection was 367 days, a period almost ten months less than by the other forms of treatment.

The average period of total protection in the group treated by traction was 219 days, of those treated by plating 266 days, and of those treated by external skeletal fixation 370 days.

All patients treated by external skeletal fixation used a brace. Six of 17 patients treated by internal fixation did not use a brace, 3 of these used crutches and 2 remained in bed for several weeks without other protection before walking. One of these 6 patients walked without protection immediately after removal of the cast. The other 11 wore an ischial bearing brace. Twenty of the patients treated by traction used ischial bearing braces. Three patients used no brace but remained in bed without other protection for several weeks before beginning free weight bearing.

PERIOD REQUIRED FOR ROENTGEN EVIDENCE OF BONY UNION

Statements are seen that bony union of a fractured femur occurs in three to four months. This may happen exceptionally but is far from the rule in the adult. Good bony callus frequently does appear in this time, but until solid bony union occurs refracture is always a possibility. The criteria for bony union are (1) obliteration of the fracture line and (2) reestablishment of bony trabeculae.

By these criteria the shortest period required for bony union in this group was 155 days, which resulted in 1 patient treated by traction. One patient treated by internal fixation had roentgen evidence of bony union in 163 days. The shortest period for bony union in a patient treated by external skeletal fixation was 270 days. This unfavorable discrepancy is probably attributable to the fact that slight distraction of the fragments was a common concomitant in this type of treatment.

The longest period for bony union to occur in a patient treated with traction was 378 days. A patient who developed a nonunion after internal fixation required a bone graft and took 600 days to obtain a bony union. Another patient treated by external skeletal fixation took the inordinately long time of 505 days to show roentgen evidence of bony union. In this patient, distraction of the fragments early in the treatment was undoubtedly a factor in delaying union.

The average period for roentgen evidence of bony union in 23 femurs treated by traction was 233 days, almost eight months. In 17 patients treated by internal

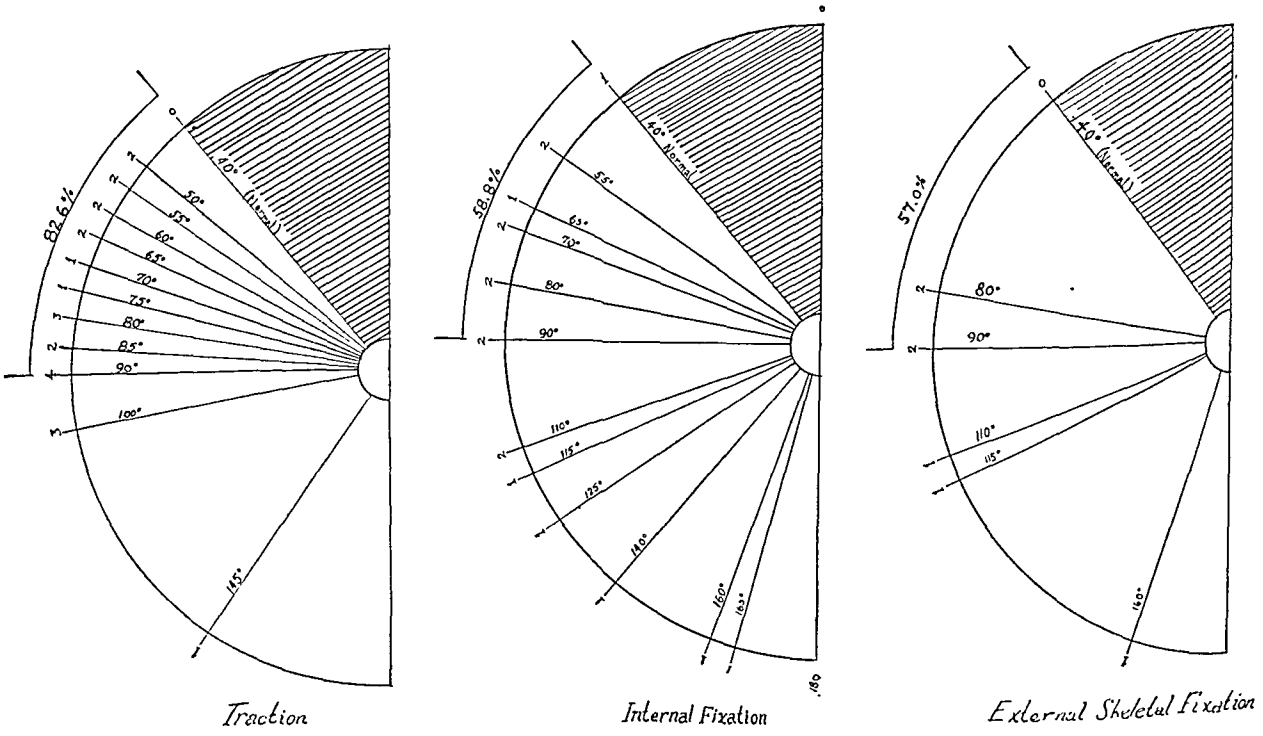


Fig. 5.—Individual range of knee flexion.

fixation it was 303 days, or ten months. In 7 patients treated by external skeletal fixation it was 374 days, or a little over twelve months.

As judged by x-ray evidence of bony union, traction was the most satisfactory method of treatment. This is consistent with the finding that it did not increase the period of total protection.

In this group of patients the period of enforced recumbency, the time required for bony union, and the total necessary period of protection do not condemn traction but rather establish it as the method likely to result in the minimum of economic dislocation.

STATUS OF JOINTS OF FRACTURED EXTREMITY

The most frequent and severe disability following in the wake of fracture of the shaft of the femur is loss of knee motion. The advocates of internal fixation and of external skeletal fixation stress the fact that these methods result in more nearly normal function of the knee. This may be true when a diligent regimen of after-care is carried out, but certainly it does not follow unless the surgeon is skilled in the postoperative management of the patient.

Of this entire group of patients, over the period during which they were observed, only 1 patient had an absolutely normal knee. This was a patient treated by internal fixation, who at the end of a year had a normal range of extension and flexion of the knee.

Loss of extension was not common and was usually of minor degree. A patient treated by traction had a loss of 5 degrees of extension at the end of a year. A patient treated by internal fixation had a loss of 20 degrees of extension and another had a loss of 5 degrees of extension. The patient with the severe loss of extension had suffered a complicating osteomyelitis. The other had been immobilized almost a year because of a bone graft following a nonunion.

No patient treated by external skeletal fixation suffered any loss of extension and all could completely straighten their knees.

Forty-six of the 47 patients had some degree of restriction of flexion in the knee over the period they were observed. Some of these will ultimately gain normal flexion with months of activity, but a very high percentage will have some permanent loss of knee bend (fig. 5).

The average arc of flexion of the knee in 23 patients treated by traction was 101 degrees; that is, the leg could be bent so that it made an angle of 79 degrees with the thigh. In this group the worst knee bent to an angle of 145 degrees and the best knee bent to an angle of 50 degrees.

The average arc of flexion of the knee in 17 knees treated by internal fixation was 85 degrees; that is, the leg could be bent to an angle of 95 degrees with the thigh. In this group the worst knee bent to an angle of 165 degrees and the best knee had normal motion (fig. 6).

The average arc of flexion of the knee in 7 patients treated by external skeletal fixation was 78 degrees; that is, the knee could be bent to an angle of 102 degrees with the thigh. The worst knee in this group bent to an angle of 160 degrees and the best knee to an angle of 80 degrees.

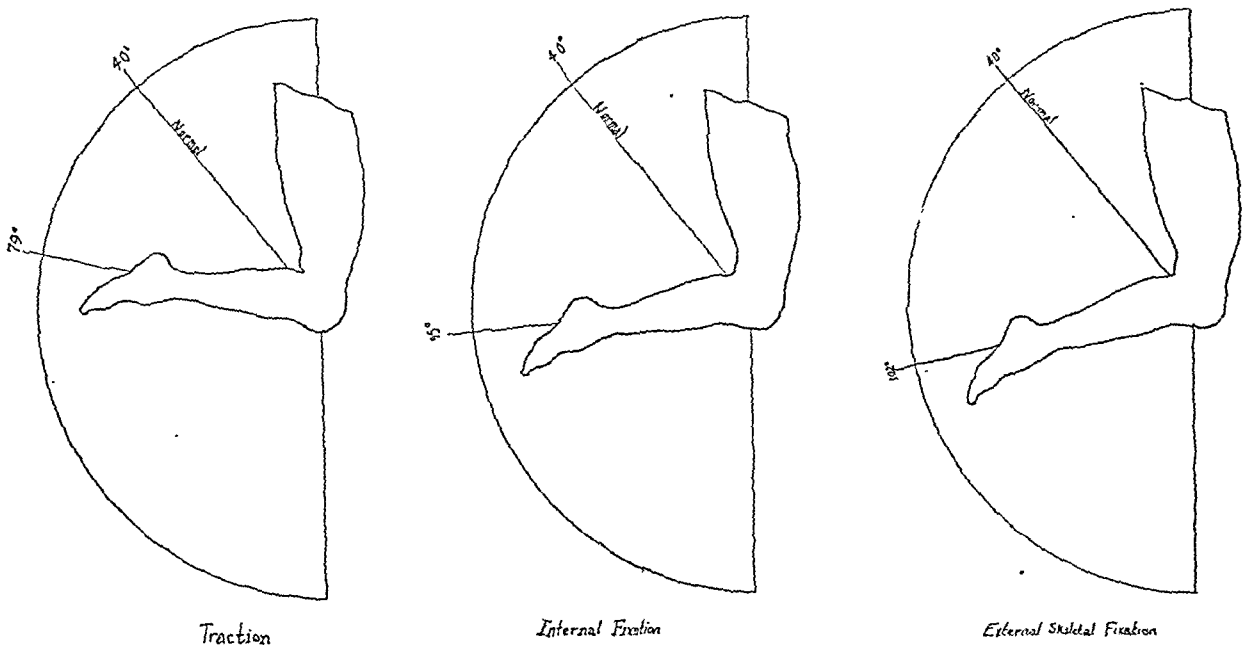


Fig. 6.—Average range of knee flexion.

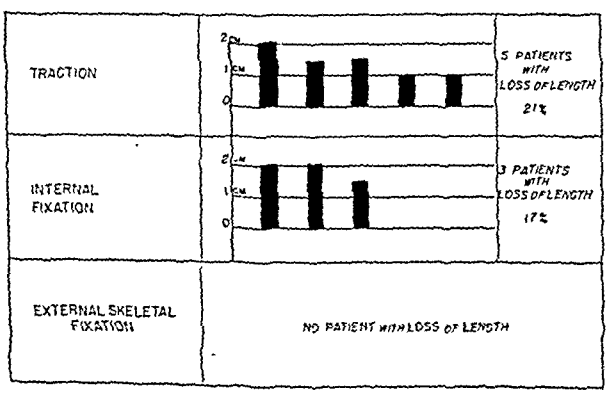


Fig. 7.—Patients with loss of length.

Eighty-two per cent of patients treated by traction could bend their knees to a right angle or better. Only 59 per cent of those treated by internal fixation could

bend the knee to a right angle, and right angle flexion was possible in only 57 per cent of those treated by external skeletal fixation. This is important, since the great majority of knees which reach right angle flexion will continue to make a slow steady gain, and an individual can carry on well in most activities with this range of motion.

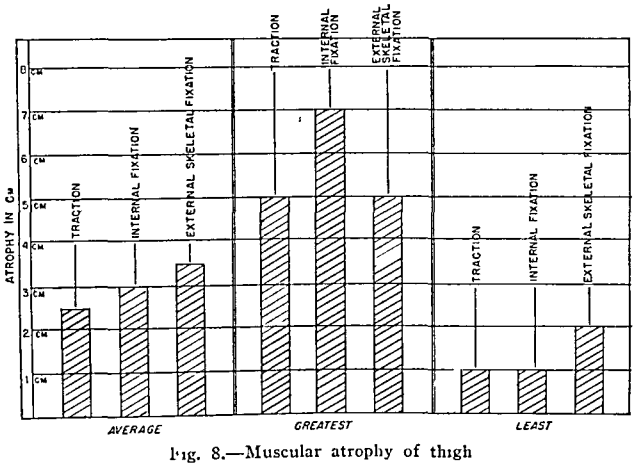


Fig. 8.—Muscular atrophy of thigh

No patient treated by traction had any loss of motion in the hip, ankle or foot. A patient treated by internal fixation who developed an osteomyelitis had an appreciable loss of rotation in the hip joint and 2 patients treated by this method, whose recovery was complicated by thrombophlebitis, developed troublesome swelling of the ankle and stiffness in the foot. A patient treated by external skeletal fixation had an appreciable loss of rotation in the hip and another had moderate stiffness in the ankle.

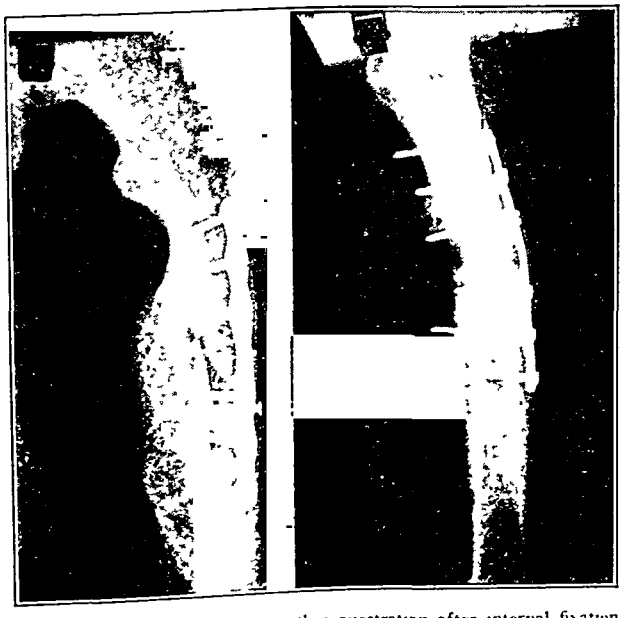


Fig. 9.—Severe osteomyelitis with sequestration after internal fixation. Saucerization necessary.

SHORTENING OF THE EXTREMITY

Five patients treated by traction, or 21 per cent, had some degree of shortening of the injured leg. In only 1 patient was this shortening of an adequate amount to produce disability. This patient had 2 cm. loss of length. Two other patients had 1.5 cm. loss of length of the leg, and the extremity of 2 patients was short by 1 cm. Of the 17 patients treated by internal fixation there were 3 patients who presented short legs. Two of these patients had a leg 2 cm. shorter than the uninjured leg. In 1 of these the shortening was due to the plate's breaking with resultant overriding, and the other patient lost length as a result of a nonunion, which required a bone graft. A third patient presented 1.5 cm. shortening. This was due to angulation from bending of the plate.

No patient treated by external skeletal fixation had any loss of length in the fractured extremity (fig. 7)

MUSCULAR ATROPHY

In the 23 patients treated by traction, the average loss of circumferences of the thigh due to muscle atrophy was 2.6 cm. The most severely affected patient in this group had a wastage of 5 cm. No patient had normal thigh muscles, and the least affected had only 1 cm. atrophy.

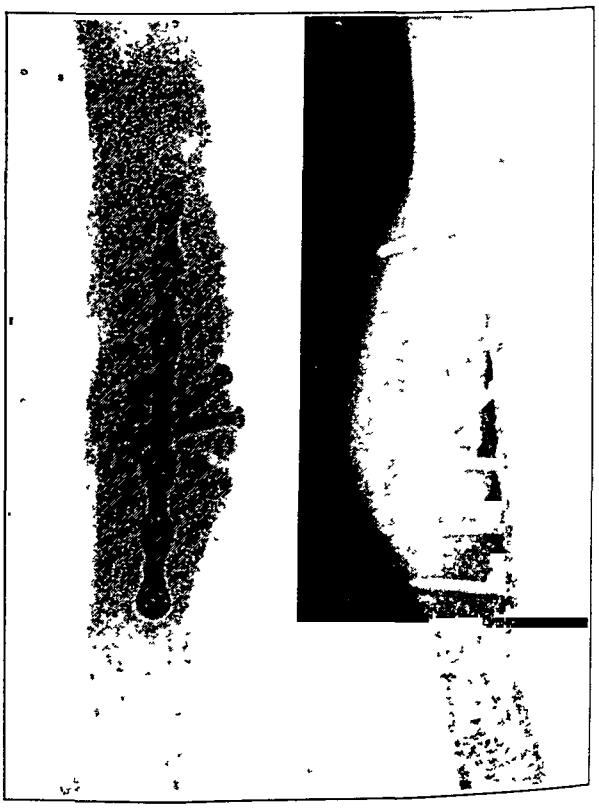


Fig. 10.—Pseudoarthrosis after internal fixation. Bone graft necessary. Patient terminated with 2 cm. shortening of leg

Of the 17 patients treated by internal fixation, the average loss of thigh circumference was 3 cm. The most severely affected thigh had shrunk 7 cm. subsequent to complicating sepsis. Another had shrunk 5 cm. One thigh had wasted only 1 cm. (fig. 8).

Of the 7 patients treated by external skeletal fixation, the average loss of thigh circumference was 3.5 cm. The greatest loss in circumference was 5 cm. and the least affected thigh in this group had shrunk only 2 cm.

Thus in judging the results of treatment by disability resulting from shortening of the extremity, from loss of motion in the knee and other joints and from the

degree of muscular atrophy in this group of patients, both external skeletal fixation and internal fixation with plate and screws were definitely inferior to traction.

COMPLICATIONS OF TREATMENT

Complications were most prevalent in the group of patients subjected to open reduction and internal fixation. Nine of 17 patients treated by this method, or 53 per cent, developed some complication. Moreover, this is the only group of patients in which any complication was of sufficient gravity to threaten the life of the patient. A patient developed a severe postoperative infection with an extensive osteomyelitis and thrombophlebitis and was critically ill for weeks. Another patient developed a severe osteomyelitis, and a third patient suffered a severe thrombophlebitis with pronounced febrile reaction, shortly after surgery. Another patient developed a severe postoperative infection but escaped without extensive osteomyelitis. However, several months later the plate had to be removed because of persistent drainage due to infection about a screw.



Fig. 11.—Broken plate, with shortening and delayed union in patient treated by internal fixation.

TABLE 3.—*Complications*

	Traction (23 Patients)	Internal Fixation (Plate) (17 Patients)	External Skeletal Fixation (7 Patients)
[illegible]	3 (13%)	9 (53%)	4 (57%)
	20	8	3
	0	2	0
	0	2	0
	0	2	0
	2	0	4
	Large pins		patients 12 of 23 pin sites
Nonunion	0	1	0
Late drainage from plate	—	3	—
Broken plate	—	1	—
Bent plate	—	1	—
Peroneal palsy	1	0	0

Complications which did not threaten survival were also prevalent in this group. A patient developed a pseudarthrosis at the fracture site. Three patients presented late drainage as a result of mild infections about the screws, with loosening of the plate. In 1 patient the plate broke and in another patient the plate bent (figs. 9, 10 and 11). This is a truly imposing incidence of complications, the gravity of which should make any surgeon hesitate to employ this method unless absolutely indicated.

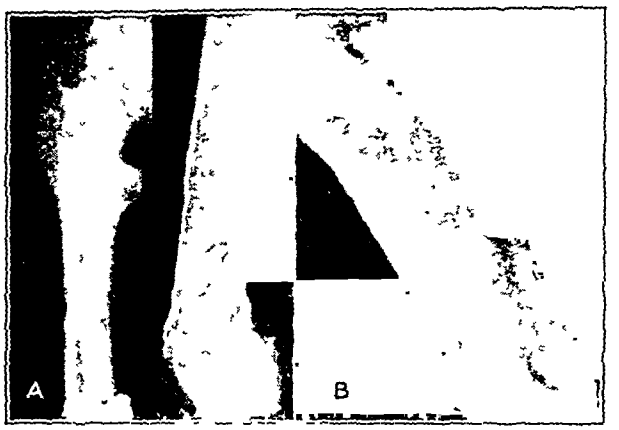


Fig. 12.—*A*, osteomyelitis of fixation pin sites in patient treated by external skeletal fixation. *B*, thigh after saucerization of trochanteric area and sequestrectomy of supracondylar pin hole which were necessary to terminate drainage.

In the group of patients treated by external skeletal fixation the incidence of complications also ran high, occurring in 4 of the 7 patients. In none of these patients was the complication a threat to life. The only complication in this group was osteomyelitis about the pin holes. This occurred in 12 of 23 pin holes. It was not seepage, but osteomyelitis, manifested by x-ray findings. This osteomyelitis was particularly severe in the trochanteric region and in the transfixed supracondylar region. The large pin, plus motion, resulted in stubborn infection of the cancellous bone. In 1 patient saucerization of the trochanteric area was necessary before drainage could be terminated. This patient was disabled eight months as a result of this complication (fig. 12).

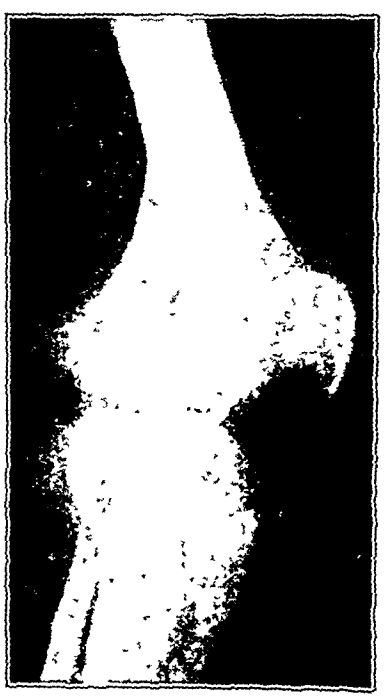


Fig. 13.—Ring sequestrum in femur of patient treated by traction with large pin. Pin placed incorrectly. The knee joint fortunately escaped infection.

In the group of 23 patients treated by traction, 3 patients, or 13 per cent, presented complications. Two patients developed localized osteomyelitis about the pin hole which required sequestrectomy. In both patients

a large Steinmann pin had been used. Neither involved the knee joint. No patient who had traction by a Kirchner wire developed infection in the bone. A patient developed a peroneal palsy which was transient and recovered spontaneously in three months (fig. 13).

OPERATIVE PROCEDURES NECESSITATED BY COMPLICATIONS

Six additional operative procedures of extensive magnitude and with some risk of their own were necessary for the 17 patients treated by open reduction and internal fixation. Two patients underwent the removal of the plate and an extensive sequestrectomy and saucerization of the femur. A patient had a bone graft of the femur. Three patients required the simple removal of the plate and screws (table 4).

Only one operation of major magnitude was necessary for patients treated by external skeletal fixation. This patient had an ostectomy and saucerization of the trochanteric area of the femur. Three other patients required sequestrectomy of one or more pin holes. In all, twelve of twenty-three pin holes required surgical attention.

In no patient treated by traction was the necessity for a surgical procedure of major importance created. Two patients required a sequestrectomy of one pin hole.

TABLE 4.—*Patients Requiring Operations Because of Complications*

Operations	Traction (23 Patients)	Internal Fixation (Plate) (17 Patients)	External Skeletal Fixation (7 Patients)
Sequestrectomy of pin holes	2	—	3 patients 12 pin holes
Removal of plate and sequestrectomy	—	2	—
Removal of plate	—	3	—
Bone graft	—	1	—

CONCLUSIONS

1. Fracture of the shaft of the femur, regardless of the method of treatment, is the cause of a long period of disability and frequently results in some degree of permanent disability.

2. The safest method of treatment of this fracture for the average surgeon in the average hospital is traction.

3. The election of traction methods to the exclusion of other types of treatment, by the average surgeon, will result in a shorter period of disability for the patient, better end results and fewer complications.

4. Failure to obtain absolute anatomic position of the fragments by x-ray is not an indication for open reduction. Under average circumstances open reduction should be reserved for those patients in whom there is well founded evidence of soft tissue interposition, after a trial of treatment by traction.

5. The general use of apparatus designed for external fixation and ambulation is likely to delay union and carries a great risk of producing osteomyelitis at the sites of the fixation pins.

Medicine an Observational Science.—In medicine we have a unique advantage in this respect over the purely experimental scientist in that medicine, while becoming increasingly an experimental, has long been and must continue largely to be an observational science. In its observational aspect it deals with a supremely difficult material under conditions that make constant demands on intuition and judgment.—Walshe, F. M. R.: The Integration of Medicine, *Brit. M. J.*, May 26, 1945.

CARCINOMA OF THE ORAL CAVITY

A TEN YEAR SURVEY IN A GENERAL HOSPITAL

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AND
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NEW HAVEN, CONN.

Carcinoma of the oral and pharyngeal mucous membranes comprises 3 per cent of all cancer and accounts for approximately 3,700 deaths yearly in the United States registration area. It is usually considered accessible cancer as contrasted to similar disease of the internal organs; yet the five year survival rates for it in this location are no better than for disease in some of the more inaccessible organs, such as the cecum and the large intestine. There are only a few large centers throughout the country limiting their work to the treatment of cancer and therefore it is treated for the most part in general hospitals. The excellent detailed reports from such specialized institutions as the Memorial Hospital of New York City are well known but perhaps do not give as clear a picture of the results obtained in a general hospital as might be desired.

Our purpose in this communication is to report a consecutive series of 145 cases of carcinoma of the oral cavity seen at the New Haven Hospital from Jan. 1, 1931 to Dec. 31, 1940 inclusive. The New Haven Hospital is a 510 bed institution serving an urban community of approximately 228,000 individuals in which during the decade under consideration there were approximately 625 practicing physicians and 210 dentists. If the two other hospitals in the city treated a similar number of persons in the same decade, a total of 435 people were afflicted with this disease in this period in the city. As the other institutions are somewhat smaller than the New Haven Hospital, it is highly unlikely that this was actually the case, and it is probable that the figure 350 would more closely approximate the number of patients treated. Moreover, many of these patients were referred from communities outside the city, and therefore the number seen by the professional men within the city and referred to the hospitals for treatment is undoubtedly less than 350. In other words, any given practicing doctor or dentist cares for an insignificant number of these persons in a lifetime of practice, and perhaps lack of familiarity with the disease and its management is an important factor in the poor results. There also may be a widespread, fatalistic tendency to give up in despair when such a disease is encountered. We do not deny that these tumors are difficult to handle, but this does not justify pessimism and should stimulate greater efforts toward earlier diagnosis, more intensive therapy and closer follow-up care. This study was not designed to analyze data such as sex incidence, nationality, age distribution and the incidence of various precancerous lesions such as leukoplakia, all of which are well known and have been discussed elsewhere; but to give the results of treatment, to discuss the causes of failure and the reasons for good results, and to suggest ways whereby the results might be improved. For this reason the group "primary admissions with treatment" has been established. To obtain this group it was necessary to exclude not only the patients who had received their initial treatment elsewhere and who came to this hospital

From the Department of Surgery, Yale University School of Medicine.
This investigation has been aided by a grant from the Jane Coffin Childs Memorial Fund for Medical Research.

for further treatment or consultation but also the patients who were in the "primary admission" class but who had either refused treatment or who had not been given treatment other than supportive because of far advanced disease. In other words, we were interested primarily in the results of our own therapeutic methods. The "secondary admission" class, the group of patients who came to New Haven Hospital after having been treated elsewhere, has been omitted from the final statistics.

The distribution of the cases is indicated in table 1. The largest group from the point of view of numbers was the hypopharynx and posterior tongue. Anatomically this consists of all tumors in the pharynx lying between the circumvallate papillae of the tongue and the extrinsic larynx. The anterior tongue group consists of all tumors of the tongue anterior to the circumvallate papillae; the floor of the mouth, of tumors in an area bounded laterally and anteriorly by the inferior alveolus and medially by the tongue; the alveolus, both upper and lower gum margins; the buccal mucosa, the mucous membrane lining of the cheeks and inner lips; the palate, both soft and hard palate; and the tonsil, tumors originating in the tonsillar fossa. There were a few cancers of the oral pharynx that were so extensive and involved such a large area (palate, tonsil, base of the tongue and floor of the mouth, for example) that they were difficult to classify as to the point of origin. Therefore, since they would have formed such a small group as to be completely meaningless, they were placed in the major groups according to where the bulk of the tumor lay.

The results are also shown in table 1. The best survival rate was obtained in the anterior tongue and buccal mucosa groups and the worst in the hypopharyngeal section. The comparative survival rates are similar to those quoted by Martin and his colleagues,[1] who have reported a 30 per cent five year survival rate for the buccal mucosa, 25.7 per cent for the alveolus, 25 per cent each for the tongue and the floor of the mouth, 19 per cent for the palate and 18 per cent for the tonsil. Richards [2] also indicates that carcinomas of the buccal mucous membrane and tongue are treated more successfully than in other locations in the oral cavity, although in this series of papers he does not give five year survival rates.

When carcinoma invades the local lymphatic system the treatment is always much more difficult, the prognosis more grave. It is generally considered that the five year survival rate when the lymph nodes are involved will be 50 per cent or less of that obtained when the lymph nodes are free of disease. Seventy, or 65 per cent of the total group of 108 (table 2), had lymph node involvement on admission or developed it at a later date, and only 4 of these, or 5.6 per cent, survived five years. On the other hand, 13 patients, or 35 per cent of the 37 patients who never had lymph node disease, were living at the end of five years. The highest rate of lymph node involvement occurred in the tonsil and hypopharyngeal groups, thus complicating already difficult therapeutic problems. An additional complication in the floor of the mouth and in the alveolus groups was direct extension of the disease into the adjacent mandible as determined by roentgenograms. Thirty-five per cent of the former group and 71 per cent of the latter were so involved.

TABLE 1.—*Oral and Pharyngeal Carcinoma, New Haven Hospital, 1931-1940 Inclusive.*

	Hypopharynx and Posterior Tongue	Anterior Tongue	Floor of Mouth	Alveolus	Buccal Mucosa	Palate	Tonsil	Total
Total admissions	35	29	23	23	14	14	7	145
Primary	32	25	20	18	13	14	6	128
Secondary	3	4	3	5	1	0	1	17
Male	32	26	21	21	9	12	7	128
Female	3	3	2	2	5	2	0	17
Lost in follow-up	0	3	0	0	0	0	0	3 (2%)
Primary admissions with treatment	26	22	17	14	13	11	5	108
Alive and well 3 years	3 (10%)	7 (32%)	6 (35%)	3 (21%)	3 (23%)	2 (18%)	1 (20%)	25 (23%)
Alive and well 5 years *	2 (8%)	5 (23%)	3 (18%)	2 (14%)	3 (23%)	1 (9%)†	1 (20%)	17 (16%)
Primary lesion controlled	6 (23%)	7 (32%)	10 (59%)	5 (36%)	4 (31%)	2 (18%)	1 (20%)	35 (32%)
Primary lesion not controlled	20 (77%)	15 (68%)	7 (41%)	9 (64%)	9 (69%)	9 (82%)	4 (80%)	73 (68%)
Cervical lymph node involvement	20 (77%)	13 (59%)	13 (76%)	8 (51%)	6 (46%)	6 (55%)	4 (80%)	70 (63%)
Mandibular involvement	..	..	6 (35%)	10 (71%)				

* Four patients are alive and well from three to five years; 1 anterior tongue, 1 hypopharynx, 1 floor of mouth and 1 palate.
† This patient is living with the disease.

The treatment of carcinoma in the mouth and pharynx is essentially a radiologic problem, since only a small number of cases are entirely suitable for surgery. There were only 3 patients in the five year survival group who were treated entirely with surgery. One was a young woman with a malignant papilloma of the tongue that was excised. The 2 others were patients with cancers of the buccal mucous membrane. In 1, local excision of the tumor was done and, in the other, local excision with a radical neck dissection was performed. All of the others were treated either with x-rays alone or with x-rays in combination with radium or radon. It seems imperative that, if a cancerocidal dose of radiation is to be delivered into the tumor, a tumor dose of 5,000 roentgens or more must be administered. The roentgen therapy department at the New Haven Hospital treats with x-rays to skin toleration with multiple external fields and, after the tumor has shrunk to its maximum degree as a result of this treatment, inserts interstitial radon so that the total tumor dose will be at least 5,000 roentgens. In the early years of the decade under discussion, however, many of the patients were totally inadequately treated according to present standards, and probably some could have been saved had they received adequate therapy.

There seem to have been several causes for failure. One of the most important, of course, is the frequency

1. Martin, H. E., and Pflueger, O. H.: Cancer of the Cheek (Buccal Mucosa), Arch. Surg. **30**: 731-747 (May) 1935. Martin, H. E.: Cancer of the Gums, Am. J. Surg. **54**: 1-37, 1941. Martin, H. E.; Munster, H., and Sugarbaker, E. D.: Cancer of the Tongue, Arch. Surg. **41**: 888-936 (Oct.) 1940. Martin, H. E., and Sugarbaker, E. L.: Cancer of the Floor of the Mouth, Surg., Gynec. & Obst. **71**: 347-359, 1940. Martin, H. E.: Tumors of the Palate (Benign and Malignant), Arch. Surg. **44**: 599-635 (April) 1942. Martin, H. E., and Sugarbaker, E. L.: Cancer of the Tonsil, Am. J. Surg. **52**: 1-39, 1941.

2. Richards, G. E.: The Radiological Treatment of Cancer, 1929-1935; IV. Intraoral Lesions (Except the Tongue), Canad. M. A. J. **35**: 599-603, 1936; The Treatment of Cancer of the Tongue, Am. J. Roentgenol. **47**: 191-206, 1942.

of lymph node involvement, which complicates the therapeutic program. It has been pointed out that 70 patients, or 65 per cent of the total group of 108, ultimately had lymph node involvement, as proved by biopsy or by the course of the disease. Eighty per cent of these 70 patients had disease in the lymph nodes at the time of admission, and 20 per cent of them developed metastases at a later date. In the early years of the period under discussion the management of this complication was inadequate and consisted of doses of radiation that are now considered much too small. In later years it has been the custom to manage these lymph nodes, in general, according to the indications and contraindications suggested by Duffy[3] for carcinoma of the tongue except that metastatic disease from carcinoma of the posterior tongue and hypopharynx is considered entirely a radiotherapeutic problem. Only 4 of these patients in this group have been salvaged. If one is to treat metastatic disease successfully, then a radical neck dissection must be done early provided the indications are met, but, if they are not, then heavy doses of radiation must be used. It is now the custom to cone down on the involved node and to give x-ray radiation to toleration. This is followed by interstitial implantation of radon so that the tumor dose will be 5,000 or more roentgens.

TABLE 2.—*Lymph Node Involvement*

	Primary Admissions with Treatment	Lymph Node Involvement		Total	Living and Well Five Years
		On Admission	Developed Later		
Hypopharynx and posterior tongue	26	19	1	20 (77%)	0
Anterior tongue	22	9	4	13 (59%)	2 (15%)
Floor of mouth	17	11	2	13 (76%)	0
Alveolus	14	6	2	8 (51%)	0
Buccal mucosa	13	3	3	6 (46%)	0
Palate	11	4	2	6 (55%)	1 (16%)*
Tonsil	5	4	0	4 (80%)	1 (25%)
Total	108	56	14	70 (65%)	4 (5.6%)

* This patient is living with the disease.

Another important cause for failure was inability to control the primary lesion. In table 1 it is pointed out that in only 35 of the 108 patients was the primary permanently controlled. The best results were obtained in the floor of the mouth, where the primary tumor was successfully and permanently controlled in 59 per cent of the 17 cases. The poorest results were in the palate, where only 2, or 18 per cent, of the 11 patients had permanent control of the primary tumor. As has already been stated, the principal cause for this failure was inadequate therapy, both surgical and radiologic, in the early years of this study. However, there are primary sites of oral carcinoma which are notoriously difficult to handle under any circumstances. The hypopharynx is such a region. Its vascularity, its rich lymphatic plexus and its inaccessibility as compared to other portions of the mouth and pharynx all contribute to this problem.

3. *Duffy, J. J.:* Cervical Lymph Nodes in Intraoral Carcinoma: Surgery or Irradiation? Am. J. Roentgenol. 39: 767-777, 1938.

Another factor which may be a cause of failure is delay on the patient's part in seeking treatment. This may not be as important as it at first seems and may be overshadowed by the inherent growth potentials of some tumors. It may account for the observation that occasionally a patient has symptoms for only a few weeks from a relatively small lesion, yet when the patient comes for treatment it is impossible to control the carcinoma by any known method, and it continues to grow rapidly with early death of the patient. If delay is arbitrarily defined as a period of more than two months elapsing between the time when symptoms first appear and the time when treatment is sought, then 65 per cent of the patients in the primary admissions group delayed. On the other hand, exactly the same proportion (65 per cent) of the patients who survived five years delayed more than two months before coming for treatment. This seems to be significant and furnishes food for thought when one considers the amount of work being done to have patients treated early.

Success in treatment is difficult to estimate. It can be defined in two ways: successful palliative management of a patient who from the first has an obviously hopeless tumor and in whom it is hoped only to obtain palliation; or it can be measured in terms of five year survival, which is the customary manner of gaging the effectiveness of therapy. Perhaps the two types of patients (the one with a hopeless tumor and the one with a hopeful lesion) should never be segregated from the point of view of management. Perhaps better success would always be obtained if one never allowed the thought of palliation alone to enter into the plan of treatment even though the disease seems to be advanced to a hopeless point. When the group of patients who have survived five years or more was analyzed in an attempt to determine reasons for the success in this group where treatment failed in the others, it was impossible to reach definite conclusions. An interesting observation was made, however, and will be illustrated by the following 3 cases:

CASE 1.—A white man aged 40 was admitted complaining of dysphagia of seven weeks' duration and a lump in the neck of two weeks' duration. Examination showed a large ulcerating carcinoma of the left tonsil and an involved lymph node in the left side of the neck. The first step in therapy was to remove the lymph node for biopsy purposes. It contained metastatic squamous cell carcinoma. The primary tumor was treated with x-ray radiation over a period of twenty-seven days to two lateral neck ports, each of which was given 2,800 roentgens measured in air. No other therapy was administered to the neck. The patient is now alive and well nine years after treatment.

CASE 2.—A white man aged 65 complained of a mass in the side of the neck of six months' duration. It measured 3 by 2 inches. It was excised and contained metastatic squamous cell carcinoma. Two weeks later a tiny primary was finally found by repeated biopsies at the base of the tongue. It was treated with 2,660 mgh. of interstitial radium. The area in the neck from which the tumor was excised was then given 2,400 roentgens of x-rays, measured in air, over a seventeen day period. This was followed in eight days by 3,325 mgh. of interstitial radium. The patient is alive and well ten years later.

CASE 3.—A white man aged 65 complained of an ulcer on the side of the tongue of three months' duration. It measured 1 cm. in diameter. The material removed for biopsy showed squamous cell carcinoma, grade 2. The primary tumor was treated with an intraoral cone and was given 4,862 roentgens, measured in air. Five months later a lymph node appeared in the side of the neck. It was excised and showed metastatic carcinoma. No other treatment was given. The patient is alive without disease six and one-half years after the last treatment.

According to our present standards, these 3 patients were among the least systematically managed of any of the entire group, yet they survived. This fact seems to emphasize the point that success in treatment depends as much on the degree of autonomy of the tumor and the host resistance as it does on such factors as delay in seeking treatment, extent of the tumor at the time of admission, intensity of therapy and adequacy of the follow-up. The lymph node in case 1 showed a pronounced degree of stroma reaction and was similar in appearance to nodes that have received radiation.

Another interesting possible factor influencing the success of treatment is brought out in table 3. We have long felt that mouth infection has a great deal to do not only with the origin of carcinoma in the mouth and upper gastrointestinal tract but also in the success of its management. It is a well known general impression that carcinoma in these locations is much more common in persons from a poor economic class whose dental care is neglected than it is in those from economically successful groups. We do not believe that trauma such as the actual chronic irritation from tooth snags is nearly as important as is the presence in the mouth over a long period of time of chronic dental infection in the forms of caries, pyorrhea and gingivitis which is continually feeding a possible etiologic agent

TABLE 3.—*Condition of the Teeth*

Condition of Teeth	*Primary* Admission with Treatment (83 of 108 Reporting)	Five Year Survivals (16 of 17 Reporting)	Failures (75 of 91 Reporting)
Good	2 (2%)	2 (13%)	0
Fair	7 (8%)	3 (19%)	4 (5%)
Poor	50 (56%)	4 (25%)	46 (63%)
Edentulous	28 (32%)	7 (43%)	21 (29%)
Complete false dentures	2 (2%)	0	2 (3%)
Total	89	16	73

into the mouth and upper gastrointestinal tract. It is also our impression that patients who have serious mouth infection do poorly under radiation therapy. Table 3 demonstrates that only 10 per cent of the group reporting had fair or good teeth and 56 per cent had poor teeth. Thirty-two per cent were edentulous. Thirty-two per cent of those who survived five years had good or fair teeth, and 25 per cent had poor teeth. Forty-three per cent were edentulous. In the failure group 5 per cent had fair teeth, 63 per cent had poor teeth and 29 per cent were edentulous. It is interesting to note that the 2 patients who had good teeth survived. These data are based on the condition of the teeth reported on the patients' records at the time of their admission to the hospital or clinic. It was impossible in a follow-up study such as this to find out the duration of dental decay in the persons with poor teeth or the period of time between the onset of dental decay and complete dental extraction in the persons who were edentulous. Both of these points deserve further study directed toward the possible relationship of the prolonged presence of mouth infection and carcinoma of the mouth, pharynx and upper gastrointestinal tract.

COMMENT

The therapy of oral and pharyngeal carcinoma is a difficult and discouraging problem. There can be only rare individuals who are naive enough to believe that radiation therapy and surgery are ideal therapeutic instruments. Yet, until something better is discovered, these two methods remain our only hope of obtaining survivals in the treatment of this as well as other cancer. Until that method appears, attempts at improving our results must be directed not only toward the more intelligent use of these two instruments but also toward making them more available to the general public and practicing physicians at large and toward educating the public and physicians in the early signs and symptoms of this disease. Perhaps it is incongruous to suggest, in face of the fact that it has been pointed out that there was no more delay in the failure group than in the successful, that early diagnosis is important. However, it is a simple platitude that a small tumor is more easily and satisfactorily treated than a large one, and if these individuals could only be seen when the lesion is small there is no doubt that greater success would be obtained.' Seven of the 26 patients with carcinoma of the hypopharynx stated at the time of admission that their chief complaint was a lump in the neck. In other words, more than 25 per cent of the patients in this group were complaining of something which indicated that for practical purposes the disease was beyond the curable stage. What would have happened if they could have been discovered when the tumor was only 1 cm. in diameter? Probably the only way that this could have been done and the only way that it can be accomplished in the future is for every one to have periodic examinations by an experienced physician. This would be a tremendous undertaking. The supply of doctors even in the postwar era probably will not be sufficient to do it and do it capably. The point has already been made that most physicians see only a few of these tumors in a complete lifetime of medical practice, and the problem in education and training men and women to recognize these lesions is equally appalling. But what other ways do we now have for detecting early cancer than in educating the populace at large in the signs and symptoms of the early disease and in training physicians to recognize the early disease when it *has appeared and to treat it adequately?* None whatever. Perhaps the time will come when a simple chemical test will suffice for diagnostic purposes, but that time has not yet arrived. The same educational program must be intensified in the dental profession as well as in the medical profession so far as oral carcinoma is concerned. Thirty-seven of the patients in this series had been seen first by a dentist. Ten of the 22 in the alveolus group had been seen and treated by a dentist before being referred for medical care, and 8 of these had delayed for more than two months. One had been under active care for nearly a year and a half. If our primary objective were only to find and treat the disease before the regional lymph nodes become involved, the salvage would be large. A specific example is the anterior tongue group, in which only 2 of the 14 patients with lymph node involvement survived five years, whereas 3 of the 9 without node involvement were living and well at the end of the same period.

As far as therapy itself is concerned, probably the cardinal point in successful management is attention to detail. The utmost care must be used in localizing the tumor and involved nodes if present, in localizing the treatment ports, in directing the treatment beam precisely not only at the initial treatment but also at all others, in management of the radiation reaction and in securing frequent follow-up examinations in the early post-therapy months so that, if an extension or

recurrence appears, further treatment can be initiated promptly. The problem of dosage is not complicated. If epidermoid carcinoma is to be destroyed, a dose of at least 5,000 roentgens must be delivered into the tumor. This usually requires supplementary interstitial radon in addition to roentgen therapy. Ideally the x-ray treatment should be administered in about twenty-one treatment days, and radon should be inserted when the tumor has regressed to its maximum degree. We believe that radiation should not be delivered so rapidly or so extensively that it will produce a pronounced degree of tumor necrosis with infection, because it is our impression that infection stimulates tumor growth.

SUMMARY

1. In a consecutive series of 145 cases of carcinoma of the oral cavity seen in a ten year period at the New Haven Hospital, the best results were in the buccal mucous membrane and anterior tongue groups, in which a 23 per cent five year survival rate was obtained.

2. The poorest result was in the hypopharyngeal group, in which an 8 per cent five year survival rate was obtained.

3. The outstanding cause of failure was inability to control the disease once it had extended into the regional lymph nodes.

4. The signs and symptoms of early disease and the principles of adequate therapy must be emphasized in educating the public and in training physicians and dentists, if the survival rates are to be improved.

IS DIGITALIS INDICATED IN MYOCARDIAL INFARCTION?

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Whether digitalis is of benefit in myocardial infarction is not generally agreed on. Many cardiologists believe that it should be used for congestive failure associated with myocardial infarction and especially if the congestive failure occurs with auricular fibrillation, but others have expressed doubt as to its ultimate value. Levine [1] believes "it is more likely to do harm than good." Conner [2] says that "among clinicians, the opinion is almost always . . . held that digitalis is dangerous." Fishberg [3] attributes much of the disrepute that digitalis suffers in myocardial infarction to its use in the early stages of shock rather than during congestive failure. He emphasizes that the theoretical dangers of digitalis in myocardial infarction are the production of (1) ventricular fibrillation, (2) rupture of the heart, (3) embolization, the latter two, he believes, being due to the more powerful systole, or (4) coronary constriction. He states, however, that whether or not these dangers are actual can be established only by observation of a large number of cases.

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1. Levine, S. A.: Clinical Heart Disease, Philadelphia, W. B. Saunders Company, 1941, p. 147.
2. Conner, L. A.: Conferences on Therapy: II. Treatment of Coronary Disease, J. A. M. A. 111: 2482-2488 (Dec. 31) 1938.
3. Fishberg, A. M.; Hitzig, W. M., and King, F. H.: Circulatory Dynamics in Myocardial Infarction, Arch. Int. Med. 54: 997-1019 (Dec.) 1934.

MATERIAL

This paper deals with the effect of digitalis in a group of 84 patients with auricular fibrillation, out of 1,247 patients with myocardial infarction admitted to the Los Angeles County General Hospital. Forty-four patients received digitalis alone, and 40 received either quinidine alone, quinidine and digitalis or no medication at all (table 1). Thirty-two patients with both congestive failure and auricular fibrillation were treated with digitalis alone. Congestive failure and auricular fibrillation are cardinal indications for digitalis therapy, and the results in these cases should be significant as to the good or bad effects of digitalis in myocardial infarction.

SUDDEN DEATH

The relation of the type of medication to sudden death (ventricular fibrillation?) is shown in table 1. Apparently there was no greater hazard from digitalis than from other medication. The 3 cases of sudden death following the use of quinidine occurred in 2 patients with intraventricular block and in 1 patient with prolonged atrioventricular conduction occurring prior to the onset of auricular fibrillation. Quinidine is ordinarily contraindicated in such cases.

RUPTURE OF THE HEART

Fifty-six patients were given digitalis alone or in combination with quinidine; rupture of the heart occurred in 3 (5.3 per cent). Seventeen patients were given no medication; rupture occurred in 1 (5.8 per cent). Digitalis apparently had no significant causative effect in these cases.

EFFECT OF DIGITALIS

Mortality and Types of Death.—The effect of digitalis on the 84 patients with auricular fibrillation was studied on two groups, one with congestive failure (48 cases) and one without congestive failure (36 cases). As "increasing congestive failure" and "progressive failure" are essential criteria of most cardiologists for the use of digitalis in myocardial infarction, only patients with liver enlargement and ankle edema were included in this group. Digitalization in most cases was fairly rapid, averaging 24 to 30 grains (1.5 to 2 Gm.) of the powdered leaf in three to four days. Thirty-two of the 48 patients with congestive failure received digitalis alone (table 2). Sixteen received other medication. Thirty-one of the 32 patients with congestive failure receiving digitalis alone died (96.8 per cent). Eleven of the 16 with congestive failure receiving other treatment died (68.7 per cent). Clinically recognized fatal embolism in the greater circulation occurred in 13 of the 31 who died in the group that received digitalis alone. Of the 13 with fatal emboli, in 7 emboli occurred in the cerebral circulation, in 5 in the femoral artery and in 1 in both the cerebral and femoral arteries. None of the 16 receiving other treatment had fatal embolism in the systemic circulation. In the 36 patients without congestive failure, digitalis alone produced no greater incidence of systemic embolism than did other types of treatment (table 3). Administration of digitalis alone seemed definitely associated with increased mortality and with increased systemic embolism in those with congestive failure but not in those without congestive failure. Because we were interested specifically in the effect of digitalis on intracardiac thrombosis, embolism in the greater circulation only was considered. Sudden hemiplegia, or sudden arterial obstruction in an extremity, if due to emboli from

intracardial thrombi, can arise only from emboli from the left side of the heart, save in the paradoxical embolism due to anomalies of the cardiac septums. Pulmonary embolism may often be due to peripheral venous thrombi. According to these data the danger of giving digitalis in myocardial infarction was not the danger of inducing ventricular fibrillation and sudden death or of producing cardiac rupture. The danger was not apparently in its administration to patients without congestive failure but was in the administration to patients with the cardinal indications for digitalis, those with congestive failure and auricular fibrillation.

HAZARD OF EMBOLISM

The hazard of giving digitalis, apparently, was chiefly the hazard of embolism. Embolism in the systemic circulation is dependent on the presence of mural thrombi in the left side of the heart and on a mechanism that releases them. The exact mechanism by which the

TABLE 1.—*Sudden Death (Ventricular Fibrillation ?) Occurring in Patients with Myocardial Infarction Plus Auricular Fibrillation: Effect of Medication*

Type of Medication	Number of Patients	Number Dying Suddenly (Ventricular Fibrillation ?)	Per Cent
Digitalis alone	44	7	15.9
[illegible]	17	3	17.6
[illegible]	11	3	27.2
[illegible]	12	0	0
Total	84	13	15.4

TABLE 2.—*Type of Death of 48 Patients with Congestive Failure and Auricular Fibrillation Complicating Myocardial Infarction*

	32 Patients Receiving Digitalis Alone	8 Patients Receiving No Drugs	7 Patients Receiving Quinidine and Digitalis	1 Patient Receiving Quinidine Alone
Systemic embolism (cerebral or peripheral vessels)	13	0	0	0
Pulmonary embolism	3	0	1	0
Acute congestive failure (both [illegible]	4	1	1	1
[illegible]	3	1	2	0
[illegible]	6	3	0	0
Pneumonia	1	0	0	0
Rupture of heart	1	1	0	0
Lived	1	2	3	0
Total	32	8	7	1
Return to sinus rhythm	3	0	5	1
Mortality	90.8%	75%	57.1%	100%

digitalis effect was exerted in producing the increased incidence of embolism is difficult to be certain about. Many factors are involved in the formation and dislodgment of the intracardiac thrombi. The group of cases in which digitalis was a hazard, that is, those with congestive failure, was the group which would naturally have a larger number of preexisting mural thrombi than the group without congestive failure and thus have more potential emboli. They were the ones with preexisting cardiovascular disease, often previous infarction and a longer standing auricular fibrillation which usually persisted.

IMPORTANCE OF PREEXISTING MURAL THROMBI

The importance of preexisting mural thrombi in producing embolism, and particularly the importance of the duration of auricular fibrillation in producing the thrombi, is suggested by the high incidence of fatal emboli in the group of 8 patients in whom auricular fibrillation had been known to exist before the onset of myocardial infarction. Of the 7 who died, 5 died of emboli in the greater circulation (71 per cent). All of these 5 had been given digitalis alone and the auricular fibrillation had persisted until death by embolism.

TABLE 3.—*Type of Death in 36 Patients with Auricular Fibrillation But Without Congestive Failure Complicating Myocardial Infarction*

	Digitalis Alone	No Medication	Digitalis and Quinidine	Quinidine Alone
Systemic embolism	1	2	1	0
[illegible]	1	0	1	0
[illegible]	3	2	0	1
Sudden death	1	1	0	3
[illegible]	2	1	1	0
[illegible]	1	0	1	0
[illegible]	0	0	0	1
[illegible]	3	3	1	5
Total	12	9	5	10
Returned to sinus rhythm	3	5	4	8
Mortality	75%	66.6%	80%	50%

The effect of old age in relation to mural clots[4] is evidenced by the increased age in this group. The average age was 70. The occurrence of systemic embolism was correlated also with the time of persistence of the arrhythmia following the attack of myocardial infarction. Of the 49 patients with auricular fibrillation persisting until death, 36 died in seven days or less and 13 died after seven days or more of the arrhythmia. Only 7 of the 36 (19.4 per cent) dying in the first week died of systemic embolism, whereas 9 of 13 dying after seven days of the arrhythmia died of systemic embolism (69 per cent).

Why did digitalis alone mobilize the thrombi in the patients with congestive failure, and not the other medication? Did it act by producing more potential emboli, that is, by forming more new mural thrombi or augmenting old intracardiac thrombi; or did it act by inducing dislodgment of the thrombi? Persistence of auricular fibrillation tends to produce new auricular clots and to augment old auricular clots. Digitalis ordinarily tends to fix and perpetuate the arrhythmia.[5] Theoretically the persistence of the arrhythmia should increase the number of potential emboli, which should be reflected by an increased incidence of actual emboli. All 13 of the patients with congestive failure who

TABLE 4.—*Intracardiac Thrombi Occurring in Patients with Congestive Failure, Auricular Fibrillation and Myocardial Infarction*

	Effect of Medication		
	Number of Necropsies	Number with Mural Thrombi	Per Cent
Digitalis alone	25	18	72
Digitalis and quinidine	3	3	100
Quinidine alone	1	1	100
No medication	8	6	75
	37	28	75.5

developed systemic embolism had persistence of the auricular fibrillation. All 13 had received digitalis alone. Increase of the blood coagulability should increase the

4. Kohn, C. M., and Levine, S. A.: Evaluation of the Use of Quinidine Sulfate in Persistent Auricular Fibrillation, Ann. Int. Med. 8: 923-938 (Feb.) 1935. Hay, W. E., and Levine, S. A.: Age and Auricular Fibrillation as Independent Factors in Auricular Mural Thrombus Formation, Am. Heart J. 24: 1-3 (July) 1942.

5. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, New York, Macmillan Company, 1941, p. 532.

number of intracardiac thrombi. de Takats [6] and Massie [7] recently have shown such an effect of digitalis. Theoretically, therefore, there are two effects of digitalis tending to produce mural thrombi and thus, by producing more potential emboli, tending to lead to a greater incidence of embolism. In the group with congestive failure examined at necropsy one would expect the patients who had received digitalis to show a higher incidence of mural thrombi than those receiving other medication. This was not found to be true (table 4). There was high incidence of mural thrombi regardless of the medicine. Perhaps this is too small a group to be significant. All those with congestive failure, however, had a high incidence of intracardiac thrombi (over 70 per cent). Only 7 of the 14 of the group without congestive failure examined at necropsy showed intracardiac thrombi.[8]

EFFECT OF DIGITALIS ON DISLODGMENT OF THROMBI

The effect of digitalis on heart size has been shown by Stewart [9] to vary, depending on whether or not congestive failure with an enlarged heart is present. A decrease in heart size occurred practically always when congestive failure was present but not necessarily when no congestive failure was present. If these data apply to our cases it may logically be inferred that the 39 patients with congestive failure receiving digitalis alone or digitalis and quinidine developed a decrease in heart size which did not occur with those not receiving digitalis or with those with no congestive failure who received digitalis. This action of digitalis on the enlarged heart, producing a slower stronger systole with a contraction in size of the ventricular cavity, theoretically could dislodge and expel a ventricular thrombus. Although the effect of digitalis in auricular fibrillation is essentially on the ventricle, Goodman and Gilman [5] say that the auricle is usually speeded both by the muscular and by the vagal effects. The composite effect of digitalis in congestive failure apparently is to expel thrombi. This mechanism could explain the high incidence of embolism in the patients with congestive failure. It is understandable but, from the standpoint of this problem, unfortunate that there are no accurate data as to the occurrence of emboli in congestive failure in heart disease in general with and without digitalis. The embolism occurring in patients with auricular fibrillation and congestive failure in heart disease without myocardial infarction possibly is the result of the expulsive action of digitalis on a heart with fewer mural thrombi than on the heart with myocardial infarction and thus fewer emboli. The incidence of embolism in such cases is so small in relation to the obvious benefit of digitalis that even though embolism admittedly was due to the drug it would be relatively negligible. In the patients with myocardial infarction whom we observed, the reverse was true. There was no obvious beneficial effect from the digitalis which outweighed the obvious harmful effect of producing embolism. Return of the sinus rhythm, formerly a supposedly notorious cause for dislodging auricular clots, occurs rarely after digitalis and was not a factor in our series. Only 3 of the 32 patients with congestive failure receiving digitalis alone returned to sinus rhythm.

Although the precise mechanism for the production of the increased embolism is not yet established, some deductions are justifiable in our cases. Congestive failure occurring in association with auricular fibrillation and myocardial infarction was associated with a very high incidence of mural thrombi (75 per cent) and the risk of fatal embolism after digitalis administration alone was very high. Digitalis apparently mobilized the thrombi in a dangerously high percentage, to such a degree that the risk of the drug became greater than the risk of the condition itself. Digitalis is particularly indicated in congestive failure of heart disease in general, but these results would seem definitely to impugn the congestive failure of auricular fibrillation occurring with myocardial infarction as an indication for the use of digitalis alone.

CONCLUSION

Digitalis alone used in congestive failure occurring with auricular fibrillation in myocardial infarction in 32 patients at the Los Angeles County General Hospital proved to be more harmful than beneficial. The hazard ordinarily considered the greatest, that is, the production of fatal ectopic ventricular rhythm with sudden death, was not in evidence. There was no increased hazard from cardiac rupture. The mortality was increased largely by the production of fatal emboli to the greater circulation. On the basis of these data, digitalis administered alone for the congestive failure associated with auricular fibrillation and myocardial infarction would seem contraindicated.

1930 Wilshire Boulevard.

6. de Takats, G.; Trump, R. A., and Gilbert, N. C.: The Effect of Digitalis on the Clotting Mechanism, J. A. M. A. **125**: 840-845 (July 22) 1944.

7. Massie, E.; Stillerman, H. S.; Wright, C. S., and Minnich, V.: Effect of Administration of Digitalis on Coagulability of Human Blood, Arch. Int. Med. **74**: 172 (Sept.) 1944.

8. C. F. Garvin (Mural Thrombi in the Heart, Am. Heart J. **21**: 713-720 [June] 1941) in 133 necropsies of patients with myocardial infarction without auricular fibrillation and not segregated as to the presence or absence of congestive failure found mural thrombi in 89 (66.9 per cent).

9. Stewart, H. J.; Crane, N. F.; Deitrick, J. E., and Thompson, W. P.: Action of Digitalis in Compensated Heart Disease, Arch. Int. Med. **62**: 547-568 (Oct.) 1938. Stewart, H. J.; Crane, N. F.; Deitrick, J. E., and Wheeler, C. H.: Action of Digitalis in Uncompensated Heart Disease, ibid. **62**: 569-592 (Oct.) 1938.

ACETYL-BETA-METHYLCHOLINE IN ADDISON'S DISEASE

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It has long been established that the disturbances in water, electrolyte and carbohydrate metabolism in acute adrenal cortical insufficiency may be corrected by adequate replacement therapy. Under certain circumstances, however, sudden circulatory collapse and even death may occur in patients with Addison's disease despite control of these other factors. These circumstances notably include infections, minor traumatic injuries or operative procedures, and they sometimes take place without apparent cause.

Swingle and his associates [1] have pointed out that fatal collapse in adrenalectomized animals need not involve changes in salt and water balance. Loeb [2] has observed a number of patients with Addison's disease who died a typical addisonian death but without the characteristic chemical changes in the blood serum and while receiving desoxycorticosterone. He has suggested that a disturbance in vasomotor regulation, either peripheral or central, may be responsible and that this is

Dr. Robert F. Loeb made many constructive suggestions.
From the Department of Medicine, Columbia University College of Physicians and Surgeons, and the Presbyterian Hospital.

1. Swingle, W. W., and Remington, J. W.: The Role of the Adrenal Cortex in Physiological Processes, Physiol. Rev. **24**: 89-127 (Jan.) 1944.

2. Loeb, R. F.: The Adrenal Cortex and Electrolyte Behavior, Bull. New York Acad. Med. **18**: 263-288 (April) 1942.

not consistently controlled by the cortical hormones now available. Despite these speculations, systematic studies of autonomic responses in patients with adrenal insufficiency have not been carried out.

The present study was undertaken to compare certain pharmacodynamic responses in patients with adequately treated adrenal cortical insufficiency and patients without disease of the adrenal gland. For this purpose the reactions of these two groups to the administration of acetyl-beta-methylcholine has been observed.

METHODS

Acetyl-beta-methylcholine chloride[3] 2.5 mg. was administered subcutaneously to 10 hospital patients as controls and on six occasions to 5 patients with Addison's disease. The control group included only cases free of hypertensive vascular disease[4] and endocrine disturbances. The diagnosis in the addisonian group had been previously established in all cases in the wards of the Presbyterian Hospital. The clinical diagnosis was confirmed by the presence of a low sodium concentration of the blood serum during a crisis or as a result of the withdrawal of salt from the diet. The experiments with acetyl-beta-methylcholine were carried out at a time when serum sodium concentrations were between 136 and 140 milliequivalents per liter as calculated by the indirect method.[5] Four of the patients studied were being treated with desoxycorticosterone acetate,[6] with or without additional salt, and 1 was being maintained on salt alone.

The systolic pressure at the time observations were made was 104 mm. of mercury or higher in all but 1 of the addisonian group. Except for this patient, whose arterial pressure was 92/60, the blood pressures were entirely comparable in the two groups. The plasma volume was determined in 1 patient with the blue dye T..1824 on the day of injection and found to be within the estimated normal range based on body surface area.

All observations were made with the patients lying in bed with a 30 degree head gatch. Blood pressures were recorded every minute for at least ten minutes prior to the administration of acetyl-beta-methylcholine and until at least five successive readings showed a systolic and diastolic fluctuation of not more than 4 mm. of mercury. After injection, readings were made at half-minute intervals and the lowest systolic and diastolic levels recorded until values had returned to their initial levels. Because of the potential hazards of even such minor procedures in patients with Addison's disease, atropine was kept at hand for immediate hypodermic use and solutions of saline and glucose were available for intravenous injection.

RESULTS

In the 10 control patients a slight drop in blood pressure was observed two to four minutes following the subcutaneous injection of 2.5 mg. of acetyl-beta-methylcholine. The decrease averaged 6 mm. of mercury systolic, with even less diastolic change. In the control group subjective symptoms were minimal. Two patients noted a slight sense of warmth, and 1 complained of epigastric "rumbling." There was no significant change in pulse rate.

In contrast to the control group the subjective and objective effects in the patients with Addison's disease were much more pronounced and at times reached alarming proportions. Within two to three minutes after injection, blood pressures reached their lowest levels, the average systolic decrease being 22 mm. of mercury, the diastolic 19 mm. In association with this more pronounced hypotension all the patients noted flushing, sweating and a sense of increased peristaltic activity; 3 had loose bowel movements shortly afterward. A slight but definite tachycardia was the rule. The blood pressure returned to its initial levels within five to ten minutes after the injection.

Atropine sulfate in doses of 0.6 mg. was given subcutaneously to 2 patients with Addison's disease a few minutes prior to the administration of acetyl-beta-methylcholine. In these patients the effects of the acetyl-beta-methylcholine were blocked, the response being similar to that observed in the control group. In 1 patient with Addison's disease 0.3 cc. of 1:1,000 epinephrine hydrochloride was given hypodermically five minutes before acetyl-beta-methylcholine. Palpitation and tachycardia were noted, with a rise in blood pressure from 122/82 to 140/86. However, the response to subsequent administration of acetyl-beta-methylcholine was not altered. To exclude the possible effects of the hypodermic injections alone, 2 patients with adrenal cortical insufficiency received sterile water subcutaneously without significant change in blood pressure or the development of symptoms.

Effect of Acetyl-Beta-Methylcholine on Blood Pressure

Normals		Hypoadrenalism	
Before	After	Before	After
122/84	116/80	104/68	78/48
136/86	130/80	92/60	68/40
110/78	104/76	108/70	94/58
100/68	90/64	122/84	100/62
116/80	110/78	116/76	84/52
124/78	120/80	138/86	114/70
104/64	96/60		
100/74	94/60		
110/70	104/64		
116/74	114/70		
Mean Values			
114/76	108/71	113/74	91/55

In 1 addisonian patient a blood sugar value of 96 mg. per hundred cubic centimeters was obtained at the peak of the acetyl-beta-methylcholine response to indicate that hypoglycemia did not contribute to the symptom complex. As already stated, the plasma volume was determined in 1 patient on the day of injection and found to be within the estimated normal range. This measurement was undertaken to exclude the possibility that patients with hypoadrenalism were not more vulnerable, owing to a reduced circulating blood volume.

COMMENT

In Addison's disease, susceptibility to cold, acrocyanosis, venospasm following introduction of a needle (as judged by abnormally high venous pressures which fall after relaxation and the application of heat) and sudden circulatory collapse after comparatively minor stimuli are among the features not infrequently observed in patients in this clinic. These disturbances are encountered not only in the presence of patent insuffi-

3. Mecholyl chloride, Merck & Co.
4. Engle, D. E., and Binger, M. W.: The Response in Blood Pressure of Hypertensive Patients to Acetyl-Beta-Methylcholine, Am. J. M. Sc. 198: 609-616 (Nov.) 1939.
5. Loeb, R. F.: Diseases of the Adrenals, in Christian, H. A., and Mackenzie, J.: Oxford Medicine, New York, Oxford University Press, 1921, vol. 3, p. 804.
6. Desoxycorticosterone acetate (Doca) was furnished through the courtesy of Dr. R. D. Shaner of Roche-Organon, Inc., Nutley, N. J.

ciency but also after electrolyte and water balance are restored to normal and when hypoglycemia is not present. This suggests that even in the adequately treated addisonian patient there exists a disturbance in the peripheral vascular system not corrected by the usual forms of therapy.

Although the lability of the peripheral vascular system may be due in part to faulty intermediate metabolism [1] or to some obscure cardiac factor,[7] some observers have noted a reduced sensitivity to pressor agents [8] and others have presented evidence of capillary dilatation and increased permeability.[9]

It has been possible in the present study to demonstrate a difference in the response of addisonian patients, maintained by salt or desoxycorticosterone, and certain nonaddisonian patients to the administration of acetyl-beta-methylcholine. The reaction of the group with hypoadrenalism was qualitatively similar to the control group, but the quantitative difference was striking. The specificity of the response was indicated by the fact that it could be minimized by the prelimiary administration of atropine.

Further evidence of the increased susceptibility of the addisonian group to acetyl-beta-methylcholine was afforded by the fact that the blood pressure of these patients and the control group was essentially the same before the injection of the cholinergic drug. The increased reaction to acetyl-beta-methylcholine could not be correlated with a deviation of the blood sugar or plasma volume from normal.

The apparent increased sensitivity of the addisonian group to parasympathetic stimulation cannot be attributed solely to a decrease in cardiac output, since increased intestinal peristalsis and flushing of the skin accompanied the fall in blood pressure and tachycardia.

CONCLUSIONS

1. Acetyl-beta-methylcholine 2.5 mg. subcutaneously given on six occasions to 5 patients with hypoadrenalism caused a pronounced blood pressure drop far out of proportion to that observed in 10 controls without adrenal disease.

2. Sweating, flushing and increased intestinal peristalsis accompanied the reaction in the group with Addison's disease, whereas associated symptoms were much less evident in the control group.

3. These abnormal responses in addisonian patients took place even though the patients were maintained in electrolyte and fluid balance and while receiving adequate therapy with salt or desoxycorticosterone.

4. The increased sensitivity of patients with treated Addison's disease to acetyl-beta-methylcholine suggests that in adrenal cortical insufficiency there is a defect in the response of the autonomic nervous system.

5. This defect may contribute to the inability of the treated addisonian patient to react normally to altered environment conditions or minor stimuli of many kinds.

7. Cleghorn, R. A.; Clarke, A. P. W., and Greenwood, W. F.: Activity of Desoxycorticosterone Acetate in Propylene Glycol by Oral and Intravenous Routes in Adrenalectomized Dogs, and Its Effect on the Cardiac Arrhythmia of Adrenal Insufficiency, Endocrinology **32**: 170-175 (Feb.) 1943.

8. Remington, J. W.; Collings, W. D.; Hays, H. W.; Parkins, W. M., and Swingle, W. W.: The Response of the Adrenalectomized Dog to Renin and Other Pressor Agents, Am. J. Physiol. **132**: 622-628 (April) 1941.

9. Maes, J.: Etude du syndrome surrénoprive de la grenouille, Arch. internat. de physiol. **45**: 135-188, 1937. Menkin, V.: Effect of Adrenal Cortex Extract on Capillary Permeability, Am. J. Physiol. **129**: 691-697 (June) 1940. Cope, O.; Brenizer, A. G., Jr., and Polderman, H.: Capillary Permeability and the Adrenal Cortex: Studies of Cervical Lymph in the Adrenalectomized Dog, ibid. **137**: 69-78 (Aug.) 1942.

Clinical Notes, Suggestions and New Instruments

KALA-AZAR (VISCERAL LEISHMANIASIS) SIMULATING SPLENIC ANEMIA

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Kala-azar (visceral leishmaniasis) is an infectious disease resembling clinically in many respects chronic malaria and undulant fever. It is characteristically associated with an irregular, recurring fever over a period of weeks, sometimes having a double daily rise, progressive enlargement of the spleen, followed by hepatomegaly, and usually later in the course of the disease anemia, leukopenia and progressive wasting. According to Manson-Bahr [1] the disease may vary a great deal in its onset. As stated in the beginning, it may be characterized by a chronicity simulating other prolonged recurring infectious diseases. On the other hand, in a small percentage of cases it may be characterized by a latency without symptoms and present its activity by an acute onset with predominantly abdominal symptoms, high temperature and associated toxic manifestations. The etiologic agent is Leishmania donovani, a protozoan organism which occurs in the Leptomonas (flagellate) form in the bodies of various insects and in artificial culture mediums. The vector is suggestively a blood sucking sand fly of the genus Phlebotomus. Also the disease may be possibly transmitted through the ingestion of food or drink contaminated with Leishmania donovani or by contact.

The disease is widespread and occurs in the Mediterranean countries, southern Russia, India, China, Manchuria, Abyssinia, Sudan, northern and eastern Brazil, the Chaco region of Argentina, the Paraguay-Brazil border and northern Bolivia. Its appearance in recent years in the Western Hemisphere has been limited to South America. Incidence of the disease in the United States has been limited to imported cases.[2] Indeed, kala-azar has been observed so infrequently in North America that it is rarely considered in this country as a cause of splenomegaly and the other signs and symptoms.

Recent importation of prisoners of war to the United States and the return of American soldiers from countries where leishmaniasis is endemic should stimulate current medical thought in this country as to the importance of this disease in future cases of unexplained splenomegaly and associated signs and symptoms. With this thought in mind the present case is reported.

REPORT OF CASE

An enlisted man aged 22, Italian, entered the Station Hospital at Hill Field, Utah, Sept. 26, 1944, complaining of severe left sided abdominal distress and distention of four days' duration.

His past history was essentially negative. He was born in Gravellona di Lomellina, province of Pavia, Italy, and except for frequent colds in childhood his health generally had been quite good. He entered the Italian army Jan. 15, 1942, at which time he weighed between 135 and 140 pounds (61 to 63.5 Kg.). While in Sicily in September 1942 he had an illness characterized by chills and fever for four days which was diagnosed as malaria. It subsided following the administration of quinine. There were no recurrences of this illness. On July 23, 1943 he was taken prisoner in Sicily by the American forces and eventually sent to the continental United States, where he became a member of an Italian service unit.

On admission to the Station Hospital the patient was malnourished and weighed about 110 pounds (50 Kg.). He appeared critically ill. His temperature was 100.8 F., the pulse rate was 112 and the respiratory rate was 20 per minute. The outstanding physical finding was confined to the abdomen,

1. Manson-Bahr, Philip: Synopsis of Tropical Medicine, Baltimore, Williams & Wilkins Company, 1943.

2. Mathieson, D. R., and Watson, B. A.: Kala-Azar, J. A. M. A. **112**: 308 (Jan. 24) 1939. Price, F. L., and Mayor, R. A.: A Case of Kala-Azar, ibid. **125**: 490 (June 17) 1944.

which was described as grossly distended, with pronounced tenderness and splinting, particularly on the entire left side. There was dulness on percussion in the left abdomen and flank.

Laboratory studies at this time revealed that the leukocyte count was 4,000, with 55 per cent polymorphonuclear cells, 35 per cent lymphocytes and 10 per cent monocytes. The urine showed a trace of albumin and numerous fine granular and hyaline casts. Repeated blood smear examinations for malaria were negative. Blood cultures were negative. The white blood cell count ranged from 2,600 to 6,200, with a tendency to a slight predominance of polymorphonuclear leukocytes. The hemoglobin varied between 60 and 80 per cent, and the red blood cell count ranged around 3,560,000. The sedimentation rate was 31 mm. per hour (Westergren method).

The patient continued to have considerable abdominal pain and distress, with an irregular febrile course and tachycardia, and because of this he was tentatively thought to have a peritonitis secondary to a possible splenic abscess. Glucose in saline solution was given intravenously, Wangensteen suction employed and oxygen inhalations administered. On September 29 penicillin therapy was started, 20,000 units every three hours intramuscularly for a total of 1,190,000 units. On September 30 plasma was given. On September 31, October 1 and October 4 transfusions of 500 cc. of citrated blood were given.

On October 8 the abdominal findings previously described were interpreted as a mass, most likely the spleen. By October 14 the patient's condition had improved. X-ray scout films of the abdomen were taken and revealed a large, soft tissue mass extending from the left diaphragm to just below the left iliac crest. This was considered to be the spleen, since the left kidney could be easily outlined beneath the mass. The patient's condition became stationary, and because of the diagnostic problem involved he was transferred to Bushnell General Hospital November 16 for further observation.

On this date the patient appeared cachectic, with a protuberant abdomen which at first glance suggested the presence of ascites. Palpation, however, disclosed the prominence to be due to a large firm, smooth mass occupying the entire left half of the abdomen, extending to the right of the midline into the pelvis just below the umbilicus (fig. 1). The lower pole of this mass in the pelvis was quite tender. There was no enlargement of the liver, nor were there any distended superficial abdominal veins. There was no lymphadenopathy nor icterus. There was pronounced wasting and atrophy of all skeletal muscles. There was no edema. The heart and lungs were normal. The pulse rate was 100, rhythm regular, blood pressure 95/70. The patient's height was 64½ inches (163 cm.). His nude weight was 111 pounds (50 Kg.).

Previous radiographic studies left little doubt as to the abdominal mass being the spleen. The case therefore became a diagnostic problem revolving about an enlarged spleen, associated anemia, cachexia, albuminuria and low grade fever. The possible diagnoses included the more likely causes of splenomegaly and embraced the following possibilities: Banti's syndrome ("Banti's disease"), thrombosis of the splenic vein, splenic infarction, leishmaniasis, schistosomiasis, chronic malaria, Hodgkin's disease, leukemia, primary neoplasm of the spleen, primary amyloidosis of the spleen, gumma or tuberculoma of the spleen.

Examination of the urine on entry showed a trace of albumin and 15 to 20 white blood cells per high dry field. Frequent urine examinations revealed a persistent, moderate albuminuria, low specific gravity with moderate numbers of red and white blood cells and hyaline and granular casts. Blood nonprotein nitrogen was 35 mg. per hundred cubic centimeters, plasma proteins 7.1 Gm. per hundred cubic centimeters, albumin 1.2 Gm. per hundred cubic centimeters, globulin 5.9 and 7.5 Gm. per hundred cubic centimeters with a persistently reversed albumin-globulin ratio. An intravenous phenolsulfonphthalein dye excretion test showed 57 per cent excretion of the dye in one hour and 27 per cent excreted in the first half hour. The sulfobromophthalein liver function test showed 32 per cent retention of the dye in the blood stream after five minutes and no retention after twenty minutes. The congo red test showed 20 per cent retention of the dye in the blood at the end of one hour. The icterus index was normal.

Examination of the blood revealed a hemoglobin of 9.8 Gm. (63 per cent), erythrocytes 3,480,000, reticulocytes less than 0.1 per cent, platelets 33,000, bleeding time eleven minutes, clotting time twelve minutes, prothrombin time 62 per cent of normal control, normal fragility test, hematocrit 32 per cent, sedimentation rate 125 mm. in sixty minutes and a leukocyte count of 4,100 with 56 per cent lymphocytes, 2 per cent monocytes, 1 per cent basophils, 39 per cent mature polymorphonuclear leukocytes and 2 per cent juvenile forms. Blood smears showed 53 per cent of the white blood cells to be peroxidase negative and 47 per cent peroxidase positive. Serologic tests of blood and spinal fluid were negative. Frequent smears of the blood were examined for malarial parasites and found to be negative also after the injection of epinephrine. Numerous smears were examined for Leishman-Donovan bodies in the circulating blood and bone marrow and were likewise negative. Because of consistently negative findings and inadvertence the formol-gel test was not done at this time. The tuberculin test gave a 4 plus reaction in forty-eight hours. Numerous stool examinations were negative for parasites. Agglutination tests for undulant fever were negative.

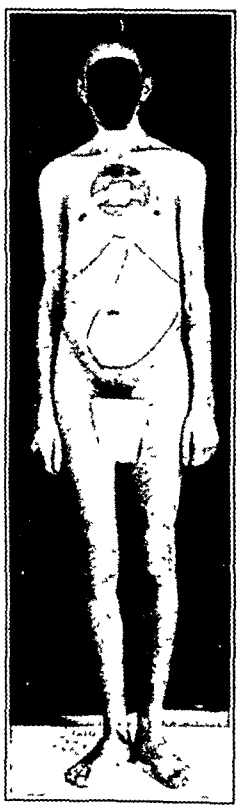


Fig. 1. — Appearance of patient, showing emaciation, generalized muscular atrophy and outline of enlarged spleen.

X-ray films of the skull, chest and pelvis for possible metastatic lesions were negative. A gastrointestinal series revealed no esophageal varices nor other abnormality of the upper gastrointestinal tract. A barium enema demonstrated a large extrinsic mass displacing the transverse colon and splenic flexure downward, occupying the left side of the abdomen and descending into the pelvis.

By December 8 the patient developed a pronounced leukopenia. The total white cell count dropped to 1,800 cells per cubic millimeter with 45 per cent polymorphonuclear leukocytes, hemoglobin 88 per cent (13.8 Gm.) and red blood cell count of 4,370,000. The gums began to bleed and appeared quite spongy. The blood ascorbic acid at this time was 0.2 per cent and appropriate vitamin therapy was initiated. The patient's general condition seemed to be slowly regressive. Splenic puncture was considered, but because of the danger of uncontrollable bleeding and the debatable nature of the splenic lesion exploration was agreed on. Between December 12 and December 14 the patient was given several transfusions of whole blood and 270,000 units of penicillin preceding surgery.

On December 14 laparotomy was performed under gas-oxygen anesthesia by Col. Henry G. Hollenberg and Major Clyde S. Roof. A long left rectus incision was made through which the enlarged spleen was palpated. It was relatively soft, with many fine adhesions. The liver, gallbladder and kidneys were normal. A few small nodes were present at the hilus of the spleen and later removed for biopsy. The incision was extended in both directions and transversely to the left in the form of a T. The perisplenic adhesions were broken by blunt dissection. They were particularly dense over the dome. There was considerable bleeding. The splenic vein was found to be free of thrombi. The splenic arteries were quite small. The pedicle was clamped and the spleen removed without undue difficulty. During and immediately after surgery the patient received 6,000 cc. of fluid, including plasma, whole blood and glucose in saline solution. The patient's postoperative course was a bit stormy for the ensuing twenty-four to thirty-six hours, but

with further supportive treatment his condition improved rapidly and was uneventful thereafter.

The spleen weighed 1,770 Gm. and measured 30 by 15 by 8 cm. (fig. 2). The external surface was mottled and gun metal gray. The capsule was thin. Over its surface were many small, fibrillar adhesions and irregular patches of fibrous tissue. Two irregular fibrotic areas, firm and brownish yellow, appeared to be infarcts. On cut section the splenic substance was uniformly dark reddish gray. Malpighian elements and trabeculations were not conspicuous. The pulp was firm and did not scrape away. The consistency was rubbery resilient. The splenic artery and vein were normal in appearance.

Microscopically the conspicuous features were the uniform dilated sinusoids containing scattered monocytes, large histiocytes and occasional polymorphonuclear leukocytes The sinusoids, however, were relatively empty, their walls being lined with elongated or flattened cells. The intervening pulp spaces were quite cellular, with a predominance of monocytes, a few plasma cells and occasional polymorphonuclear leukocytes. Trabeculations were not increased and there was little, if any, excess fibrous tissue. Malpighian elements were of the usual size and architectural configuration.

The small infarcted areas showed various stages of organization, characterized by the presence of amorphous material containing cellular débris, poorly stained cells and polymorphonuclear infiltration. Throughout the more fibrous portions of the infarct were noted brown pigmented monocytes, lymphocytes, plasma cells, scattered histiocytes and large, pale, clear foam cells.

Giemsa stain of the formaldehyde fixed material and Wright's stain of impression smears showed many Leishman-Donovan bodies within the large monocytes (fig. 3).

Histopathologic studies of the lymph nodes found at the hilus of the spleen were not remarkable except that Leishman-Donovan bodies were observed in many monocytes and reticuloendothelial cells.

On December 16 the patient was given 4 cc. of a 1 per cent solution of antimony and potassium tartrate intravenously, on the 18th 3 cc. of a 2 per cent solution and on the 20th 4 cc. of a 2 per cent solution. On December 21 he was given 0.2 Gm. of neostibosan intravenously and then 0.3 Gm. daily until the 27th. From that date he was given 0.3 Gm. every other day



Fig. 2.—Enlarged spleen, weighing 1,770 Gm.

until a total dosage of 4.7 Gm. of the drug had been administered. The patient's improvement was quite noticeable shortly after the institution of neostibosan therapy and was characterized clinically by an augmented appetite, normal temperature, gradual gain in weight and increase in sense of well-being. He was ambulant ten days postoperatively. The blood picture reached a stationary level with hemoglobin 90 per cent (14 Gm.), 4,500,000 red blood cells per cubic millimeter, 9,400 leukocytes per cubic millimeter, 50 per cent mature polymorphonuclear leukocytes and 2 per cent juvenile forms, 4 per cent eosinophils, 42 per cent lymphocytes and 2 per cent monocytes. By January 1945 the platelet count had risen to 150,000, the reticulocyte count was 1.1 per cent, clotting time was four minutes five seconds, bleeding time was three minutes fifty-five seconds, pro-

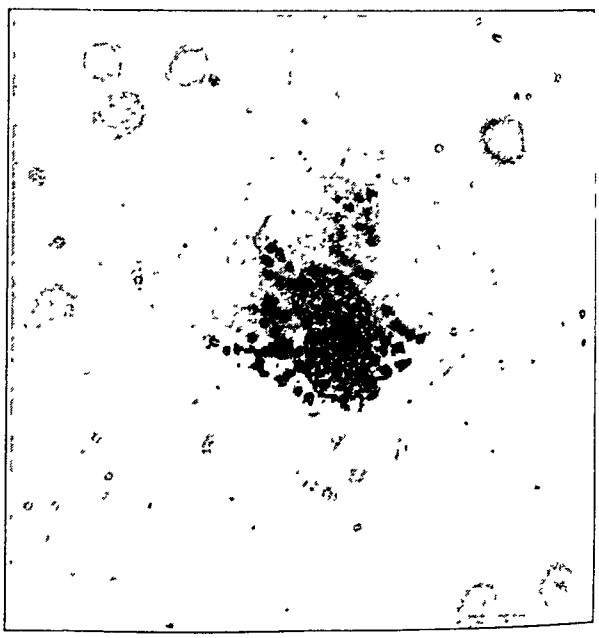


Fig. 3.—Leishman Donovan bodies within enlarged monocyte.

thrombin time was 95 per cent of normal control, hematocrit was 45 per cent and the sedimentation rate was 94 mm.

Numerous blood smears for Leishman-Donovan bodies were negative. The formol-gel test, which was strongly positive at first, gradually became less so, and at the time of this writing it is only faintly positive. The plasma proteins were 7.8 Gm. per hundred cubic centimeters, albumin 1.6 Gm. per hundred cubic centimeters, globulin 6.2 Gm. per hundred cubic centimeters and the albumin-globulin ratio 0.2. Urinary examination was negative except for a faint trace of albumin

SUMMARY

Kala-azar simulating splenic anemia was found in a 22 year old Italian enlisted man, who in all probability contracted the disease in Sicily. Following a presumptive latent period of two years the disease appeared with manifestations resembling an acute surgical condition of the abdomen.[3] Splenectomy was performed because of the patient's very poor progress and apparently hopeless prognosis, the mechanical abdominal discomfort, the undetermined cause of the splenomegaly and finally its possible therapeutic value. Histopathologic studies of the spleen showed the presence of Leishman-Donovan bodies, which were not found preoperatively in numerous examinations of the circulating blood and bone marrow. The patient's postoperative course was uneventful and apparent recovery has been accomplished by the administration of neostibosan.

ADDENDUM

Since this article was submitted, the Army Medical Museum has reported that Leishman-Donovan bodies were found in the button bone biopsy which was done during the diagnostic course. It is stated, however, that their identity would have been questionable without the knowledge of the fact that the patient had kala-azar. But they were present in the bone. Also in *War Medicine*, March 1945, there have been reported by Captains Joseph H. Burchenal, M. C., and Robert P. Woods, M. C., 3 cases of kala-azar in American troops returning from overseas, which serves to accentuate the warning as expressed in this report.

3. Burke, E.: Abdominal Pain in the Diagnosis of Early Kala Azar Tr. Roy. Soc. Trop. Med. & Hyg. 37: 441 (May) 1944.

Special Article

AMERICAN HEALTH RESORTS

THE PLACE OF SPA THERAPY IN THE TREATMENT OF CARDIOVASCULAR CONDITIONS

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These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

"Though chronic disease frequently remains with the patient, its proper management and treatment often controls and nearly always slows the progress of the disease, and such treatment teaches the patient to accommodate himself to his physical limitations and to live a useful and happy existence without further injury. It also teaches him to increase the reserve of the handicapped functions. It makes clear to the patient the wisdom of utilizing fully such functions as have little or no handicap and reeducates him to get joy out of doing things which he can do rather than insisting on doing the things which he cannot do." [1]

The problem of cardiovascular disease is the largest in size in the field of chronic disease.[2] Vital statistics show that it leads all other causes of death in those over 45 years of age. The studies of the American Heart Association indicate that between 1.5 and 2 per cent of the population of this country are afflicted with it in one form or another. In the attempt to ameliorate this situation there have been established a few private and public facilities organized as sanatoriums or as spas. My purpose in this paper is to create a clearer concept of what a spa as conducted in this country consists, how it functions, and what its relationships and availability are to the practitioner at large.

The physical components of a spa which concerns itself largely with cardiovascular disease are presumably well known to all physicians, but it might be well to visualize in a few words the essentials: reasonably level, pleasant, spacious and partly wooded terrain, of not too great altitude and with a climate which for the greater part of the year is equable and moderate as to heat, cold and humidity, accommodations for the varying social economic levels—accommodations which specialize in the particular needs of the patient; facilities for physical therapy; suitable amusements and relaxations. The concept should be one of pleasant and peaceful surroundings with the tempo of life slowed.

With these tools at hand it is the purpose of the spa physician to establish a maximum of cardiac reserve and to teach the patient to live within his individual capacity. The opportunity created during a period of several weeks is exceptional in that the patient is seen daily and at some length. The physician learns in detail not only the physical but the emotional status of his patient and of almost equal importance the impact of his environment. An understanding of these factors points the way toward the solution of the problem as far as it can be solved.

It would perhaps be pertinent to emphasize the wisdom on the part of the home physician in forwarding to the spa physician a summary of the case history with progress together with essential laboratory data, since the spa physician is attempting to carry on in perhaps greater detail and with more leisure the ideas and wishes of the home physician. A mutual understanding of what is to be undertaken is highly essential. This, however, does not preclude the necessity of a competent examination on the part of the spa physician, since it is more than a little difficult to get an adequate picture of the myocardial status from letters and laboratory reports, and the success of a regimen depends particularly on a careful estimate of what the individual heart is capable and a goodly amount of supervision in the doing of it. Many changes and adjustments in detail take place during the program.

Conceivably some misunderstanding might exist concerning the types of patient to whom the spa regimen is suited, and a word in the matter would seem warranted. He is ambulatory. He may have a mild degree of congestive failure but no more, or a moderate degree of coronary failure. Often he is in that phase of convalescence between the end of hospitalization and the return to routine. Frequently he has suffered a mild to moderate damage from coronary thrombosis. More often he is represented by the patient suffering from a coronary insufficiency gradually increasing through the years and who returns annually for a period of self discipline and reconditioning. A lesser number constitute the group afflicted by quiescent and compensated rheumatic heart disease, but by far the largest group suffer with hypertensive disease with varying degrees of myocardial damage.

Experience has shown that patients with syphilitic heart disease do not do well, nor patients who are prone to frequent attacks, though often mild, of edema of the lungs.

It is more than likely that the physician referring a patient to a spa would for his own knowledge and for the sake of advice to his patient wish to have some concept of what constitutes a spa regimen. The general plan of treatment entails a fairly thorough organization of the patient's day and has to do largely with rest, exercise, diet and the teaching of a calm, philosophic outlook on life in general and on the cardiovascular handicap in particular. Also it has to do with the matter of a mineral bath, the essence of which is carbon dioxide, an agent of considerable potency as a cardiac and respiratory stimulant and as a vasodilator.

One considers the matter of rest first because it plays so large a part in the restoration of cardiac competence and in the retardation of the progress of cardiovascular disease. It conceives not only of physical rest but also of that state of emotional equilibrium which is well expressed by the term "calm philosophy of life." It implies a controlled emotional state that permits true relaxation. It necessitates freedom from problems to be solved and from moral obligations to be met. It implies also suitable recreation.

The amount of physical rest needed can be determined best by the status of the myocardium and its response to effort. It falls naturally into periods following major meals and varies in amount with the individual. One or two hours after luncheon are particularly indicated

1. Wyckoff, John (dean of the Medical College, New York University): Address delivered at laying of the cornerstone of the Simon Baruch Research Institute at Saratoga Spa published by the state of New York, Saratoga Springs Authority.
2. National Health Survey (1935-1936) conducted by the National Institute of Health, U. S. Public Health Service

and often a half hour before dinner is advisable. A quiet period after the evening meal is essential, though it need not necessarily imply bed rest. Games which tend to excite or create problems are inadvisable during this period, since often they are conducive to poor sleep. Reading which can be given up easily and the enjoyment of music are most satisfactory. Eight to nine hours of sleep are desirable, and breakfast in bed is not only pleasant but frequently indicated. Often one day a week in bed is an excellent investment of time.

EXERCISE

About twenty years ago Sir James Mackenzie,[3] in speaking of exercise in heart disease, postulated that "the guide in these persons is the patient's response to effort. It may be taken for granted that effort which he performs with comfort is not harmful but beneficial, in the sense that exercise of the heart muscle within the limits of its power keeps the muscle in good condition." More recently White,[4] in his experience, states that "it is important generally to allow a patient with heart disease to take as much exercise as he reasonably and safely can, with periods of rest, perhaps of a few days each, because it is physical exercise that helps to maintain a state of general good health, and undoubtedly the proper functioning of the peripheral circulation resulting from reasonable exercise aids the heart in its work. The most practicable exercise is walking and this is also quite uniformly good; it can be graded easily by three factors—distance, speed and grade (hill climbing)." Nylin,[5] in a paper on physical exercise in cardiac conditions, has put the matter of exercise in a most satisfactory manner. He states that "best results are obtained where there is a correct proportion between the demand of the exercise on the heart and the degree of cardiac reserve power." It is acceptable, then, that the cardiovascular system is benefited by that amount of exercise which it can undertake without embarrassment, for it is altogether conceivable that the myocardium will find itself in the same status as the general musculature.

The exercise which may be prescribed by the spa physician will fall under two types—active or passive—and depends on the status of the individual myocardium. Although difficult to demonstrate by controlled experiment, it is generally accepted that active or voluntary exercise is of more benefit than is any passive or involuntary form and is the type of choice when circumstance permits. Of all forms of active exercise walking, as has been stated by White, lends itself most easily to graded work. Golf on level and short courses often gives point and pleasure to the treatment, as do other suitable forms of recreational activity such as croquet. Passive exercise is most often applied as massage, frequently combined with passive movements of flexion, extension, rotation and circumduction of the limbs.

DIET

It is desirable to eliminate the unnecessary burden of obesity to the degree to which reduction is consonant with the safety of the individual. The stay at a spa creates an excellent opportunity to effect this when indicated, which is rather frequently. In any event simple foods, properly prepared and in moderate amount, are a basic part of the regimen. Ample provision is made for special types of diet as required when the complication of diabetes or gout exists for instance. By and large the tendency is to restrict fluids to 3 or 4 pints daily and to keep salt moderately low.

THE CARBON DIOXIDE BATH

The physiologic effect of the carbon dioxide bath has been studied extensively during the past twenty years and considerable information on the response of the body to it has been accumulated. Professor Franz M. Groedel[6] has reviewed the subject recently, and studies by Dr. Walter S. McClellan[7] at the Saratoga Spa have summarized our limited knowledge: "The physiological observations of the influence of the CO_2 baths show a decrease in the pulse rate and increase in the pulse pressure dependent mainly on a drop of the diastolic pressure, a better emptying of the venous blood vessels, a hyperemia with increased capillary circulation, a slightly elevated minute volume output of the heart, an increase in respiration and elimination of large quantities of the CO_2 through the lungs." Claims beyond these cannot be accepted as conclusive until research now in progress has clarified and substantiated them.

A rare opportunity to teach a suitable conduct of life for the individual is present during the stay at a spa, for by the end of several weeks' observation of response to the regimen, and especially to effort the physician there should have fairly concrete data on which to advise the patient. Education concerning the "red flags" is particularly indicated, and of these that of a sense of exhaustion is emphasized particularly. Shortness of breath or precordial distress is less often passed over lightly by the patient. Emotional stability is stressed. A sense of humor, a calm and somewhat fatalistic philosophy and emphasis on the things which the patient can do, rather than on those he cannot—all of these are much dwelt upon. He is urged to keep as physically fit as his capacity permits. By learning his problem and facing it squarely he gains not only the conquest of fear but a way of life.

3. Mackenzie, Sir James: Angina Pectoris, London, Hodder & Stoughton, Ltd., 1923, p. 141.
4. White, Paul D.: Heart Disease, New York, Macmillan Company, 1931, p. 572.
5. Nylin, Joseph B.: M. Rec. 149: 373 (June 7) 1939.
6. Groedel, F. M.: Arch. Phys. Therapy 18: 457 (Aug.) 1937.
7. McClellan, W. S.: Internat. Clin. 1: 199 (March) 1937.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

The Council has authorized publication of the following statement.

AUSTIN SMITH, M.D., *Secretary.*

DANGERS FROM THE EXTERNAL USE OF SULFONAMIDES

Frequent mention has been made of the dangers from the external use of the sulfonamides. Almost two years ago the Council adopted for publication (THE JOURNAL, Oct. 16, 1943, p. 411) a statement reviewing the status of the local use of the sulfonamides and warned against indiscriminate use. Since that time other warnings have appeared. Abramovitz[1] reviewed the dangers inherent in the local use of the sulfonamide compounds which apply not only to the skin but to the ear, eye, nose and even to prolonged dusting or packing in cavities. Abramovitz, however, thinks that the latter mode of administration provides fewer possibilities of later reactions.

The frequency of reactions is difficult to estimate, as probably many cases have never been reported. However, several signifi-

1. Abramovitz, E. W.: Hazards of the External Use of Sulfonamide Compounds, Arch. Dermat. & Syph. 50: 289 (Nov.) 1944.

cant studies have been made. Darke[2] reported sensitization in 5.5 per cent of 218 minor surgical patients treated with a 5 per cent sulfathiazole cream. Dermatologists are seeing many such cases, and recent conversation with an ophthalmologist revealed that an increasing number of cases of sensitivity to sulfonamides are being seen by men in that field. Downing[3] observed 300 serious cutaneous reactions where sulfonamides had been used in industrial dermatitis. J. H. Schwartz of Boston, in discussing the Abramovitz paper, reported that a man who used "nose drops" containing sulfonamides later contracted pneumonia and received sulfonamide therapy. A severe exfoliative dermatitis and anuria developed and the patient died. A member of the Council has likewise seen a death under even as bizarre conditions.

The type of cutaneous reaction varies greatly. It may be simply a local fixed reaction or there may be a generalization or an exfoliative dermatitis. The process may be further complicated because of the photosensitization that the patient develops. Relapses are not uncommon, and with scalp involvement there may be temporary loss of the hair. Most of the cases seen by dermatologists do not result from medication prescribed by the physician. Usually the patient has purchased freely a sulfonamide cream preparation for a skin disorder. Bloom[4] read a paper before the Section on Dermatology of the New York State Medical Society and introduced a resolution strongly disapproving the indiscriminate use of the sulfonamide drugs in relatively harmless disorders of the skin and recommending that the society condemn the use of prepared dressings containing sulfonamides which are sold promiscuously to the public. The Department of Health of the City of New York on Aug. 31, 1943 amended section 118 of the Sanitary Code to require a physician's prescription for sulfonamide drugs not only for internal use but for external use whether they are made available in the form of powders, ointments or sprays.

The therapeutic value of the sulfonamide compounds is well established, but they are undoubtedly often being used carelessly for skin lesions. Their use on the skin for ordinary skin disorders should be frowned on. Other measures should be employed first; then if local sulfonamide therapy is necessary it should not be continued for a period longer than five days because of the danger of sensitization of the patient. Further, such therapy should be employed only under a physician's direction.

One of the Council members who was on active service in the North African theater of operations has informed the Council concerning the strong recommendations which were issued by himself and a consulting physician against the local use of sulfonamide creams in the treatment of superficial skin infection. The recommendations were based on experience gained in this theater. The rate of sensitization from such creams appears to be far higher than that observed following the oral use of the drug. This bears special significance when it is realized that the value of such creams in superficial skin infections under ordinary conditions of use is so limited that their routine use is not warranted. According to the Council's informant, the local use of sulfonamide powders was not recommended except in perforating wounds of the abdomen. In this condition sulfanilamide is instilled in the peritoneal cavity and the procedure is considered an aid in reducing infection and a life saving measure.

Special attention should be given to the possible dangers that exist in pediatric practice, e. g. the possibility of harmful results following the routine use of suspensions of sulfonamides for the prevention of impetigo in nurseries.

There are real dangers from the external use of the sulfonamides, and such use should be limited to a comparatively few skin disorders which may be effectively treated by a sulfonamide preparation. Only a physician can determine the condition most likely to respond, and even he should exercise careful judgment in prescribing and using a sulfonamide ointment, emulsion or other preparation. Claims supporting their value in "nose drops" and other similarly exploited preparations remain to be generally supported. Certainly there does not seem to be sufficient evidence to justify over the counter sale of any sulfonamide preparation, while on the other hand there is adequate evidence concerning the dangers of promiscuous use.

2. Darke, R. A.: Sensitivity to Topical Application of Sulfathiazole Ointment, J. A. M. A. **124**: 403 (Feb. 12) 1944.
3. Downing, J. G.: Dermatophytosis and Occupational Dermatitis, J. A. M. A. **125**: 196 (May 20) 1944.
4. Bloom, D.: The Danger of Cutaneous Reactions to Sulfonamides, New York State J. Med. **43**: 1499 (Aug. 15) 1943.

Council on Foods and Nutrition

ACCEPTED FOODS

The following additional foods have been accepted as conforming to the Rules of the Council on Foods and Nutrition of the American Medical Association for admission to Accepted Foods.

GEORGE K. ANDERSON, M.D., *Secretary.*

PREPARATIONS USED IN THE FEEDING OF INFANTS (*See* Accepted Foods, 1939, p. 156)

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT JUNIOR FOODS CHICKEN SOUP WITH VEGETABLES, consists of chicken broth, water, farina, carrots, celery, chicken meat, salt, onion and yeast.

Analysis (submitted by manufacturer).—Total solids 12.30%, moisture (by difference) 87.70%, ash 1.39%, fat (ether extract) 1.72%, protein (N × 6.25) 3.15%, crude fiber 0.59%, carbohydrates other than crude fiber (by difference) 5.45%, calcium (as Ca) 0.019%, phosphorus (as P) 0.027%, iron total 0.49 mg. per hundred grams, iron "available" (bipyridyl method) 0.38 mg. per hundred grams, copper (McFarlane method) 0.06 mg. per hundred grams.

Calories.—14 per ounce; 50 per hundred grams.

Vitamins.—

Vitamin A equivalent	640 U. S. P. units per hundred grams
Thiamine	0.035 mg. per hundred grams
Ascorbic acid	0.8 mg. per hundred grams
Riboflavin	0.038 mg. per hundred grams
Niacin	0.45 mg. per hundred grams

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT STRAINED CHICKEN SOUP WITH VEGETABLES, consists of chicken broth, water, farina, carrots, celery, chicken meat, salt, onion and yeast.

Analysis (submitted by manufacturer).—Total solids 10.42%, moisture (by difference) 89.58%, ash 1.49%, fat (ether extract) 1.35%, protein (N × 6.25) 1.91%, crude fiber 0.17%, carbohydrates other than crude fiber (by difference) 5.50%, calcium (as Ca) 0.036%, phosphorus (as P) 0.016%, iron total 0.69 mg. per hundred grams, iron "available" (bipyridyl method) 0.62 mg. per hundred grams, copper (McFarlane method) 0.17 mg. per hundred grams.

Calories.—11.9 per ounce; 42 per hundred grams.

Vitamins.—

Vitamin A equivalent	500 U. S. P. units per hundred grams
Thiamine	0.042 mg. per hundred grams
Riboflavin	0.050 mg. per hundred grams
Niacin	0.57 mg. per hundred grams

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT STRAINED PUMPKIN.

Analysis (submitted by manufacturer).—Total solids 7.06%, moisture (by difference) 92.94%, ash 1.23%, fat (ether extract) 0.37%, protein (N × 6.25) 0.45%, crude fiber 0.70%, carbohydrates other than crude fiber (by difference) 4.31%, calcium (as Ca) 0.047%, phosphorus (as P) 0.016%, iron total 0.35 mg. per hundred grams, iron "available" (bipyridyl method) 0.23 mg. per hundred grams, copper (McFarlane method) 0.06 mg. per hundred grams.

Calories.—6.2 per ounce; 22 per hundred grams.

Vitamins.—

Vitamin A equivalent	2,530 U. S. P. units per hundred grams
Thiamine	0.013 mg. per hundred grams
Ascorbic acid	2.8 mg. per hundred grams
Riboflavin	0.045 mg. per hundred grams
Niacin	0.51 mg. per hundred grams

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT STRAINED PUMPKIN AND SQUASH, consists of pumpkin and squash.

Analysis (submitted by manufacturer).—Total solids 6.81%, moisture (by difference) 93.19%, ash 1.10%, fat (ether extract) 0.58%, protein (N × 6.25) 0.45%, crude fiber 0.62%, carbohydrates other than crude fiber (by difference) 4.06%, calcium (as Ca) 0.050%, phosphorus (as P) 0.012%, iron total 0.44 mg. per hundred grams, iron "available" (bipyridyl method) 0.35 mg. per hundred grams, copper (McFarlane method) 0.06 mg. per hundred grams.

Calories.—6.5 per ounce; 23 per hundred grams.

Vitamins.—

Vitamin A equivalent	1,850 U. S. P. units per hundred grams
Thiamine	0.012 mg. per hundred grams
Ascorbic acid	3.7 mg. per hundred grams
Riboflavin	0.046 mg. per hundred grams
Niacin	0.53 mg. per hundred grams

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, AUGUST 4 1945

DENGUE VACCINE

Thanks to the heroic cooperation of inmates of the New Jersey State Prison, who volunteered without offer of reward to serve as subjects for numerous inoculations with virus, Sabin and his associates [1] of the Army Epidemiological Board announce the development of a promising new vaccine for dengue fever

In 1928 Manoussakis [2] found that dengue virus (infective human serum) which had lost its pathogenicity as a result of irradiation heating or prolonged storage would not protect nonimmune human beings against subsequent inoculation with fully virulent dengue virus He concluded that inoculation with a nonviable dengue vaccine was without promise as a prophylactic measure Blanc and his associates [3] of the Hellenic Pasteur Institute subsequently found that repeated vaccination with a dengue vaccine (infectious serum) attenuated by the addition of 5 to 8 per cent bile confers an effective immunity The virus-bile mixture, however, lost all traces of its immunizing power within fifteen minutes after preparation Such an unstable vaccine was of little practical promise Equally unsuccessful attempts to prepare an attenuated vaccine were made with individual bile salts, formaldehyde, chloroform, phenol and other chemical agents

These earlier failures narrowed the search for a practical dengue vaccine to the possibility of developing a natural human virus of sufficiently low virulence or an antigenically similar virus from lower animals Evidence was not available, however, that any wild or domestic animal contracts dengue naturally during an epidemic, in spite of the probability that many are bitten by infective mosquitoes Attempted experimental inoculation of domestic animals also gave negative results Guinea pigs inoculated intraperitoneally with massive doses of infected human blood may at times harbor the virus for as long as nine days without febrile response or other evidence of illness Inoculation from these animals into other guinea pigs, however, failed to show a continuation of the cryptic infection

In 1931 Dinger [4] attempted without success to propagate the dengue virus by intracerebral inoculation into young mice, using infective human serum as the inoculum In the New Jersey prison experiments this technic was varied by inoculating young mice intracerebrally with an ultracentrifuged concentrate of such serum, this concentrate containing approximately 10 million minimum human infective doses per cubic centimeter On the first attempts only 10 to 20 per cent of the inoculated Swiss mice exhibited clinical signs of infection and then only after an incubation period of nearly four weeks

Serial passage was accompanied from these few first generation mice, 0 2 cc of a 5 per cent centrifuged suspension of brain and cord being used as the inoculum As a result of murine serial passage there was a definite increase in the virulence for mice of the dengue virus By the sixth passage the incubation period had been reduced to two weeks, and the incidence of fatal paralysis increased to approximately 60 per cent By the ninth passage the fatalities were still further increased to 90 per cent and by the fifteenth passage to 100 per cent

The virus, however, did not acquire a pathogenicity for cotton rats, guinea pigs, hamsters or rabbits Its human pathogenicity was greatly reduced Up to the fifth passage 0 2 cc. of a 1 1,000 dilution of centrifuged mouse brain and cord suspension produced skin lesions at the site of intracutaneous injection in human volunteers This was followed six to nine days later by fever, maculopapular and petechial rash leukopenia and enlargement of certain lymph nodes Infective concentrations of the virus were demonstrable in the blood of the inoculated volunteers, and transmission by Aedes aegypti mosquitoes was accomplished A solid convalescent immunity to subsequent infection with fully virulent dengue virus invariably followed this inoculation

By the tenth passage subcutaneous injection of fifty times this routine dose usually gave rise to no systemic reactions in the human volunteers, there being at most only a slight fever without headache or malaise lasting less than twenty-four hours When the same multiple dose was given simultaneously or mixed with the regular U S Army dose of yellow fever vaccine, even these occasional symptoms were rarely noted, presumably because of the well known "interference phenomenon" between heterologous viruses All human volunteers inoculated with the practically avirulent tenth mouse passage dengue virus acquired a solid immunity against

1 Sabin, A B, and Schlesinger, R W Science **101**: 640 (June 22) 1945

2 Manoussakis E Bull Soc path exotique **21** 200, 1928

3 Blanc, G and Caminopetros J Ann de l Inst Pasteur **44**: 367, 1930

4 Dinger, J L, and Snijders T P Arch f Schiffs- u Tropen Hyg **35**: 498 1931

subsequent inoculation with fully virulent virus or to bites of mosquitoes from a batch of mosquitoes demonstrably infective to nonimmune human volunteers. Volunteers immunized with the combined dengue-yellow fever vaccine also developed neutralizing antibodies for the yellow fever virus.

From these preliminary successes Sabin concludes that mouse adapted dengue virus could be used safely and effectively as a prophylactic vaccine against dengue fever. Whether or not a polyvalent vaccine would be required has not yet been determined. If this murinized dengue vaccine proves clinically successful, the War Department would be fully justified in awarding suitable recognition to each inmate of the New Jersey State Prison who volunteered for the experimentation.

MUSCLE SPASM IN POLIOMYELITIS

Still in the field of controversy is the concept that spasm in the antagonists of muscles weakened by poliomyelitis is the damaging symptom. The use of the Kenny technic for combating this symptom relieves pain and stiffness. Many observers have reported that this method minimizes deformities and the degree of paralysis. These observations have tended to discourage passive splinting and to promote active treatment in the acute stage of the disease.

Muscle spasm can be studied by physical methods in which the personal or subjective element is largely eliminated. Extremely minor contractions of muscle in situ can be recorded by action currents. A particular pattern of action current records is established as definite evidence of muscle spasm. For purposes of recording, spasticity in a muscle can be evoked by a sudden stretching of the muscle. Schwartz and Bouman [1] made oscillographic records of muscle action in 7 cases of poliomyelitis, in 3 with spastic paralysis and in 3 normal subjects. In poliomyelitis, spasticity of the muscles was found not only in the antagonist of the weakened muscle but also in the weakened muscle itself and in muscles in parts of the body in which clinical symptoms of the disease are not evident. They concluded that the spasticity is reflex and is not present in the completely paralyzed muscle. The investigators were not able to say whether the spasticity is actually responsible for weakening of the muscle or whether it is a phenomenon which is merely another consequence of the disease.

Watkins, Brazier and Schwab,[2] in their electromyographic studies of 11 cases of poliomyelitis over a period of two years, found that the term "muscle spasm" is inadequate to describe the complexity of this condition, which is revealed by electromyography. In the acute stage only muscles with some degree of paralysis discharge electrical potentials at rest; these electrical abnormalities are not correlated with the presence of clinical "spasm." They state further that the concept of "mental alienation" did not contribute to the explanation of paresis in their cases, since objective signs of a disease process were always present in the paretic antagonists of muscles in "spasm." They conclude that the only one of the three concepts of Kenny upheld by their objective measurements is that of "incoordination," although the term is misleading. They have demonstrated not only simultaneous activation of protagonists and antagonists but also intermittent synchrony of individual discharges from opposing muscles, such as is found in peripheral nerve injuries during regeneration of axons. They believe that the term "disordered reciprocal innervation" is a more descriptive term for this type of dysfunction.

A more recent study by Watkins and Brazier [3] was concerned with the effect of various forms of thermal therapy and of neostigmine on muscle spasm as recorded by the standardized electromyographic method. These investigators studied the effect of a single application of a therapeutic agent on muscle spasm during the first weeks of the disease. The degree of spasm was measured by the voltage of the electrical potentials discharged by the muscles on passive stretching. On each test day a number of control observations were made on every muscle before the therapeutic procedures were begun. The methods investigated were twenty minute applications of the Kenny type of hot packs, infra-red irradiation, luminous heat, short wave diathermy by induction technic and intramuscular injection of 1.6 mg. of neostigmine methylsulfate. They found that single application of hot packs, infra-red irradiation and diathermy were without effect on the muscle spasm. Luminous heat and neostigmine caused a decrease in spasm of approximately 25 per cent. This degree of change was not great enough to indicate a specific effect on spasm. Further studies on repeated use of a single method of treatment will be necessary for final evaluation.

Solution of the problems presented by the symptoms of poliomyelitis will probably come through the correlation of objective investigations with clinical observations rather than from clinical observations alone. The newer mechanical methods of study emphasize the great importance of research designed to eliminate the subjective factors in evaluating symptoms or their relief.

1. Schwartz, R. P., and Bouman, H. D.: Muscle Spasm in the Acute Stage of Infantile Paralysis, J. A. M. A. **119**: 923 (July 18) 1942.

2. Watkins, A. L.; Brazier, Mary A. B., and Schwab, R. S.: Concepts of Muscle Dysfunction in Poliomyelitis, J. A. M. A. **123**: 188 (Sept. 25) 1943.

3. *Watkins*, A. L., and Brazier, Mary A. B.: Observations on Muscle Spasm in Poliomyelitis: Electromyographic Studies on the Effect of Various Forms of Thermal Therapy and of Prostigmine, Arch. Phys. Med. **26**: 325 (June) 1945.

Current Comment

HOSPITAL PROGRESS ANNIVERSARY

With a silver cover *Hospital Progress,* the official journal of the Catholic Hospital Association of the United States and Canada, celebrates a silver jubilee in May 1945. Conspicuous is the high tribute paid by many leaders in the medical and hospital fields. During the twenty-five years celebrated by this publication the growth and development of the Catholic hospitals, the quality of the service that they render, the spiritual ideals that they foster in the maintenance of health and medical care, have been an inspiration to every one in the field of medicine. All who are familiar with the nature of man and with a knowledge of disease recognize the important part played by the environment and by personal contacts in the rendering of care to the ailing human being. The loss of this important factor for recovery would be a disaster to medical science. Many of the articles in this issue of *Hospital Progress* are a pledge for the continuous maintenance of the self-sacrificing personal and spiritual service given by these institutions not only to the people of Catholic faith but to all the people of the United States. Especially noteworthy also in this large special issue is the cleanliness of the medical advertising—free from the advertisements of nostrums, bogus devices or any of the other forms of charlatanism that still pervade the pages of some publications in the field of medicine. THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, soon to celebrate the one hundredth anniversary of the American Medical Association, congratulates a contemporary on twenty-five years of which it may well be proud.

THE MATERNAL AND CHILD WELFARE ACT OF 1945

Senator Pepper of Florida on July 26, for himself and nine other members of the Senate Committee on Education and Labor, introduced S. 1318 to provide for the general welfare by enabling the several states to make more adequate provision for the health and welfare of mothers and children and for services to crippled children and for other purposes. Joining Senator Pepper in sponsoring this legislation were Senator Walsh of Massachusetts, Senator Thomas of Utah, Senator Hill of Alabama, Senator Chavez of New Mexico, Senator Tunnell of Delaware, Senator Guffey of Pennsylvania, Senator LaFollette of Wisconsin, Senator Aiken of Vermont and Senator Morse of Oregon. The bill was referred to the Senate Committee on Education and Labor. It will authorize an appropriation of $100,000,000 for the fiscal year ending June 30, 1946: $50,000,000 for maternal and child health services, $25,000,000 for services for crippled children, $20,000,000 for child welfare services and $5,000,000 for expenses necessary to enable the Children's Bureau to administer the provisions of the bill. Thereafter such sums will be made available as the Congress shall decide. Apparently any person under 21 years of age is to be considered a child within the meaning of the provisions of this bill, with respect both to the contemplated program for maternal and child health services and to the contemplated program for crippled children. Services will be made available to all who elect to participate in such a program, irrespective of financial status, race, creed, color or national origin. Beneficiaries will be permitted to select the physician, hospital, clinic or health agency of choice from among those that meet prescribed standards. The bill provides that the physician, hospital, clinic or health service agency selected may refuse to accept the case. If the beneficiary does not exercise his right to make a selection, the state plan must set forth the method by which care will be made available. Payments to individual physicians will be on a "per capita, salary, per case or per session basis" or, in the case of consultations or emergency visits, on a fee-for-service basis. A state plan must provide for a general advisory council and for technical advisory committees. On a federal level there will also be advisory committees with which the Children's Bureau will be required to "consult." This would seem to be an effort to extend and expand the EMIC program after the termination of the war. A detailed analysis of the provisions of the bill will be published in an early issue of THE JOURNAL.

CALCIUM CONTENT OF TISSUES

Administration of the relatively insoluble drugs such as sulfaguanidine and succinylsulfathiazole reduces the synthesis of various vitamins and possibly amino acids by the intestinal bacteria. Pilgrim and Elvehjem [1] have recently demonstrated that the feeding of succinylsulfathiazole to rats is followed by an accumulation of calcium in the livers of the animals that receive the drug for two to twelve weeks. Since microscopic studies indicated that there was not an increased deposition of inorganic calcium salts, the increased calcium could not be due to calcification following necrosis. Livers of rats with the increased calcium content showed in addition approximately 50 per cent increase in weight over those of the control animals, an observation which had been made earlier in animals receiving various sulfonamides. The administration of a solubilized liver concentrate for ten to forty days along with the sulfonamide reduced the high calcium content of the livers but did not reduce the calcium content of normal livers. In the case of sulfadiazine there may be an increased calcium content of the kidney, but this is believed to be due to the deposition of the insoluble acetyl derivative of the drug, which causes irritation and resulting calcification. The high calcium content of the liver is not believed to be caused by a similar mechanism but thought to be primarily a metabolic defect, since the sulfonamide which produced this condition most consistently was succinylsulfathiazole, the least readily absorbed of drugs of the sulfonamide type. Furthermore, the changes can be remedied by feeding a liver concentrate which is known to be rich in nutritional factors.

1. Pilgrim, F. J., and Elvehjem, C. A.: Proc. Soc. Exper. Biol & Med. 59: 17 (May) 1945.

MEDICINE AND THE WAR

ARMY

ARMY NOW RELEASING MEDICAL OFFICERS

Approximately 900 medical corps officers have been relieved from the Army since Jan. 1, 1945 and approximately 7,000 more will be released during the next nine months, the War Department recently announced. One thousand medical corps officers have been requisitioned from Europe for return to the United States during June and July to relieve a shortage of doctors in the army hospitals in this country, to relieve doctors who have not had overseas service and to increase the rate of the return of doctors to civilian practice. During the past six months the patient load in army hospitals in the United States has doubled.

There will be an initial lag in the discharge of medical officers over other officers because sick and wounded soldiers remain in hospitals long after battles are over. Provision is made, however, for their release as soon as possible. The peak load of patients in army general and convalescent hospitals in the United States is not expected to be reached before late this fall, assuming that the present casualty rate in the Pacific continues.

The plans to discharge medical officers will take into consideration such factors as requirements of the service and of civilian population, adjusted service ratings of the individual officers and their own desires for release or retention.

The redeployment of medical officers from Europe to the Pacific for relief and return of doctors in that theater, although being expedited, is still a time consuming operation and must necessarily be geared with the entire redeployment and readjustment program. For example, the medical officers now in Europe who are available and eligible for return to the United States must be given leave and must be assigned to stations here, redeployed or discharged. Medical officers in the Pacific cannot be returned until replacements are available.

DISCHARGE OF MEDICAL OFFICERS OF THE ARMY

The Office of the Surgeon General of the Army expects to announce next week a detailed statement of the policy that will prevail regarding the discharge of medical officers. An adjusted service point system is being established which will guide the determination. It is understood that the age, the nature of the service rendered, the extent of service abroad and similar factors will be taken into account. A statement in TIME magazine to the effect that "Army doctors with little or no prospect of being mustered out were those already in the Pacific area (especially men in some much needed specialty like psychiatry") is said by the Office of the Surgeon General to be absolutely without any foundation in fact.

MEDICAL PERSONNEL ENTER STALAG VI

The 515th Medical Clearing Company, under the command of Major Henry L. Harrell, and two officers and eighteen enlisted men from the 118th evacuation hospital were the first medical personnel to enter Stalag Vi, at Hemer, Germany. Over 20,000 prisoners, all undernourished, and 4,000 patients in the Stalag Hospital were found. There were no sanitary facilities, tuberculosis was rampant and there were many cases of typhus. All prisoners were infested with lice. A sanitary detail, a delousing detail and other details necessary for establishing order from chaos were immediately organized. All of the 20,000 prisoners were deloused by the men of these medical units, using DDT powder. Two new hospitals were organized and staffed with personnel from the 515th Clearing Company. Eight other hospitals with German patients were supervised by officers and men from the company. The three medical administrative officers of the company were responsible for the records and supplies for all these hospitals.

TRANSPORTATION OF WOUNDED

The War Department recently announced that well over a million trips involving multimillions of miles had been made by some 510,000 wounded or sick soldiers between November 1942 and June 30, 1945. Of the 510,000 patients approximately 81,000 were flown to inland hospitals by the Air Transport Command from airports of debarkation. Of the more than 426,000 patients returned by ship, about 346,000 came by transport and nearly 81,000 by the Transportation Corps' twenty-three U. S. Army hospital ships and three other hospital ships operated by the Navy for the Army. Another 84,000 were returned by air. During the first six months of 1945 the army used 251 army owned hospital cars, making them do the work of 3,804 Pullmans which otherwise would have had to be employed. By August it is expected to add 69 new unit-type cars to increase the fleet to 320. In addition to these, the Army has 60 medical kitchen cars which are used on long hospital train movements.

Major Gen. C. P. Gross, chief of transportation, Army Service Forces, stated that the army's hospital cars were not enough to handle all patients and, consequently, for the first six months of this year alone the Army was forced to enlist the aid of the railroads in obtaining 5,978 Pullmans, 884 of them for use in June.

While being carried by rail, patients are cared for by a staff of doctors, nurses and medical technicians trained by the Office of the Surgeon General and made available to the various service commands. "Convoy personnel" of this type is made available for moves of from 1 patient to a hospital train of patients. The volume of convoy personnel for the first six months of this year was 54,663, of which 10,235 were for June alone.

General Gross said that by August all transportable patients should have been returned to the United States from England.

ARMY AWARDS AND COMMENDATIONS

Major Carl T. Javert

The Soldier's Medal was recently awarded to Major Carl T. Javert, formerly of New York. The citation read "for heroism at great risk of life in Italy. On April 9, 1945 an ammunition ship loaded with aerial bombs exploded in a harbor in Italy, and Major Javert immediately rushed to the scene. Heedless of great danger, he set upon the dangerous and extremely difficult task of rendering first aid and extricating wounded personnel from the demolished buildings about the perimeter of the explosion. In one instance, using an improvised crow bar and sledge hammer, he extricated a seaman from beneath a heavy locker and heavy beams of masonry. Several others were likewise extricated and removed and their lives saved, despite a raging warehouse fire which set off repeated hails of small arms ammunition which flew about the scene of rescue. Minor explosions also rocked the partly demolished building, causing

showers of débris and masonry to fall about him. By his outstanding leadership, humanity, courage and devotion to duty, despite grave hazards and multiple threats to his safety, Major Javert reflects great credit on himself and on the armed forces of the United States of America." Dr. Javert graduated from the University of Buffalo School of Medicine in 1932 and entered the service Aug. 19, 1942.

Colonel Bradley L. Coley

The Legion of Merit was recently awarded to Col. Bradley L. Coley, formerly of New York. According to the citation "He performed outstanding services as surgical consultant of the Eighth Service Command from July 1942 to February 1945. He assisted in organizing the surgical service of one hundred and five hospitals, choosing personnel with unusual keenness and assigning them to positions where their talents were used with maximum effectiveness. He overcame handicaps coincident with establishing medical installations and built the command's surgical service to a high level of efficiency, starting with meager facilities and limited personnel. With unusual ability and resourcefulness he dealt with other branches of the Army. He tirelessly devoted his great knowledge of surgery to providing exceptional surgical care for troops in the command and to preparing many highly trained surgical officers for duty in theaters of operations. By his unfailing tact, judgment and administrative skill he was in great measure responsible for the excellent record made on the surgical service of the Eighth Service Command." Dr. Coley graduated from Columbia University College of Physicians and Surgeons, New York, in 1919 and entered the service June 1, 1942.

Major John C. Angley

The Bronze Star was recently awarded to Major John C. Angley, formerly of Bryantville, Mass., for "meritorious service in support of combat operations during the period April 1, 1944 to Nov. 15, 1944 in Italy, Corsica and Sardinia. During this period Major Angley supervised malaria control activities for the army air forces and in this vital mission noteworthy success was achieved. This was due largely to his unceasing efforts and conscientious attention to the most minor details. It was imperative that the incidence of malaria and other insect borne diseases be held to an absolute minimum in units of the Twelfth Air Force to insure successful support in the invasion of southern France. These units, along with units of the Fifteenth Air Force, were stationed in some of the most highly malarious areas in the world, and the coordination, education and labor instigated and carried out by Major Angley required exceptional professional and executive abilities, plus the willingness to work many long hours. These qualities were responsible for holding malaria to an almost irreducible minimum in air force units and has been a very significant factor in the successful conclusion of air force operations for the period." Dr. Angley graduated from Harvard Medical School, Boston, in 1932 and entered the service Sept. 17, 1942.

Lieutenant Colonel Ralph S. Muckenfuss

The Legion of Merit was recently awarded to Lieut. Col. Ralph S. Muckenfuss, formerly of New York, "for exceptionally meritorious conduct in the performance of outstanding services as commanding officer, 1st Medical General Laboratory, from June 28, 1943 to Jan. 19, 1945. Through the initiative and energy of Lieutenant Colonel Muckenfuss, the 1st Medical General Laboratory, the first organization of its type, was set up in the United Kingdom. The unit performed in a superior manner its mission of assisting all hospital laboratories, performing laboratory examinations beyond the resources of hospitals, maintaining the only virus diagnostic laboratory in the United Kingdom, maintaining a veterinary laboratory and investigating the causative factors of epidemics. As United Kingdom consultant for research, Lieutenant Colonel Muckenfuss did much to further the scientific background of medical practice in the European theater of operations. Under his supervision the only blood bank in the United Kingdom was organized." Dr. Muckenfuss graduated from Emory University School of Medicine, Atlanta, Ga., in 1921 and entered the service July 22, 1942.

Lieutenant Colonel William S. Moore

The Legion of Merit was recently awarded to Lieut. Col. William S. Moore, formerly of Memphis, Tenn. The award was accompanied by a citation for "service as assistant military attaché to the legation of the United States at Cairo, Egypt, from February 1942 to February 1943. His observations and reports on military operations throughout the Middle East, particularly in the Western Desert and the El Alamein offensive, were invaluable to the War Department, especially those pertaining to the causes, treatment and evacuation of battle casualties. As military attaché and liaison officer with the representatives in Cairo of the Allied Governments in Exile from February 1943 to January 1944 he established and coordinated intelligence activities which were of great value to the headquarters of the United States Army Forces in the Middle East." Dr. Moore graduated from the University of Tennessee College of Medicine in 1938 and entered the service July 6, 1940.

Captain Philip G. Creese

The Soldier's Medal for heroism was recently awarded to Capt. Philip G. Creese, formerly of Danvers, Mass. The citation read "For heroism displayed in rescuing an enlisted man from drowning. While participating in landing exercises on a beach in England, a landing craft was swamped and a number of men were thrown into the surf. One man was carried off shore by the swell and in a few minutes was in a drowning condition. Lieutenant Creese, without hesitation, plunged into the surf and brought the drowning soldier far enough toward shore for others to assist in the rescue." Dr. Creese graduated from Harvard Medical School, Boston, in 1942 and entered the service March 13, 1943.

Major Israel Weinstein

Major Israel Weinstein, formerly of New York, was recently awarded the Purple Heart as a result of having been wounded April 25, 1945 near Regensburg, Germany, during very heavy fighting. Dr. Weinstein is division medical inspector and assistant surgeon of an infantry division. He has been on leave from the New York City Health Department, where he is assistant director of the Bureau of Health Education. Dr. Weinstein graduated from Columbia University College of Physicians and Surgeons, New York, in 1926 and entered the service Aug. 28, 1942.

Major Victor A. Bacile

Major Victor A. Bacile, formerly of Poughkeepsie, N. Y., was recently commended for "professional ability while serving with surgical units" during the heavy fighting on Okinawa. The letter of commendation pointed out that Major Bacile worked long hours day and night, without regard to his own health and safety, in caring for the wounded during the height of the bloody battle last May and praised him for his efforts. Dr. Bacile graduated from Long Island College of Medicine, Brooklyn, in 1927 and entered the service Aug. 10, 1942.

Captain George P. Schwab

The Silver Star was recently awarded to Capt. George P. Schwab, formerly of Union City, N. J., for "gallantry in action in Germany in November 1944." Dr. Schwab has also been the recipient of the Bronze Star with two oak leaf clusters "for heroic achievement in connection with military operations against the enemy" in France, Belgium and the Netherlands respectively. He graduated from New York Medical College, Flower and Fifth Avenue Hospitals, New York, in 1937 and entered the service April 10, 1941.

Major Paul A. Burgeson

The Silver Star was recently awarded to Major Paul A. Burgeson, formerly of Warsaw, N. Y., for "extraordinary gallantry in action on Aug. 2, 1944 near Coulances, France." Dr. Burgeson was also awarded the Bronze Star for meritorious service in connection with military operations against the enemy during the Normandy campaign while serving with an infantry battalion. He graduated from Cornell University Medical College, New York, in 1936 and entered the service Sept. 22, 1942.

NAVY

NAVY AWARDS AND COMMENDATIONS

Lieutenant Commander Spencer K. Phillips

The Legion of Merit was recently awarded to Lieut. Comdr. Spencer K. Phillips, formerly of Rochester, Minn. The citation accompanying the award read "For exceptionally meritorious conduct in the performance of outstanding services to the government of the United States at Tarawa, Gilbert Islands, from Nov. 20 to 24, 1943, and at Saipan and Tinian, Marianas Islands, from June 16 to Aug. 4, 1944 During the Tarawa operation he demonstrated outstanding ability as a surgeon. On the Saipan operation he came ashore under heavy enemy artillery and mortar fire on the evening of June 16. He assumed command of a medical company when his company commander became a casualty immediately after landing and by his untiring efforts and cool leadership was able to keep his men and equipment intact and at daylight proceeded to set up a hospital installation in a captured Japanese hospital building. This hospital section was the first to operate on the island and saved many lives when evacuation to ships at night could not be carried out. He later moved his company forward to a position directly in rear of the front lines, at the junction of the two main roads of evacuation, and under his cool leadership, in spite of several severe artillery barrages, his company performed invaluable service in screening casualties from all three combat regiments. His untiring devotion to duty, coolness under fire and efficient direction of his organization were an inspiration to the men under his command and in keeping with the highest traditions of the United States Naval Service." Dr. Phillips graduated from Northwestern University Medical School, Chicago, in 1940 and entered the service in January 1942.

Commander Cripps B. Shacklette

Comdr. Cripps B. Shacklette, formerly of Shively, Ky., was recently awarded the Legion of Merit "for distinguishing himself by outstanding devotion to duty during naval action in Pacific waters." The citation said that "Commander Shacklette, senior medical officer aboard an aircraft carrier, despite intensive shelling and bombing by enemy surface craft and aircraft units, remained at his post for three days and nights administering aid to the wounded and suffering" Dr. Shacklette graduated from the University of Louisville School of Medicine in 1930 and entered the service April 15, 1942.

Captain Jesse W. Miller

The following letter of commendation was recently presented to Capt. Jesse W. Miller, formerly of Washington, D. C.: "Your performance of duty while serving as executive officer of a large naval base hospital in southern England prior to, during and after the invasion of the French coast in June 1944 has been brought to my attention. You were instrumental in the successful conversion of an old British hospital to one conforming to modern hospital standards. Your assistance in the acquisition of this institution from the U. S. Army, in the maintenance of the good relations which existed with the British army, and your work in connection with the organization of the base hospital in preparation for the reception of casualties was outstanding. You exhibited, in the innumerable details of hospital administration incident to combat casualties, excellent judgment and administrative ability, thus contributing most materially to the successful work of the institution. For your initiative and outstanding service during this period you are hereby commended. This commendation carries with it the privilege of wearing the commendation ribbon." Dr. Miller graduated from the University of Nebraska College of Medicine, Omaha, in 1927 and entered the service in June of that year.

Lieutenant Philip B. Phillips

Lieut. Philip B. Phillips, formerly of Portsmouth, Va., was recently awarded the Legion of Merit. He won the award for his action as a flight surgeon, "distinguishing himself by meritorious conduct in the performance of outstanding service. While conducting air operations against Japanese surface task forces his ship was struck and badly damaged by enemy air attacks. Not only was the ship unable to carry on further operations against the enemy because of damage, but casualties were extremely heavy. He treated injured gunners on the deck while enemy planes circled overhead preparing to attack the formation further. He made his way through smoke and flame on the deck, where a bomb exploded, to care for the critically wounded and to provide for their removal to sick bay. For four days and nights he applied his skill to the saving of life and was rewarded by success countless times. His energy, skill and determination were such that his profession may well take pride in him." Dr. Phillips graduated from the University of Arkansas School of Medicine, Little Rock, in 1941 and entered the service in June 1941.

MISCELLANEOUS

DR. JOHN H. STOKES COMMENDED

The Army recently awarded a certificate of commendation to Dr. John H. Stokes, professor of cutaneous medicine and syphilology at both the School of Medicine and the Graduate School of Medicine of the University of Pennsylvania. The citation follows.

". . . For meritorious service to the Third Service Command in the field of venereal disease control, a master clinician and research worker, Dr. Stokes has been engaged in fundamental medical research and teaching throughout his medical career. He has made significant contributions in the treatment and control of syphilis, critically evaluated public health technic and legislation concerned with the control of venereal diseases, not only for his intense devotion to duty and frequent counsel to army venereal disease control officers, has materially assisted in maintaining the health of the armed forces in the Third Service Command."

The presentation was made by Brig Gen. Thomas E. Troland, commanding general, Pennsylvania District, Third Service Command.

Dr. Stokes is one of a number of medical specialists who were appointed by the Army as civilian consultants to the Office of the Surgeon General to work with Brig. Gen. Hugh J. Morgan, chief consultant in medicine He also is special consultant to the United States Public Health Service and a senior surgeon in the United States Public Health Service Reserve.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Birmingham General Hospital, Van Nuys: The Management of Simple Skin Diseases, Lieut. Col. Everett R. Seale, August 8; Anesthesia in War Surgery, Lieut. L. E. Trotter, August 22.

A. A. F. Regional Hospital, Camp Haan: Surgery of the Liver and Its Ducts, Capt. E. E. Larson, August 7.

Camp Cooke Station Hospital, Lompoc: Psychosomatic Medicine, Dr. H. Douglas Eaton, August 15.

U. S. Naval Hospital, Santa Margarita Ranch: Some Dynamics of Military Neuropsychiatry, Major Alex Blumstein, August 9; Intraocular Foreign Bodies, Lieut. Comdr. H. Lusic, August 23.

U. S. Naval Hospital, Corona: Pulmonary Tuberculosis, Comdr. W. L. Rogers and Comdr. A. W. Hobby, August 9; Penicillin in Syphilis and Gonococcic Infections, Lieut. Comdr. W. W. Duemling, August 23.

U. S. Naval Air Training Station, San Diego: Communicable Diseases, Major Norman Nixon and Capt. Charles Marple, August 17.

Santa Ana Army Air Base Regional and Convalescent Hospital: Peritoneoscopy, Capt. J. C. Ruddock, August 7; War Wounds of the Chest, Lieut. Comdr. J. P. O'Connor and Lieut. Henry Jaffee, August 21.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

July 30, 1945.

One-Hundred and Seventieth Birthday of the Army Medical Department

Instead of cutting a birthday cake, the Army unveiled some of the medical advances made during the war, when the 170th birthday of the Army Medical Department was observed at Walter Reed Hospital, with Sir Alexander Fleming, discoverer of penicillin, and some 6,000 Washingtonians present. The new medical processes were described as methods which are enabling more wounded servicemen to be returned mentally and physically sound to their homes than in any previous war. Guests were escorted through typical wards and the artificial limb shops. Sir Alexander met some of the servicemen whose lives his discovery had saved, and he answered their questions regarding the drug. He also disclosed that penicillin will soon be mixed with a new ingredient which will permit the drug to remain longer in the body and require fewer administrations.

Scientific Dependence on Germany Scored by Committee

American dependence on Germany for scientific research was scored by a Senate subcommittee on war mobilization, which suggests legislation to expand research and development by private organizations and the government. In its report the Senate Military Affairs Committee said that since science is decisive in war and peace it must be provided for within the regular framework of government. Its report stated that "only in this way can we become independent of German science, on which we have leaned so heavily in the past. Our people must support basic research instead of relying on basic research evolving from the laboratories of other nations. In addition to philanthropy at home we have depended very heavily on the basic research done in Germany with the support of the German government. Through the cartel system we have also presumably relied on Germany for a great deal of our applied research." In supporting government support of scientific research on the largest scale in American history, the subcommittee said that it was technological development and the "concentration of this advanced technology for aggression" that had carried Germany to "the edge of victory."

Shortage of Office Space for Returning Doctors

Theodore Wiprud, secretary of the Medical Society of the District of Columbia, has again called attention to the shortage of office space in Washington for doctors returning from practice with the armed forces, a serious situation that also exists in many other cities. Mr. Wiprud said, in part, "It seems to us that the public is entitled to know that, if office space in Washington continues to be unobtainable, service physicians returning to civilian life will find it impossible to reestablish themselves in practice. The District Society's Committee on Service Physicians, of which Col. A. Clagett Gray, chief medical officer of the District Selective Service, is chairman, recently called attention to the difficulty a few discharged veterans have already had. During the war a number of buildings which have been, or might have been, used by physicians have been taken over by the government. If the agencies which occupy them are dissolved or their staffs reduced, and the buildings they occupy made available for civilian use, the situation might be alleviated.

Correction of Misstatement in Press

An erroneous impression on the number of doctors in Washington, resulting from a news story in the Washington *Post*, which quoted Dr. Paul F. Dickens, state chairman of the Procurement and Assignment Service, as saying that "Washington has several more physicians than it needs," has been corrected by Dr. Dickens. He has issued this statement: "What I did say was this: 'The Advisory Committee to the State Chairman for Procurement and Assignment Service for Physicians, after a careful survey of the situation, advised that 910 physicians was the minimum number necessary to care for the basic health and comfort of the community and we should not withdraw physicians from the community below that number. It is estimated that as of this date we have perhaps 922 physicians practicing medicine in the metropolitan area. Many of these physicians are in the upper age bracket and certainly need a rest. Some of the physicians now practicing in this community previously had retired and to help the war effort came back into the practice of medicine.'"

Inspection of Hospitals by House Veterans Committee

Unannounced inspections of veterans' hospitals throughout the country are being made by members of the House Veterans' Committee during the House recess in order that they may be ready with concrete information for resumption of the committee's investigation in the fall. They are also discussing veterans' hospital problems with the managers and medical officers. Extensive changes are expected to be made in the Veterans' Administration medical setup under Gen. Omar T. Bradley, who will succeed Brig. Gen. Frank T. Hines on August 15. Representatives expect that future committee hearings will explore legislation designed to improve the medical service and discover present shortcomings. Early in October Chairman Rankin will take up a pending bill which would set up in the Veterans Administration a bureau of medicine and surgery similar in scope and authority to the Army Surgeon General's Office and the Navy Bureau of Medicine and Surgery. In favor of this legislation in principle are Representative Rogers of Massachusetts, ranking minority member, and a number of others. As yet General Bradley has not expressed himself on proposals to reorganize the Veterans Administration. Several physicians of national prominence, who testified at hospital hearings, favor the medical bureau, but with a strictly civilian staff.

Presentation of Humanitarian Award to Sir Alexander Fleming

Sir Alexander Fleming, Scottish scientist who discovered penicillin, was awarded the Variety Clubs' Humanitarian Award for 1944 before cabinet members, diplomats and representatives of the United Nations. At the Mayflower Hotel a letter from President Truman was read by Secretary of the Treasury Fred M. Vinson describing Sir Alexander as a man "to whom the world owes a debt of gratitude difficult to estimate." Sir Alexander was the sixth person and the first Briton to receive the silver plaque and the honorarium of $1,000. He was nominated as the man "whose humanitarian efforts have contributed most to the welfare of mankind" in 1944. R. J. O'Donnell, national chief barker of the Variety Clubs of America, an organization of the show business, presented the award, which recognized the scientist for his "faithful and diligent efforts" in medical research, "which have meant so much toward the alleviation of pain and suffering."

Limited Quantities of DDT Released to Civilians

Civilians will get limited quantities of DDT in August. The War Production Board reports that release of the powerful insecticide developed in this war for military use has been made possible by increased production. To date, civilian and agricultural use of the insecticide has been restricted to experimental purposes. The agency cautions that "there is a great deal that is yet to be learned about how to use DDT insecticides safely." DDT has proved effective in killing mosquitoes, cockroaches, flies, bedbugs and other insects.

Postwar Medical Service

MINUTES OF MEETING OF JUNE 23

The Committee on Postwar Medical Service met on Saturday, June 23, 1945, in the Board of Trustees Room of the American Medical Association Building in Chicago. The meeting was called to order by the Chairman, Dr. Ernest E. Irons, at 10 a. m. Those present were:

Dr. *Louis H. Bauer, Trustee, American Medical Association.*
Lieut. Col. R. D. Bickel, Liaison Officer, Office of the Surgeon General, U. S. Army, and the American Medical Association.
Dr. Walter L. Bierring, Federation of State Medical Boards.
Dr. Francis G. Blake, American Medical Association Committee.
Capt. W. E. Eaton (MC), U. S. Navy, American Medical Association Committee.
Dr. Morris Fishbein, American Medical Association Committee.
Dr. E. L. Henderson, American Medical Association Committee.
Mr. J. W. Holloway Jr., Director, Bureau of Legal Medicine and Legislation, American Medical Association.
Dr. Ernest E. Irons, American College of Physicians Committee.
Dr. Victor Johnson, Secretary, Council on Medical Education and Hospitals, American Medical Association.
Dr. Edwin P. Jordan, Associate Editor, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.
Dr. B. R. Kirklin, Advisory Board for Medical Specialties.
Dr. H. L. Kretschmer, President, American Medical Association.
Dr. Roger I. Lee, President-Elect, American Medical Association.
Lieut. Col. H. C. Lueth, Office of the Surgeon General, War Department.
Col. Hugo Mella, Veterans Administration.
Col. F. V. Meriwether, U. S. Public Health Service.
Dr. J. J. Moore, Treasurer, American Medical Association.
Col. George M. Powell, Office of the Surgeon General, War Department.
Brig. Gen. Fred W. Rankin, Office of the Surgeon General, War Department.
Father A. M. Schwitalla, S.J., Catholic Hospital Association.
Dr. R. L. Sensenich, Trustee, American Medical Association.
Dr. H. H. Shoulders, American Medical Association Committee.
Dr. LeRoy H. Sloan, American College of Physicians Committee.
Dr. Olin West, American Medical Association Committee.

Approval of Minutes.—The minutes of the Committee meeting held on May 12, 1945, as circulated, together with minor corrections suggested by Drs. Sloan and Bierring, were presented by the Chairman, and the corrected minutes were approved.

Committee Membership.—The Chairman informed the Committee that Dr. Walter W. Palmer of New York had accepted reappointment by the American College of Physicians as a member of the Committee on Postwar Medical Service to succeed Dr. W. W. Herrick, deceased.

Communication from Miss Switzer.—A telegram from Miss Mary Switzer, liaison member of the Committee representing the Procurement and Assignment Service, was presented. The communication dealt briefly with the supply of medical and dental students and with the surplus property situation.

Dr. Fishbein supplemented the information offered in Miss Switzer's telegram. He said that the deferment of medical and dental students is being considered in Washington through an interdepartmental committee. He also stated that the advisory committee on surplus property to be appointed by Mr. McNutt probably will contain representatives of the American Hospital Association, the American Medical Association, the American Dental Association, the Conference of State and Territorial Health Officers, the Conference of State Sanitary Engineers and others. This advisory committee, with Surgeon General Parran as chairman, will set up a policy for the disposal of surplus medical and hospital supplies. He touched briefly on the preliminary conference on this matter which he and Dr. Irons had attended in Washington some weeks ago. (A report of this conference appeared in the minutes of the Committee's May 12 meeting.)

Bureau of Information.—The following report on the status of the work of the Bureau of Information, prepared by Lieutenant Colonel Bickel, was presented by Dr. Jordan:

The Bureau of Information is developing along the lines originally established. The work of securing information from counties about the need for doctors has been the most difficult part of establishing the Bureau, but the problems having to do with education and licensure have been more easily handled, as the result of the cooperation of the Council on Medical Education and Hospitals and the Bureau of Legal Medicine and Legislation. During recent weeks there has been a gratifying increase in the number of completed county summary sheets received from the state medical societies. However, there are still many counties to be heard from, and continued efforts are being made to complete this part of the program.

Twenty-one states, as of June 22, 1945, have returned completed summary sheets for each county in the state. Twenty state medical societies have sent in completed summary sheets for some of the counties in their states. A total of 1,981 county summary sheets have been received from all of these states. Eight states, including a total of 247 counties, have made no returns, although some of these states are completing their data and it is expected that this material will be received soon.

The following facts illustrative of the beginning of the service of the Bureau of Information may be of interest: Approximately 106 physician veterans have asked for information about places in which to establish a practice; fifty different localities have communicated with the Bureau through local civic groups and others in an effort to secure physicians to practice in these areas, and there have been approximately fifty personal interviews with physician veterans who were interested in obtaining residencies, other hospital appointments or information about likely places in which to begin practice.

Recently work has been started on an information pamphlet which will describe the facilities of the American Medical Association for aiding returning physicians. This should be helpful to physicians in their problems of education, licensure and medical practice. This pamphlet includes material prepared by the Council on Medical Education and Hospitals, the Bureau of Legal Medicine and Legislation and the Bureau of Information.

Dr. Jordan presented galley proofs of the proposed Information Bulletin for Medical Officers, and it was the Committee's opinion that the information contained therein will be of interest and benefit to all medical officers. The proposed bulletin was approved subject to corrections or additions which may be offered by members of the Committee, and authorization was given for its widest possible distribution to the medical members of the armed forces, including those now on active duty and those who may be in process of separation from active service.

Various suggestions were offered as to the distribution of the bulletin: It was felt that it should be sent to any individual medical officer who may write to the Committee on Postwar Medical Service, placed in the hands of medical officers at separation centers and made available to the Surgeons General of the Army, Navy and Public Health Service for possible distribution by means of insertion in the medical bulletins of those services. It was also suggested that copies might be distributed on an individual basis through the offices of the surgeons of the various service commands and might also be circulated from the offices of the state Procurement and Assignment agencies.

Colonel Powell agreed to present to the Surgeon General of the Army the request that the pamphlet be inserted in an early issue of the *Army Medical Bulletin*, and Captain Eaton agreed to present the request to the Surgeon General of the Navy that it be inserted in the *Naval Medical Bulletin*. Colonel Meriwether stated that he would ask General Parran if it could be inserted in the Public Health Service bulletin. It was the opinion of the Committee that it would be desirable to carry out all of these suggestions.

The Chairman stated that a further report from the Bureau of Information would be requested at the next meeting.

Progress Report on the Availability of Residencies and Short Courses for Physician Veterans.—Dr. Johnson presented the following report, which, after discussion, was accepted:

Responses from hospitals which are expanding their facilities indicate that approximately 28 per cent of the 1,054 civilian hospitals approved for internships and/or residencies probably will be in a position to supply approximately 42 per cent of the overall demand for increased house officerships. This would indicate that when all hospitals have completed their plans the demand, in all probability, will be met.

There is a special need for providing additional places in surgery where nearly 1,600 physicians probably will seek training, and at present only about one fourth of this number appears to be available.

The expanded number of places in approved hospitals will be indicated in the next printing of Approved Residencies and Fellowships in September 1945. This will constitute the first list which includes facilities especially for veterans and will be so labeled.

In the next semiannual publication of continuation courses, which will appear in THE JOURNAL in July, there will be included a considerable number of special courses which have been developed to meet the needs of physician veterans. This will also constitute a first publication of such courses and will be entitled "Continuation Courses for Veteran and Civilian Physicians."

These lists will be incomplete, since not all institutions have fully formulated their plans, but the lists can and will be modified on republication in accordance with further expansion of educational facilities.

In the discussion of Dr. Johnson's report, it was mentioned that there is a definite relationship between the philosophy of demobilization and the availability or nonavailability of residencies. Father Schwitalla asked if there had been a very great demand for additional places in anesthesiology in the civilian hospitals independent of the increase coming through the physician veterans. He commented that the nurse anesthetist organizations are using the reported demand as an argument for recruitment and that what he said with respect to anesthesiology might also apply to the field of radiology and to other special

Expansion of Residencies in 292 of the 1,054 Civilian Hospitals Approved for Internships and/or Residencies

Field of Training	Estimated Requirement (2 Year Demobilization)	Additional Residencies Available in 292 Hospitals
Anesthesiology	71	102
Dermatology and syphilology	108	54
General review	705	77
Hospital administration	7	..
Industrial and insurance medicine	7	..
Internal medicine and subspecialties	1,089	457
Neurologic surgery	14	40
Obstetrics and gynecology	615	209
Ophthalmology	172	77
Orthopedic surgery	201	107
Otolaryngology	185	87
Pathology	126	127
Pediatrics	253	143
Plastic surgery	39	17
Psychiatry and neurology	200	258
Public health	43	..
Radiology	155	133
Surgery and subspecialties	1,595	416
Urology	108	78
Other fields	34	..
Totals	5,727	2,382

fields, the argument in all cases being on the basis that there are not enough physicians to fill the need. Dr. Johnson agreed that this is a vital problem.

Father Schwitalla stated that there has been a growing tendency toward specialization among recent graduates and that a 15 per cent increase in the desire for residencies in the various specialties must be anticipated. He wondered if this was not a dangerous situation with respect to the future of medical practice. In reply, Dr. Kirklin stated that the specialty boards are trying to take care of the problem and that while there seems to be a general feeling among the members of the profession that the boards may lower their standards for the benefit of the men returning from service, the fact is that the standards are being kept up to where they always have been and even may be raised a little higher. He further stated that the Advisory Board for Medical Specialties had discussed, at length, credit that might be allowed for military service and that such credit had been considered by every one of the specialty boards. General Rankin stated that the American Board of Surgery allows its candidates a year's credit for military service provided that service has included hospital training, and Dr. Kretschmer said this was also true of the American Board of Urology, as did Dr. Irons of the American Board of Internal Medicine. Dr. Moore informed the Committee that the American Board of Pathology gave credit for military service only if such service or a sufficient part of it had been in a laboratory.

Refresher Courses for Army Medical Officers.—Colonel Powell reported that since the May 12 meeting the following information concerning refresher courses for medical officers had been made available:

Refresher training for medical officers will be conducted in the European Theater of Operations during the period of redeployment.

In military installations, basic refresher courses starting July 1, 1945 are to be taught at hospital centers and at general and station hospitals and will include general surgery and general medicine eight weeks, and anesthesia, radiology, psychiatry, clinical psychology and dermatology four weeks. Also in military installations there will be advanced courses of three months' duration in medical specialties starting July 1, 1945 at hospital centers and at general and station hospitals, which will include infectious diseases, cardiovascular diseases and gastroenterology.

It is proposed to begin refresher courses in civilian agencies by June 18, 1945 at the earliest, to be in progress by July 15. Refresher courses in basic general medicine and surgery—four weeks—are to be given at eleven London medical schools, Glasgow University and the University of Paris, and in general surgery—six weeks—at Edinburgh University, the University of Paris, eleven London medical schools and the British Post-Graduate Medical School. Advanced courses of six weeks' duration in obstetrics and gynecology will be given at the British Post-Graduate Medical School, the University of Paris and Edinburgh University, and a basic course of four weeks in the same subjects at Queen Charlotte Hospital. A six weeks course in neurology and psychiatry will be taught at the University of Paris, and an advanced course in radiology will be provided under the proctor system with one student per British radiologist.

In a recent communication from the European Theater of Operations, requests for availability of training material in preventive medicine, particularly tropical diseases, indicate that such courses are contemplated.

These courses will provide refresher instruction in military installations to 965 medical officers and in civilian agencies to 425 medical officers.

It was stated by Colonel Powell that in addition to the foregoing there are now 177 officers in the courses established for the Army Service and Ground Forces, and that the Air Forces also have courses.

Lieutenant Colonel Lueth stated that the Office of the Surgeon General had established a card reporting system for the returning medical officer, who fills out the card questionnaire indicating his desire for refresher courses as he arrives at a reception station. As the medical officer returns he is grounded for thirty days' temporary duty at home, which gives the office enough time to assign him; this scheme is designed to be of service to those officers who do not stay in Europe long enough to take advantage of the courses offered in the European Theater of Operations. He added that the Air Forces have nearly 100 men registered in their refresher courses.

After discussion as to the method of teaching and the manner in which the faculties are arranged, Colonel Powell's report was received.

Enrolment of Medical Students.—Dr. Johnson, Chairman of the Subcommittee on Enrolment of Medical Students, reported that Dr. Evarts Graham, who was made a member of the subcommittee at the May 12 meeting, was instrumental in arranging an interview with the President on May 31; present at this interview were Dr. Graham, Dr. Johnson, Dr. Harvey Stone and Dr. Zapffe. Since the President undoubtedly will confer with the military authorities on this problem, attempts are being made to arrange an interview with the Chief of Staff, and Dr. Stone has reported that he thinks it will be possible to arrange such an interview in the near future. Further plans are under way for bringing the matter to the attention of the people.

The Chairman presented a memorandum which the subcommittee had submitted to the President, and Father Schwitalla requested that it be published. (This memorandum was printed in THE JOURNAL, July 21, p. 884.)

The report of the subcommittee was accepted.

National Research Foundation.—Dr. Fishbein gave an outline of a report recently made by Mr. Vannevar Bush dealing with future government activity in connection with scientific research. He stated that he had been requested by the Board of Trustees of the American Medical Association to present the matter to the Committee on Postwar Medical Service with a view to the establishment of a group or subcommittee to study the report as soon as it becomes available and report back to the Committee so that a policy on this subject may be formulated.

The Chairman was authorized to appoint a subcommittee to study the Bush report when it becomes available and to make recommendations to the Committee on Postwar Medical Ser-

vice. The following subcommittee was appointed: Dr. Francis G. Blake, chairman; Dr. Victor Johnson, Dr. Frederick A. Coller, Father A. M. Schwitalla and Dr. Walter W. Palmer.

Surplus Medical and Hospital Supplies.—Father Schwitalla, chairman of the Subcommittee on Surplus Medical and Hospital Supplies, stated that he had no information beyond what had been submitted earlier in the meeting.

Dr. Fishbein said that it is proposed that the advisory committee which Dr. Parran is to appoint draw up a schedule of the minimum equipment necessary for a physician going into a rural district, and the Surplus Property Board will be able to rent the equipment to such a physician for five years at an annual rental of $1, thus encouraging the establishment of a physician in a needy area. He also stated that there is included in the surplus property that will be available a great deal of equipment left over from World War I, and that it is desired to set up a system whereby much of this old, obsolete and in many cases worthless and possibly harmful material can be destroyed. He further stated that there will be a distributing station in each state and that priorities are to be given to all returning medical officers, who will be entitled to a special discount. It is expected that disposal of the surplus property will be accomplished within three years after the close of the war.

Dr. Bierring described the system of distribution contemplated in Iowa.

The Chairman brought to the attention of the Committee the report submitted by Father Schwitalla at the meeting of the Committee on March 17, 1945, and Father Schwitalla stated that the informational part of the original report was still up to date but he would prefer that final action on it be deferred until the next meeting of the Committee, at which time it is hoped that more and newer information will be available.

The subcommittee was continued to report at the next meeting.

Veterans Administration.—Replies to Statement on Transfer of Medical Officers: The Chairman read for the information of the Committee replies to the statement protesting the transfer of medical officers to the Veterans Administration, which was adopted by the Committee at the May 12 meeting and sent to the Secretary of War and the Secretary of the Navy.

The Chairman stated that a telegram had just been received by the Editor of THE JOURNAL from Surgeon General Kirk in which it was stated that "In the future Medical Corps officers will not be assigned to the Veterans Administration unless they were previously employed by that agency or they specifically request such assignment."

Report of Subcommittee to Confer and Cooperate with Veterans Administration: Father Schwitalla, chairman of the subcommittee, referred to recent instructions issued by the Veterans Administration in connection with educational opportunities offered under the G. I. bill. He stated that provision is made for recognition of lists of institutions maintained by established accrediting agencies, and that such approved institutions need not be investigated. The accrediting agencies so recognized are:

American Association of Teachers' Colleges
American Association of Theological Schools
American Bar Association
American Council on Pharmaceutical Education
American Osteopathic Association
Association of American Universities
Council on Dental Education, American Dental Association
Council on Medical Education and Hospitals, American Medical Association
International Association of Boards of Examiners in Optometry
Middle States Association of Colleges and Secondary Schools
National Association of Schools of Music
National League of Nursing Education
New England Association of Colleges and Secondary Schools
North Central Association of Colleges and Secondary Schools
Northwest Association of Secondary and Higher Schools
Southern Association of Colleges and Secondary Schools

Father Schwitalla raised the question as to whether or not an intern who is receiving a small intern stipend from a hospital is entitled to receive the maintenance benefit provided for student veterans, and Dr. Johnson made the following statement:

Conferences and subsequent correspondence have been had with Mr. H. V. Stirling, director of the Vocational Rehabilitation and Education Service of the Veterans Administration, regarding the case of Dr. Henry I. Colman, who applied for benefits under the G. I. Bill of Rights while he was taking a nine months course as an intern in obstetrics and gynecology at the Bellevue Hospital in New York. He had been refused subsistence benefits by the Veterans Administrator in New York City on the grounds that he was already receiving compensation from the hospital in the form of maintenance and a stipend. Mr. Stirling made a clearcut ruling in this case, which should serve as a precedent for similar instances of this kind that are very likely to arise elsewhere in this country. Among other things, Mr. Stirling stated the following in his letter to the Veterans Administrator in New York City:

"It has been determined that where a person is pursuing on the job training and receiving compensation for productive labor as a part of the course of training on the job, he may be paid subsistence allowance provided the sum of the amount he received from the employer-trainer and his subsistence allowance do not exceed what is considered to be the beginning salary or compensation for persons qualified to perform the duties and functions of the position for which training is being pursued. Subsistence allowance may be reduced to a lesser amount not to exceed the amount of the difference between the compensation for productive labor as a part of his training on the job and the beginning salary or compensation for a person who has completed the type of training being pursued.

"If the facts in this case are shown to be in substantial agreement with those stated, it is considered that subsistence allowance may be awarded this veteran from the date of his application, formal or informal, or the date he entered training, whichever is the later. It is believed the compensation received by Dr. Colman plus the full amount of subsistence allowance does not exceed a reasonable beginning salary for a physician skilled in the specialty for which he is receiving training."

It was the consensus of the Committee that Mr. Stirling's communication completely sustained the statement on the payment of salaries under the G. I. bill that was contained in the report of Father Schwitalla's subcommittee presented at the May 12 meeting, and that Mr. Stirling's interpretation established a precedent.

A letter received from a veteran who wished to know whether or not he could study part time under the G. I. bill was presented by the Chairman, and Colonel Mella informed the Committee that the medical service had obtained a ruling that a veteran may utilize half days or evenings for his educational program; there is a time limit of a year or more, depending on the veteran's length of service, but if he is entitled to one year's training and attends his course only half time then he actually can spend two years in his educational pursuits; that is possible under the law and there has been a very definite ruling; however, each case is handled on an individual basis. Colonel Mella noted that this matter is covered in the proposed Information Bulletin for Medical Officers previously discussed.

The report of the subcommittee was received and the committee continued.

Report of Subcommittee on Establishment of a Medical Corps in the Veterans Administration: Father Schwitalla, chairman of the subcommittee, stated that he had been informed that the bills for the establishment of a Medical Corps seem to be dead, and that perhaps nothing will be done until the new administrator has had time to familiarize himself with the entire problem. He thought that the subcommittee might be discontinued, but Colonel Mella thought it would be unfortunate if the subcommittee was discontinued at this time with all the changes that undoubtedly will soon be made, and also that the statement as to the bills being dead was not official.

The subcommittee was continued with the expectation that matters with which it is concerned will again be taken up at the next meeting.

The Governors and the G. I. Bill.—Dr. Shoulders, chairman of the Subcommittee to Draw Up Recommendations to the Governors of the States Concerning the G. I. Bill of Rights, gave a short analysis of the replies of various state governors to the recommendations forwarded to them in accordance with the action of the Committee on Postwar Medical Service at its meeting in March.

The chairman stated that the reception of the "Governors' Letter" had, on the whole, been very favorable and cordial.

The report of the subcommittee was received.

Demobilization of Medical Officers.—Dr. Johnson, chairman of the Subcommittee on Formulation of Lists of Medical Officers to be considered for Demobilization, presented the following report:

Communications have been sent to the deans of the schools of public health and to the public health officers of each state requesting the names of public health teachers and officers whose release would relieve critical shortages. Many states and schools have already reported. The names of these individuals have been submitted to the Office of the Surgeon General of the Army in the same manner that the names of critically needed teachers in medical schools were submitted. The original instructions of the Committee on Postwar Medical Service to the subcommittee concerning the release of essential teachers included investigation of these fields of public health. Likewise, in his original request to the subcommittee for lists of essential teachers, the Surgeon General indicated a desire to have names of public health officers as well. As further names are submitted they will be transferred to the Office of the Surgeon General.

Dr. Rankin reported that Dr. Morgan, Dr. Menninger and himself with the assistance of heads of technical services had gone over the lists to determine the military essentiality of the officers involved; that there are a number on the list who cannot be released; that at present the list is incomplete but it appears that it may be possible to release 233 medical officers, 121 of whom are unfortunately not in this country; that 5 essential teachers already have been released from service; that there should be a considerable number discharged by the time of the next meeting of the Committee, and that the list can be supplemented by substitutions and additions from time to time.

Captain Eaton stated that this matter is being carefully considered by the Surgeon General of the Navy, and Lieutenant Colonel Lueth said that there would be about 20 names on the Public Health Service roster to be added to the 233 mentioned by General Rankin.

Licensure.—A résumé of several letters that had been received inquiring as to the conditions of licensure that will apply in the case of returning medical officers was given by the Chairman.

Dr. Bierring reminded the Committee of the report made by him at a previous meeting in which he had stated that it was the considered opinion of the Federation of State Medical Boards that the question of special consideration for veterans who are applicants for license is an individual matter to be left to the individual state boards. He stated that the matter is being pushed particularly by graduates of unapproved schools; that the Federation has received letters from United States senators, and that an attempt is being made to arouse popular sentiment.

There was lengthy discussion of H. R. 2969, recently introduced by Congressman Eberhardt. It was thought that this bill may be the forerunner of other forms of legislation designed to make it easier for discharged medical officers, particularly the graduates of unapproved medical schools, who wish to locate in a state other than that in which they formerly were licensed, to secure a license—and perhaps to avoid examination—under more liberal conditions than now prevail.

Dr. Bierring remarked that the reciprocity agreements between states and the fact that many of the medical officers are diplomates of the National Board of Medical Examiners should take care of some of the difficulties, and that by the time the Committee meets again more information will be available. The Chairman stated that it is quite beyond the function of the Committee on Postwar Medical Service or of the Board of Trustees of the American Medical Association to tell any state licensing board what it should do, but he thought the matter should be brought to the attention of the state boards.

Informational Reports.—Wartime Graduate Medical Meetings: Dr. Shoulders reported for Dr. F. F. Borzell that it is becoming increasingly difficult to supply speakers for the programs sponsored by the Wartime Graduate Medical Meetings and that it has been suggested that the Army and Navy might be willing and able to supply medical officers for this purpose. Captain Eaton said he would present the matter to the Surgeon General of the Navy, but he thought that some arrangements could be made locally, which had already been done in some cases. It was suggested by the Chairman that Dr. Borzell might himself communicate with the Surgeons General and request their assistance.

Navy Department: Captain Eaton presented a pamphlet prepared by the Professional Division of the Bureau of Medicine and Surgery entitled "Essentials of Internship and of Residency-Type Training in United States Naval Hospitals."

Time and Place of Next Meeting.—It was decided that the next meeting of the Committee will be held at American Medical Association Headquarters in Chicago on Saturday, Sept. 22, 1945, and that if matters of emergency should arise in the meantime they can be referred to subcommittees or, if necessary, the Chairman will call a meeting of the Committee.

The meeting adjourned at 12:35 p. m.

H. H. Shoulders, M.D., Secretary.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Maternal and Child Welfare Act of 1945

Senator Pepper, Florida, for himself and nine other members of the Senate Committee on Education and Labor, has introduced S. 1318 to provide for the general welfare by enabling the several states to make more adequate provision for the health and welfare of mothers and children and for services to crippled children. This bill would authorize an appropriation of $100,000,000 for the fiscal year ending June 30, 1946: $50,000,000 for maternal and child health services, $25,000,000 for services for crippled children, $20,000,000 for child welfare services and $5,000,000 for administrative expenses incurred by the Children's Bureau in carrying out the provisions of the bill. Thereafter such sums will be made available as the Congress may decide.

Army Optometry Corps

A bill to establish an Optometry Corps in the Medical Department of the Army, H. R. 3755, has been reported by the House Committee on Military Affairs with the recommendation that it pass. Officers of the proposed Optometry Corps will be assigned to optometrical duty or to administrative duty in connection therewith. When assigned to optometrical duty, they are to perform optometrical work determined on by a medical officer, who is required to be an ophthalmologist. The right of officers of the Optometry Corps to command, it is proposed, will be limited to command within the Optometry Corps and the Medical Administrative Corps. Provision is made for Optometry Corps reserve units.

Dental Research

Representative Priest, Tennessee, has introduced H. R. 3816 to provide for, foster and aid in coordinating research relating to dental diseases and conditions and to establish the National Institute of Dental Research. Congressional hearings have recently been held on previous bills relating to this subject.

Hospital Construction

A bill substantially similar to the Hill-Burton hospital construction bill, S. 191, was introduced in the House of Representatives, July 18, by Representative Snyder, Pennsylvania. H. R. 3845.

Bureau of Information

The Bureau of Information has prepared and has begun the distribution of a questionnaire to civilian physicians. Physicians in Iowa and Florida have already been mailed their questionnaires, and those in other states will receive theirs soon.

In accordance with the obligation of the Bureau to collect as complete data as possible on the distribution of physicians and other aspects of medical practice, it is hoped that physicians will return their questionnaires promptly so that the files of the Bureau will be more complete and up to date.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST, SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Officers of State Medical Board.—At a meeting June 8 of the state medical board Dr. Robert J. Haley Jr., Paragould, was chosen president, Dr. Robert H. Hood, Russellville, vice president and Dr. Leonce J. Kosminsky, Texarkana, secretary-treasurer. Other members of the board include Drs. John B. Jameson, Camden, Jasper T. Matthews, Heber Springs, John M. Proctor, Hot Springs National Park, and William H. Poynor, Harrison. Dr. DeVeaux L. Owens, Harrison, was retired after serving eight years on the board, which is the allowed time. Dr. Eugene A. Callahan, Carlisle, also served eight years but died May 28, preceding the June 8 meeting.

CALIFORNIA

Personal.—On June 23 the University of Southern California, Los Angeles, conferred the honorary degree of doctor of science on Dr. Walter L. Treadway, Los Angeles, formerly assistant surgeon general of the U. S. Public Health Service.——Dr. William McDowell Hammon, associate professor of epidemiology in the George Williams Hooper Foundation for Medical Research, University of California, San Francisco, accepted a similar appointment in the school of public health on the Berkeley campus, effective July 1. Dr. Hammon, who will continue his association with the Hooper Foundation, will be responsible for developing training programs in epidemiology in the school of public health.

Equalization Board Revises Ruling on Sales Tax.—The California Board of Equalization on June 11 reported to the American College of Radiology a revision of its ruling specifying that the physicians engaged in the specialty of radiology should be subject to a state sales tax on films used. The sales tax now, stated the board, would be applied only in those cases in which the radiologist or commercial laboratory delivers to patients films employed in their examination. On April 7 the college of radiology filed a brief contesting the original ruling of the board of equalization, which stipulated that the radiologists would be required to pay a sales tax on that portion of fees charged by them which represent a "fair retail value of x-ray pictures or negatives" employed in the examination of patients. A similar action took place in New York (THE JOURNAL, April 28, p. 1141).

COLORADO

Occupational Disease Compensation Law.—Occupational diseases become compensable for the first time in the history of the state, under a law passed by the general assembly of Colorado recently. The act goes into effect Jan. 1, 1946. Coverage is limited to diseases listed in a schedule which includes silicosis and asbestosis. According to the *Industrial Hygiene News Letter* the Colorado division of industrial hygiene cooperated in drafting the bill. Colorado is the twenty-ninth state to adopt a law compensating for industrial disease.

CONNECTICUT

Personal.—Dr. James H. Naylor, Hartford, recently received an honorary degree of doctor of laws from the University of Vermont, Burlington, where he graduated in medicine in 1895.

Student Membership.—Two hundred and eight medical students whose family residence is in Connecticut have been elected to student membership in the Connecticut State Medical Society by the council of the society. The student members are enrolled at twenty-five medical schools, with nearly 50 per cent registered at the Yale, Long Island, Tufts, University of Vermont and Boston University medical schools. Fifty-nine Connecticut towns and cities are represented on the list of home addresses of the new members, who are at various stages in the study of medicine ranging from the first year to internship. The student members will be affiliated with the county medical associations in the counties where they reside and will share in the privileges and participate in the activities of these organizations except that they may not vote or hold office.

ILLINOIS

Physician Named "Man of the Week."—Dr. William R. Roberts, Cissna Park, was recently chosen "Man of the Week" by the Danville *Commercial News*. In his nomination for the honor, credit was given to Dr. Roberts for his service to the community and his recent admission to membership in the fifty year club of the Illinois State Medical Society. Two of his sons, both physicians and now in service, were formerly associated with him.

KENTUCKY

Personal.—Dr. John O. Salyers has been appointed full time resident physician at the State Reformatory Hospital, La Grange, effective July 16.——Dr. Bertha A. C. Wiseman, La Grange, health director of Oldham County, has been assigned to the Shelby County Department of Health temporarily until a full time director can be named to succeed Dr. Martin H. Skaggs, resigned (THE JOURNAL, June 30, p. 676).

Eight Attend Fifty-Second Class Reunion.—Eight physicians of 224 members of the class of 1893, Kentucky School of Medicine, assembled for a reunion June 21 at the Henry Clay Hotel, Louisville. Thirty-five members of the class are still living. The eight physicians who attended the reunion are Drs. Maurice Bell, Eminence; Charles C. Crampton, Delphi, Ind.; Pinkney H. Crutchfield, Stamping Ground; Ross H. Gregory, Fontanelle, Iowa; Richard W. McCracken, Union Grove, Wis.; James H. Morrison, Hartsville, Ind., and Harry S. Noble, St. Marys, Ohio. Dr. James W. Fitch, Portsmouth, Ohio, one of the charter members of the group, was ill and unable to attend.

LOUISIANA

University News.—Dr. John C. Henthorne, Jackson, Miss., was recently appointed assistant professor of pathology at Tulane University of Louisiana School of Medicine, New Orleans. Dr. Alton Ochsner, professor of surgery at the school, was recently given the title of member honoris causa of the College of Physicians and Surgeons of Costa Rica. Dr. Wilbur C. Smith, professor of gross anatomy at Tulane, has been elected president of the National Collegiate Athletic Association. Dr. Roscoe LeRoy Pullen, instructor in medicine on the Tulane faculty, was chosen by Knox College, Galesburg, Ill., as recipient of the award for the alumnus who has done the most for humanity during the year, it was announced, June 11. Dr. Pullen, who graduated at Knox in 1935 and received his medical degree at Northwestern University Medical School in 1940, has been connected with Tulane since 1941 and is the first physician to have received the award in eight years.

Commencement Activities.—An oil portrait of Dr. Urban Maes, professor and director of the department of surgery, Louisiana State University School of Medicine, New Orleans, the work of William Branks Stewart, medical artist, was presented to the school by the graduating class during the recent commencement exercises. Dr. Morris Fishbein, Editor of THE JOURNAL, spoke on "Medicine in the Postwar World." Dr. Joyce Wofford Odell received the George S. Bel Memorial Award of $50, having been voted by the faculty as the leading member of the class. This award is given by Mrs. Elsie Bel in memory of her late husband, Dr. George S. Bel, who was formerly professor and director of the department of medicine at the school. Dr. Odell also received the A. J. Majors Medical Book Company Award of a book, which is presented for exceptional scholarship in courses offered by the department of pathology and bacteriology. Dr. William H. Stewart received the Hull award, which is presented to the foremost senior member of the Society of Medical Sciences of the school of medicine.

MISSOURI

Appointments to Cancer Commission.—Members of the state cancer commission, in accordance with recent appointments by Governor Phil M. Donnelly, include Dr. Major G. Seelig, St. Louis; Dr. Clifton Smith, St. Joseph; W. Ed Jameson, Fulton, and Frank T. Hodgdon, Hannibal.

Professors Retire.—Dr. Frank C. Neff, Kansas City, on June 30 retired as professor and head of the department of pediatrics, University of Kansas School of Medicine, Kansas City, Kan., and has been succeeded by Dr. Herbert C. Miller Jr., New Haven, Conn. Dr. Neff has been associated with the medical school since 1924. He was formerly a member of the Section on Pediatrics, American Medical Association.

Dr Edward J Curran, Kansas City, retired as professor of ophthalmology and head of the department He has been succeeded by Dr John A Billingsley, Kansas City, Kan

NEBRASKA

Fifty Years of Practice.—Dr Francis P Dorsey Sr, Wayne, was given a dinner by the Five County Medical Society recently in honor of his completion of fifty years of practice——Dr George A Harris, Valley, was recently given a dinner by the Valley Chamber of Commerce in recognition of his completion of fifty years in the practice of medicine

NEW YORK

New Professor of Physiologic Chemistry.—Wilfred W Westerfeld, Ph D, associate in biochemistry, Harvard Medical School, Boston, has been appointed professor of physiologic chemistry at Syracuse University College of Medicine, Syracuse, effective October 1 Dr Westerfeld succeeds Dr Robert K Brewer, who died in March

Cancer Teaching Day.—On October 3 a clinical cancer teaching day will be held at the Homer Folks Tuberculosis Hospital, Oneonta, under the auspices of the Medical Society of the County of Otsego, Sixth District Branch of the state medical society, Tumor Clinic Association of the State of New York, the state medical society and the state department of health's division of cancer control Speakers will include

Dr Gray H Twombly New York, Ovarian Carcinoma
Dr Norman Treves New York Cancer of the Breast
Dr William A Milner, Albany Carcinoma of the Bladder
Dr Fred W Stewart, New York Biopsy in Tumors

Gastroenteritis from Cream Filled Pastries.—*Health News* reports a series of outbreaks of gastroenteritis from cream filled pastries Nine known cases in two counties were reported in one outbreak, all of which were traced to a cream filled cake, prepared by a single bakery, which had been without refrigeration from the time of its preparation until it was consumed twenty-four hours later Fifty-eight known cases were reported in a second outbreak The common source was again traced to a filling in cream cake and chocolate éclairs which had been allowed to stand at room temperature for a period of twenty-four hours following their preparation by a baker who had just recovered from an upper respiratory infection and sore throat Large numbers of hemolytic Staphylococcus aureus organisms were observed in cake and eclairs Early in the year about 100 cases of gastroenteritis occurred in a city in the western part of the state One of the patients died Again the illnesses were traced to chocolate eclairs and cream puffs which had not been properly refrigerated by the bakery concern

New York City

Dr. Ray Dies—George B Ray, Ph D executive director of the department of physiology and pharmacology, Long Island College of Medicine, Brooklyn, died July 6, aged 52

Standards for Hospital Supplies—Columbia University is offering a group of courses on standards of quality for institutional supplies and medical and surgical supplies, medical terminology and medical records According to James U Norris, president of the Hospital Bureau of Standards and Supplies, this represents an educational effort on standards for hospital supplies designed primarily for those persons on hospital staffs who are purchasing commodities of one kind or another Instruction will be given by Dewey H Palmer, M S, research director, Hospital Bureau of Standards and Supplies, Eleanor Lee, A B, assistant professor of nursing, Columbia University, and Dorothy L Kurtz A B, supervisor of the record department, Presbyterian Hospital Additional information may be obtained from the Secretary of Columbia University, 116th Street and Broadway, New York 27

Student Prizes—On June 28 during the eighty-seventh commencement exercises of the Long Island College of Medicine, Brooklyn Lieut Ehah Maurice Nadel M C received three of the eleven prizes given annually to members of the graduating class He won the Nathan H and Johanna Szerlip Medal, given for the best thesis on pneumonia the Jeannette Millman Memorial Award, for the best essay or report on some subject in the field of tumors and the Robert R Benedict Jr Prize, for the best report on a psychiatric problem Top honors in the graduating class went to Dr Frances Anderson Greenwood, Tuscaloosa, Ala who received the Mitchell Prize, awarded to the member of the class who in the judgment of the faculty is best qualified in all departments of medicine, and to Lieut Milton Virshup, M C, who received the Phi Delta Epsilon Prize, awarded for the highest scholastic record Lieutenant Virshup also received the alumni prize awarded to the member of the class best qualified in gynecology Dr Mildred Elsie Kamner received the Dudley Memorial Medal for the best clinical report of a case in the surgical wards of the Long Island College Hospital, and Dr Catherine Elva Spears the prize of the class of 1898 awarded to the student whose scholastic average in the fourth year has shown the greatest improvement over that of previous years Other prize awards went to Dr Louis Jay Scheinman, who received the Ford Prize awarded for the best dissection, Lieut Sam Tully Simpson, M C, the obstetric prize awarded for the best thesis on a subject in obstetrics, and Lieut Bertram E Bromberg (MC), the Joseph Howard Raymond Prize in physiology

NORTH DAKOTA

State Medical Election.—Dr Albert E Spear, Dickinson was named president-elect of the North Dakota State Medical Association at a meeting of the council and house of delegates in Valley City May 20-21, and Dr James F Hanna, Fargo, was inducted into the presidency Vice presidents are Drs Philip G Arzt, Jamestown, and Wilbert A Liebeler, Grand Forks, Dr Leonard W Larson, Bismarck, is secretary and Dr William W Wood, Jamestown, treasurer Dr Aloysius P Nachtwey, Dickinson, was named delegate to the American Medical Association and Dr Willard A Wright, Williston as the alternate Minot was selected as the 1946 convention city

Meeting on Obstetrics—Dr Edwin H Boerth, Buffalo, was elected president of the North Dakota Society of Obstetrics and Gynecology at its semiannual meeting in Fargo May 26 and Dr Paul W Freise, Bismarck, was named vice president Dr Gerald Wilson Hunter, Fargo, was chosen secretary-treasurer Among the speakers at the meeting were

Dr Frederick L Schade, Worthington, Minn, The Rh Factor in Pregnancy
Dr Boerth, Case Report—Erythroblastosis Fetalis
Dr Freise External Version
Dr Russell J Moe, Duluth, Minn, Amnion Fluid Embolism
Dr William F Mercil, Crookston, Minn, Case Report—Postpartum Mesenteric Thrombosis
Dr Robert B Woodhull Minot, Radium in Menopausal Bleeding
Dr Claude J Ehrenberg, Minneapolis, The Prepartum and Intrapartum Use of Ergot

OHIO

Academy of Medicine Seeks Funds—The Toledo Academy of Medicine is in the midst of a campaign to raise funds either to modernize the present academy building or to build a new one, depending on the amount of money subscribed, according to the *Ohio State Medical Journal*

Physician Sentenced in Narcotic Racket.—Dr Erich Otten, Akron, who was arrested recently on a charge (THE JOURNAL, May 19, p 217), was sentenced July 9 to a year and a day's imprisonment by U S District Judge Emerich B Freed, according to the Cleveland *Press* The physician was said to be one of a group involved in a $100 000 a year 'dope racket in the Akron area which was exposed by federal narcotic agents The *Press* stated that the physician had been supplying narcotics to about 150 drug addicts before his arrest

Personal—Dr Harry L Rockwood, for fifteen years superintendent of Mount Sinai Hospital, Cleveland, has resigned to take over the newly created position of medical director of the Cleveland city infirmary and chronic disease hospital Warrensville William B Seltzer, superintendent of Bronx Hospital, New York, since 1930, is the new superintendent at Mount Sinai——Dr Robert D Taylor, Indianapolis, has joined the research division of the Cleveland Clinic Foundation effective July 1——Dr Joseph B Stocklen Cleveland, is the new president of the Ohio Public Health Association——Dr James P Parlante, Shadyside, has been appointed medical director of the Powhatan Mining Company, Powhatan Point to succeed Dr James M Skinner Jr, effective July 1 Dr Skinner who held the position for the past fourteen years resigned to enter private practice in New Martinsville, W Va——Dr Richard B Holt, U S Public Health Service has been named head of the U S Marine Hospital, Cleveland succeeding Dr Alvin R Sweeney (THE JOURNAL, July 21 p 891)——Dr Charles E Holzer, Gallipolis who received the honorary degree of doctor of laws from Ohio State University, Columbus, recently was cited as 'an outstanding citizen devoted to public service, an organizer and promoter of productive enterprises of economic and social importance'

OKLAHOMA

State Association Honors Governor.—The Oklahoma State Medical Association held a banquet recently in honor of Governor Robert S. Kerr in appreciation of his interest in the health of the people of the state. Other guests included members of the twentieth legislature, all of whom were helpful in the passage of various health bills. Dr. Tom Lowry, dean of the University of Oklahoma School of Medicine, was toastmaster. Speakers included the governor, members of the legislature and representatives of the state health department, the medical school and the state medical association.

OREGON

Personal.—Dr. Carl G. Heller, assistant professor of physiology, Wayne University College of Medicine, Detroit, has been appointed associate professor of physiology and medicine at the University of Oregon Medical School, Portland.——Dr. William H. Earl has been named health officer of Cottage Grove, succeeding the late Dr. Albert W. Kime.

Kenneth Swan Named Professor of Ophthalmology.—Dr. Kenneth C. Swan, associate professor, has been appointed professor and head of the department of ophthalmology at the University of Oregon Medical School, Portland. He is succeeding Dr. Frederick A. Kiehle, who has been named professor emeritus. Dr. Kiehle has been associated with the school since 1910.

TEXAS

Medical College Honored with Anniversary Issue.—The *Dallas Medical Journal* for June was designated a special anniversary edition to commemorate the second anniversary of the Southwestern Medical College. The journal contains editorial comments and the history of the various departments of the school.

University News.—Charles M. Pomerat, Ph.D., professor of anatomy, University of Texas Medical Branch, Galveston, is a guest worker on invitation for a month at the Institute de Salubridad Enfermidades Tropicales, Mexico City, D. F. Dr. Pomerat will work on tissue culture experiments with reference to retiçuloendothelial immune serums.——Dr. Heinrich W. Neidhardt of the department of pathology, University of Kansas School of Medicine, has been appointed assistant professor of pathology at the university, effective August 1.——Wilbur A. Selle, Ph.D., professor of physiology, is a guest research worker for several months at the Massachusetts Institute of Technology, Cambridge, on problems in physical medicine, under the auspices of the Baruch Committee on Physical Medicine.——MacDonald Fulton, Ph.D., formerly professor of bacteriology, Southwestern Medical College, Dallas, has been appointed visiting professor of pediatrics research at the university. He will be in charge of bacteriologic studies relating to Salmonella organisms as part of the child health program supported by the William Buchanan Foundation, Texarkana.——The Smith, Kline & French Laboratory, Philadelphia, has made a grant to the pharmacology laboratory of the university for a study of the influence of the reticuloendothelial system in trypanosomiasis and syphilis. Paul L. Ewing, Ph.D., associate professor of pharmacology, will have charge of the research effort and will conduct certain studies under the direction of Dr. Arthur L. Tatum, professor of pharmacology, University of Wisconsin Medical School, Madison.

VERMONT

New Dean at University of Vermont.—Dr. William Eustis Brown, associate professor of preventive medicine, University of Cincinnati College of Medicine, has been appointed full time dean of the University of Vermont College of Medicine, Burlington, effective September 1. Dr. Clarence H. Beecher, who has been serving as dean on a part time basis, will continue to serve the school as professor of medicine.

WASHINGTON

Changes in State Health Department.—Dr. Rollin E. Cutts has been appointed head of the maternal and child hygiene and crippled children's section of the Washington State Department of Health. Dr. Cedric Northrop has been named in charge of the newly created section of tuberculosis control. Howard W. Lundy, Dr.P.H., has been appointed head of the section on public health education.

Personal.—Dr. and Mrs. George W. Ingham, Olympia, observed their fiftieth wedding anniversary, April 17.——Dr. Robert H. Welding, Ellensburg, has resigned as health officer of Kittitas County. L. H. Walker, D.O., health officer of Ellensburg, has been named to succeed Dr. Welding.——Dr. Paul A. Lindquist has been appointed health officer of Walla Walla County. He succeeds Dr. Arthur L. Ringle, who recently became state health commissioner with offices in Seattle.

WEST VIRGINIA

Scholarships in Public Health.—The West Virginia Health Department has announced that four scholarships in public health will be offered successful applicants, who will receive nine months' postgraduate training at the School of Public Health at the University of North Carolina, leading to a degree of master of public health education. Field training for a period of three months will follow, during which applicants will receive a monthly stipend of $100. Full travel expenses will be allowed during the period of field training. Applicants must be college graduates, and scholarships will be awarded to those who evince a sincere desire to make public health their career. Many positions as public health educators are now available as a result of the rapid expansion in the field of public health in the state.

New Procedure in Application for Cancer Treatment.—Needy cancer patients may now apply for treatment and care through county, district and city health departments under a new setup announced by Dr. Paul R. Gerhardt, director of the West Virginia state division of cancer control. The new procedure follows the recommendations of the public health council and the cancer committee of the West Virginia State Medical Association that further case referral sources be developed. Heretofore all applicants had been referred through the county department of public assistance. Evidence must be submitted to show that there has been a diagnosis of cancer and that the patient is unable to pay for treatment and care. One of the new forms to be used in submitting the information must be signed by the applicant and the referring agency and must be filled out by the city, county or district public health officer or public health nurse. Applications for care may also be filed with the local department of public assistance. The second form, which is a medical report of the case, is to be filled out by the patient's physician without charge to the division. Both forms should be sent to the division of cancer control, 1719 East Washington Street, Charleston, since no disposition of a case can be made until both types of information have been received on form CA-1 and form CA-2. The division will notify the patient whether the application can be accepted and where to report for treatment. A copy of the notice will be sent to the referring agency. A patient will be referred to the nearest of twelve treatment centers in the state. The division of cancer control cannot pay transportation cost, and local resources should be utilized if the patient or the family is unable to assume responsibility.

WYOMING

State Medical Election.—Dr. William A. Steffen, Sheridan, was recently chosen president-elect of the Wyoming State Medical Society and Dr. William Andrew Bunten, Cheyenne, was installed as president. Other officers include Drs. Thomas J. Riach, Casper, vice president; Peter M. Schunk, Sheridan, treasurer; George E. Baker, Casper, secretary, and George P. Johnston, Cheyenne, delegate to the American Medical Association.

Personal.—Dr. Edwin Earl Whedon, Sheridan, has been appointed a member of the state board of health.——Drs. George H. Phelps, Cheyenne, Junius C. McHenry, Gillette, Roscoe H. Reeve, Capper, and Foster G. Shaffer, Douglas, have been appointed to the Wyoming State Board of Medical Examiners.——Dr. George P. Johnston, Cheyenne, who observed his eighty-second birthday recently, is, according to the *Rocky Mountain Medical Journal*, the oldest practicing physician in Wyoming.

ALASKA

New Commissioner of Health of Alaska.—Dr. Conrad Earl Albrecht was recently placed on inactive status in the Army to become commissioner of health for the Territory of Alaska, effective July 1. Dr. Albrecht, who graduated at Jefferson Medical College of Philadelphia in 1932, reports that members of the new board of health are Dr. Dwight L. Cramer, Ketchikan; Mrs. Katherine Kehoe, Nome; Rev. R. Rolland Armstrong, Anchorage, and Mr. George Preston Sr.,

Fairbanks (THE JOURNAL, June 2, p. 379). Dr. George A. Hays has been executive director of the Territorial Department of Health since his loan from the U. S. Public Health Service in the fall of 1942. *Northwest Medicine* credits Dr. Hays with accomplishing numerous medical improvements in Alaska during his service. The 150 bed hospital at Skagway belonging to the Northwest Service Command and valued at about one million dollars was turned over to the territory without cost through Dr. Hays' efforts. The hospital is now functioning for white persons as well as for natives, and the Alaska Office for Indian Affairs has made an appropriation of $200,000 to assist in the work.

PHILIPPINE ISLANDS

Meetings of Ophthalmologists.—The first meeting since the Japanese occupation of Manila of civilian and military physicians interested in diseases of the eye, ear, nose and throat was held in the chapel of the Philippine General Hospital, Manila, July 5. The meeting was arranged by Dr. Herminio Velarde, assisted by Dr. Herminio Velarde Jr. and Dr. Antonio G. Sison, dean of the University of the Philippines College of Medicine and director of the hospital. Most of the patients presented were civilians suffering from malnutrition, tuberculosis, yaws, war injuries and wasting diseases. Although the medical school is completely damaged, the staff of the hospital is managing to treat several thousand patients with the barest equipment and little laboratory assistance. On July 26 all medical officers in the area were invited to attend a clinical conference at the San Lazaro Hospital, Manila. The meeting featured eye, ear, nose and throat cases of leprosy, yaws, tuberculosis and contagious diseases under the auspices of the staff of the hospital.

GENERAL

Anton Carlson Made Director of Alcohol Council.—Dr. Anton J. Carlson, emeritus professor of physiology, University of Chicago School of Medicine, has been appointed on a part time basis as director of the Research Council on Problems of Alcohol, New York.

Congress of Ophthalmology.—The Pan American Congress of Ophthalmology will definitely take place in Montevideo, Uruguay, the week of November 26. A comprehensive program will be presented, which will include reports from two committees, namely that on the prevention of blindness and that on trachoma. From these committee reports it is hoped that some codification will eventuate in uniformity throughout the entire Western Hemisphere. Despite wartime restrictions, it is still possible for a limited number of North American ophthalmologists to obtain transportation to Montevideo. Arrangements can be made through the American Express Company and the Pan American Airways.

Two Years' Study of Military Educational Technics.—The American Council on Education has received a grant of $150,000 from the Carnegie Corporation of New York and the General Education Board to carry on a two year investigation to determine what civilian schools and colleges can learn from Army and Navy wartime educational technics. The study will be under the direction of Alonzo G. Grace, Ph.D., commissioner of education of Connecticut, on leave of absence for the purpose. Dr. Grace will establish headquarters and staff in Washington and will also have the assistance of a special commission of leading educators, who will meet with the staff from time to time and visit military and naval installations to observe training programs in operation. Included in the comprehensive study of educational needs will be the consideration of training programs for leadership and for the training of teachers in physical education and health.

Gallup Poll on Cancer.—The American public would favor a congressional appropriation of a $200,000,000 fund for the study and treatment of cancer, according to a Gallup poll published in the newspapers July 21. Three out of four persons said they were willing to pay more taxes to provide the money. In reply to a question issued by the American Institute of Public Opinion, "Should Congress pass a law which would provide $200,000,000 for the study and treatment of cancer in this country?" "Yes" was returned in 81 per cent, "no" 10 per cent and "no opinion" in 9 per cent. For the question "Would you be willing to pay more taxes to provide this money?" 75 per cent voted "yes," 20 per cent "no" and 5 per cent "no opinion." The newspaper report stated that the studies by the institute have shown that the American public still has many misconceptions and false notions about cancer, indicating the need for continuous educational campaigns.

Association of Medical Illustrators.—Mr. Tom Jones, professor of medical and dental illustration, University of Illinois Colleges of Medicine, Dentistry and Pharmacy, Chicago, was elected president of the Association of Medical Illustrators at its organization meeting in Chicago, July 16-19. Other officers include Mr. Willard C. Shepard, art editor, W. B. Saunders, publishing company, Philadelphia, vice president; Muriel McLatchie, Massachusetts General Hospital, Boston, secretary, and Elizabeth Brödel, New York, treasurer. The association was formed to promote the study and to encourage the advancement of medical illustration and allied fields of visual education to promote understanding and cooperation with the medical and dental professions, including public health and nursing and to advance medical education. The association begins with a charter membership of about fifty-four, and Philadelphia was tentatively selected as the site for a meeting in 1946. A dinner honoring the delegates to the organization meeting was given July 17 (THE JOURNAL, July 7, page 744). The association will include members in Latin America and Canada.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended July 21 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Division and State	Week Ended 7/21, 1945	Week Ended 7/22, 1944
New England States:		
Maine	3	..
New Hampshire	4	3
Vermont	2	..
Massachusetts	14	6
Rhode Island	..	..
Connecticut	3	..
Middle Atlantic States:		
New York	46	153
New Jersey	37	7
Pennsylvania	12	56
East North Central States:		
Ohio	8	14
Indiana	2	10
Illinois	6	13
Michigan	3	24
Wisconsin	..	2
West North Central States:		
Minnesota	..	3
Iowa	1	8
Missouri	4	3
North Dakota	..	3
South Dakota	..	..
Nebraska	1	3
Kansas	8	5
South Atlantic States:		
Delaware	2	..
Maryland	6	10
District of Columbia	9	8
Virginia	28	30
West Virginia	1	4
North Carolina	3	62
South Carolina	12	4
Georgia	5	5
Florida	2	5
East South Central States:		
Kentucky	3	77
Tennessee	20	1
Alabama	3	7
Mississippi	..	5
West South Central States:		
Arkansas	3	..
Louisiana	4	5
Oklahoma	9	4
Texas	62	9
Mountain States:		
Montana	..	1
Idaho	..	..
Wyoming	..	..
Colorado	2	..
New Mexico	..	..
Arizona	..	..
Utah	11	..
Nevada	..	..
Pacific States:		
Washington	4	1
Oregon	1	6
California	25	11
Total	369	568
First 29 weeks:		
1945 and 1944	2,048	2,320
Median 1940-1944	1,223	

Narcotic Violations.—The U. S. Bureau of Narcotics announces the following actions:

Dr. James E. Sherman, Houston, Texas, pleaded guilty in the U. S. District Court at Houston, May 4, to violation of the federal narcotic law and was sentenced on count 1 to serve a term of two years in jail; on count 3 the sentence of one year and one day was suspended and he was placed on probation for a period of five years, which is to take effect on the expiration of the two year sentence received for count 1. Count 2 was dismissed.

Dr. Robert E. Heath, Uniontown, Pa., pleaded guilty on June 8 in the U. S. District Court in Erie, Pa., to violation of the federal narcotic law. His sentence of two years was suspended and he was placed on probation for a similar period; he was also ordered to pay the cost of the criminal proceedings.

Dr. Ralph S. Walter, Harrisburg, Pa., pleaded guilty in the U. S. District Court in Harrisburg, May 8, to violation of the federal narcotic law. He was fined $300 and placed on probation for one year.

Dr. Wayne D. Daugherty, Grove City, Pa., on March 21 pleaded guilty in the U. S. District Court to violation of the federal narcotic law. He was given a two year suspended sentence and placed on probation for a similar period; he was also ordered to pay the costs of prosecution.

Dr. Weir M. Hamilton, Natrona, Pa., on April 25 pleaded guilty in the U. S. District Court at Erie. He was given a suspended sentence of five years and placed on probation for a similar period. The court further stipulated that the physician enter the U. S. Public Health Service Hospital at Lexington, Ky., for treatment of his addiction to narcotics and remain there until discharged by the authorities.

Dr. Herbert L. Wright, Konawa, Okla., on May 21 pleaded guilty in the U. S. District Court at Muskogee, Okla., to violation of the federal narcotic law. He was given a suspended sentence of five years and placed on probation for a similar period.

Dr. Samuel H. Dender, New York, convicted in the Southern District Court of New York of violation of the federal narcotic law, on March 21 was sentenced to a term of two years and fined $1,500 on four counts of the indictment. On the remaining counts of an indictment sentence was suspended, and he was placed on probation for a period of one day to begin at the expiration of the penitentiary sentence on condition that he resign from the medical profession. The state board of medical examiners voted on April 20 to revoke Dr. Dender's license to practice medicine in New York.

Dr. Charles H. Hamilton, Vermont, Ill., pleaded guilty July 5 to violation of the federal narcotic law. His sentence was suspended and he was placed on probation for a period of two years and ordered to pay a sum of $50 for costs.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 7, 1945.

Central Medical War Committee of British Medical Association Thanked by the Government for Its Services

On the termination of the war in Europe Mr. Willink, minister of health, has thanked the Central Medical War Committee of the British Medical Association for its valuable help and cooperation during the past six years. He says that its task, readily undertaken at the outbreak of war, assumed a magnitude and complexity greater than could have been foreseen, but its members shouldered the work with determination and efficiency. Their first duty was to provide the practitioners necessary for the medical needs of the armed forces. This was indeed a positive contribution to victory. He knew the difficulties of weighing the counterclaims of civilian needs in general practice, hospitals, public services, teaching, research and other fields. As the war lengthened and civilian medical resources were progressively deleted, almost each individual case became a problem, but the committee could always be relied on for a sound and fair minded judgment in striking the balance between civil and military needs. It also gave much careful consideration to safeguarding the interests of serving practitioners.

The Urinary Complications of Pregnancy

At a joint meeting of the Sections of Urology and of Obstetrics and Gynecology of the Royal Society of Medicine Mr. Joel Gabe opened a discussion on the urinary complications of pregnancy. He described the changes which occurred in the urinary tract during pregnancy. As early as the third month there were changes in the upper urinary tract. The anatomic changes most often seen were dilatation of the calices, pelvis and ureter as far down as the pelvic brim. The abdominal ureter was often elongated and might become tortuous, kinked and laterally displaced. Kinking usually affected the upper third of the ureter and there might be so much as to obstruct ureteral catheters. Even before the uterus was large enough to exert pressure certain physiologic changes—atony, relaxation and stasis—occurred. These were generally regarded as due to the action of hormones elaborated by the placenta. If the urine of pregnant women was injected into virgin rabbits, changes were produced in their urinary tracts like those observed in the pregnant animal. It had also been shown that the amount of the luteinizing principle and estrogen excreted in the urine increased during pregnancy.

The stasis and atony which occurred in the urinary tract were the perfect prerequisites for infection and it was remarkable that this did not more often happen. Stasis was found in 73 per cent of primiparas and in 45 per cent of multiparas. When excessive it might cause temporary renal impairment, but normally the total renal function was unaffected, and there were no changes in the blood chemistry. After normal pregnancy retrogressive changes occurred in 60 per cent of women within two weeks of delivery and intravenous pyelograms were usually normal by the tenth day of the puerperium. Ureteral atony might last for a fortnight or longer.

Miss Gladys Dodds discussed 287 cases of antepartum pyelitis admitted to University College Hospital. The average age was 25.4 years and 185 were primiparas. The infection occurred most commonly before the twenty-fifth week. The onset in the majority was sudden, with acute stabbing pain referred to one side, often associated with shivering, occasionally with frequency of micturition and less often with vomiting. The acute stage lasted on the average six days and then the general condition improved. In just over 10 per cent the course was more unfavorable, the temperature remaining high, the general condition not improving, and anemia perhaps developing as a result of the prolonged sepsis. Two patients died after the pregnancy terminated, 1 after spontaneous labor in the twenty-ninth week, the other nine days after hysterotomy at the twenty-third week. Necropsies showed in 1 case mild pyelonephritis and in the other pyelonephritis with the acute inflammation of the kidney pelvis and ureters.

The early patients, numbering 186, were treated with large doses of alkalis, occasionally with acids and methenamine. Only 4 so treated had sterile urine during the pregnancy. Another group of 37 were treated by a ketogenic diet or by mandelic acid. Five had sterile urine after treatment. A third group of 64 were treated with sulfonamides and in 36 the urine became sterile. Of the total number, 236 were subsequently delivered in a hospital of a viable fetus. Signs of toxemia developed in 73 before the end of pregnancy and 2 had eclampsia. The incidence of toxemia was thus 30.9 per cent, which was lower than that of the normal clinic population.

Cold Storage of Skin for Autogenous Grafting

The severe burns sustained in airplane crashes often necessitate a succession of operations for which the patient is unsuited mentally and physically. In a Hunterian lecture, delivered at the Royal College of Surgeons, Squadron Leader D. N. Matthews, medical officer in charge of a plastic unit of the Royal Air Force, described a method by which the number of operations could be reduced and which had other uses. A succession of operations had been necessary because the time required to surface all the areas at one operation was prohibitive and because the operation would have to be postponed until all the sloughs had separated and all the areas were bacteriologically clean enough for skin grafting. This would mean that the areas ready first would have to wait until the slower areas were also ready; during this time fibrosis would progress and the functional and cosmetic would therefore suffer. The method of Matthews reduces the number of operations to the short one necessary for cutting the skin. The stored skin can then be applied as a bedside dressing without anesthesia, as and when required.

Skin storage has other uses. It reduces the number of donor areas necessary in multiple stage routine plastic repair of healed wounds. The patient is saved the pain of a second or even a third donor area. The duration of each operation after the first is also lessened by the time it would have taken to cut a fresh graft. Another use is to provide a spare piece of skin in case the graft partially fails. Finally, stored skin provides an experimental skin bank for investigating the problems of heterogenous grafting.

Matthews preserves skin by folding it with its raw surfaces opposed and wrapping it in a piece of tulle-gras, and this in turn in a piece of gauze wrung out of isotonic solution of sodium chloride. It is then put in a sterile, air tight, screw stopped glass bottle and held away from the small amount of fluid which collects in the bottle by insertion of a rubber ring or leadfoil to rest on. The bottle was stored in a household refrigerator at a temperature between 3 and 6 C. At this low temperature the autolytic activity of the tissue enzymes and the destructive power of microbes are slowed. The cells pass into a state of latent or suspended life. Grafts which had been stored for periods up to twenty-one days took satisfactorily in all cases when applied to granulating surfaces. Successful grafting after cold storage was described by the French surgeon de Martigny in 1913. Carrel in 1912, when discussing tissue culture of pieces of skin, stated that when they ceased to proliferate he placed them in cold storage for several days "in a state of latent life" and then, when he replaced them in a

suitable medium, he observed new and active growth. Thus the principle of cold storage of skin for grafting is not new, but its application by Matthews in the treatment of the burns of airmen is an innovation.

BUENOS AIRES

(From Our Regular Correspondent)

June 15, 1945.

Surgical Therapy of Arterial Hypertension

At a recent meeting of the Society of Internal Medicine of Buenos Aires at which Dr. Egidio S. Mazzei presided, surgical therapy of arterial hypertension was the subject of discussion. Dr. Anibal S. Introzzi of Buenos Aires said that arterial hypertension and its complications are the causes either of death or of permanent invalidism of a large number of relatively young persons. Death of persons over 50 is due to arterial hypertension in 25 per cent of the cases. Many patients cannot afford the necessary rest. Drs. Julio Palacio, G. Hugo Dickmann, Egidio S. Mazzei and Andres A. Veppo reported observations in 17 cases of hypertension. Surgical therapy is indicated in certain cases after failure of medical therapy. Smithwick's operation is indicated (1) when hypertension does not diminish after a period of mental and physical rest of the patient during which the proper diet and proper therapy are administered, (2) when headache, anxiety and irritability are either acute or almost constant, (3) when cardiac accidents (cardiac asthma, pulmonary edema and acute waves of hypertension) are menacing the patient and (4) in cases either of vascular spasm or of papillary edema of the fourth type and hypertension of Keith and Wagener's type and also when renal insufficiency is still subacute. Proper therapy consists of iodides, antispasmodics and vasodilating drugs. Acute renal insufficiency, subacute retinal arteriosclerosis which shows hypertension of either acute or long course, cardiac insufficiency and angina pectoris contraindicated an operation on patients with hypertension.

Dr. Benito Just Tiscornia discussed the pathognomonic and nonpathognomonic ocular signs of arterial hypertension before and after surgical therapy. Papillary and retinal edema, congestion of the macula, exudates and hemorrhages may diminish or else disappear after the operation. Organic lesions, arteriovenous anastomosis, arteriosclerosis and the hypertensive aspect of the blood vessels are not modified after the operation. The changes in the fundus of the eye showing improvement depend on the degree of favorable changes of arterial pressure. The visual acuity and clear perception of objects improves in all cases after the proper surgical therapy of hypertension. The operation should be performed during the first or second states in the course of hypertension (according to Keith and Wagener's classification). In these second stages of the disease the operation prevents the occurrence of secondary changes of the fundus of the eye. However, even in the third and fourth stages of the disease the operation gives good results in hypertension.

Social Medical Centers

The National Department of Public Health of Argentina recently passed regulations compelling mutual insurance associations and organizations of a medicosocial type to declare the type of work they carry on and the bases on which the medicosocial service is given the insured. The National Department of Public Health can approve or cause modifications in the conduct of such centers.

New Hospitals in Countries of Latin America

More than one hundred hospitals, dispensaries and public health centers have been recently organized in Latin American countries under the auspices of the Office of Inter-American Affairs. Twenty-four of these were opened in Brazil, Bolivia, Peru and Colombia. New hospitals and dispensaries are already functioning or will soon function in Lima, La Paz and several mine regions of Bolivia. A leprosarium was recently opened in São Paulo. The efforts of four hospitals and of twenty-four health centers in Central America are directed toward the control of malaria and the teaching of public health. Several of these centers are situated along the Pan American road, others are located in territories in which rubber or textiles are produced. The construction and functioning of health centers in Uruguay are under the direction of the Inter-American Cooperative Center of Public Health. The main activity of these centers is concerned with various phases of preventive medicine.

Reappointment of Professors of Universities

In October 1943 several professors of the Universities of Buenos Aires, La Plata, Litoral, Cordoba and Tucumán issued a manifesto proclaiming their democratic ideals. The government removed the professors from their chairs. Members of the government asked the universities to normalize their functions. The professors were requested to return to their chairs. Dr. B. A Houssay was the last to accept reinstatement in the Faculty of Buenos Aires. The request for his reinstatement was made by the faculty and the government. The professors signed reinstatement papers on the condition of the maintenance of academic freedom and their attitude toward democracy.

Medical Society at Rio de la Plata

The Sociedad de Medicina Interna of Rio de la Plata was recently established. It will function in collaboration with the Societies of Internal Medicine of Buenos Aires and of Montevideo. Drs. Egidio S. Mazzei of Buenos Aires and Héctor Franchi of Montevideo are the presidents.

Brief Items

A committee for moral help to the blinded in war was recently established in Buenos Aires.

Dr. Egidio S. Mazzei of Buenos Aires, ex-president of the Society of Internal Medicine of Buenos Aires, was appointed regular professor of clinical medicine at the Faculty of Medicine of the University of La Plata.

Deaths

Dr. Alejandro A. Raimondi, aged 67, head of the Hospital Tornú of Buenos Aires, died on Feb. 11, 1945.

Marriages

FLOYD SAMUEL BARRINGLR, Emden, Ill., to Miss Winifred Lois Wain of Forest Hills, N. Y., in Ripley, England, June 2.

JOSEPH J. LIKOS, Los Angeles, to Miss Lorraine Martha Rolle of East St. Louis, Ill., in St. Louis, June 15.

BRUCE D. LEE, River Forest, Ill., to Ensign Jane Roberts of Pocatello, Idaho, in Washington, D. C., April 20.

BENJAMIN JACKSON PHILIPS JR., Jacksonville, Fla., to Miss Carolyn Parker of Lenoir, N. C., June 24.

HENRY DONATO, Mount Pleasant, S. C., to Miss Anne Theodore Koster of Charleston, June 19.

JAMES RAY NUNEZ, Abbeville, La., to Miss Agnes Pietrowski of Jersey City, N. J., June 2.

WARD JOHN MCFARLAND, Glenbrook, Conn., to Miss Mary Luise Henry in Orange, June 23.

ROBERT CHARLES HASTY, Omaha, to Miss Jeanetta Jane Bryant of Norfolk, Va., June 4.

HUGH MCCULLOCH JR., St. Louis, to Miss Patricia Rentsler of Plainfield, N. J., June 24.

ARTHUR M. PARKER, Brookline, Mass., to Miss Sheryl Newiger of Brooklyn, July 1.

CARL DOUGLAS HUCKLEBERRY, Danville, Ind., to Miss Marcia Connor of Sullivan in June.

ARTHUR A. GOLDFARB to Miss June Florence Wax, both of New York, June 3.

Deaths

Isaac Levin ⊕ New York; University of Tomsk Faculty of Medicine, Russia, 1890; interned at the Military Medical Academy in St. Petersburg, Russia; attending surgeon at the Army Hospital in St. Petersburg, Russia, 1890-1891; associate in pathology at Columbia University from 1909 to 1912 and associate in cancer research from 1912 to 1915; for many years clinical professor of cancer research at the University and Bellevue Hospital Medical College; specialist certified by the American Board of Radiology, Inc.; member of the American Association of Pathologists and Bacteriologists, Harvey Society, American Physiological Society, American Genetic Association, American Association for Cancer Research, Radiological Society of North America, American College of Radiology, Society for Experimental Biology and Medicine and the American Radium Society; fellow of the American Association for the Advancement of Science and the New York Academy of Medicine; director of the New York City Cancer Institute from 1923 to 1930; at various times on the staffs of the Sydenham, Beth David, Montefiore, St. Bartholomew's and Lebanon hospitals; editor of *Archives of Clinical Cancer Research* from 1925 to 1930; died June 19, aged 78.

Lee Maidment Hurd ⊕ Rowayton, Conn.; Columbia University College of Physicians and Surgeons, New York, 1895; professor emeritus of laryngology at the New York University College of Medicine and professor of otolaryngology at the New York Polyclinic Medical School and Hospital, New York; an Affiliate Fellow of the American Medical Association; retired member of the Medical Society of the State of New York; member of the American Academy of Ophthalmology and Otolaryngology and American Laryngological Association; member and past president, American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; consulting laryngologist at the Downtown Hospital, New York; attending otolaryngologist at the New York Polyclinic Medical School and Hospital, New York, where he died May 15, aged 71, of arteriosclerotic heart disease and parkinsonism.

Frederick William Shaw, Richmond, Va.; University of Kansas School of Medicine, Kansas City, 1906; research professor of bacteriology at the Medical College of Virginia, where he had been professor of bacteriology and parasitology and head of the department, professor of bacteriology and clinical pathology and associate professor of bacteriology; associate professor and professor of hygiene at the University of Missouri School of Mines from 1919 to 1924; member of the American Society of Clinical Pathologists, Richmond Academy of Medicine and the American Medical Association; at one time associated with the Indian Service; major, medical corps, U. S. Army, 1917-1918; formerly physician at State Hospital number 1 in Fulton, Mo.; died in the Medical College of Virginia Hospital May 29, aged 62, of gastric ulcer.

Lawrence George Hanley, Buffalo; Niagara University Medical Department, Buffalo, 1887; member of the American Medical Association; served on the faculties at his alma mater and the University of Buffalo School of Medicine; an examiner for the city civil service commission; for many years on the surgical staff of the Buffalo Hospital of the Sisters of Charity, serving as its president; on the staffs of the Emergency Hospital, St. Mary's Infant Asylum and Maternity Hospital, Our Lady of Victory Hospital and Providence Retreat; said to be the first ambulance surgeon in the city of Buffalo; awarded the honorary degree of doctor of laws from Niagara University in 1912; died May 22, aged 81, of myocardial failure.

Charles Leo Merrill, Salina, Utah; University of Illinois College of Medicine, Chicago, 1920; member of the American Medical Association; in 1942 chosen honorary president of the Utah State Medical Association; served during World War I; at one time professor at the Utah State Agricultural College, Logan; later spent three years in South America with the U. S. Extension Division of the Agricultural Department; twice mayor of Salina; medical superintendent and owner of the Salina Hospital; died in the Dr. W. H. Groves Latter-Day Saints Hospital, Salt Lake City, May 25, aged 57, of coronary thrombosis.

Gertrude Allen, Hackettstown, N. J.; New York Medical College and Hospital for Women, Homeopathic, New York, 1890; died in Bloomfield May 29, aged 79, of cardiac degeneration.

Marcus Moses Anshin ⊕ Lynn, Mass.; Loyola University School of Medicine, Chicago, 1919; on the courtesy staff of the Lynn Hospital; died in the New England Deaconess Hospital, Boston, May 21, aged 52, of myocarditis.

George Ballantyne Brown, Oakland, Calif.; College of Physicians and Surgeons of San Francisco, 1918; member of the American Medical Association; died March 1, aged 52, of rupture of the heart.

Bascomb Lanier Chipley ⊕ Chillicothe, Ohio; University of Maryland School of Medicine, Baltimore, 1906; member of the American Society of Anesthetists, Inc.; fellow of the American College of Chest Physicians; superintendent of the Mount Logan Sanatorium; on the staff of Chillicothe Hospital; member of the board of directors of the Ross County Tuberculosis Association; died in Brunswick, Md., May 13, aged 61, of heart disease.

William H. Cooper, Catchings, Miss.; Mississippi Medical College, Meridian, 1910; died May 13, aged 67.

Charles Morgan Davis, Laurel, Miss.; University of Nashville (Tenn.) Medical Department, 1890; Vanderbilt University School of Medicine, Nashville, 1890; member of the American Medical Association; died May 22, aged 76.

William Thompson DeCoster, Mankato, Minn.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1897; died March 26, aged 70, of coronary thrombosis.

Arthur Charles Delacroix, Bernardsville, N. J.; University of the City of New York Medical Department, New York, 1892; member of the American Psychiatric Association; died in the Memorial Hospital, Morristown, May 7, aged 74, of arteriosclerosis and cardiac decompensation.

Peter Lycourgou Economos, Detroit; National University of Athens School of Medicine, Greece, 1897; died in the Harper Hospital May 15, aged 69, of adenocarcinoma of the pancreas.

Frank Alvin Elders, De Soto, Mo.; Bennett Medical College, Chicago, 1915; served in the medical corps of the U. S. Army in France during World War I; died in Hot Springs National Park, Ark., May 25, aged 56, of coronary disease.

Robert Trimble Foster, Groom, Texas; Atlanta School of Medicine, 1906; honorary member of the State Medical Association of Texas; member of the American Medical Association; served as local surgeon for the Rock Island Railroad; died March 27, aged 61, of heart disease.

John McIver Furman ⊕ Fort Worth, Texas; Memphis (Tenn.) Hospital Medical College, 1902; president of the Tarrant County Medical Society in 1939; died March 21, aged 73, of coronary occlusion.

Samuel Sampson Glasscock, Goodland, Kan.; Rush Medical College, Chicago, 1887; member of the American Medical Association; honorary member of the Kansas Medical Society; at one time professor of psychiatry at the University of Kansas School of Medicine in Kansas City, where he was medical director of the Grandview Sanitarium and on the staff of the Bethany Hospital; formerly assistant medical director of the State Sanatorium for Tuberculosis in Norton; died April 28, aged 83, of coronary thrombosis.

Edward Cornelius Haagensen ⊕ Grand Forks, N. D.; Northwestern University Medical School, Chicago, 1894; served as city health officer; on the staffs of the Grand Forks Deaconess and St. Michael's hospitals; died in a local hospital March 28, aged 75, of heart disease.

Austin Hutchison ⊕ Bixby, Okla. (licensed in Oklahoma under the Act of 1908); on the courtesy staff of the Hillcrest Hospital in Tulsa; local surgeon for the Mid-Valley Railway Company; died March 27, aged 70, of coronary occlusion.

Gordon H. Jackson, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; died in the Presbyterian Hospital March 9, aged 58, of heart disease and arteriosclerosis.

Darie Lemieux ⊕ Rolla, N. D. (licensed in North Dakota in 1900); in 1905 member of the state house of representatives; for four years mayor of Dunseith; acting assistant surgeon of the U. S. Public Health Service during World War I; a member of the state tuberculosis board of trustees; for many years superintendent of the Rolette County Board of Health; died in St. Andrews Hospital, Bottineau, March 26, aged 70, of pleurisy.

George Lafayette Lewis ⊕ San Angelo, Texas; University of Texas School of Medicine, Galveston, 1906; past president of the Fourth District Medical Society and the Tom Green-Coke-Crockett-Concho-Irion-Sterling-Sutton-Schleicher Counties Medical Society; founder member of the San Angelo Medical and Surgical Clinic; on the staffs of St. John's Hospital and the Shannon Hospital, where he died April 5, aged 63, of coronary occlusion.

John William Macune, Ballinger, Texas; Southern Methodist University Medical Department, Dallas, 1913; member of the American Medical Association; president of the Runnels County Medical Society in 1942; for many years city and county health officer; served during World War I; died April 3, aged 63, of lymphosarcoma.

Joseph Samuel McCreary, *Buffalo, Texas;* Baylor University College of Medicine, Dallas, 1932; member of the American Medical Association; interned at the Parkland Hospital in Dallas; began active duty as a captain in the medical corps, Army of the United States, in July 1942; went overseas with the Ninety-Third Division in March 1943, serving in the North African, Sicilian and Italian campaigns; relieved from active duty in October 1944; died February 15, aged 45, of heart disease.

Harvey Lafayette Meador, Clayton, Mo; National University of Arts and Sciences Medical Department, St. Louis, 1913; member of the American Medical Association; health commissioner of Clayton; at one time alderman; on the staffs of the Missouri Baptist Hospital, St. Mary's Hospital and the Deaconess Hospital, St. Louis, where he died April 26, aged 62, of hypertension and arteriosclerosis.

J. M. P. Pichette, Lake Linden, Mich.; School of Medicine and Surgery of Montreal, Que., Canada, 1892; served as health officer of the town of Lake Linden; died May 23, aged 75.

Benjamin Ashby Pope, Newsoms, Va.; Medical College of Virginia, Richmond, 1898; member of the American Medical Association; died in Richmond April 18, aged 69, of cirrhosis of the liver.

Walter V. Prentice, Toledo, Ohio; Toledo Medical College, 1903; in 1932 appointed county jail physician; on the staff of the East Side Hospital, where he died April 30, aged 68, of uremia.

William D. Sears, Ellaville, Ga.; Georgia Eclectic Medical College, Atlanta, 1882; died March 15, aged 88, of acute pyelonephritis

Albert Astor Shelley, Phoenix, Ariz.; Kansas Medical College, Topeka, 1898; member of the American Medical Association, on the staffs of the Santa Monica (Calif.) Hospital, St. Joseph's Hospital and the Good Samaritan Hospital, where he died April 16, aged 78, of dissecting aneurysm of the aorta.

Willard Alvin Stearns, Savannah, Mo.; Lincoln (Neb.) Medical College of Cotner University, 1909; died April 28, aged 76, of coronary sclerosis.



CAPT. RIPLEY BUCKINGHAM
M. C., A. U. S., 1912-1944



CAPT. JOHN WINFIELD BASSETT
M. C., A. U. S., 1913-1943



CAPT. HARVEY RODNEY CLUGSTON
M. C., A. U. S., 1910-1944

Clifford Irwin Oliver ⊕ Graceville, Minn.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901 · fellow of the American College of Surgeons; served during World War I; formerly state senator; on the staff of the West Central Minnesota Hospital; died March 27, aged 68, of coronary thrombosis.

Bernard Pehr, John Day, Ore.; Baylor University College of Medicine, Dallas, Texas, 1915; died May 6, aged 70.

Francis Eugene Talty, Hoboken, N. J.; Harvard Medical School, Boston, 1906; member of the American Medical Association and the New England Roentgen Ray Society; died May 27, aged 65.

Rudolf Henry Wald, Los Angeles; Harvard Medical School, Boston, 1904; served overseas during World War I; formerly on the staff of the Charles Miller Hospital in St. Paul; died March 26, aged 71, of arteriosclerotic heart disease.

KILLED IN ACTION

Ripley Buckingham, Washington, D. C.; George Washington University School of Medicine, Washington, 1941; interned at the Garfield Memorial Hospital; entered the medical corps, Army of the United States, on June 11, 1941; began active duty as a first lieutenant in the medical corps on July 1, 1942; later promoted to captain; killed in action in China Aug. 18, 1944, aged 32.

John Winfield Bassett, *San Diego, Calif.;* University of Southern California School of Medicine, Los Angeles, 1940; interned at the Santa Fe Coast Lines Hospital in Los Angeles; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 10, 1939; began active duty in the Army of the United States on Jan. 13, 1941; later promoted to captain; killed in action in the North American area May 29, 1943, aged 29.

Harvey Rodney Clugston, New Orleans; Louisiana State University School of Medicine, New Orleans, 1940; interned at the Charity Hospital in New Orleans; served a residency at the Lafayette Charity Hospital in Lafayette, La.; began six weeks' training period at St. Mary Parish Health Unit at Franklin in March 1942; appointed director of the Red River Parish Health Unit in Coushatta in April 1942, began active duty as a first lieutenant in the medical corps, Army of the United States, on June 13, 1942; later promoted to captain; left for overseas duty in April 1943; died from injuries received in action in Belgium Dec 17, 1944, aged 34.

Correspondence

EARLY HEALING IN CHRONIC OSTEOMYELITIS AND COMPOUND FRACTURES

To the Editor:—Those who are familiar with the surgical program that I have been advocating for many years will remember that I insist on early correct position for inflamed or injured parts, adequate surgical drainage by clean-up of contaminated or inflamed areas (débridement), wide open wounds to provide adequate drainage, prolonged immobilization in correct position, and protection of the wound surface against secondary infection. There must be the same kind of protection (usually by infrequent dressings) until there is sound healing, in the best position for physiologic function in the extremity, and for use of the limb after the patient's recovery.

In dealing with the wound and the wound surface, suturing of the wound should not be done in such a way as to cover up contaminated or septic areas (and thus pockets of infection) during or after wound healing. Efforts at primary and secondary suture, such as are still being advocated, for example, by Dr. Albert J. Key (*Bull. New York Acad. Med.* **21**:87, 1945), have often resulted in immediate flare-ups because of the suturing in of contaminated or infected material or a subsequent explosion with septic complications. Even when such wounds heal primarily, pockets of infection in the scar give trouble later on when they become irritated or traumatized, sometimes long after successful healing is supposed to have taken place.

A new method, which offers not only an opportunity for earlier and sound healing but a satisfactory way of dealing with the wound and wound surface, has been employed recently by Lieut. Ernest M. Burgess, Fort Benjamin Harrison, Billings General Hospital, Indianapolis. Dr. Burgess advocates early skin graft of the wound surface as a new item in my program for osteomyelitis and compound fracture wounds.

The skin graft, when fitted carefully onto the wound surface in such a case, does away with any attempt at suturing and provides the same kind of wound drainage which I have advocated in using the petrolatum pack. The sheet of skin graft not only covers the wound surface and provides wide drainage of the entire cavity but begins the process of healing immediately, so that both drainage and healing go along together in a satisfactory way.

The results already obtained by Lieutenant Burgess indicate that this is so. From my point of view his proposal is entirely rational. It enables the surgeon to carry out the program on which I have always insisted, with the addition that the covering for the wound surface, instead of being a petrolatum pack, under which we must wait for skin growth, is a similar covering but with a pack on top of the graft provided by the surgeon at the time of operation. Under this layer of skin, drainage and healing then go along together, as suggested.

I should recommend also that with the skin graft the use of sulfonamide drugs in the wound be discontinued.

(Since this was written, the following appeared in THE JOURNAL, June 23, p. 598, under the heading "Local Application of Crystalline Sulfonamides Discontinued":)

The War Department Technical Bulletin of Medicine (TB MED 147), March 1945 (distributed to general and field hospitals and other medical units), announced the general policies regarding the local use of chemotherapeutic agents. Experience in wound management justifies the abandonment of local use of any chemical agent in a wound for its supposed antiseptic effect in the prevention or treatment of infection. The practice of routine local application of crystalline sulfonamides to wounds as an emergency aid measure and prior to initial wound surgery will be discontinued. The local application of these compounds to wounds not involving serous cavities following wound surgery will also be discontinued, and their local use in wounds involving serous cavities is not recommended.

This order finally meets a demand I have been making for many years, i. e. that a program of surgical care be substituted for all the attempts to prevent and cure wound infection by chemotherapy. For example: from one of my recent papers, "The Physiologic Factors Involved in Protecting the Patient Against Infection in the Healing of Fractures in Compound Wounds" (*Tr. Coll. Physicians of Philadelphia,* February 1943):

In a recent circular from the Bureau of Medicine and Surgery, Navy Department, April 1942, immobilization of wounds and infected parts is mentioned, débridement and drainage are discussed, but irrigation of wounds is still permitted and reliance for a cure rests chiefly, as far as these official instructions are concerned, upon the sulfa drugs. In eleven pages in the circular on wounds and burns, the sulfa drugs are mentioned on every page, employed for every type of wound and injured part, and in the eleven pages of the circular are mentioned thirty-nine times; ten times oftener than any other drug. The very great danger of poisoning by sulfa drugs is barely referred to.

With so many factors unknown and no possibility of exact determination of the physiologic factors involved we can only infer that whether we breathe germs, swallow them or infect our wounds from the atmosphere we can and usually do defend ourselves against all atmospheric kinds and amounts of infection. And this is true whether the air or we ourselves are treated chemically or not.

As I have pointed out on numerous occasions, my percentage of healing without the use of chemical antiseptics has always been as good as or better than most of the results claimed by others with chemical agents. By doing an adequate drainage, or débridement, by being sure that all pockets are open and then by applying the skin graft over the entire surface, leakage can take place around the skin graft just as it did when I made my first report on this method in 1923, with the petrolatum pack. Suitable provision is made, of course, for the infrequent dressing after-care. Along with this the remainder of our program can of course be carried out; that is, original correct length and position for the inflamed and injured parts, immobilization after operation in plaster of paris, using skeletal pin fixation with plaster of paris when necessary and prolonged protection of the limb, with the patient in the correct position. Perhaps I may be pardoned if I make the observation that, having visited a considerable number of army and navy hospitals during the past two years, I have found that there is excellent technical operative surgery being done, but there has been some disregard of preliminary correction of deformity and inadequate protection of parts in correct position after operation.

Plastic operations are being done on extremities on which no previous attempts at restoration of correct position and function has been attempted, and in the postoperative care immobilization and splinting have been neglected on the theory that early motion is necessary. It is most important to remember that ultimate usefulness depends very largely on anatomic position. The best position possible is necessary in order that inflammatory complications may be avoided and protection of the inflamed or injured parts against damage, even by the patient himself, is most important. For this no apparatus is as good as plaster of paris, properly applied and properly cared for during the entire period of the patient's recovery. Prolonged immobilization is harmful only in those cases in which there is constriction or faulty position or in which infection and inflammatory complication have had inadequate or improper surgical care primarily and secondarily as well.

Meleney of New York has recently reported the results of several years' clinical study of the effects of sulfonamide drugs in wounds (*Surg., Gynec. & Obst.* **80**:263 [March] 1945). He concludes that the sulfonamides have no value in the local prevention or cure of wound infection. For some reason which I cannot understand he thinks that we can find out why sulfonamide drug bacteriostasis is "inactivated" in wounds! And he suggests that we resume the search for a "miracle drug" and fall back on "good surgery," which to many surgeons still means a good operation followed by daily dressings. This is certainly not enough.

H. WINNETT ORR, M.D., Lincoln, Neb.

THE TERM "WHOLE BLOOD"

To the Editor:—Dr. Scannell's contention (THE JOURNAL, June 23, p. 614) that "citrated" blood should not be classified as "whole" blood is erroneous. "Whole" blood means that the blood used for transfusion contains all the vital elements of the blood. Even when a small amount of sodium citrate is added to the blood (0.38 per cent), the blood represents "whole blood." Whether the complicated technic of the stopcock method or similar apparatus (Unger, Soresi, Miller, Scannell, Oehlecker and many others) or the most flexible and simple citrate method is used, the blood represents "whole blood." "Citrated blood" is justly called "whole blood" in contradistinction to citrated plasma, which contains only a small part of the vital blood constituents.

I suggested the citrate method of blood transfusion in 1915. Unger (then an intern at Mount Sinai Hospital) constructed at the same time his apparatus, which was the most popular among the different instruments used for blood transfusion. For a number of years both the Unger apparatus and the citrate method were used in this hospital. Both methods had their supporters among members of the staff. However, according to the darwinian law of "survival of the fittest," the citrate method is now the only method used at this hospital. More than three thousand transfusions are given every year at Mount Sinai Hospital, all by the citrate method. Transfusion apparatus have disappeared completely not only from this hospital, but from most institutions all over the world.

Scannell should know that reactions are not due to sodium citrate. They occur following any method of transfusion, unless instruments, solutions and tubing are kept immaculately clean. Ever since Rosenthal in 1933 pointed out the importance of these technical details, post-transfusion chills have been kept at a very low level.

The citrate method is the only practical method of blood transfusion. For this reason it is used in peace and war to the exclusion of other methods. Furthermore, blood banks cannot be used unless the citrate method is employed.

All other methods are of only historical interest, completely forgotten except by a few members of the profession whose names are connected with one or another apparatus.

Scannell states that whole blood and citrated blood are as different as black and white. Unless I am color blind, all apparatus which necessitate a direct connection between donor and recipient are definitely on the "black" list. The citrate method has supplanted them all and after thirty years continues to shine in bright "white" colors.

RICHARD LEWISOHN, M.D., New York.

MULTIPLE CARCINOMAS

To the Editor:—In the clinical note by Dr. C. A. Holland of Philadelphia in THE JOURNAL, June 2, appears the following paragraph:

> Irradiation was administered by Dr. Edward Chamberlain between June 10 and July 18, five days a week in daily dosages of 100 roentgens (one fourth in each of four positions: anteroposterior, posteroanterior, left posterior oblique and right posterior oblique) to a total of 3,000 roentgens. This heavy dosage was well tolerated, with a minimum of skin reaction. . . .

Unfortunately this paragraph does not truly set forth the essential factors that were used in the x-ray treatment of this remarkable case. In reading Dr. Holland's description of the therapy technic, one would naturally understand that each of the four skin portals received one fourth of 3,000 roentgens. Actually each of the four skin portals received 3,000 roentgens. On each of the thirty days on which treatments were administered the daily dose of 100 roentgens was administered to each of the four skin portals.

Dr. Holland's case report is a valuable one. I know you will agree with this because you would not have published it if you had not considered it valuable. Its importance would seem to warrant some statement to correct the misunderstanding. I have already received a letter from a radiologist in Florida asking for additional information in view of the likelihood that the factors as described in the case report were in error.

Had I had an opportunity to edit this paragraph about the irradiation of this patient's esophageal carcinoma, I would have changed the first sentence of the paragraph quoted to read as follows:

> Irradiation was administered under the supervision of Dr. W. Edward Chamberlain between June 10 and July 18 in daily (occasionally the interval was forty-eight or seventy-two hours instead of twenty-four hours) doses of 100 roentgens, to a total dose of 3,000 roentgens, to each of four skin portals, anterior, posterior and right and left oblique lateral.

W. EDWARD CHAMBERLAIN, M.D., Philadelphia.

"EPILEPSY, THE GHOST IS OUT OF THE CLOSET"

To the Editor:—A pharmaceutical house has distributed to physicians a pamphlet printed by the Public Affairs Committee called "Epilepsy, the Ghost Is Out of the Closet." An accompanying letter from the company's president quotes a favorable comment about the pamphlet by THE JOURNAL and states that I assisted in the preparation of the pamphlet. This is true, but paragraphs dealing with heredity contain statements which I know are untrue and were printed in this red covered edition over my protest. A corrected blue covered edition has been printed for distribution by the American Epilepsy League, 50 State Street, Boston.

WILLIAM G. LENNOX, M.D., Boston.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, July 28, page 973.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various centers, Jan. 18. *Oral.* Various centers, Oct. Final date for filing application is Oct. 20. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York 24.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, May 27. Final date for filing application is Jan. 31. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I.* Various centers, Feb. 2. Final date for filing application is Nov. 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 2-5 and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1107 Willow St., Minneapolis 4.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Severance of Ileum During Performance of Appendectomy.—The plaintiff instituted an action for damages for malpractice against the physician defendant, Edwards, alleging, so far as is here material, that the physician negligently severed her ileum from the cecum in performing an appendectomy on her and negligently bound together small loops of her small intestine, resulting in an almost complete obstruction therein. The trial court overruled a motion for a directed verdict on the grounds of insufficiency of evidence to establish negligence on his part and the jury returned a verdict in favor of the patient. Later the physician made a motion for a new trial and from the denial of the motion appealed to the Supreme Court of Colorado.

Because the physician contended that the evidence adduced at the trial was insufficient to establish his negligence, the court undertook to summarize that evidence. The plaintiff, said the court, on being stricken with acute appendicitis, on the direction of the physician, was taken to a hospital in Denver where her appendix was removed by the physician. A few days later fecal matter began to exude from the incision and this condition continued. Several months thereafter another physician performed another operation, which disclosed, he stated, that the patient's ileum had been cut in two and that the two ends were about 8 inches apart. He effected finally a proper union of the loose ends of the ileum. The second physician could only account for the separation of the ileum by "an accidental severance with a knife or scissors." Another physician who assisted him in the second operation testified:

> The terminal ileum was found to be completely severed from the cecum. . . . It was severed or cut so the two ends were not approximating one another; they were several inches away. . . . The stump (of the lower portion of the separated ileum) looked like it might have been severed. I couldn't say definitely—with some sharp instrument of some sort.

The defendant testified that he did not either cut or sever the ileum in the course of the appendectomy and claimed that by placing a gauze packing around the ileum before the appendix was cut he precluded such a possibility. However, cross examination and the testimony of other medical witnesses tended to show that in the procedure actually followed in the questioned operation positive infallibility in the protection of the ileum from an accidental cut was not insured by the insertion of gauze packing. Both the physician defendant and another physician who assisted him in the operation testified that the patient's intestines were friable from inflammation caused by some preexisting infection and intimated that the fecal discharges through the incision came via a fistula from lesions resulting therefrom. In opposition, the physician and his assistant performing the second operation testified that the patient's intestines were normal and displayed no signs of any disease condition whatsoever. The physician defendant called five other physicians, who testified in response to hypothetical questions that had the ileum been severed completely the early death of the patient from peritonitis, caused by the consequent flooding of the abdominal cavity with fecal matter, would have been almost inevitable, and since the patient had not died, they believed that the intestine had not been severed during the course of the appendectomy. To controvert this testimony, on behalf of the patient there was presented expert medical testimony to the effect, apparently as revealed in the second operation, that through nature's protective processes the upper end of the severed bowel, following the line of least resistance, had become adherent to the abdominal wall at the place of the incision and there had formed a seal whereby the fecal matter from the organs above was discharged on the outside of the abdomen at that point, and that coincidentally the lower severed end of the intestine, being deprived of fluid, had sealed off and taken a position of repose. There was disagreement in the opinion of the medical witnesses as to the length of the period fecal discharges might continue after a severance of the ileum, the evidence of witnesses for the plaintiff being that such as factually were known to have occurred properly could be attributed to previous accumulations in the large bowel below the disjunction, while, contra, medical experts called by the defendant expressed the belief that the established rectal emissions demonstrated that there had been no severance of the bowel extract.

It is to be observed, continued the court, that the testimony of no medical witness so much as suggested that the ileum at the alleged area of disjunction was involved in the original condition of acute appendicitis or that it was necessary to cut it, treat it or do anything at all with it in order to remove the appendix. The defendant sought vindication from liability on a denial that he had in fact severed the intestine. While the testimony was in sharp conflict as to both factual and hypothetical matters, it seems certain to us that the evidence upholding the contention of the patient was amply sufficient to warrant the submission of the case to the jury and to support the finding of liability returned by it. The resolution of questions relating to the credibility and reliability of the various witnesses and the weight to be given their testimony are for the jury, and its conclusions in this field may not be disturbed by an appellate court.

In support of their arguments, the defendant cited a number of authorities relating to the safeguards from liability accorded by the courts to physicians in their practice, where the conduct in question was shown to be in pursuance of a recognized technic and where the unfavorable results were brought about by honest errors or mistakes in judgment in diagnosis or procedure. It seems to us, answered the court, that in so contending the defendant has lost sight of the circumstance that the transgression here charged was not directed to any dereliction in the performance of the appendectomy as such but to the needless and negligent injury to an unrelated organ, which all the medical witnesses agreed should not have been cut in any degree during the course of an appendectomy. In other words, severance of the ileum, at the point herein claimed, in the performance of an appendectomy would be, as was said in *Vergel v. Hartzell*, 8 Cir., 1 F. (2d) 633, cited by this court with approval in *Daly v. Lininger*, 87 Colo. 401, 288 P. 633, as:

> If a surgeon, undertaking to remove a tumor from a person's scalp lets his knife slip and cuts off his patient's ear, or if he undertakes to stitch a wound on the patient's neck and by an awkward move thrusts his needle into the patient's eye, or if a dentist, in his haste, leaves a decayed tooth in the jaw of his patient and removes one which is perfectly sound and serviceable, the charitable presumptions, which ordinarily protect the practitioner against legal blame where his treatment is unsuccessful, are not here available.

During the selection of the jury, counsel for the patient asked if any of the prospective jurors had "ever been an officer or employee of a company that insures against malpractice." This was the basis of a motion for a mistrial made by the physician which was overruled by the trial court. Ordinarily, said the Supreme Court, it is not reversible error in cases of this character to ask prospective jurors whether or not they are interested in a certain designated insurance company as officers, employees, stockholders or otherwise, since a plaintiff is entitled to inquire if any member of the panel has an interest in the corporation which has, or is supposed to have, indemnified the defendant against the liability asserted. However, the physician argued that the right so to inquire does not permit asking a blanket question concerning all insurance companies but must be limited to a certain company expressly named. Whatever may be the proper procedure hypothetically, answered the court in the present case because of the surrounding facts the trial court committed no error in the ruling made. Counsel for the patient, previous to propounding the question, could not ascertain from counsel for the physician what indemnity company was interested in the outcome of the case. The trial court then ruled that if the patient's counsel could not obtain the name of the insurance company involved from the physician's counsel "he is entitled to ask the general question." Following the ruling the physician's counsel divulged the name of the insurance company involved and presumably thereafter inquiries to the jurors concerning their interests or employment referred to the proper company by name. The court accordingly concluded that the question objected to was proper.

The judgment in favor of the patient was affirmed.—*Edwards v. Quackenbush, 149 P. (2d) 809 (Colo., 1944).*

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

209:561-700 (May) 1945

*Severe Type of Hereditary Anemia with Elliptocytosis: Interesting Sequence of Splenectomy. T. B. Cooley.—p. 561.

Frequency of Thalassemia. J. V. Neel and W. N. Valentine.—p. 568.

Eosinophilia Following Parenteral Liver Therapy: Literature and Case Report. H. A. Hanno and M. Mensh.—p. 572.

Prognostic Value of Marrow Eosinophils in Thrombocytopenic Purpura. S. O. Schwartz.—p. 579.

Infectious Mononucleosis and the Negro, with Report of 6 Cases. A. Blain and E. C. Vonder Heide.—p. 587.

Spontaneous Pneumothorax as Complication of Pneumonia in Adults. E. R. Movitt.—p. 595.

Hepatotoxic Action of Diethylstilbestrol with Report of Case. H. Elias and D. Schwimmer.—p. 602.

Enhancement of Plasma Concentration of Penicillin in Dogs by Simultaneous Administration of Para-Aminohippuric Acid: III. K. H. Beyer, W. F. Verwey, R. Woodward, L. Peters and P. A. Mattis.—p. 608.

Antistaphylococcal Activity of Various Sulfonamides, with Method for Routine Determination of Chemotherapeutic Activity. N. Ercoli, M. N. Lewis and Eleanor M. Harker.—p. 621.

*Persistence of Pneumococci in Sulfonamide Treated Cases of Pneumonia. R. A. Goodwin Jr., Clare Wilcox and M. Finland.—p. 628.

*Clinical Study of Sensitivity to Sulfathiazole. G. T. Kent and H. W. Diefendorf.—p. 640.

Failure of Penicillin in Rheumatoid Arthritis. B. I. Comroe.—p. 646.

Focal Electroencephalographic Changes During Scotomas of Migraine. G. L. Engel, E. B. Ferris Jr. and J. Romano.—p. 650.

Initial Cardiac Examination of 23,000 Inductees and Volunteers. N. Flaxman.—p. 657.

Acute Syphilitic Meningitis: Discussion of Problems Encountered in Diagnosis. A. Heyman.—p. 664.

Joint Disease Associated with Acromegaly. H. Waine, G. A. Bennett and W. Bauer.—p. 671.

Hereditary Anemia with Elliptocytosis.—The subjects of Cooley's report are 2 brothers, Jerome and Robert, coming from a family in which during five generations 19 of 29 boys born to women in the mother's line of descent exhibited a severe anemia. Sixteen of the 19 have died, 1 is said to have recovered and the other 2 are the present patients. No girls have been affected. The family history indicates that the disease is transmitted by unaffected females in the "sex linked" manner of hemophilia, or the "sex influenced" manner of pattern baldness. Both of the brothers exhibit in their blood a striking type of elliptocytosis, which is not found in any of the numerous siblings or in either parent. Robert, the elder, has never shown indications of serious illness but lives comfortably on average hemoglobin of 7.8 Gm., while Jerome, the younger, has always been more or less of an invalid, stunted, pale, and subject to frequent exacerbations of his anemia, in which transfusions become necessary. He has had more than twenty such periods during three years of observation. The blood of both boys has tended to be microcytic and hypochromic, and each has had periods of polycythemia with counts above 6,000,000. Jerome's frequent relapses have apparently been due to infection, and the fact that at these times his blood shows fragmentation makes it seem probable that there is a hemolytic element present. His episodes of respiratory infection are described by his parents as asthmatic. They are probably bronchitis. The patient's white cells immediately following a relapse have usually shown a neutrophil count above 20,000. A striking change in Jerome's cells followed a splenectomy. Robert's cells have never shown anything similar. It is believed that the operation influenced favorably the fundamental disease process and that, if by suitable prophylaxis the infectious element can be minimized, something approaching a cure can be hoped for. This anemia adds one more to the list of the "refractory" anemias, uninfluenced by any therapy, except occasionally by splenectomy. All of these refractory anemias are due to constitutional defects in the hemopoietic system. Sickle cell anemia, Mediterranean anemia and a familial anemia reported by Strauss and Daland are other examples of refractory anemias. This last is also characterized by elliptocytes.

Persistence of Pneumococci After Sulfonamide Treatment.—Goodwin and his associates studied the persistence of pneumococci in sulfonamide treated cases of pneumonia by examination of sputum and throat cultures from 43 patients at the Boston City Hospital before and at intervals during and after treatment with sulfathiazole or sulfadiazine. Three of the patients were studied during two attacks of pneumonia. Considerable variations were found in the persistence of pneumococci. Of the strains of pneumococci found before the sulfonamide therapy was started, about 30 per cent persisted throughout the period of observation or were obtained intermittently during this time. Three fourths of the remaining strains could no longer be found after the third day of treatment. New types of pneumococci which were not found in the pretreatment cultures appeared in the specimens studied during or after sulfonamide therapy in a considerable proportion of the cases. Most of the strains which first appeared during sulfonamide therapy could no longer be found after that treatment was completed. Multiple types of pneumococci were found more frequently in patients with a history of chronic respiratory infections. In these cases and in those with purulent complications of the pneumonia there was a greater tendency for the pneumococci to persist than in uncomplicated cases. The persistence of pneumococci was not related to the failure of the patient to develop antibodies for the homologous types.

Sensitivity to Sulfonamides.—The untoward reactions resulting from the administration of sulfonamides may be divided into (1) direct toxic effects such as vomiting and cyanosis, (2) mechanical effects due to precipitation of the drug or its acetyl derivative in the urinary passages and (3) allergic reactions such as drug fever and eruption. Kent and Diefendorf studied the time of appearance of certain of the allergic reactions to the drugs and the incidence and time of onset of allergic reactions when the drug was readministered after being withheld for an interval. Of 472 patients who received one course of sulfathiazole, 110 exhibited some form of reaction to the drug, and approximately one half of these had allergic reactions. Regarding the percentage of patients developing drug fever on any one day the therapy is given, the authors say that the curve rises to a peak of 9.9 per cent on the ninth day and thereafter drops sharply. Thus, if a patient has had no reaction after nine days of therapy his chances of developing one subsequently on the same administration diminish rapidly. Of 103 patients receiving sulfathiazole twice, 22 patients exhibited sensitivity reactions. Of the patients showing manifestations of sensitivity on the second course, drug fever occurred within the first two days of readministration in all of the patients who had fever on the first course. Three fourths of them had had no reaction on the first course. Of the patients who reacted to the second administration but not the first, none developed a reaction before nine days had elapsed from the time the first course was started. The appearance of sensitivity reactions on the second course is not related to the total time the drug is administered or to the absolute duration of the interval between courses. Sensitivity reactions may follow an initial course, which may be as short as two or three days. No influence of dosage on the incidence of sensitivity reactions was demonstrated. The short time between the beginning of readministration and the appearance of drug fever is regarded as evidence that an allergic state was present at the time the second course was started. An interval between courses serves to demonstrate that an initial administration has sensitized an individual to subsequent courses of the drug.

American Journal of Public Health, New York

35:433-552 (May) 1945

Vincent's Infection—Wartime Disease: Preliminary Considerations on Epidemiology of Ulcerative Gingivostomatitis. H. T. Dean and D. E. Singleton Jr.—p. 433.
Id.: Observations on Oral Spirochetal Flora Present in Vincent's Infection. E. G. Hampp.—p. 441.
Id.: Reporting of Vincent's Infection by State Health Departments. C. L. Sebelius.—p. 451.
*Ultraviolet Light Control of Air Borne Infections in Naval Training Center: Preliminary Report. S. M. Wheeler, H. S. Ingraham and others.—p. 457.
Tuberculosis in Armed Forces. E. R. Long and E. A. Lew.—p. 469.
Industrial Hygiene and Labor. H. G. Dyktor.—p. 480.
Statistical Approach to Cancer Problem in Massachusetts. Evelyn A. Potter and Mildred R. Tully.—p. 485.
Study and Control of Industrial Atmospheric Pollution Nuisances. F. M. Stead.—p. 491.
Industrial Hygiene and Expanded Federal-State Vocational Rehabilitation Program. D. A Clark.—p. 504.

Ultraviolet Light Control of Air Borne Infections.—Wheeler and his associates investigated the efficiency and practicality of ultraviolet irradiation as a method of reducing the spread of respiratory infection in navy barracks. Ultraviolet lights were installed at similar locations in all the lighted barracks. Overhead fixtures provided indirect irradiation directed to the upper air of the barracks. Lights were also installed under the bunks with irradiation directed downward to the floors and lower air, where bacteria laden dust particles are found to be the most numerous. There was a 25 per cent reduction of respiratory illness in the barracks equipped with high intensity sources (235 watts of ultraviolet energy per dormitory sleeping quarters of 112 men) as compared with illness in the adjacent control barracks. This effect was most noticeable in the early winter months, when illness rates were at a high level throughout the camp. At this time the reduction of incidence in barracks with irradiation as compared to the controls was approximately 35 per cent. Streptococcic illness and carrier rates were at a low level. These low levels were not further reduced among men living in irradiated barracks. Bacterial counts from air samples in irradiated barracks showed a 50 per cent reduction in total saprophyte colony counts as compared with nonirradiated control barracks. Beta hemolytic streptococci isolated from air and dust were found more frequently and in greater numbers in control barracks than from irradiated sleeping quarters. In view of the fact that reduction in morbidity rates was pronounced in the high intensity irradiated group only in the first months of the study period, the results of the experiment of 1943-1944 should be interpreted with caution.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:423-526 (May) 1945

Cardiac Changes in Arteriovenous Fistula. R. C. Pendergrass.—p. 423.
Significance of Calcification in Ascending Aorta as Observed Roentgenologically. J. Jackman and M. Lubert.—p. 432.
Egg Shell Calcifications in Silicosis. A. D. Riemer.—p. 439.
Calcified Hemangiomas of Liver. M. Aspray.—p. 446.
Roentgen Demonstration of Semilunar Cartilages of Knee. J. W. Grossman and H. H. Minor.—p. 454.
Multiple Myeloma in Youth. H. Wood, J. W. Quinlan and E. F. Merrill.—p. 466.
Choledochoduodenal Fistula: Case Report. J. Weinberger and A. Rosenthal.—p. 470.
Photoelectric Timing in General Roentgenography. P. C. Hodges and R. H. Morgan.—p. 474.
*Evaluation of Roentgen Therapy in Filariasis. H. L. Jaffe.—p. 483.
Direct and Indirect Radiotherapy. B. Grynkraut.—p. 491.

Roentgen Therapy in Filariasis.—Jaffe evaluates the results of roentgen therapy in filariasis by comparing the course of the disease in a group of 50 patients treated by roentgen rays with that of an untreated group of the same number. Three months after treatment the course of filariasis was similar in the irradiated and in the untreated patients. Several patients derived benefit from roentgen therapy in that some glandular swellings were reduced in size and were rendered less painful. No harmful effects were observed as a result of this roentgen treatment. Total body irradiation offers no advantage over local roentgen therapy and at times does not appear to be as effective in relieving the pain of enlarged glands or in reducing their size. Roentgen therapy did not influence the frequency, duration or severity of recurrent attacks after periods of remission. Several patients who complained of a pleuritic type of pain presented lesions of a transitory and migrating type of chronic pneumonitis affecting one or both lungs. These patients were afebrile and showed a normal white blood cell count.

Anesthesiology, New York

6:225-336 (May) 1945

*Use of Spinal Anesthesia to Control Sympathetic Overactivity in Hyperthyroidism. R. T. Knight.—p. 225.
The Action of Curare on Smooth Muscle of Small Intestine and on Blood Pressure. E. G. Gross and S. C. Cullen.—p. 231.
Ten Years of Pentothal Sodium Intravenous Anesthesia: Evaluation of Its Past, Present and Future. R. C. Adams, J. S. Lundy and T. H. Seldon.—p. 239.
Peripheral Circulation During Anesthesia, Shock and Hemorrhage: Digital Plethysmograph as Clinical Guide. A. D. Foster, C. Neumann and E. A. Rovenstine.—p. 246.
New, Simple and Practical Needle for Intravenous Anesthesia. T. Gordh.—p. 258.
Influence of Autonomic Nervous System on Spontaneous Cardiac Arrhythmias During Cyclopropane Anesthesia. C. R. Allen, E. A. Hoeflich, B. M. Cooper and H. C. Slocum.—p. 261.
Anesthetic and Postanesthetic Respiratory Problems in Infant Operated on for Tracheoesophageal Fistula: Case Report. W. H. Cassels and Helen E. Yeager.—p. 268.
Surgeon-Anesthetist Relations. R. L. Sanders.—p. 273.
Method for Administration of Pentothal Sodium Anesthesia. S. H. Mann.—p. 279.
*Avertin Poisoning with Acute Yellow Atrophy of Liver and Toxic Nephrosis. Dorothy H. Andersen.—p. 284.

Spinal Anesthesia in Hyperthyroidism.—Spinal anesthesia has been considered part of the operative management only in those cases which have not been brought under sufficiently satisfactory control by the usual measures. Spinal anesthesia is not administered with the purpose of providing or even assisting the anesthesia for the surgical procedure. The purpose is solely to anesthetize that part of the sympathetic nervous system which innervates the adrenal glands and to reduce the secretion of epinephrine immediately before the operation. It is the custom at the author's clinic to anesthetize the apprehensive and toxic patients with intravenous sodium pentothal in their rooms without the patient knowing that the day of operation has arrived. While asleep under sodium pentothal, the patient is taken to the operating room. The anesthesia is then usually continued with some inhalation agent. For the few patients who have been especially resistant to the preoperative treatment, spinal anesthesia is added. The spinal anesthetic is administered when the patient arrives in the operating room and after the inhalation anesthesia is begun. The typical picture is that the blood pressure and pulse run a more even and less elevated course than can be expected in even less toxic patients without spinal anesthesia. The awakening is more quiet, the patients are more content and less active. Spinal anesthesia to the level of the fifth or fourth thoracic segment seems to have a beneficial effect on patients in thyroid crisis and thyrotoxic patients undergoing operation.

Tribromoethanol Poisoning with Atrophy of Liver and Toxic Nephrosis.—Andersen reports the case of a child, aged 8, in whom tribromoethanol anesthesia was followed by acute yellow atrophy of the liver, uremia and death in fourteen days. Since the dose was conservative and the administration was according to standard procedure, the author thinks that the patient was unusually susceptible to the drug. The author presents data on 16 cases collected from the literature in which death followed tribromoethanol anesthesia and postmortem examination showed hepatic or renal damage or both. The pathologic changes are comparable to those found in delayed chloroform or carbon tetrachloride poisoning.

Bulletin New York Academy of Medicine, New York

21:225-278 (May) 1945

Some Psychiatric Aspects of Nervous System Injuries. W. O. Klingman.—p. 225.
Present Status of Etiology of Primary Atypical Pneumonia. J. H. Dingle.—p. 235.
Chemotherapy in Acute Upper Respiratory Infections. R. L. Cecil.—p. 263.

California and Western Medicine, San Francisco

62:243-304 (May) 1945

Philosophical Background of Compulsory Health Insurance. L. S. Goin. —p. 247.
Epidemic Vomiting Sickness (Spencer's Disease). A. G. Bower.—p. 253.
Intercostal Nerve Block. P. C. Samson and L. J. Fitzpatrick.—p. 254.
Acroparesthesia. L. Shepard.—p. 256.

Canadian Journal of Public Health, Toronto

36:175-216 (May) 1945

Saskatchewan Plans Health Service. M. C. Sheps.—p. 175.
Experiences with Use of Propylene Glycol as Bactericidal Aerosol in Royal Canadian Air Force Barracks. J. M. Mather and A. D. McClure.—p. 181.
Observations on Diphtheria in the Immunized. J. Gibbard, E. T. Bynoe and R. J. Gibbons.—p. 188.
Milk Control Under Board of Public Utilities. J. S. Robertson.—p. 192.
World Standard and Unit for Penicillin. P. Hartley.—p. 196.
Vaccination of Humans Against Western Equine Encephalitis Virus. M. Bowman.—p. 199.
Equine Encephalomyelitis: Serum Neutralizing Antibodies in Man Before and After Vaccination. L. M. Heath—p. 201.
Fitness in Saskatoon School Children According to Pullhems Profile. G. Binning.—p. 206.

Epidemiological Information Bull. Washington, D. C.

1:289-310 (April 30) 1945

Typhus During the War. K. Stowman.—p. 289.
Current Reports on the Prevalence of Certain Diseases: Data on Plague, Cholera, Yellow Fever, Smallpox and Typhus Received During the Period March 16 to 31, 1945.—p. 311.
Trend of Certain Notifiable Diseases: Typhus Cases Reported in European Area, 1919-1945.—p. 319.

1:327-364 (May 31) 1945

Adhesions to International Sanitary Conventions, 1944: Commonwealth of Australia.—p. 327.
Expert Commission on Quarantine. G. H. de Paula Souza.—p. 333.
Current Reports on Prevalence of Certain Epidemic Diseases.—p. 334.

Gastroenterology, Baltimore

4:289-374 (April) 1945

Clinical Significance of Alteration of Small Intestine Pattern as Demonstrated by X-Ray. J. M. Ruffin, G. J. Baylin and D. Cayer.—p. 289.
Rare Syndrome of Crisis-like Abdominal Pain. W. C. Alvarez.—p. 296.
Krukenberg Tumors: Roentgen and Gastroenterologic Aspects of Secondary Ovarian Carcinoma. R. M. Lowman and S. D. Kushlan.—p. 305.
Effect on Gastric Secretion of Pedicle Jejunal Grafts in Wall of Stomach. A. C. Anderson, B. Slutzky and R. W. Maertz.—p. 323.
*Enzyme Inhibitory Action of an Alkyl Aryl Sulfonate and Studies on Its Toxicity when Ingested by Rats, Dogs and Humans. S. Freeman, Marie W. Burrill, Tsan-Wen Li and A. C. Ivy.—p. 332.
Cholelithiasis: Report of a Case with 36,329 Stones in the Gallbladder. J. R. Schenken and F. C. Coleman.—p. 344.
Effect of Nausea on Gastric Secretion and Study of Mechanism Concerned. M. I. Grossman, J. R. Woolley and D. F. Dutton.—p. 347.

Enzyme Inhibitory Action of Alkyl Aryl Sulfonate.—The information available concerning the toxicity of orally ingested wetting agents indicate a relatively low toxicity for alkyl and aryl sulfates and sulfonates. Such toxic manifestations as have been reported are largely explainable on the basis of gastrointestinal irritation. There is also in vitro and in vivo evidence indicating that these substances will denature proteins and inhibit peptic and tryptic activity. Freeman and his collaborators decided to determine the oral toxicity of a detergent substance which they designate as NAS and which is essentially a purified mixture of alkyl aryl sodium sulfonates. In vitro experiments indicate that this wetting agent will inhibit enzyme activity, but the feeding experiments with rats, dogs and human beings indicate that in vivo this inactivation was not of sufficient magnitude to alter digestion and absorption of foodstuffs materially. When the substance was administered daily to rats for sixty-five days in an amount constituting 0.5 per cent of the diet, it did not significantly influence growth or reproduction. One Gm. daily for six months did not affect the maintenance of adult dogs. The normal cellular composition and hemoglobin content of the blood in both dogs and rats as well as the normal gross and microscopic appearance of the stomach, liver, kidney and bone marrow are all indications that there was no significant systemic toxic effect from the substance. In dogs, normal dye clearance by the liver and the serum phosphatase values furnish further evidence that the function of the liver was not impaired. In relatively large daily amounts the substance produced irritation of the gastrointestinal tract of dogs as evidenced by the passage of loose stools and mucus. Death probably resulted from inanition and dehydration when sufficiently large doses (3 or 4 Gm. daily) were fed. In human subjects daily ingestion of 100 mg. for four months produced no change in the cellular composition and hemoglobin of the blood nor any demonstrable effect on the kidney function. The substance apparently also had no effect on absorption from the gastrointestinal tract, as indicated by body weight and analysis of the fecal fat and nitrogen.

Georgia Medical Association Journal, Atlanta

4:67-86 (April) 1945

Combined Surgical and Injection Treatment of Varicose Veins. C. E. Rushin.—p. 67.
I Became a Patient. T. C. Davison.—p. 72.
Heart-Vascular Aging. E. S. Byrd.—p. 74.

Indiana State Medical Assn. Journal, Indianapolis

38:149-172 (May) 1945

Methods to Save Vision. J. V. Cassady and C. B. McFarland.—p. 149.
Methods to Improve Vision. E. L. Bulson.—p. 151.
Methods to Prevent Blindness. O. T. Allen.—p. 154.
Visual Requirements for Armed Services. V. A. Teixler.—p. 156.

38:173-208 (June) 1945

Uses of Penicillin in Otolaryngology. D. D. Geiger.—p. 173.
Internal Fixation of Fractures: The "Spike" Operation. E. B. Mumford.—p. 180.
Peripheral Gangrene of Unknown Etiology: Case Report with Discussion of Differential Diagnosis. E. M. Beck and J. O. Ritchey.—p. 184.

Journal of Allergy, St. Louis

16:121-164 (May) 1945

Treatment of Ragweed Pollinosis with Antigen Antibody Mixtures: Preliminary Report. M. B. Cohen and H. J. Friedman.—p. 121.
Study of Fungus Contaminants of Air of San Diego and Vicinity. G. F. Harsh and Sonia E. Allen.—p. 125.
Depletion in Asthma. F. M. Rackemann.—p. 136.
*Vitamin C in Hay Fever: Therapy and Blood Levels. S. Friedlaender and S. M. Feinberg.—p. 140.
*Inhalant Sensitization and Shock in Guinea Pigs Under Controlled Atmospheric Conditions: III. Possible Effects of Changing Meteorologic Circumstances: Four Year Summary. L. J. Courtright and A. B. Courtright.—p. 146.
Propeptans in Treatment of Ragweed Hay Fever. S. W. Landau and L. N. Gay.—p. 159.

Vitamin C in Hay Fever.—Friedlaender and Feinberg investigated the vitamin C content of the blood in hay fever patients who were given vitamin C and in some who received no vitamin C. They found that patients with hay fever have a normal blood level of vitamin C. Large doses (500 mg. daily) of vitamin C produce the usual saturation blood levels but do not change the course of the hay fever or asthma. The inability to detect any deficiency of the vitamin C nutrition in seasonal hay fever and asthma patients is in keeping with the absence of therapeutic results when large amounts of vitamin C are administered in these conditions.

Inhalant Sensitization in Guinea Pigs.—The Courtrights attempted to analyze several components of weather and their actions on inhalant sensitization and shock in guinea pigs. They report reactions of 350 guinea pigs sensitized and shocked by inhalation of horse dander in various controlled weather conditions. More than 1,500 shock exposures were made. The conditions under which the greatest number and most severe anaphylactic reactions occurred were (*a*) shifting from hot dry air to low barometric pressure, (*b*) shifting from low pressure to hot dry air and (*c*) shifting from hot moist to cold dry air without the allergen and back to hot moist with the allergen. The single weather conditions, in the order of the number of severe reactions which occurred in each, were (*a*) hot dry, (*b*) room air, (*c*) cold dry, (*d*) hot moist and (*e*) cold moist air. The single weather conditions, in the order in which the greatest number of all types of reactions occurred, were (*a*) hot moist, (*b*) cold dry, (*c*) hot dry, (*d*) room air and (*e*) cold moist air. The single weather conditions, in the order in which the most severe reactions in the first shock exposure occurred, were (*a*)

hot dry, (*b*) hot moist, (*c*) cold dry, (*d*) room air and (*e*) cold moist air. In one well controlled experiment the experimental low pressure condition was conducive to a significantly higher number of reactions than was that of high pressure.

Journal of International College of Surgeons, Chicago

8:109-209 (March-April) 1945

Congenital Parotid Sialectasis. H. Bailey.—p. 109.
*Mixed Tumors of Salivary Glands: Critical Review of 14 Surgically Treated Cases. G. B. Kent, K. C. Sawyer and J. S. Benwell.—p. 115.
Pentothal Sodium Anesthesia in Major Surgery and Its Dangers. K. Schlaepfer.—p. 121.
Dystocia Due to Hydroureter of Excessive Size: Report of a Case. G. King.—p. 128.
Does a Vitellobiliary Duct Exist? C. Chi and H. C. Seng.—p. 133.
Endometriosis and Adenomyosis. Y. C. Yin.—p. 135.
Blue Sclerotics Associated with Bony Defects. E. Chan.—p. 140.
Congenital Absence of Segments of the Small Intestine. H. C. Sheng and C. Chi.—p. 145.
Eclampsia During Pregnancy and Labor—A Ten Year Survey. A. Sadowsky.—p. 147.
New Nasal Tissue Clamp Used in a New Method of Narrowing the Columella. A. P. Seltzer.—p. 154.
Revived Treatment for Varicose Veins. H. A. Springer.—p. 160.
Ascites of Seven Years' Duration: Report of a Case. C. J. DePrizio.—p. 164.

Mixed Tumors of Salivary Glands.—Kent and his associates operated on 14 mixed tumors of the salivary glands over a period of seventeen years. The youngest of the patients was 27, the oldest 64 years of age. The average duration of symptoms was 7.6 years. The mean age of onset was computed as 36 years. The sex incidence was much higher in the female than in the male patients, the ratio being 11:3. All but 2 of the mixed tumors occurred in the parotid gland; the 2 remaining ones were in the submaxillary gland. All of the lesions except 1 were well encapsulated. In 5 cases the capsule was ruptured, in the others it remained intact. The only constant symptom was the presence of a lump, mass or swelling. Salivary tumors usually turn out to be much more extensive than originally contemplated. In this series the tumors were removed by the block method in 10 cases. In the 2 submaxillary tumors the entire gland was removed and the digastric triangle widely dissected. The tumor was enucleated in 2 cases. Six of the patients had a resultant facial paralysis, which was permanent though not extensive in 3 instances. A temporary salivary fistula ensued in 2 of the cases. The results have been good. There was 1 recurrence which responded to irradiation. The follow-up has varied from six months to sixteen years, the average follow-up period being slightly less than nine years.

Journal of Lab. and Clinical Medicine, St. Louis

30:395-474 (May) 1945

*Heredity of Rh Blood Types: IV. Medicolegal Application in Cases of Disputed Parentage. A. S. Wiener and Eve B. Sonn.—p. 395.
Relationship Between Changes in Serum Protein Concentration and Plasma Volume in Normal Subjects. R. H. Lyons, S. D. Jacobson and J. L. Neerkin.—p. 404.
Precipitin Test for Tuberculin Antibodies. R. O. Muether and W. C. MacDonald.—p. 411.
Serologic Diagnosis of Endemic Typhus: II. Comparison of Water Bath and Icebox Fixation in Complement Fixation Test. S. R. Damon and Mary B. Johnson.—p. 415.
Comparison of In Vitro and In Vivo Penicillin Resistance of Strain of Hemolytic Staphylococcus Aureus. Helen Warmer and J. Amluxen.—p. 419.
Further Studies on Choline Deficiency in Dogs. J. M. McKibbin, R. M. Ferry Jr., S. Thayer, E. G. Patterson and F. J. Stare.—p. 422.
Adrenal Cortex Stimulating Substance in Female Human Urine. H. T. Blumenthal.—p. 428.
Determination of Prothrombin Time Following Administration of Dicumarol, 3,3'-Methylenebis (4-Hydroxycoumarin), with Special Reference to Thromboplastin. Margaret Hurn, N. W. Barker and T. B. Magath.—p. 432.
Prothrombin Studies Using Russell's Viper Venom: VII. Effect of Prothrombin Clotting Time of Concentrations of Calcium and Other Salts. A. Kleinman, R. C. Page and P. W. Preisler.—p. 448.
*Fatal Cardiac Tamponade Following Sternal Puncture. J. H. Scherer and J. S. Howe.—p. 450.
Intermediate Type of Ovalocytosis in Negro. F. Wagner.—p. 454.
Preliminary Report on Rapid Method for Diagnosing Sickle Cell Disease. P. M. Neuda and M. S. Rosen.—p. 456.
Alterations in Concentration of Blood During Pregnancy. J. W. Mull and A. H. Bill.—p. 458.

Heredity of Rh Blood Types.—Wiener and Sonn present data on the Rh types in a series of 91 families with 161 children. A single apparent exception to the theory of six allelic genes has been shown to be due to illegitimacy. These data combined with previously published results make a total of 197 families with 463 children tested by the authors for the Rh blood types. The satisfactory agreement between the observations and expectations under the theory justify the medicolegal application of the Rh tests for the exclusion of paternity. To date, in 102 cases of disputed paternity, tests for the Rh types have been carried out together with the usual A-B-O, A_1-A_2 and M-N tests. In 4 cases the accused man was excluded by the Rh tests; in 2 of these cases he was also excluded by one of the other tests, but in 2 cases the woman's false accusation might have been believed had the Rh tests not been performed.

Fatal Cardiac Tamponade Following Sternal Puncture.—Scherer and Howe report the history of a man aged 31 in whom several unsuccessful attempts were made to aspirate marrow from the sternum. The depth to which the needle was inserted at times reached about ¾ inch. Repeated attempts at several levels resulted only in the aspiration of a small amount of blood tinged fluid. The procedure was given up as unsuccessful. Shortly thereafter the patient became pale, semicomatose, breathing noisily and with pupils dilated. The pulse was thready and rapid and the blood pressure not determinable. The foot of the bed was elevated, nikethamide and epinephrine were given and artificial respiration was started. The patient died suddenly after a few minutes, approximately thirty minutes after the unsuccessful aspiration. Necropsy revealed a through and through needle puncture wound of the sternum just below the sternal angle, with slight periosteal extravasation of blood about the point of exit on the posterior surface of the sternum. Directly beneath this wound there was a similar needle puncture wound through the parietal pericardium. The pericardial sac was distended by approximately 350 cc. of fresh blood, and the heart was completely surrounded by fresh clot. Just beneath the puncture wound of the parietal pericardium there was a triangular laceration of the musculature of the right ventricle 1 cm. in greatest diameter. The authors say that this is the second death from sternal puncture recorded in the literature and the first reported necropsy on such a case.

Journal-Lancet, Minneapolis

65:167-210 (May) 1945

Problems in Fat Metabolism in Children. A. E. Hansen.—p. 167.
Conversion Hysteria in Children. R. A. Jensen and A. D. Wert.—p. 172.
Dental Arch Development as Guide to Time for Malocclusion Correction. J. T. Cohen.—p. 176.
Congenital Atresia and Congenital Tracheoesophageal Fistula. N. L. Leven and B. G. Lannin.—p. 179.
Convulsions in Infants and Children: Age and Etiologic Incidence. E. P. Crump.—p. 182.
*Reading Disability: A Pediatric Problem. T. H. Wolf.—p. 184.
Jaundice in Infancy and Childhood. R. V. Platou and S. B. Nadler.—p. 186.
Chickenpox Encephalitis. Elizabeth C. Lowry.—p. 191.
Third Epidemic of Primary Virus Pneumonitis Among Infants in Minnesota. J. M. Adams.—p. 192.
Intratibial Infusions in Children. R. D. Semsch and A. V. Stoesser.—p. 194.
Rubella in Pregnancy and Congenital Malformations. F. H. Adams.—p. 197.
Management of Rheumatic Fever. P. F. Dwan.—p. 199.
Physician and Child with Defective Speech. Francis M. Brown.—p. 200.

Reading Disability a Pediatric Problem.—Wolf shows that disability in reading may play a part in the physical complaints and emotional tensions found in school children, particularly in those 9 to 10 years of age or older. From the fourth, fifth and sixth grades on, the ability to read assumes an increasingly important part in nearly every school subject. A youngster unable to compete with his classmates because he cannot read finds himself at a disadvantage, and repeated failure results in unhappiness for which he may try to compensate in various ways. He may develop into a behavior problem, becoming sullen and negativistic toward his teacher and classmates. He may become the bully or withdraw from contacts with the group. On the other hand, he may develop bizarre physical complaints varying from mild headaches to severe digestive disturbances, fainting spells or convulsive seizures. He may manifest both emotional and physical symptoms. A case recently encountered in the pediatric outpatient department of the University of Minnesota Hospitals illustrates the point. A frequent error of parents and teachers is to think of the child as dull and stupid. Measured intelligence and rapid school progress

after remedial treatment have proved otherwise Uncorrected conditions of the eye or ear may be responsible for the reading difficulties The physician should look for muscular imbalance, which may cause a lack of fusion of visual images Some children need additional corrective eye muscle training Islands of deafness may be unrecognized Other factors that play a part in reading disability are inadequate instruction, emotional problems and cerebral factors The theories of causation due to lefthandedness, to mixed eye-hand dominance in the cerebral hemispheres, have been open to serious question and criticism Most if not all of the difficulties can be relieved by proper guidance

Journal of Pediatrics, St. Louis

26:415 508 (May) 1945

*Studies on Growth and Development of Male Children Receiving Evaporated Milk II Physical Growth Dentition and Intelligence of White and Negro Children Through First Four Years as Influenced by Vitamin Supplements Teresa F Rhoads M Rapoport Ruth Kennedy and J Stokes Jr —p 415
Results in Treatment of Meningococcic Meningitis with Antitoxin and Sulfonamide Drugs J H Davis, W J Morrow and J A Toomey —p 455
*Treatment of Meningococcic Meningitis in Children with Single Intravenous Dose of Sodium Sulfadiazine Report of 9 Cases S J Winter —p 459
Antigenic Relationships of Coliform and Related Bacteria Isolated from Infants in Nurseries of Two Institutions C A Stuart and Elizabeth Van Stratum —p 464
*Ten Years Experience with BCG (Experimental and Clinical) S R Rosenthal, Margery Blahd and Eleanor I Leslie —p 470
Chemotherapy of Staphylococcus Aureus Infection of Lung and Pleura in Infancy B Philips and B Kramer —p 481
Inguinal Ectopia of Ovary P M Bancroft —p 489
Exstrophy of Bladder Report of 2 Patients Operated on at 2 Months of Age A A Schneffer and S Sakaguchi —p 492
Hand Schuller Christian Disease E G Hummel —p 501

Growth of Children Receiving Evaporated Milk—Rhoads and her associates used various criteria of growth and nutrition in following the progress of a group of white and Negro children who received evaporated milk as the sole milk supply from birth through 5 years of age The children were from low income families and were observed at periodic visits to the clinic of the Children's Hospital of Philadelphia Except for the milk and vitamin supplements which were provided by the clinic, the remainder of the food was the customary home diet Group 1, as controls, received irradiated evaporated milk as the sole antirachitic Group 2 received nonirradiated evaporated milk plus 1 tablespoon of cod liver oil daily Group 3 received irradiated evaporated milk plus 10 drops of carotene daily, equivalent approximately to 2 250 U S P units of vitamin A Group 4 received irradiated evaporated milk plus 10 drops of carotene and ½ tablespoon of brewers' yeast The brewers' yeast furnished approximately 0 5 mg of vitamin B and 0 2 mg of riboflavin After the child reached the age of 1 year the evaporated milk was usually consumed as a beverage at the rate of one 14½ ounce can daily per child The nutritional adequacy of evaporated milk for growth and development through infancy and early childhood was demonstrated Dietary supplements of vitamin A or vitamin B complex were found to be without demonstrable effect by the criteria used

Single Intravenous Dose of Sodium Sulfadiazine in Meningococcic Meningitis—The 9 cases of meningococcic meningitis reviewed by Winter were observed at the Department of Pediatrics of the United States Naval Hospital, San Diego, Calif The treatment varied from the customary in that a single large intravenous dose of sulfadiazine was given Eight patients received 2½ grams per pound of body weight, 1 patient received 2 grams per pound This single dose of sodium sulfadiazine resulted in complete recovery This dose will maintain a sulfonamide level in the spinal fluid and blood long enough for rapid recovery With the present method of treatment there is every indication that the present quarantine period of meningococcic meningitis is unnecessarily long It is possible that less than 2 grams per pound of body weight will be adequate to give the same result Further studies will be necessary to determine the minimum single dose of sulfadiazine sufficient for rapid recovery High sulfadiazine levels are shown to be well tolerated if adequate alkalization of the urine is maintained Spinal fluid cultures were sterile twenty-four hours after a single large intravenous dose of sodium sulfadiazine, thereby lessening the chance for complications and sequelae

Ten years' Experience with BCG—Rosenthal and his associates say that ten years ago the Trice Laboratory and Clinic of the Chicago Municipal Tuberculosis Sanitarium set about to determine whether the bacillus of Calmette and Guerin (BCG) was safe for animals and man and whether this form of vaccination against tuberculosis was beneficial It was found that BCG was entirely innocuous both locally and generally in animals studied over a period of ten years and in infants studied over a period of seven years In 1,204 vaccinated children in whom no contact with tuberculosis was known there were 3 cases of tuberculosis and 1 death from the disease, whereas in 1,213 controls there were 23 cases of tuberculosis and 4 deaths from the disease In 98 vaccinated newborn infants who were in contact with tuberculosis following vaccination there was 1 case of tuberculosis and no deaths, whereas in 63 controls there were 4 cases of tuberculosis and 3 deaths Considering the contact and noncontact group as a whole, there were 27 cases of tuberculosis in the control group against 4 cases in the vaccinated, there were 7 deaths from tuberculosis in the control group and 1 in the vaccinated The authors conclude that in the first seven years of life BCG vaccination is of definite value in the prevention of tuberculosis

Medicine, Baltimore

24:111-218 (May) 1945

Diabetic Neuropathy General Review, with Report of 125 Cases R W Rundles —p 111
Histopathology of Central Nervous System After Exposure to High Altitudes, Hypoglycemia and Other Conditions Associated with Central Anoxia E C Hoff R G Grenell and J F Fulton —p 161

New England Journal of Medicine, Boston

232:521-546 (May 10) 1945

*Pancreatoduodenal Resection Preliminary Report of 18 Cases R B Cattell —p 521
*Cardinal Manifestations of Paroxysmal Tachycardia II Vascular Collapse L Wolff —p 527
Scarlet Fever C Wesselhoeft and L Weinstein —p 531

232:547-612 (May 17) 1945

Hodgkin's Disease IV Involvement of Certain Organs H Jackson Jr and F Parker Jr —p 547
Increasing Cost of Medical Care Its Relation to Hospitals and Specialization in Medicine G W Holmes —p 559
Partial Gastrectomy for Carcinoma Thirty Five Years Ago F B Lund —p 562
Endoscopy E B Benedict —p 565
Subacute Glomerulonephritis J Lerman —p 600
Meningioma of Left Parietal Region Osteoma of Skull M E Cohen —p 603

Pancreatoduodenal Resection.—Cattell reports observations on 18 patients on whom pancreatoduodenal resections were performed There were three deaths The one stage operation was employed in 5 cases and the two stage operation in 13 Since many patients are over 60 years of age, have severe obstructive jaundice and are in poor condition, the two stage operation is considered necessary in most cases An antecolic long loop cholecystojejunostomy is recommended since it permits rehabilitation and does not complicate the resection Restoration of the external pancreatic juice to the intestine is accomplished by direct anastomosis of the duct of Wirsung to the jejunum as a means of avoiding the serious complication accompanying pancreatic fistula and in order that normal pancreatic and digestive function may be accomplished Antecolic gastric, biliary and pancreatic anastomoses are advised Results for a period up to two years are reported, with satisfactory results in 13 of 18 cases

Paroxysmal Tachycardia· Vascular Collapse—Wolff analyzes 253 cases of paroxysmal tachycardia with reference to the occurrence of vascular collapse, which occurred in 16 per cent Extreme tachycardia induces vascular collapse in more than half with rates at or above the critical level, which is in the vicinity of 200, below this level collapse is not induced by tachycardia alone The critical level is not lower in cases of myocardial infarction or other types of heart disease, with the exception of aortic valvular disease, than in normal heart Extremely rapid ventricular rates induce vascular collapse in about half the cases with normal hearts and with coronar heart disease, in about three fourths of the cases of acute or

recent myocardial infarction and in all the cases of mitral stenosis Causes other than tachycardia must be suspected when collapse is associated with rates well under 200 or when termination of the abnormal rhythm or significant reduction of heart rate is not promptly followed by resumption of a normal circulation

New York State Journal of Medicine, New York

45:1041 1152 (May 15) 1945

Thiouracil in Hyperthyroidism Survey of One Years Experience M G Vorhaus and H H Rothendler —p 1087
Dr Lyman Guy Barton, Senior Marjorie L Porter —p 1094
Congenital Malformation and Birth Injuries Among Children Born in New York State Outside of New York City in 1940 1942 J V De Porte and Elizabeth Parkhurst —p 1097
Rehabilitation of Discharged Soldiers B Liber —p 1101
Outbreak of Early Syphilis in Western New York State B F Mattison and E H Harris —p 1105
Metals of Medical Importance Used in Aviation Industry W D Schmidt —p 1107
Epidemic Virus Gastroenteritis Occurring in Civilian Population J S Tribush —p 1113

Radiology, Syracuse, N. Y.

44:425 530 (May) 1945

Tomography of Skull E H Holvey, L M Rosenthal and B J Anson —p 425
*Osteitis Deformans Paget's Disease of the Bone D D Dickson J D Camp and R K Ghormley —p 449
Roentgen Appearance of Lobar and Segmental Collapse of Lung I Technic of Examination L L Robbins C H Hale and O E Merrill —p 471
Bone Lesions of Congenital Syphilis in Infants and Adolescents Report of 46 Cases P E Russo and L F Shryock —p 477
Idiopathic Spontaneous Pneumothorax History of 100 Unselected Cases L Schneider and I I Reissman —p 485
Case of Arterial and Periarticular Calcinosis of Unknown Etiology J Levitin —p 489
Duodenal Obstruction to Tuberculous Lymphadenitis R H Marshak and D Dreiling —p 495
Jejunal Intussusception Through Gastroenterostomy Stoma F E Butler, I M Woolley and W Y Burton —p 498

Osteitis Deformans —At the Mayo Clinic prior to January 1938 a diagnosis of osteitis deformans or Paget's disease was made in 367 cases Dickson and his associates analyze the records of these cases They attempt to correlate the clinical manifestations of the disease with the roentgenologic evidence As the term osteitis deformans implies, Paget believed the disease to be a chronic inflammatory process Local heat may be demonstrated in the bones particularly in those which are easily palpable The highest incidence of the disease occurred during the sixth decade, a third of the 367 patients falling in this group Sixteen of the patients had relatives with the same disease Seventy-five patients had no complaints prior to the time of diagnosis and had not been aware of anything unusual as far as the bone disease was concerned The disease was discovered incidentally in the course of a roentgenographic investigation On the basis of roentgenologic variations 200 cases have been classified into 100 with the sclerotic phase and 100 with the combined phase In the pelvis the sclerotic phase is characterized roentgenographically by a homogeneous increase of the density of bone, with details of the cancellous trabeculae no longer perceptible The combined phase has a more complex roentgenographic picture, it represents nonhomogeneous alterations of density of bone Areas of osteoporosis osteosclerosis and cysts are demonstrable The most striking alteration observed in the blood of patients with osteitis deformans is an elevation of the serum phosphatase Higher levels for serum phosphatase were observed in the combined than in the sclerotic phase Pathologic fracture is one of the most common complications Seventy-seven pathologic fractures were encountered in 62 of the patients included in this series They were most frequent during the combined phase The fracture usually heals with abundant callus formation In 3 cases sarcoma and in 1 case a benign giant cell tumor complicated the osteitis Localized or diffuse areas of finely mottled osteoporosis of the skull are thought to be an early roentgenographic manifestation of osteitis deformans In a study of 117 cases in which there was involvement of the skull, 26 instances of osteoporosis circumscripta were encountered Subsequent roentenologic examination in some instances demonstrated multiple shadows of increased density typical of osteitis deformans, which appeared in the areas of osteoporosis It would seem that osteoporosis circumscripta is an early roentgenographic manifestation or precursor of osteitis deformans of the skull. Earlier observers held the view that the skull and tibia were the most frequent sites of the disease The authors found that the most frequent site is the pelvis This high incidence of involvement of the pelvis, 243 of 307 cases, may be partially accounted for by the frequency with which the diagnosis was made during urologic examination

Southern Medical Journal, Birmingham, Ala.

38:293-366 (May) 1945

Experience with Gastroscope Over a Period of Six Years J T Howard —p 294
Round Cell Tumor of Bone Resembling Ewing's Tumor R J Reeves —p 302
Carpal Bone Injuries J D Sherrill —p 306
Penicillin as Adjunct to Surgery in Treatment of Brain Abscess Report of 6 Cases L T Furlow —p 312
The Clinical Use of Penicillin in Dermatology W J Morginson —p 320
Summary of the Findings in 200 Consecutive Operated Cases of Neck Infection of Dental Origin A M Alden —p 327
Concentrated Red Blood Cells Preparation and Use R O Muether —p 330
Some Clinical and Public Health Hazards in the Southern United States E C Faust —p 334
Minimal Standards for Sterility Surveys E C Hamblen —p 339
Neonatal Mortality Rates in Infants Receiving Prophylactic Doses of Vitamin K W W Wadell and Betty W Whitehead —p 349
Postoperative Hemorrhage in Anorectal Surgery J H Dodson —p 352
Perineal Lacerations and New Retractor for Repairing Them E H Wesson —p 355
Cultural Values in Medical Education E P Lehman —p 356

Surgery, St. Louis

17:641-772 (May) 1945

Symposium on the Ulcer Problem

Direct Visual Technic for Studying Chemical and Other Injury to Exposed Mucosal Surfaces F Kolouch Jr —p 641
Pathogenesis of Caffeine Induced Ulcers J A Roth and A C Ivy —p 644
Influence of Caffeine on Ulcer Genesis Experimental Production of Gastric Ulcer in Guinea Pigs and Cats with Caffeine, Together with Study of Its Effect on Gastric Secretions in Dog and Man K A Merendino E S Judd I Baronofsky, S S Litow B G Lannin and O H Wangensteen —p 650
Pedicled Jejunal Transplant onto Gastric Wall Evaluation of Its Effect on Gastric Acidity and Failure of Such Transplants to Afford Protection Against Ulcer Provoked by Histamine in Beeswax F Kolouch Jr A T S Dubus and O H Wangensteen —p 667
Attempt to Confirm Alleged Inhibitory Effect on Gastric Secretion of Jejunal Pedicle Grafts in Wall of Stomach M I Grossman, D F Dutton and A C Ivy —p 685
Indications for Operation in Cases of Peptic Ulcer from Internist's Point of View A L Bloomfield —p 692
*Medical Treatment of Peptic Ulcer Refractory to Sippy Therapy A Winkelstein, A Cornell and F Hollander —p 696
Treatment of Perforated Duodenal Ulcers R R Graham and E B Towe —p 704
Experimental Evaluation of Satisfactory Operation for Ulcer B G Lannin —p 712
*Removal of Vagus Innervation of Stomach in Gastroduodenal Ulcer L R Dragstedt and P W Schafer —p 742
Gastric Ulcer and Cancer A W Allen —p 750
Synthetic Predigested Aliment for Jejunostomy Feeding F Hollander S Rosenak and R Colp with technical assistance of Ruth F Karelitz —p 754

Medical Treatment of Refractory Peptic Ulcer —According to Winkelstein and his associates only a small percentage of patients with peptic ulcer are cured medically, many go through life with mild symptoms and about 25 per cent are refractory and require intensive medical or surgical therapy For this purpose the usual Sippy therapy seems inadequate because it has a number of disadvantages, one of the more important being that it does not effect interdigestive neutralization, especially of the night secretion Methods to control the harmful nocturnal hypersecretion included gastric aspiration, atropine, sedatives, olive oil and alkalis given separately or in combination As a result of the failure of these measures there arose the idea of continuous intragastric drip therapy throughout the twenty-four hours These colloids, besides preventing alkalosis, are antiseptic and astringent and can be substituted

for the milk sodium bicarbonate mixture wherever the latter is contraindicated, as in cases of an allergic reaction or an idiosyncrasy toward milk The nutritive value of milk and the simplicity of the apparatus required for its administration favor its use whenever conditions permit A mixture of milk and alumina gel has also been tried and found adequate Experience of thirteen years with the continuous intragastric drip method has demonstrated its clinical efficacy The technic is learned quickly, so that nearly all the patients can administer it to themselves at home during the night Using a vessel similar to the ordinary enema can as a milk container and a rectal drip indicator, they can operate the drip at home during the night and carry on their work during the day, thus continuing a 'home cure" for as long a time as may be necessary Most of these patients are "tube broken' having had various gastric analyses performed on them, so that they do not find the method difficult The authors have used the intragastric drip procedure on 60 ulcer patients who were refractory to the usual medical therapy Twenty two of these are cited as examples of the successful application of this form of therapy

Removal of Vagus Innervation of Stomach in Gastroduodenal Ulcer—Acting on the conception that the hypersecretion of gastric juice in gastroduodenal ulcer is largely neurogenic in origin Dragstedt and Schafer have treated a series of patients with this disease by an operation designed to remove permanently and as completely as possible the vagus innervation of the stomach Supradiaphragmatic division of the vagus nerves has been performed on 13 patients with duodenal ulcer, on 1 patient with gastric ulcer and on 1 with a gastrojejunal ulcer The patient with gastric ulcer has been apparently cured of his disease, as judged by the disappearance of symptoms and by x-ray and gastroscopic evidence All but 1 of the patients with duodenal ulcer have been greatly improved or have been cured, although 3 patients have required gastroenterostomy because of persistence of obstructive symptoms The patient with the gastrojejunal ulcer, although improved, has been continued on medical management The excessive continuous night secretion of gastric juice has been greatly reduced by the vagus section thus providing additional and perhaps conclusive evidence that this abnormality is neurogenic in origin The striking improvement in these patients is in harmony with the view that gastroduodenal ulcer is a psychosomatic disease and that the central nervous system affects the stomach via the vagi, probably chiefly through greatly augmenting the secretion of gastric juice

West Virginia Medical Journal, Charleston

41:121-144 (May) 1945

Differential Diagnosis and Treatment of Diseases Involving Spleen C A Doan—p 121
Evaluation of Cardiac Symptoms W C Stewart—p 129
Cutaneous Anthrax Diagnosis and Treatment (with Case Report) S W Meyer and B I Golden—p 133

41:145-176 (June) 1945

Some Medical Aspects of Chemical Industry—T W Nale—p 145
Foreign Bodies in Eye R S McLaughlin—p 151
Rh Factor Review of Its Clinical Significance C P Artz—p 155
Interesting Urologic Problem Case Report R L Whipple—p 158

Wisconsin Medical Journal, Madison

44:481-522 (May) 1945

Infections and Surgery of Hand T J Snodgrass—p 503
Chemotherapy in Otolaryngology H L Williams—p 507
Importance of Certain Extracardial Conditions in Coronary Disease N C Gilbert—p 512
Cardiac Trauma I G Carr—p 517

44:567-648 (June) 1945

Homologous Serum Jaundice Case G P Langenfeld—p 591
Problems of Plastic Surgery of Face C R Dix—p 593
Postwar Tropical Disease Problems D D Stiver—p 596
Diarrhea and Its Differential Diagnosis in General Practice S Rosenthal—p 601
Surgical Treatment of Extraocular Muscles Suggestions Value of Irangen—p 604
Diagnosis of Mandibular Joint Neuralgia and Its Place in General Diagnosis of Pain J B Costen—p 608

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below Single case reports and trials of new drugs are usually omitted

British Journal of Dermatology and Syphilis, London

57:45-84 (March-April) 1945

Relationship of Acne with Dandruff and Seborrheic Dermatitis E I Cohen—p 45
Psychogenic Factors in Acne E I Cohen—p 48
Multiple Superficial Carcinomata of Skin Mary Johnson—p 58

Lancet, London

1:455-486 (April 14) 1945

Chronic Amebiasis Investigation and Treatment W L Lamb and G R Royston—p 455
*Effects of Clostridium Welchi Type A Toxin on Body Tissues and Fluids A C Frazer, J J Elkes H G Sammons A D T Gowan and W T Cooke—p 457
Factors Promoting Venous Return from Arm in Man E Bowers D J M Campbell and C W P Johnston—p 460
Hyperthyroidism Treated with Methyl Thiouracil D Leys—p 461
Idiopathic Gangrene of Scrotum G B Mair—p 464
Recovery from Tuberculous Meningitis G H Jennings—p 466
Actions After Being Shot Through Brain D J A Kerr—p 467

Effects of Clostridium Welchi Toxin on Body Tissues—Frazer and his associates studied the effect of Clostridium welchi toxin on tissues and fluid substrates in vitro, in animals and in human subjects The experiments indicate some points which may be significant in determining the local spread of infection and they also open up two new lines of investigation with regard to the systemic reactions—namely, demyelination and fat embolism Cl welchi toxin will cause rapid destruction of red blood cells, and there is evidence that hemolysis occurs The other changes in the blood consist of flocculation of chylomicrons and the breaking of lipoprotein complexes The fact that flocculation of chylomicrons is caused by the serum of these patients may be significant in relation to the production of fat emboli The occurrence of demyelination is an effect of lecithinase or may be secondary to fat embolism in the central nervous system With regard to the origin of the fat in clostridial fat embolism there are two possibilities The first is the free fat which is liberated from adipose tissue and muscles and can be seen as large globules in in vitro studies and in the material from the site of tissue destruction The second is from flocculated chylomicrons and the fatty material set free from broken lipoprotein complexes In experimental studies there seems little doubt that the fat must be derived from the site of local destruction

Medical Journal of Australia, Sydney

1:289-312 (March 24) 1945

Clinical Importance of Renal Function Tests in Pregnancy R Nick Rome—p 289
*Renal Function Tests in Pregnancy V I Krieger—p 290
Treatment of Postirradiational Ulcers by Radon Ointment A G S Cooper and D F Robertson—p 297

Renal Function Tests in Pregnancy—Krieger discusses results of an investigation carried out by an obstetric research committee since 1926 on biochemical tests in relation to their value in the toxemias of pregnancy Kidney function was estimated by tests on the blood and the urine The blood was examined for its content of urea, nonproteim nitrogen, uric acid creatinine and undetermined nitrogen A twenty-four hour specimen of urine was examined for its content of urea, ammonia and total nitrogen, and its diastatic index was calculated Maclean's urea concentration test was performed Liver function was investigated by testing pigmentary function and carbohydrate metabolism The pigmentary function was assessed by examination of the blood by Fouchet and van den Bergh tests and by testing the urine for bile pigments and salts and also for urobilin Carbohydrate metabolism was estimated by the levulose test The urine was tested qualitatively and quantitatively for the presence of diacetic acid and acetone as a means of detecting the presence of acidosis The blood urea content and Maclean's urea concentration test were found to be the most useful means for determining renal function while the Fouchet and van den Bergh tests were found to be the most useful in the estimation of liver function Many thousands of renal function tests have been performed Tests cannot replace thorough clinical investigation but their results are weighty

evidence which cannot be disregarded. The management of a patient on clinical data alone is often sufficient in one pregnancy, but there will be no evidence of its effects on the kidneys. Thus, information of value in later pregnancies is not available. One pregnancy may result in a living baby and a surviving mother. The mother, however, may not be able to withstand the effects of toxemia in later pregnancies. Renal function tests are practically the only means by which some idea of this possibility can be obtained. In cases in which the clinical condition is satisfactory and renal function is poor, and when the results of renal function tests do not improve after a few days of treatment, termination of pregnancy is advisable, since follow-up examination indicates that, even if the present pregnancy terminates satisfactorily, later history may be unsatisfactory.

Acta Dermato-Venereologica, Stockholm

24:457-546 (March) 1944

Reexamination of 63 Cases of Erythema Induratum Bazin. J. Knap. —p. 457.
Treatment of Parapsoriasis with Bucky Rays. P. V. Marcussen.—p. 472.
*Pathogenesis of Eye Complications of Arsphenamine Dermatitis. S. von Pastinszky.—p. 480.

Eye Complications of Arsphenamine Dermatitis.—Of 3 patients who had dermatitis with eye complications as the result of antisyphilitic treatment with arsphenamine, the first had a panophthalmitis, the second a superficial keratitis punctata and the third corneal edema. Von Pastinszky has observed that conjunctivitis is frequent in arsphenamine dermatitis with ocular involvement, but superficial keratitis is rare and corneal ulcers with perforation and panophthalmitis are still rarer. This is due to the fact that the cornea is not as likely to develop allergic inflammations as is the conjunctiva. Secondary infection, lack of resistance, hypovitaminosis and perhaps mechanical factors may play a part in addition to the allergic factor. The allergic nature of the inflammation is indicated by the extreme eosinophilia demonstrable in the conjunctival secretion.

Nordisk Medicin, Stockholm

21:317-356 (Feb. 18) 1944. Partial Index

Hospitalstidende

*Cancer of Neck of Uterus in Pregnancy. J. Jessen.—p. 325.

Hygiea

Value of Primary Cholangiography in Cholecystectomy: After-Examination of 241 Cholangiographed Cases of Cholecystectomy. P. Rudström.—p 341.
Pain in Region of Root of Fourth Lumbar Segment. G. von Reis. —p. 344.

Cancer of Neck of Uterus in Pregnancy.—Of 1,168 cases of cancer of the neck of the uterus treated from 1931 to 1942, 22 (1.9 per cent) were complicated by pregnancy; 11 patients were over 35 and 4 were under 30. The growth of the tumor was not affected by pregnancy, but parturition seemed to have an unfavorable effect. Jessen considers cesarean section and supracervical amputation of the uterus justifiable when the tumor is found shortly before the end of term. When abortion has been induced because of cancer of the cervix, radiotherapy should be instituted as soon as possible.

21:409-452 (March 3) 1944. Partial Index

Wound Healing in Cases with Disturbances in General Condition. P. Sandblom.—p. 409
Relation of Intestinal Peristalsis to Salt Control in Blood and Urine. J. Lehmann.—p. 410.

Hospitalstidende

Results of Insulin Shock Treatment, Together with Combined Insulin and Shock Treatment, of 43 Chronic Restless Schizophrenic Patients. Ellen Eriksen and N. Holm.—p. 415.

Hygiea

Influence of World War on Development of Surgery. G. Nyström. —p. 425.
Case of Symptomatic Sprue After Resection of Small Intestine. S. Holmgren.—p. 430.
*Correlation Between Heart and Arm. E. Ask-Upmark.—p. 434.

Correlation Between Heart and Arm.—Ask-Upmark has observed a characteristic arm syndrome in connection with certain diseases of the heart, particularly coronary insufficiency, which consists of humeroscapular periarthritis, infiltrations of the palmar aponeurosis and edema of the fingers. The symptoms, unilateral as a rule, may occur together, but the shoulder changes and the palmar infiltration are most often present. The syndrome is one of the most common complications after a heart infarct. In predisposed persons, especially women, a cardiac syndrome consisting of palpitations, premature beats and oppression may be registered in connection with arm movements.

21:513-568 (March 17) 1944. Partial Index

Diagnosis and Treatment of Coronary Diseases. V. Mortensen. —pp. 457, 516.

Hospitalstidende

*Myotonia Atrophica with Special Regard to Mental Changes. E. Thomasen.—p. 519.

Hygiea

Determination of Gas Exchange in Lungs with Relation to Metabolism Together with Hormonal and Vegetative Functions. L. Herlin.—p. 531.

Myotonia Atrophica and Mental Changes.—Since 1941 Thomasen has observed 94 patients in nineteen families with myotonia atrophica and with cataract in some members. Deceased members of the families are also believed to have had the condition. Cataract, senile or presenile, may be the first manifestation of the disease. Reduced intelligence is the most conspicuous psychic change in the disorder. Of the 94 patients only 20 have fairly normal intelligence. Most patients lack initiative and are indolent and carefree. The muscular symptoms include myotonia, muscular atrophy and early muscle fatigue. Fertility is diminished. Atrophy of the sternocleidomastoid muscle is of differential diagnostic significance. Psychiatrists, especially in institutions for the feebleminded, should keep dystrophia myotonica in mind; it is transmitted by dominant inheritance, and examination of the patient's relatives will usually reveal overlooked or misinterpreted cases.

21:569-600 (March 24) 1944. Partial Index

Hospitalstidende

*Investigations on Regulation of Respiration During Muscular Work. M. Nielsen and E. Asmussen.—p. 573.
*Oculogyric Instability as Initial Symptom in Multiple Sclerosis. V. A. Jensen.—p. 580.
Epidemic Curve for Chickenpox. P. Heiberg and H. Petersen.—p. 584.

Hygiea

Ten Years' Work for Standardization of Hospital Equipment. F. Bauer. p. 585.

Regulation of Respiration During Muscular Work.—Nielsen and Asmussen state that during muscular effort respiration is probably regulated by reflex impulses from the working muscles to the respiratory center which increase the excitability of the center to carbon dioxide in proportion to the intensity of the work. Sensory nerves are believed to lead the impulses to the respiratory center. Hyperventilation in heavy work may be due to substances produced in the working muscles when the oxygen supply fails. In patients with poorly capillarized muscles or weakened peripheral circulation hyperventilation may occur on slight physical exertion because of a beginning deficiency in the oxygen supply.

Oculogyric Instability as Initial Symptom in Multiple Sclerosis.—Jensen reports that oculogyric instability was established in 70 per cent of 50 patients (23 men, 27 women) with multiple sclerosis. It was demonstrable in 12 of the 14 patients with duration of the disorder of a year or less. For examination of the circumductive leading movement the patient is requested to keep his head still and follow attentively with the eyes an object, such as the end of a fountain pen, shown to him and then made to describe steadily a not too large circle about 50 cm. in front of his face. In patients with multiple sclerosis, even in the initial stage, the circular movement on both sides often proceeds in a series of jerks, and an irregular snappy nystagmus occurs every time the eyes reach one or two definite points in the path of the object. The second phenomenon is bilateral and occurs most often in the upper quadrants of the range of vision, but not in the horizontal line or the vertical meridian.

Book Notices

Peripheral Nerve Injuries: Principles of Diagnosis. By Webb Haymaker, Capt., M. C., A. U. S., Neuropathologist, The Army Institute of Pathology, Washington, D. C., and Barnes Woodhall, Maj., M. C., A. U. S., Chief, Neurosurgical Section, Walter Reed General Hospital, Washington, D. C. Cloth. Price, $4.50. Pp. 227, with 225 illustrations. Philadelphia & London: W. B. Saunders Company, 1945.

This is a carefully organized manual which painstakingly details the fundamentals of anatomy, physiology and the diagnosis of injuries of the peripheral nervous system. It is short, interestingly presented and to the point. It is divided into three major sections. In the first section the segmental and peripheral nerve supply of skin, muscles and skeleton are analyzed. The authors have crystallized out all that is known with certainty and have eschewed the more theoretical and controversial aspects of innervation. Excellent charts and illustrations adapted from Foerster and Bing are included in this section. The second section describes the examination of the peripheral nervous system. Here are succinctly described all the maneuvers and tricks in the armamentarium of the neurosurgeon. The authors discuss in this section all the influences which modify the clinical picture of peripheral nerve injuries such as pain or associated vascular injuries. This is an important factor in diagnosis and is not generally known. In this section are numerous line drawings and photographs, graphically illustrating the various technics in the examination of peripheral nerve function. The third and last section details the findings in injuries of the plexuses and peripheral nerves. Excellent anatomic drawings of the involved plexuses and nerves and numerous photographs of actual cases are presented. With a bare minimum of words the authors describe all that can be found when a nerve or plexus is injured. This useful manual is an ideal reference book for any one whose practice includes injuries of the peripheral nerves. Its clarity and brevity make it a valuable item for medical students and general practitioners. It is a necessary reference textbook for any army surgeon or neurosurgical assistant. The only fault that the book seems to have is that it was not published four years ago.

Fisiologia endocrina. Por Amado Ruiz Sánchez. Tesis de doctorado, Universidad de Guadalajara, Hospital civil. Tomo II. Paper. Pp. 416, with 166 illustrations. Guadalajara, 1944.

This book is the continuation of one which was previously published by the author with the name of "Apuntes de Fisiologia Endocrina." It deals with the anatomy, embryology, histology and physiology of the genital organs, thyroids, adrenals, pancreas, parathyroids, pineal body and thymus, as well as with endocrine abnormalities and with diseases due either to endocrine hypofunction or to endocrine hyperfunction. The pictures showing endocrine abnormalities and those of patients with endocrine diseases belong to the files of the Endocrinologic Department of the Civil Hospital of Guadalajara. The last two chapters deal with the correlation between endocrine hormones and vitamins and between malnutrition and endocrine diseases and also with the chemistry of genital hormones. The final section includes 442 references. The book condenses the interesting panorama of the fascinating subject of endocrinology.

The Common Cold and How to Fight It. By Noah D. Fabricant, M.D. Cloth. Price, $1.50. Pp. 107, with 9 illustrations. Chicago and New York: Ziff-Davis Publishing Company, 1945.

This is a comprehensive statement of what we know and an acknowledgment of what we do not know about the common cold. It is written for the lay reader and is of interest to the doctor because he is so frequently called on to recommend books to his patients. This book is interesting, readable and reliable. It should be helpful and encouraging to readers, without arousing false hopes which must only be disappointed later.

Sobre el caracter epiléptico: La histeria y la histeroepilepsia. Por el Dr. José Incollá. Tesis del doctorado en medicina, Universidad de Buenos Aires, Facultad de ciencias médicas. Paper. Pp. 65. Buenos Aires, 1944.

This thesis for a degree in medicine reviews the diverse opinions of some forty-six authors who have discussed the problems of epilepsy, hysteria or hysteroepilepsy. The author gives case histories of 11 patients with epilepsy and 3 with hysteroepilepsy, the latter comprising the number encountered in a group of 105 patients diagnosed as epileptic.

Microbes That Cripple. By T. Arthur Turner. Written and Illustrated under the direction of Edward L. Compere, M.D. Cloth. Price, $2.50. Pp. 241, with illustrations. Elyria, Ohio: National Society for Crippled Children, Inc., 1944.

In conception, organization, execution and production this book is an outstanding contribution to the literature in medicine for the lay reader. It is definitely conceived as a treatise in a limited field of bacteriology as indicated by its title, "Microbes That Cripple," and takes in, therefore, the tubercle bacilli, the spirochete, poliomyelitis and other viruses, the hemolytic streptococcus and infectious agents such as gonococci, typhoid bacilli, pneumococci and meningococci. More limited mention is made of occasional cripplers such as measles, whooping cough and influenza. The story of chemotherapy is briefly told, and there is an outline on public health, health education and public health and disease in wartime.

The organization of the book is in thirteen chapters, of which the first is introductory. The second is a broad outline of "the world of microbes." The third has to do with immunity and the fourth with the human body and how infection can cripple it. Then follow specific chapters dealing with the various organisms. The closing chapter is on chemotherapy and public hygiene, and then there are an especially good glossary, an excellent bibliography and an adequate index.

Execution of the idea is excellent by reason of concise and sprightly writing and a flair for putting scientific material into easily understood English, which is exceptional among writers for the public. A typical example is the author's designation of the coccus group of organisms "The Berry (Alias Cocci) Family," "Bacilli—The Little Sticks," and the flagellated organisms, described as "Microbes with Oars."

Further to illuminate the manuscript is liberal use of exceptionally fine artwork, in which a number of technics are used, including photography, wash-drawings in color, pen and ink drawings, and pictograph charts, combinations of pen and ink with wash in pictograph charts, cartoons and stylized diagrams. Illustrations appear so frequently that it is difficult to turn more than two pages without finding illustrative matter, which is always clear, often striking and not infrequently amusing as well.

Finally, production is worthy of the excellence of the conception, organization and execution of this book. Good paper, large type, generous margins and clever arrangements make this a book which any one might be proud to have in his library.

An Introduction to Somatic Methods of Treatment in Psychiatry. By William Sargant, M.A., M.B., M.R.C.P., Medical Officer, Maudsley Hospital, London, and Eliot Slater, M.A., M.D., M.R.C.P., Medical Officer, Maudsley Hospital, London. Cloth. Price, $2.50. Pp. 171, with 1 illustration. Baltimore: William Wood & Company, 1944.

Although the authors are well known in the field of English neuropsychiatry, this book leaves the interviewer somewhat confused as to its purpose. They are apparently interested in setting forth positive and aggressive methods of psychiatric treatment. However, one could easily quarrel with their premise that most of the advances in psychiatric therapy have been along somatic lines. This is set forth in a long introduction describing the "constitutional approach," emphasizing biologic rather than experimental factors operating in the development of behavior disorders. While they pay some lip service to a monistic approach, they are definitely dualistic in their attitudes and adhere to archaic concepts of psychophysical parallelism. Thus we find adjunctive therapy set up as etiologic although the authors admit the empirical nature of most of the methods used. They even go so far as to describe them as "therapeutic tricks," as in the use of insulin in the treatment of schizophrenic disorders. There are chapters on supposedly specific treatment by drugs, convulsions, diet, pyrexial agents and surgery. Whenever psychotherapy is mentioned it would appear to be dispensed in the same direct positive and even aggressive manner. There is no bibliography; and, although the descriptions of technic are detailed, the beginner, for whom this book was supposedly written, would not find them complete enough to be used as a sole source of reference. The conclusion reached is that the authors seem to feel a great need to make psychiatry "respectable." When this is done by aping traditional medical approaches nothing new or worth while is added.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PENICILLIN FOR SYPHILIS

To the Editor:—I have a patient with a slight touch of recurrent syphilis. He had fairly steady treatment for one and a half years consisting of neoarsphenamine for three months followed by bismuth for three months. Following this his Wassermann reaction on three occasions was negative. A Kahn test several weeks ago gave a 4 plus reaction. He was anxious to try penicillin and was able to pay for it, so he was given 2,000,000 units: 15,000 units intramuscularly every two hours. Should arsenic and bismuth be continued a year or more or should we wait six months or so to see what his serologic reaction indicates?

M.D., Tennessee.

ANSWER.—The treatment of syphilis with penicillin is at the moment entirely in the experimental stage. Whether 2,000,000 units of penicillin given as described would be effective treatment for the patient in question cannot be determined without full and complete data as to what the correspondent means by "a slight touch of recurrent syphilis." Has the patient's spinal fluid ever been tested and, if so, with what results? Does he now show any clinical evidence of syphilis and, if so, of what sort? What were the blood serologic findings on a quantitative rather than a qualitative basis? Since under any circumstances the penicillin given must be regarded as experimental, the decision as to whether to continue with a year or more of further chemotherapy or to wait six months to see what happens is largely up to the patient, provided he is properly advised on the basis of full information by his physician. It cannot be too strongly emphasized that "4 plus" blood tests viewed as isolated phenomena are by no means the determining factor in the treatment of a patient with "a slight touch of syphilis."

HYDROCEPHALUS OR SUBDURAL HEMATOMA

To the Editor:—A boy aged 17 months has an internal hydrocephalus, the blockage probably being in the aqueduct of Sylvius. He does not walk or talk as yet and except for occasional slight vomiting and slight rises in temperature appears to be in good health. At birth his head was of normal size and shape, the changes gradually occurring after about the third month. What chance has he that a spontaneous arrest might happen? Is there any recommended treatment in the meantime? Is early intervention advised, such as an attempt to locate and remove the blockage?

M.D., Illinois.

ANSWER.—In any enlargement of the head developing about the third month after birth, the first indication is to determine the presence or absence of a subdural hematoma. This can be done by aspirating from the subdural space either through the lateral angles of the anterior fontanel or through the coronal suture. If a subdural hematoma is present it should be evacuated surgically. If it is not, and the condition is an obstructive hydrocephalus as postulated here, then one would have to know the severity of the condition and the rapidity of its progress to determine the advisability of surgical intervention. Surgical treatment of hydrocephalus in infants, whether it is of the obstructive or of the communicating type, is not satisfactory. Obstruction of the aqueduct of Sylvius can be treated either by a third ventriculostomy or by a Torkildsen operation in which a catheter is passed from the lateral ventricle to the cisterna magna extracranially. Some cases of hydrocephalus do undergo spontaneous arrest. The percentage of this happening could be determined only if additional details were known. It would be wisest to have the child examined by a competent neurologic surgeon, who could best determine the course to follow in the future.

VITAMIN K AND BILE SALTS IN HEPATOMEGALY

To the Editor:—Is the daily administration of 1 to 6 mg. of vitamin K combined with bile salts of value in relieving congestion of the enlarged cirrhotic liver which is due to long standing congestive heart failure?

M.D., Indiana.

ANSWER.—Clinical or experimental evidence leading to the expectation that the administration of bile salts combined with vitamin K would have any effect in reducing a hepatomegaly secondary to heart failure has not been found. Vitamin K is known to be necessary to the proper formation of prothrombin and, since the naturally occurring vitamin is fat soluble, bile salts are necessary for its absorption

ASPIRATION OF SECRETIONS DURING LUNG SURGERY

To the Editor:—Reports on pneumonectomy and lobectomy for tuberculosis (Overholt, R. H., and Wilson, N. J.: Am. Rev. Tuberc. 51: 18 [Jan.] 1945) stress the fact that contralateral spread of infection remains the greatest hazard the surgeon has to face. The same problem exists in resection for bronchiectasis and lung abscess, perhaps to a lesser degree. Presumably the spread of infection occurs as the result of transbronchial aspiration of pus expressed from the diseased lung by the surgeon's manipulation while the patient has a depressed or absent cough reflex due to the anesthesia. Could this be prevented by introducing, prior to operation, a bronchospirometer tube of the type used by physiologists in measuring the function of the separate lungs? As I understand it, these tubes have a cuff which can be inflated to seal off the separate major bronchi. This should prevent the transtracheal passage of pus; pus accumulating in the trachea could be aspirated before the bronchospirometer tube is removed. The tube could serve for administration of anesthesia, the anesthesia to be given endobronchially instead of endotracheally. This seems like such an obvious notion that I suppose it has been tried. If so, how did it work out? If it hasn't been tried, would it work?

Winsor Chase Schmidt, M.D., Rye, N. Y.

ANSWER.—Various arrangements of inflatable balloons around intratracheal or intrabronchial anesthesia tubes have been used but have largely been abandoned for one or more of the following reasons, some of which are theoretical: 1. The difficulty of placing the balloon or balloons exactly where they must be placed in order to accomplish their purpose is great, as are the dangers of misplaced balloons. 2. The anesthesia tube used for intrabronchial intubation of the lung not being operated on is too small to permit the free passage of an aspirating catheter of sufficient size to remove thick secretions. Direct suction on the anesthesia tube while the bronchial lumen around the tube is completely occluded by a balloon tends to empty the lung of air and produce acute atelectasis, which might be quickly fatal. 3. A single balloon used to occlude the lowermost trachea and the proximal ends of both main bronchi (the anesthesia tube being placed in the bronchus of the lung not being operated on) may bulge into the bronchus that is to be divided during a total pneumonectomy and be cut when the bronchus is divided, thereby exposing the bronchi of the opposite lung to being suddenly flooded by the secretions that had been dammed back while the balloon was intact. Apart from the possibility of this accident, a slight accidental upward displacement of the balloon at any time before the lung has been removed would result in the aspiration of the infectious secretions from the diseased into the undiseased lung. 4. When two balloons and two catheters are used, as for bronchospirometry determinations, one catheter and one balloon are introduced into a main bronchus; the other catheter ends in the lower trachea, and both catheters are surrounded by a balloon which is used to occlude the trachea. The lung to be removed is the one in which the intrabronchial catheter and balloon have not been placed. The tube ending in the trachea is too small for the passage of an aspirating catheter and, as this tube, which is surrounded by the inflated balloon, cannot be moved about, direct suction on it removes only those secretions that happen to lie at its orifice; therefore some secretions almost inevitably collect in the lowermost trachea proximal to the sutured bronchial stump and these secretions may be aspirated into the remaining lung after the intrabronchial balloon has been deflated. The double tube, double balloon apparatus can be used only for a right sided pneumonectomy because, if the anesthesia tube and balloon should be introduced into the right bronchus the balloon would occlude the upper lobe bronchial orifice, which arises just below the level of the bifurcation of the trachea (the left upper lobe bronchus arises about 3 cm. below the bifurcation). If the intrabronchial tube should be introduced into the bronchus of the lung (either left or right) to be removed while anesthesia was maintained by means of a separate intratracheal tube without a balloon, the intrabronchial tube and its surrounding balloon would be divided when the bronchus was divided after a clamp had been placed distal to the site of intended division; such a maneuver would prevent the flooding of the trachea and opposite lung by secretions from the diseased lung. The occlusion of the bronchi of the diseased lung would, however, prevent the deflation of the lung that is necessary in order to permit the surgeon to reach the hilar structures, unless the air in the lung was rapidly absorbed by the blood. 5. With regard to lobectomy, the anatomic arrangement of the lobar bronchial orifices in relation to the main bronchi is such that a balloon cannot be placed so as to block the secretions from one lobe without the balloon's occupying the part of the bronchus that should be surgically divided. If, in preparation for removal of the right lower lobe, the balloon should be placed in the intermediate bronchus proximal to the apical bronchus of the lower lobe, infectious secretions from the lower lobe would be free to pass into the middle lobe. If both the lower and middle lobes are to be removed, the balloon should not be placed in the intermediate bronchus because this should be divided just

distal to the upper lobe orifice. 6. Miscellaneous objections to the use of an inflated balloon include (*a*) accidental rupture of the balloon followed by flooding of the trachea and aspiration into the undiseased lung, (*b*) rupture of the trachea or a bronchus by the inflated balloon and (*c*) the formation of an obstructing false membrane on the tracheal or bronchial mucosa as a result of the prolonged pressure by the inflated balloon, this danger being especially great in children.

Because of the many objections to attempts to prevent aspiration of infectious secretions into undiseased portions of the lung or lungs by means of inflated balloons, the great majority of thoracic surgeons and anesthetists now use a simple intratracheal tube through which a sufficiently large catheter can be introduced for the aspiration of secretions from the trachea and bronchi. The placing of the patient in the Trendelenburg position has an important influence in causing secretions that are not reached by the aspirating catheter to flow by gravity to the pharynx, passing between the intratracheal tube and the larynx.

ERYTHEMA MULTIFORME BULLOSUM

To the Editor:—A white woman aged 45 has had erythema multiforme bullosum for seventeen years. The bullae appear on the feet and legs and are especially prevalent in the mouth. At times it becomes impossible for her to talk or eat because of the soreness of the mouth. All symptoms are promptly relieved for three months by a single injection of arsenicals. However, she has developed a great sensitivity to all arsenicals with shock-like symptoms, numbness of the extremities, projectile vomiting and substernal pain. Arsenicals used throughout the seventeen years have included arsphenamine, neoarsphenamine, oxophenarsine hydrochloride and bismarsen. Fowler's solution in dosage more than 2 drops causes nausea. Can you give me any suggestions as to alternative treatment or methods of desensitizing to arsenicals?

M.D., Wisconsin.

ANSWER.—If this patient, who has evidently developed a sensitization to arsenicals, has not had any calcium, it would be well worth trying. Although the bullous form of erythema multiforme is often more obstinate than the usual type, calcium intravenously in the form of the calcium gluconate or calcium levulinate is often helpful. In numerous instances the use of calcium in the early stages has apparently aborted the attack of erythema multiforme and lessened the frequency of attacks. This woman might be given an intravenous injection of calcium at the first sign of symptoms. This can, of course, be repeated daily three or four times if it seems advisable. There is no satisfactory method of desensitization to arsenicals. The cause of an erythema multiforme bullosum is not known, and calcium, like arsenic, has been found empirically to be useful in certain cases.

HEAT TREATMENT OF ADHESIONS—DRY AND MOIST HEAT

To the Editor:—In a patient with postoperative intraperitoneal adhesions when it is desirable to apply heat once daily over a period of months, I have been accustomed to order a hot moist abdominal pack, with an overlying hot pad, for an hour or so nightly; this is a cumbersome procedure. Do the authorities think that dry heat from an infra-red lamp or from any other convenient form of dry heat is as effective as is moist heat?

M.D., Missouri.

ANSWER.—Satisfactory evidence is not available that any form of heat applied to the abdomen is of value in the treatment of postoperative intraperitoneal adhesions.

The heat obtained from infra-red lamps, radiant heat lamps and electrically heated pads is not the same as that obtained from hot compresses. Clinically the results frequently differ, the hot compress proving to be more effective than the "dry" methods of heating in the treatment of some conditions. Lamps produce heat which is conversive, convective and conductive. The surface of the skin to which the radiation is applied is exposed to the motion of the air of the room. The heat produced by hot compresses is conductive—and the surface to which it is applied is protected from environmental influences.

DYSMENORRHEA WITH CLOTS

To the Editor:—A woman aged 25, single, has suffered severe dysmenorrhea associated with scanty flow. The menstrual flow consists largely of both large and small clots. A headache of a migraine nature usually is present. How can these large clots be prevented?

M.D., Illinois.

ANSWER.—There is no satisfactory way of preventing clot formation during the menses except by curettement, and even this procedure is far from being a specific remedy. Nevertheless if the curettement is preceded by a thorough dilation of the cervix it may not only prevent the formation of clots but also relieve the patient's dysmenorrhea, at least temporarily.

TOXICITY OF CALCIUM

To the Editor:—Is there a good clinical basis for the warning that calcium lactate is contraindicated in old age? This warning appears on a label and refers to compressed tablets of calcium lactate 10 grains (0.65 Gm.). Is there a definite contraindication for a high calcium diet for the aged? If so, what about attributing the longevity of certain Bulgarian or Balkan peoples to their consuming liberal amounts of soured milk, which, along with acidophilus bacilli, is rich in calcium?

Frederick G. Murray, M.D., Cedar Rapids, Iowa.

ANSWER.—The toxic effects from calcium differ according to the route of administration. Intravenous administration should be performed with care, as large or rapid injections may cause acute lowering of the blood pressure and paralysis of the heart and respiration. Such an effect would be more serious in older people. In view of its synergism with digitalis, it is dangerous to inject calcium solutions into digitalized patients. Winkler has pointed out the possibility that a heart predisposed to ventricular fibrillation may respond in this way in an occasional case to an ordinarily innocuous concentration of calcium. Sollmann states that the toxic effects of calcium salts occur only with parenteral administration. The absorption of orally administered calcium depends on the p_H of the contents of the gastrointestinal tract. Serious elevation of serum calcium does not occur even under the most favorable conditions for absorption unless an excess of vitamin D or parathyroid hormone is present. Overdosage of these may raise the serum calcium to abnormally high levels and result in metastatic calcification and other toxic effects. The same factors are involved in the use of a high calcium diet. Robertson concludes that overdosage of calcium by diet alone cannot exist in the normal adult population, since excess calcium is excreted in the feces. His findings indicate no difference in calcium balance in older people as compared to younger adults. Laboratory experiments on rats show a slight increase in longevity from a lifetime limited increase in the calcium content of the diet. The possible clinical significance of these experiments has not been determined.

There are no satisfactorily controlled studies which prove that sour milk or "acidophilus milk" has a favorable effect on longevity. The favorable clinical results (gastrointestinal) reported for "acidophilus milk" have been obtained only when living organisms have been present. Thus, it is unlikely that the beneficial effects usually claimed are related to the calcium content.

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GLASS AMPULES

To the Editor:—In the operation of our various clinics we have need of and use a great number of glass ampules. Observing the careless manner in which some doctors and nurses break these ampules I am wondering what effect would result if the following hypothetical conditions prevailed: If glass particles are left in the intravenous solution could they pass through a hypodermic needle of 20 gage capacity? If by chance a small particle of glass did enter the lumen of the vein and get into the circulatory system, what harmful effect might accrue? How could an insoluble particle like glass escape out of the circulation and what would be its probable final disposition? Some ampules have a constriction in the neck which simplifies smooth breakage. Others have a sloping neck which makes it practically impossible to prevent shattering of the glass. What precautions would be advisable to offset these difficulties?

M.D., Texas.

ANSWER.—There is little doubt that fine glass particles are frequently injected intravenously. The final disposition of the particles probably varies greatly. There is some evidence that the liver capillaries are smaller or less distensible than those of other parts of the body and consequently one would expect foreign bodies to be walled off in the liver tissue in most cases. Reasonable care in drawing solutions for intravenous injection into the needle should be observed, but there are no other particular precautions which can be exercised. Perhaps ampules made of plastic or glass with a plastic closure will be available at some future time. Considering the vast number of intravenous injections made with materials contained in glass ampules without evidence of harmful effect, there would seem to be little practical danger from this procedure.

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TRANSIENT HYPERTENSION

THE RELATIVE PROGNOSTIC IMPORTANCE OF VARIOUS SYSTOLIC AND DIASTOLIC LEVELS

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In the preceding paper in this series,[1] based on an analysis of the medical records of 22,741 officers of the United States Army, the significance of transient hypertension was considered in terms of the subsequent state of health and the cause of death. A comparison was made between those who exhibited temporary elevations of blood pressure and those with normal levels throughout the periods of observation. The group with transient hypertension showed a greater incidence of later sustained hypertension and higher rates for disability retirement and death with cardiovascular-renal diseases.[2] It is thus apparent that, in many persons, a temporary rise in blood pressure, even though this occurs under emotional stress, must be regarded as of consequence; it is often an early sign of disorder in the circulatory system.

In the study just mentioned, the group with transient hypertension was dealt with as a whole; there was no attempt to ascertain possible differences in the prognostic importance of various systolic and diastolic levels. To obtain data on this point seemed the next logical step in the inquiry. The results are given in the present report.

MATERIAL AND PROCEDURE

The sources of the records and the general composition of the material already have been published in detail.[3] A punch card was made for each of the 22,741 cases, so that manipulation for statistical purposes could be readily carried out. Cardiovascular-renal conditions, if present, were always tabulated as causes of retirement and death, even though not immediately responsible for either. For example, malignant disease may have been the reason for which an officer left the service; but if hypertension also was present, he was considered to have retired with this circulatory disorder. A similar procedure was followed in case of death.

In dealing with data of this sort, age is of fundamental importance. This factor has been taken into account by resorting to an analysis in terms of person-years of observation, as was described in a previous paper.[1]

For purposes of study, the subjects with transient hypertension were divided into groups according to the highest levels of blood pressure recorded during the period of observation. For the systolic, the groups were 151 to 165 and 166 to 225; for the diastolic, 91 to 100 and 101 to 150. There were no readings noted above 225 systolic and 150 diastolic. Every combination of systolic and diastolic pressure was given separate consideration so that, excluding the simultaneous occurrence of normal values for the two, there were eight categories in all. Further subdivision, by reducing the number in each group, would have lessened the value of the comparisons.

RESULTS

The fundamental results are summarized in table 4. Tables 1, 2 and 3, from which the various ratios of table 4 are derived, are reproduced merely to illustrate the method employed.

In table 1 is shown the number of person-years of observation in each age group before the occurrence of sustained hypertension, for the various degrees of transient hypertension. By far the most extensive observations pertain to the group with a normal systolic pressure and a minimal elevation of the diastolic; the least extensive are in the group with a high systolic and a normal diastolic. The latter combination, as might be expected, is relatively uncommon. The distribution in the other groups is fairly even. Similar distributions of person-years were tabulated for each group before the occurrence of retirement or death. In this table the length of the calculated overall period of observation is some 5 per cent larger than that indicated in table 1 because it includes the time from the onset of permanent hypertension to retirement or death. Although the table is not shown, it was used in the derivation of table 4.

This is the third in a series of papers dealing with "Studies of Blood Pressure in Army Officers."

Dr. John W. Fertig, professor of biostatistics, Columbia University College of Physicians and Surgeons, aided in the analysis and preparation of the material for final presentation.

The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Columbia University.

1. Levy, R. L.; Hillman, C. C.; Stroud, W. D., and White, P. D.: Transient [illegible]nificance in Terms of Later Development of [illegible] and Cardiovascular-Renal Diseases, J. A. M. A. [illegible] 1944.

2. By transient hypertension is meant a reading over 150 mm. of mercury systolic or 90 diastolic which is followed, on any particular examination or at a later examination, by a reading below these levels. The highest systolic and diastolic readings obtained in any one of a series, taken at a given examination, were recorded. Sustained hypertension is taken to mean a reading of over 150 systolic or 90 diastolic, persisting throughout an examination and not followed in subsequent examinations by lower levels.

3. Hillman, C. C.; Levy, R. L.; Stroud, W. D., and White, P. D.: Studies of Blood Pressure in Army Officers: Observations Based on an Analysis of the Medical Records of 22,741 Officers of the United States Army, J. A. M. A. 125:699 (July 8) 1944.

In table 2 are given the rates, in the subjects without transient hypertension, for the later occurrence of sustained hypertension, and of retirement and death with cardiovascular-renal diseases. These figures are taken from tables 2, 3 and 5 in an earlier paper.[1]

In table 3 appears the comparison, by age and for various degrees of transient hypertension, between the observed and expected number of cases of later sustained hypertension, of retirements and of deaths with cardiovascular-renal diseases. The expected number of cases was obtained by applying, at the various ages, the normal rates shown in table 2 to the corresponding age distribution of person-years, such as given in table 1. In each of the three categories of occurrences, the total observed number of cases exceeded that expected; and with only one exception, this relationship held for every combination of systolic and diastolic pressure.

In table 4 are shown the ratios for the observed to the expected number of cases of later sustained hypertension, as well as for retirements and deaths, by various levels of systolic and diastolic blood pressure. These ratios were calculated from the figures given in table 3.

The ratios for deaths with cardiovascular-renal diseases are, with one exception, all greater than unity. But they are not all significantly greater, nor do they show differences between the various levels of pressure, either for the systolic or for the diastolic. It is thus not clearly demonstrated that every transient elevation of blood pressure above the normal is important from the point of view of death with a circulatory disorder.

COMMENT

Very few attempts have been made to appraise the relative importance of various degrees of transient hypertension. In fact, only two pertinent references have been found. On the basis of the experience of the Prudential Insurance Company of America, MacKenzie and Shepherd[4] in 1937 stated that a systolic pressure of 150 mm. or more in the past required a rating, even though later pressures were normal; and a record of a previous systolic of 165 or over, with moderate elevation on subsequent examination, required a substantial rating or rejection. No similar information on diastolic pressures was available.

In 1940 Hines[5] reported the results of a study of 1,522 patients at the Mayo Clinic, of whom some were checked ten and some twenty years later. Only 243 (4.4 per cent) had blood pressure readings on the first examination of more than 145 mm. systolic and 90 diastolic. This initial elevation was assumed to be due to nervousness, since there was no evidence of vascular or renal disease. The following conclusions were drawn: Transient elevations of blood pressure above

TABLE 1.—*Person-Years Observed Before Occurrence of Sustained Hypertension, by Age, for Various Degrees of Transient Hypertension*

	Degree of Transient Hypertension, Mm. Hg							
	150 or Less	150 or Less	151-165	151-165	151-165	166-225	166-225	166-225
Age, Years	91-100	101-150	90 or Less	91-100	101-150	90 or Less	91-100	101-150
25-29	1,061	147	331	201	117	70	90	105
30-34	2,613	312	284	428	268	53	144	294
35-39	4,351	550	273	740	475	48	244	574
40-44	5,613	774	326	1,037	693	85	398	864
45-49	5,576	827	356	1,212	763	108	509	1,012
50-54	3,964	637	275	1,197	659	81	502	877
55-59	2,315	344	252	913	433	66	418	521
Total	25,493	3,591	2,097	5,728	3,428	511	2,305	4,237

With respect to the later development of sustained hypertension, it appears that all levels of transient hypertension, whether involving the systolic or diastolic or both, are relevant. The ratios for all levels of the systolic are so nearly alike that no emphasis can be placed on any one of them. In general, the ratio does not change significantly with a change in the systolic level, provided the diastolic remains constant. On the other hand, as the diastolic level rises while the systolic remains constant, the ratio does increase significantly. On closer analysis, however, it is evident that the ratios for the "90 or less" and the "91 to 100" groups do not differ from each other, but that both of these differ from the "over 100" group. The high ratio for this last group stands out prominently.

The same trends are evident in the case of retirements with cardiovascular-renal diseases. Here again, with one possible exception, every transient elevation above the normal, for both systolic and diastolic pressures, has a statistically significant ratio. After detailed analysis of the ratios, the same conclusion is reached as in the case of later sustained hypertension, namely that it is a diastolic reading above 100 which is of the greatest importance. Because of the small number of cases involved, not much attention should be given to the ratio obtained for the group 166 to 225 systolic, 90 or less diastolic.

TABLE 2.—*Rates for Sustained Hypertension, Retirements and Deaths, by Age, Among Those Without Transient Hypertension*

	Rate per Thousand Person-Years Observed		
	Later Occurrence of Sustained Hypertension	Cardiovascular-Renal	
Age, Years		Retirements	Deaths
25-29	0.45	0.16	0.23
30-34	0.87	0.23	0.00
35-39	1.67	0.51	0.14
40-44	2.57	1.38	0.38
45-49	5.74	3.92	1.24
50-54	9.68	10.34	2.10
55-59	14.90	22.49	5.16

4. MacKenzie, L. F., and Shepherd, P.: The Significance of Past Hypertension in Applicants Later Presenting Normal Average Blood Pressures, Proc. A. Life Insur. M. Dir. America 24: 157, 1937.

5. Hines, E. A., Jr.: Range of Normal Blood Pressure and Subsequent Development of Hypertension: A Follow-Up Study of 1,522 Patients, J. A. M. A. 115: 271 (July 27) 1940.

140 mm. systolic or 85 diastolic are prognostic of probable subsequent hypertension (defined as above 160 systolic and 100 diastolic), the higher the original reading, the higher the incidence of subsequent hypertension; rise in the systolic pressure alone is not indicative of subsequent hypertension, 85 mm marks a critical level of the diastolic pressure as to the possible occurrence of subsequent hypertension.

TABLE 3—*Observed Number of Cases of Sustained Hypertension, and of Retirement and Death, by Various Degrees of Transient Hypertension, Compared with That Expected on the Basis of the Rates for the Group Without Transient Hypertension* *

Degree of Transient Hypertension, Mm Hg	Later Occurrence of Sustained Hypertension		Cardiovascular Renal			
			Retirements		Deaths	
	Observed	Expected	Observed	Expected	Observed	Expected
150 or less / 91 100	372	129	248	136	75	33
150 or less / 101 150	84	19	62	22	9	5
151 165 / 90 or less	32	10	19	12	10	3
151 165 / 91 100	122	37	62	43	26	10
151 165 / 101 150	111	20	67	24	8	6
166 225 / 90 or less	14	3	12	3	2	1
166 225 / 91 100	48	16	26	19	2	4
166-225 / 101 150	139	26	87	30	20	7
Total	922	260	583	289	152	69

* The expected number of cases was obtained by applying, at the various ages, the normal rates shown in table 2 to the observed age distribution of person years, such as that given in table 1

Our own study is characterized by being based on the records of a relatively large number of persons followed over long periods of time and by the fact that annual examinations were made In addition, in all of the calculations age and the period of follow-up were taken into account by using the method of person-years For these reasons, direct comparison of our results with those so far reported by others is not feasible

Certain features merit special mention. It is clear that all levels of transient hypertension, as here defined, are significant This obtains for both the systolic and the diastolic pressure, using as indexes the later development of sustained hypertension and retirement with cardiovascular-renal diseases Of particular interest is the observation that slight degrees of elevation are important, even when the systolic level alone is involved Outstanding, however, and of the greatest significance, is a transient rise in the diastolic pressure above 100 mm, especially as far as this may be an early sign of subsequent sustained hypertension

It has already been pointed out that, in the group with transient hypertension as a whole, the death rate with cardiovascular-renal diseases was significantly higher than in the group with normal pressures. Yet no real differences were apparent between the rates pertaining to the various degrees of elevation. This may be explained in part by the relatively small number of deaths involved. But it may be due also to the unpredictable course of hypertensive vascular disease, once this has been established. Prognostic criteria, except in the advanced stages, are uncertain and frequently deceptive. So too the degree of transient hypertension does not serve to foretell the severity and extent of the condition which eventually is a cause of death.

SUMMARY AND CONCLUSIONS

1. In an earlier paper, based on an analysis of the medical records of 22,741 officers of the United States Army, it was shown that in the group with transient hypertension there was a greater incidence of later sustained hypertension and there were higher rates for retirement and for death with cardiovascular-renal diseases Using the same material and indexes, the present study was designed to demonstrate possible differences in the prognostic importance of various systolic and diastolic levels of transient hypertension.

2. With respect to the later development of sustained hypertension and retirement with cardiovascular-renal diseases, all levels of transient hypertension, both systolic and diastolic, were significant Of particular interest was the observation that slight degrees of elevation were important, even when the systolic level alone was involved Of the greatest significance was a transient rise in diastolic pressure above 100 mm, especially as an early sign of subsequent sustained hypertension.

3. No significant differences were apparent between the various degrees of transient hypertension in relation to the death rates with cardiovascular-renal diseases So, as is true for many other prognostic criteria applied to these conditions, the height of a temporary rise in blood pressure does not appear to foretell the severity or extent of the lesions which eventually are a cause of death.

4. The data given lend support to the view that transient elevations of blood pressure, above the upper range of normal, often represent an early stage of hypertensive vascular disease.

TABLE 4—*Ratio of Observed to Expected Number of Cases of Later Sustained Hypertension, and of Retirement and Death with Cardiovascular-Renal Diseases, by Various Levels of Systolic and Diastolic Blood Pressure* *

Later Development of Sustained Hypertension

B P Level, Mm Hg		Diastolic: 90 or Less	91 100	101 150
Systolic	150 or less	(1 0)	2 9	4 4
	151 165	3 2	3 3	5 0
	166-225	4 7	3 0	5 3
Average ratio †		3 5	2 0	5 1

Retirements with Cardiovascular Renal Diseases

B P Level, Mm Hg		Diastolic: 90 or Less	91 100	101 150
Systolic	150 or less	(1 0)	1 8	2 8
	151 165	1 6	1 4	2 8
	166 225	4 0	1 4	2 9
Average ratio †		2 1	1 7	2 8

Deaths with Cardiovascular Renal Diseases

B P Level, Mm Hg		Diastolic: 90 or Less	91 100	101 150
Systolic	150 or less	(1 0)	2 3	1 8
	151 165	3 2	2 6	1 3
	166-225	2 0	0 5	2 9
Average ratio †		3 0	2 2	2 1

* These ratios were derived from the figures given in table 3
† These averages are based on the totals of the observed and expected cases involved

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THE USE OF HUMAN IMMUNE SERUM GLOBULIN (GAMMA GLOBULIN)

IN INFECTIOUS (EPIDEMIC) HEPATITIS IN THE MEDITERRANEAN THEATER OF OPERATIONS

I. STUDIES ON PROPHYLAXIS IN TWO EPIDEMICS OF INFECTIOUS HEPATITIS

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Prior to the report of Stokes and Neefe [1] indicating the value of gamma globulin from pooled human plasma in the prevention and attenuation of infectious (epidemic) hepatitis, no method of control of outbreaks of this disease had been available. The extensive literature on infectious (epidemic) hepatitis that has accumulated in the past several years bears witness to the widespread occurrence of this disease both in the armed services and among civilian populations. The lengthy period of convalescence following infectious hepatitis has made it of prime importance to the armed services of all the United Nations.

On the basis of the report of Stokes and Neefe and on the recommendation of the Surgeon General, U. S. Army, and at the invitation of the Chief Surgeon and the Commanding General, Mediterranean Theater of Operations, U. S. Army, to two of the authors of this present report, field studies on the effectiveness of gamma globulin [2] in the prevention of infectious hepatitis were conducted during the fall of 1944 and the winter of 1944-1945 in the Mediterranean Theater of Operations, U. S. Army. A heavy bombardment group with a relatively high incidence of infectious hepatitis was chosen at the suggestion of Col. Marion H. Barker, M. C., and Lieut. Col. Ross Gauld, M. C., and with the concurrence of Col. William S. Stone, M. C., and Col. Otis Benson, M. C., for the initial testing of the gamma globulin.

This bombardment group consisted of four squadrons and headquarters personnel. The four squadrons were of approximately equal size (each about 500 men) and were quartered around the same air field. Despite the fact that the study was begun late in the course of the outbreak of the disease, the group appeared highly suitable for investigation since its location was fixed and its rate of replacement was low. The number of cases of hepatitis with jaundice in the various squadrons of this group up to the time of injection of globulin is summarized in table 1.[3]

Squadrons A and C were chosen for globulin administration, while Squadrons B and D served as controls. Because of its large number of key personnel, the headquarters group also received globulin. As a result of the inclusion of the headquarters group, the number injected exceeded the number of controls by over 100 men.

TABLE 1.—*Cases of Hepatitis with Jaundice Previous to Globulin Injections*

	Head quarters	Squadron A	B	C	D
Aug. 15 to Sept. 30	2	23	32	6	14
Oct. 1 to Oct. 31	1	13	19	9	9
Nov. 1 to Nov. 27	1	20	30	4	12
Total	4	56	81	19	35

Over a two day period, beginning on Nov. 27, 1944, a total of 10 cc. of globulin was given intramuscularly in the buttocks to each man in the injected squadrons. A few men, however, failed to receive the injections. The 10 cc. dosage was chosen as the largest that could be administered without adversely affecting full duty status of the men. No reactions followed administration of the globulin except for an occasional mild burning sensation at the site of injection.

Cases of hepatitis without jaundice were not included in the evaluation of the effectiveness of globulin. This form of hepatitis may be confused with various other diseases, and it was felt that by limiting the study to hepatitis with jaundice the conditions of the experiment were made more exacting.

In table 2 are recorded the cases of hepatitis with jaundice which occurred in the period from December 3 to January 26, following the date of injection. Cases which occurred between November 27 and December 1944 are not included, because of previous experience which had indicated that globulin when administered very late in the incubation period failed to prevent completely the development of the disease.

Thus in the injected squadrons 3 cases of hepatitis with jaundice occurred following the administration of globulin. In 2 of the 3 cases globulin had not been administered. The third case, with evidence of scleral icterus only, occurred nine days following the injection of globulin. In the same period 25 cases of hepatitis with jaundice occurred in the control squadrons.

TABLE 2.—*Cases of Hepatitis with Jaundice Occurring from Dec. 3, 1944 to Jan. 26, 1945 in Injected Men and Controls*

Date	Control Squadrons B	D	Injected Squadrons A	C	HQ
Dec. 3 to 8	3	1	.	..	1
Dec. 9 to 15	2	1	..	..	.
Dec. 16 to 22	3	.		..	
Dec. 23 to 29	3		.	.	
Dec. 30 to Jan. 5	2	.		..	.
Jan. 6 to 12	4	1			
Jan. 13 to 19	2	1	1*	1*	..
Jan. 20 to 26	2			.	
Total	21	4	1*	1*	1

* Failed to receive globulin

This work was carried out under the direction of the Commission on Measles and Mumps of the Army Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, U. S. Army.

1. Stokes, J., Jr., and Neefe, J. R.: The Prevention and Attenuation of Infectious Hepatitis by Gamma Globulin, J. A. M. A. 127:144 (Jan. 20) 1945.

2. The gamma globulin used in these studies was obtained from pools of plasma, each pool representing 3,000 to 5,000 individuals, collected by the American Red Cross and fractionated, according to the method of Cohn and his co-workers, by various biologic manufacturers. These pools were obtained originally from groups of individuals in the Eastern and Southern regions of the United States.

3. The selection of squadrons for the injected and control groups was based on the reports of the total number of cases of hepatitis. When it was possible later to examine more complete data it was found that, while the total number of cases of hepatitis had been approximately equal in the injected and control groups previous to the time of injection, the cases of hepatitis with jaundice as indicated had not been equal. The experiment was thus weighted slightly in favor of the injected group, but not sufficiently so to account for the difference obtained.

With the extension of the disease in the Mediterranean Theater of Operations the opportunity arose to conduct a similar study in the ground forces.[4] Regiments were selected in which the disease had already started, and three groups of men from various companies of these regiments were chosen for the study. In group 1 406 men, 40 per cent of the strength of the companies forming the group, received globulin, the remaining men, 683, served as controls. In group 2 831 men, 10 per cent of the strength of the companies selected, were injected; 8,270 men remained for controls. In group 3 495 men, 25 per cent of the strength, were injected, the remaining 1,373 serving as controls Each man injected received 10 cc. of gamma globulin intramuscularly. Group 1 was then studied for twelve weeks, group 2 for seven weeks and group 3 for five weeks following the date of injection.

In table 3 are recorded the cases of hepatitis with jaundice which occurred in the three groups during the follow-up period.

The significant results obtained in the foregoing studies suggest that gamma globulin is a potent agent in the prevention of infectious hepatitis. It is impossible to draw conclusions from these studies as to the duration of immunity conferred by globulin, but the results suggest that it may be a period of at least six to eight weeks.

TABLE 3.—*Cases of Hepatitis with Jaundice Following Date of Injection with Globulin*

Group	Total Injected	Jaundice Cases	Incidence, per Cent	Total Controls	Jaundice Cases	Incidence, per Cent
1	406	4	1	683	25	3.7
2	831	3	0.4	8,270	283	3.4
3	495	2	0.4	1,373	27	2.0

COMMENT

The present studies, together with those reported previously,[1] indicate that human immune serum globulin (gamma globulin) has been effective in preventing infectious (epidemic) hepatitis with jaundice in three separate epidemics of the disease. Although the signs and symptoms of the disease in all three epidemics were similar and although two of the epidemics appeared in the Mediterranean Theater of Operations at approximately the same time, it is still possible, although not probable, that the etiologic agent in each epidemic was different. Irrespective of possible etiologic differences, it is clear that the gamma globulin was equally effective in all outbreaks of infectious hepatitis. Whether or not such globulin from large pools of blood from three to five thousand individuals is effective in prophylaxis against serum hepatitis, such as that caused by the yellow fever vaccine during the present war, is not clear and must await further experimental study.

SUMMARY

An outbreak of infectious (epidemic) hepatitis in a bombardment group based in the Mediterranean Theater of Operations and in various regiments of the ground forces in the same theater offered an opportunity to study the effectiveness of human immune serum globulin (gamma globulin) in the prevention of this disease.

The results of these two field studies support the findings of Stokes and Neefe that the gamma globulin is a potent agent in the prevention of such hepatitis and suggest that the globulin confers a period of passive immunity of at least six to eight weeks.

4 Col. Charles O Bruce, M C., and Lieut Col Ross Gauld, M. C., assisted in this investigation.

AN EPIDEMIC OF INFECTIOUS HEPATITIS APPARENTLY DUE TO A WATER BORNE AGENT

EPIDEMIOLOGIC OBSERVATIONS AND TRANSMISSION EXPERIMENTS IN HUMAN VOLUNTEERS

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The control of infectious (epidemic) hepatitis, the only pandemic disease of the present war, has been seriously handicapped by the lack of any conclusive evidence concerning its method or methods of transmission. In our recent report on the prevention and attenuation of infectious hepatitis by gamma globulin [1] there was brief mention of the epidemic in which the globulin was tested. The epidemiologic factors involved in that epidemic also were investigated, and subsequently transmission experiments in human volunteers, using materials obtained from the patients and the camp, were conducted in order to supplement and confirm the epidemiologic observations. The results of these investigations have provided information concerning the sources of the causative agent and at least one of the methods responsible for its transmission.

I. THE EPIDEMIC

The Camp.—The epidemic occurred in a summer camp for boys and girls located in an isolated area in the Pocono Mountains near Philadelphia. The boys' and girls' sections of the camp were not separated by any physical boundary but were relatively independent units because each section had its own office, kitchen, dining room, infirmary, staff and activities. However, considerable intermingling between some of the members of the two groups resulted from mixed social and athletic activities. The members of the camp group were all of homogeneous racial origin (Jewish) and came from many cities and towns in a number of different states. With few exceptions all

Read in abbreviated form at the annual meeting of the American Epidemiological Society in Washington, D. C., April 7, 1945.

From the Department of Pediatrics, University of Pennsylvania School of Medicine and the Hospital of the University of Pennsylvania.

This investigation was conducted under the Commission on Measles and Mumps, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, U. S Army, Washington, D. C.

This investigation was made possible through the continued assistance and cooperation of the owners of the camp. Dr. I. E. Brownstein, Dr. Simon Forman and Dr. S. S. Mintz supplied information concerning the early phases of the epidemic and assistance in the collection of specimens Members of the camp group and the many family physicians provided case data, obtained and delivered specimens and reported new cases among the camp group or their contacts. Other persons assisting in this part of the investigation included Miss Marion Thatcher, Miss Ruth Kennedy, Dr. James Woods, Dr Robert Mayock and many members of Civilian Public Service Unit No 140, Philadelphia.

The use of human volunteers for the transmission experiments was made possible by the cooperation of the administrative staffs of Selective Service (Camp Operations Division), the National Service Board for Religious Objectors, the American Friends Service Committee, the Philadelphia State Hospital and the New Jersey State Hospital Members of Civilian Public Service Unit No 140, Philadelphia, volunteered as subjects for these experiments. Many other members of C. P. S Unit No 140 assisted in analysis of the data, prepared the illustrations and assisted in many other ways in the conduct of parts of this investigation John G Reinhold, Ph D, principal biochemist, Philadelphia General Hospital, gave advice, supervised the biochemical studies and prepared some of the materials used in the experiments Mr Charles Ming, Capt Sydney S. Gellis, M. C, A. U S, and Dr. Francis D. W Lukens also assisted in the conduct of some phases of the investigation. Cooperation and assistance were given by the members of our laboratory staffs (Miss Dorothy Feinberg, Miss Arvilla Howley, Mrs Jean Flick, Mrs Mary Ming and Miss Catherine Fowler), Miss Dorothy Lanning and Miss Anne Messer of the biochemical laboratory of the Philadelphia General Hospital and members of the laboratory staff of the New Jersey State Hospital The bacteriologic divisions of the laboratory of the New Jersey State Hospital and of the William Pepper Laboratories of Clinical Medicine of the Hospital of the University of Pennsylvania made the bacteriologic studies

1. Stokes, J., Jr., and Neefe, J R The Prevention and Attenuation of Infectious Hepatitis by Gamma Globulin, J. A. M. A. **127**: 144 (Jan. 20) 1945.

arrived at the camp on or about the opening date of June 30, 1944. After that time there was relatively little change in the camp population until the onset of the epidemic, although many friends and relatives visited. Prior to the epidemic, campers and counselors in the boys' and girls' sections numbered approximately 275 and 220 respectively. The campers ranged from 3 to 17 and the counselors from 17 to 30 years of age. Approximately 78 other persons, most of them under 40 years of age, completed the camp group.

Collection of Data.—For the sake of convenience in description of time relationships, the weeks following the opening date of camp have been numbered in sequence. We were notified [2] of the existence of this epidemic during the 7th week of the season, approximately two weeks after the start of the epidemic. Case data at that time were obtained from the records of the camp physicians and directors. Subsequent case data were obtained from the same source and by questionnaires which were sent to all members of the camp group. As many of them developed the disease after returning the first questionnaire and after they had returned home, a second set of questionnaires was sent to the entire group at a later date. The response to both sets of questionnaires was excellent. Since many of the group were from Philadelphia, additional data were obtained by telephone, from personal visits and from family physicians. When necessary, information was obtained by telephone concerning persons in other cities and towns

Course of the Epidemic.—Three days after the opening of the camp (1st week) a woman (patient 1) aged 21, working in the office of the girls' section and living in cabin A, became ill with infectious hepatitis. During the 3d week an outbreak of "gastrointestinal upsets" occurred in the girls' section. As these were transient and usually did not require admission to the infirmary, complete records were not available. However, the section physician estimated that 25 to 30 per cent of the girls were involved, and the outbreak was of sufficient magnitude to lead him to institute special dietary measures for the entire female group. The outstanding symptom was nausea, headache was common, and vomiting and fever were present in some cases. Diarrhea was infrequent. Recovery occurred in twenty-four to forty-eight hours. A similar outbreak occurred during the 4th and 5th weeks in the boys' section.

During the 4th week and three and one-half weeks after the onset of hepatitis in the office worker, a female counselor (patient 2) developed the disease. This person also resided in cabin A and was closely exposed to case 1 during the 1st week. In the 5th week 2 more persons in the female group developed hepatitis. These persons lived in different cabins and had no unusual exposure to the first 2 cases. The epidemic nature of the disease became apparent during the 6th week, when 40 persons in the female group and 13 in the male group became ill with hepatitis. In both groups, campers and counselors living in different cabins were involved and the cases in the male group had had no recognized exposure to the early cases in the female group. In the following week the incidence in the male group rose sharply and that in the female group decreased. Additional cases continued to appear in the female and male groups until the end of the 12th and 13th weeks respectively, at which time the epidemic abruptly terminated.

TABLE 1.—*Total Incidence of Hepatitis at the Camp*

Group	Number	Hepatitis: With Overt Jaundice No.	%	Without Overt Jaundice No.	%	Total No.	%
Female group	292	139	53	43	16	182	69
Male group	280	116	38	52	17	168	55
Both groups	572	255	44	95	17	350	61

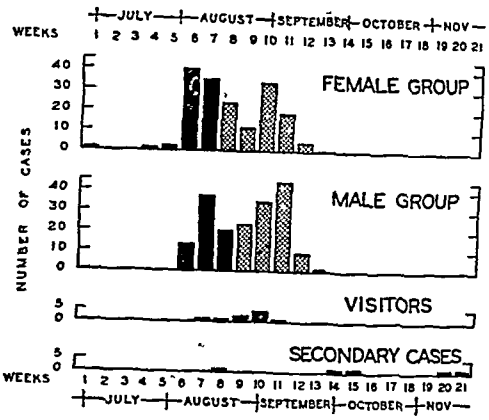


Chart 1.—Weekly incidence of hepatitis. The female and male groups include only those persons who resided in the female and male sections of the camp respectively. The group designated as visitors includes the persons who developed hepatitis after visiting the camp for only short periods. The group designated as secondary cases includes only those persons who had not visited the camp but developed hepatitis after exposure to infected persons from the camp. In respect to the female and male groups, solid bars have been used to indicate the number of persons developing the disease while at the camp, the cross hatched bars indicating the number developing their initial symptoms after leaving the camp. Although indicated by solid bars, in all of the visitors and secondary cases the disease developed away from the camp.

In table 1 the total incidence of hepatitis for the female and male groups is shown in terms of the number of cases and the percentage of the total group involved. The cases of hepatitis have been divided on the same basis according to the presence or absence of overt jaundice. The data show that the female group had the highest incidence of hepatitis even though the number of persons in this group was smaller than that in the male group. In respect to the combined groups, 350 (61 per cent) of the 572 persons contracted hepatitis during the thirteen weeks of the epidemic. Of the 350 cases, 344 occurred between the 6th and 12th weeks. None of these patients died. Forty-four per cent (255) of the total group of 572 persons developed overt jaundice, and 17 per cent (95) had hepatitis without overt jaundice. Thus 27 per cent of the hepatitis cases did not develop overt jaundice, giving a ratio of 2.7 to 1 of jaundiced to nonjaundiced cases.

As shown in chart 1, the weekly incidence curves of both the male and female groups showed two peaks. The highest weekly incidence in the female group is shown by the primary peak in the 6th week. The lower secondary peak occurred in the 10th week. The primary peak in the male group was in the 7th week. However, the highest weekly incidence in this group is reflected by the high secondary peak in the 11th week. Thus the majority of cases in the female group occurred during the early weeks of the epidemic period, whereas the majority in the male group occurred during the later weeks.

At least 9 persons who visited the camp for periods of two hours to several days at some time during the first six weeks developed hepatitis after three to six weeks. The total number of visitors to the camp is not known.

2. Dr. Charles L. Brown, professor of medicine and head of the Department of Medicine, Temple University School of Medicine, first was called in consultation by the camp directors for advice in connection with this epidemic. Dr. Brown, knowing of the interest of the Commission on Measles and Mumps in this disease, notified the director of the commission (J. S. Jr.) of the existence of the epidemic and of the desire of the camp directors for its investigation.

Since all of the girl campers and most of their counselors had returned to their homes by the end of the 7th week, and the entire camp group by the end of the 9th week, chart 1 shows that approximately 175 persons developed the disease at home after leaving camp. In addition, approximately 175 others in various stages of the disease had returned home with hepatitis. Follow-up inquiries were made at frequent intervals for four months after the camp had closed, and all of the members of the camp group were informed of the importance of reporting secondary cases among their contacts. Of the many relatives and friends, including many children, who had not visited the camp but subsequently were in close and prolonged contact in the various homes with approximately 350 infected persons from the camp, only 5 are known to have contracted hepatitis. Four of the 5 persons were relatives who lived in houses with persons infected at the camp. The 5th was a hospital nurse who was responsible for the care of one of the boy campers during the preicteric period of his disease. Considering the large number of persons exposed, the occurrence of only 5 secondary cases suggests that the agent was not easily acquired from infected persons away from the camp.

Diagnosis.—The differential diagnosis will be discussed in more detail in a subsequent report on other observations made in relation to this epidemic.[3] Briefly, the diagnosis of the disease as infectious hepatitis was based on the following points: (1) typical clinical picture and laboratory findings of infectious hepatitis; (2) absence of previous injections of homologous blood products and no opportunities for syringe or needle transmission of agent of serum hepatitis; (3) exclusion of Weil's disease by laboratory studies, which included dark field and electron microscopic examinations of serum, guinea pig inoculations, agglutination and complement fixation tests, leukocyte counts and microscopic urine examination; (4) absence of history of ingestion of hepatotoxic drugs or exposure to chemicals; (5) demonstration that the causative agent passed through a Seitz filter.

The diagnosis of infectious hepatitis without jaundice was made in patients presenting the same symptoms and signs as those who subsequently developed overt jaundice. Liver function studies on representative cases of the nonicteric group revealed bilirubinuria, increased urobilinogenuria, positive cephalin cholesterol flocculation tests and abnormal retention of sulfobromophthalein.

II. TRANSMISSION EXPERIMENTS IN HUMAN VOLUNTEERS

The transmission experiments will be considered first because the results assist in the subsequent discussions ("Epidemiologic Observations") of the possible sources of the causative agent and its method or methods of transmission at the camp. Because all attempts to cultivate the hepatitis agent in chick embryos and tissue cultures have been unsuccessful and no animal has been found to be susceptible, the only method of determining the presence of the agent in a given material is by demonstrating the ability of that material to produce the disease in human volunteers. It has been necessary, therefore, to use human beings for the transmission experiments.

A. METHODS AND MATERIALS

Volunteers.—The men who volunteered as subjects for these experiments were all under 35 years of age and had no previous history of jaundice and no evidence of liver dysfunction detectable by history, physical examination and liver function tests.

3. Neefe, J. R., and Stokes, J. Jr.: Infectious Hepatitis: Miscellaneous Observations on an Epidemic, to be published.

Studies on Volunteers.—Each subject was studied frequently by means of the group of liver function tests described in a previous report.[4] These included quantitative determinations of the serum concentrations of total bilirubin, total protein, albumin, globulin and total and esterified cholesterol; the serum cephalin cholesterol flocculation test; the thirty minute sulfobromophthalein test (5 mg. per kilogram dose), and urine tests for bilirubin (Harrison and diazo spot tests), urobilinogen (Wallace and Diamond) and urobilin (Schlesinger). These studies were made on each volunteer at frequent intervals during a one to three month preinoculation[5] period in order to determine the physiologic variation in the response of each one to these procedures over a period of time. After inoculation, most of these tests were carried out two to more times weekly up to six months. The same studies were conducted over the same interval of time on a group of 10 control subjects. In a few cases electrophoretic studies of the serum proteins were made on serum specimens collected before and after the onset of hepatitis. During the postinoculation period, groups inoculated with different materials were isolated from one another and the usual measures to prevent cross infection were instituted.

Materials.—Serum, nasopharyngeal washings, urine and feces were collected from many persons of the camp group in various stages of hepatitis. Serum and feces were also collected from volunteers who developed hepatitis following their inoculation with certain of the aforementioned materials. All specimens were examined bacteriologically, and any that contained bacteria other than the usual flora were discarded. These materials were all frozen within one to six hours after collection and were stored at minus 5 to minus 20 C. until used. In addition to the foregoing materials, water was obtained from one of the camp wells and flies were obtained from a fly trap in the boys' section of the camp. After thawing, certain specimens were pooled prior to their administration to human volunteers. The relationship of the specimens used in each pool to the times of onset of hepatitis in the donors is given in table 2, and the methods of collection of specimens and of preparation of the pools are discussed in connection with the results of their administration to volunteers (table 3).

TABLE 2.—*Time of Collection of Specimens Used in Pools in Relation to Time of Onset of Hepatitis in Donors*

Material	Weeks Before Onset: Number of Specimens 5	4	3	2	1	Weeks After Onset: Number of Specimens 1	2	3	4	5	6	7	Total Number of Specimens	Number of Patients Represented
Serum														
Pool 1 SIH						6	2						8	8
Pool 2 SIH				2	4	14	13	5	1				39	4
Nasopharyngeal washings														
Pool 1 NPIH						4	2						6	6
Pool 2 NPIH			1	1	1	10	5	1	1				20	20
Urine—Pool 1 UIH	1				1	11	11	3	2	4	3	2	38	38
Feces														
Pool 1 FIH						1	3						4	4
Pool 2 FIH						+	+	+	+				See text	2
Pool 4 FIH						5	9						14	3

B. RESULTS

The results of administration to volunteers of serum, nasopharyngeal washings, urine, feces, water and a preparation made from the flies were as follows (tables 2 and 3):

Serum.—Two serum pools[6] were prepared and administered to volunteers with the following results:

Pool 1 SIH: Single specimens were collected from 8 of the "camp hepatitis patients" during the first or second week after

4. Neefe, J. R.; Stokes, J., Jr.; Reinhold, J. G., and Lukens, F. D. W.: Hepatitis Due to Injection of Homologous Blood Products in Human Volunteers, J. Clin. Investigation **23**: 836 *(Sept.)* 1944.

5. The term "inoculation" is used herein to indicate the administration of potentially infectious materials regardless of the route.

6. Pools have been designated with code letters to simplify identification. Thus the code SIH indicates serum, infectious hepatitis; NPIH, nasopharyngeal washings, infectious hepatitis; FIH, feces, infectious hepatitis; UIH, urine, infectious hepatitis.

the onset of the disease Three volunteers (group A) were injected parenterally with 1 1 cc of this pool These subjects have been observed for eleven months and no definite evidences of hepatitis have been detected

Pool 2 SIH This consisted of 39 specimens obtained from 4 volunteers before and after the onset of hepatitis produced experimentally by the oral administration of feces pool 1 FIH Three volunteers (group B) received 3 cc of this pool orally, and after twenty-six and thirty-three days respectively 2 developed infectious hepatitis with jaundice, indicating that the causative agent was present in this serum However, 3 other subjects (group C) who were injected parenterally with 2 1 cc of the same serum have shown no signs of hepatitis during the 132 days that have elapsed to date

Nasopharyngeal Washings[7]—Specimens were collected from many of the 'camp hepatitis patients" by having them gargle with sterile saline solution or beef broth Selected specimens were pooled and, without further treatment, two different pools were administered to two different groups of volunteers with the following results

Pool 1 NPIH Single specimens were collected from 6 patients during the first or second week after the initial symptoms of hepatitis Approximately 4 cc of this pool was sprayed and dropped into the nasopharynx of 3 volunteers (group D) on each of three successive days, a total volume of approximately 12 cc being administered No evidences of hepatitis have been detected during a period of eleven months

Pool 2 NPIH This consisted of single specimens collected from 20 patients during the preclinical,[8] preicteric, early, middle and late icteric stages of hepatitis Six cc was sprayed and dropped into the nasopharynx and 30 cc was administered orally to each of 5 volunteers (group E) None have shown any evidence of hepatitis during a period of seven months

Urine—One large urine pool was prepared and administered to volunteers as follows

Pool 1 UIH Single specimens collected from 38 of the "camp hepatitis patients" in the preclinical, preicteric and early, mid and late icteric stages of the disease were pooled and, without further treatment. 25 cc was administered orally to each of 7 volunteers (group F) No evidences of hepatitis have been detected in any of these men during a period of eight months

Fly Extract—In the 6th week of the camp season, during the first peak of the epidemic, a pint bottle was filled with living flies obtained from a fly trap located adjacent to the kitchen in the boys' section The flies were killed within three hours by freezing Later, after thawing, they were placed in buffered saline solution and subjected to the action of a Waring blendor The resulting preparation was then filtered twice through a Berkefeld filter, and the filtrate produced no illness in mice, rats, guinea pigs or monkeys on intraperitoneal and intracerebral injection[9]

Fifteen cc of the filtrate (fly extract) was administered orally to each of 5 volunteers (group G) No evidence of hepatitis was detected in any of these men during a period of eight months

Feces—The following preparations were administered to volunteers

Pool 1 FIH Portions of 4 specimens collected from 4 of the "camp hepatitis patients" during the 1st or 2d week after the onset of the disease were pooled and approximately a 10 per cent suspension in distilled water was prepared by mixing the feces with distilled water in a Waring blendor After being subjected to the action of the blendor for five to ten minutes, the suspension was strained through several layers of gauze and, after storage for several weeks at minus 5 to minus 20 C, was thawed and administered, without further treatment, to the volunteers

Of 16 men (groups H, I and J) receiving 1 6 to 5 cc of this pool orally, 11 developed infectious hepatitis after incubation periods of 18 19, 19, 19, 21, 22, 22, 23, 24, 24 and 26 days Ten of the 11 cases showed overt jaundice and, in these, the incubation periods did not exceed 24 days The other, who had the longest incubation period in this group, had mild but definite hepatitis without jaundice The mean incubation period for these 11 cases was 21 5 days

The men of group K each ingested a volume of water which originally had contained approximately 1 5 cc of feces pool 1 FIH Before it was administered, this contaminated water was treated with coagulants and an adsorbent (sodium carbonate, aluminum sulfate and activated carbon) in an attempt to decrease the concentration of the hepatitis agent The treatment procedure, described in detail elsewhere,[10] removed 85 per cent of the total organic solids in the specimen and made the water, formerly opalescent and pale brown, crystal clear It seems certain, therefore, that the men of group K received considerably less than 1 5 cc of feces pool 1 FIH Two of the 5 men so inoculated developed mild infectious hepatitis 1 with only scleral jaundice and the other without overt jaundice, after incubation periods of 33 and 37 days respectively

TABLE 3—*Results of Administration of Materials Obtained from Patients and from the Camp to Human Volunteers*

Material *	Amount, Cc	Route	Subjects: Number	Subjects: Group	Results: No Illness	Results: Hepatitis: With Overt Jaundice	Results: Hepatitis: Without Overt Jaundice	Incubation Period, Days
Serum								
Pool 1 SIH	1 1	Parenteral	3	A	3	0	0	
Pool 2 SIH	3 0	Oral	3	B	1	2	0	26, 33
	2 1	Parenteral	3	C	3 †			
Nasopharyngeal washings								
Pool 1 NPIH	12 0	Nasopharynx	3	D	3	0	0	
Pool 2 NPIH	6 0	Nasopharynx						
	30 0	Oral	5	E	5	0	0	
Urine—Pool 1 UIH	25 0	Oral	7	F	7	0	0	
Fly extract	15 0	Oral	5	G	5	0	0	
Feces								
Pool 1 FIH	5 0	Oral	2	H	0	2	0	21, 23
	2 0	Oral	9	I	4	4	1	18, 22, 24, 24, 26
	1 6	Oral	5	J	1	4	0	19, 19, 19, 22
	<1 5*	Oral	5	K	3	1	1	33, 37
Seitz filtrate pool 1 FIH	2 0	Oral	3	L	0	3	0	28, 30, 32
	1 0	Parenteral	3	M	3 †	0	0	
Pool 2 FIH	5 0	Oral	7	N	6	1	0	28
Water								
Water specimen GW	7000	Oral	5	P	1	0	4	61, 63 66, 71
Feces pool 4 FIH ‡	10 0	Oral	5	R	4	0	1	24

* See text † Results at time of writing (132 days), subject to change ‡ Prepared from specimens obtained from group P

7 The term nasopharyngeal washings has been used herein to indicate washings of the nasopharynx and of the oropharynx

8 The term preclinical' is used to indicate the period between infection and the first evidence, clinical or laboratory, of the disease

9 The mice rat and guinea pig tests of the fly extract and the Seitz filtrate of feces were made by Dr Werner Henle assistant professor of bacteriology in pediatrics University of Pennsylvania School of Medicine The tests of the same materials in monkeys were made by John F Enders Ph D, associate professor of bacteriology and immunology, Harvard Medical School

10 Neefe J R, Stokes J, Baty J B and Reinhell J G Disinfection of Water Containing the Causative Agent of Infectious (Epidemic) Hepatitis, this issue, p 1076

Seitz Filtrate of Pool 1 FIH: In order to determine whether the agent was filtrable, a portion of pool 1 FIH was passed through a Seitz filter. The filtrate was sterile on bacteriologic examination and produced no illness in mice, guinea pigs and monkeys. All of the 3 men (group L) receiving 2 cc. of this filtrate orally developed moderately severe to severe infectious hepatitis with jaundice after incubation periods of 28, 30 and 32 days. None of the 3 volunteers (group M) who received 1 cc. of the filtrate parenterally have developed infectious hepatitis to date (132 days).

Pool 2 FIH: This was prepared in the same manner as pool 1 FIH from portions of all specimens obtained from the men of group H during the first four weeks after the onset of hepatitis which followed their experimental inoculation with pool 1 FIH. One of the 7 volunteers (group N) who received orally 5 cc. of this pool developed hepatitis with jaundice after twenty-eight days.

Water.—On September 6, approximately two weeks after the camp had closed, specimens of water from both of the camp wells (see "Epidemiologic Observations") were collected in sterile containers, by the camp directors, for bacteriologic examination. The examination of the specimen obtained from the well in the girls' section revealed the presence of Escherichia coli, indicating fecal contamination. The specimen from the well in the boys' section was reported satisfactory for human consumption.

Collection and Storage of Water.—On October 6, 15 gallons of water was collected from the "girls' well" as follows: As water had not been pumped from this well after September 6, the water was allowed to run at full force (electric pump) for forty-five minutes from a faucet at the surface of the well. Each of three clean 5 gallon bottles then was rinsed thoroughly four times with water from the faucet, after which each bottle was filled with water, stoppered and transported to the laboratory. Circumstances did not permit a bacteriologic examination of these specimens until October 17, eleven days after collection. At that time Escherichia coli was isolated from each of the three bottles but no pathogenic intestinal bacteria were found. Owing to a lack of low temperature storage space, the water specimens were stored at room temperature in plain glass bottles, unprotected from light, in a laboratory from October 6 until November 5. On that date, thirty days after collection, approximately 12 liters of water from each of the three bottles was pooled (water specimen GW) and portions were ingested by volunteers (group P).

Criteria for Hepatic Dysfunction.—The significance of the changes that occurred in the responses of each of these men (group P) to the various liver function tests after inoculation has been evaluated by comparing them with their own preinoculation responses and also by comparing them with the results obtained in the control subjects. Such comparisons are permissible because the conditions of the experiment were uniform in respect to the inoculated and uninoculated groups and did not change throughout the period of observation. The occurrence of a single deviation from the normal in the results of one liver function test has not been regarded as significant evidence of hepatic dysfunction, because such sporadic deviations previously have been observed in supposedly normal persons or in patients with various conditions.[4] Deviations in the results of one test from the previously established normal response of that person have been regarded as evidence of hepatic dysfunction when persistent and associated with suggestive clinical manifestations or when associated with abnormal responses to one or more other tests of liver function. In order to determine the statistical significance of the changes observed in the men of group P during the postinoculation period, the normal responses of each person to the various tests, based on the studies made during the three month preinoculation period, have been calculated in terms of means and standard deviations. Values departing from the mean by more than twice the standard deviation were accepted as statistically significant deviations.

Experimental Conditions and Studies on Control Subjects.—The only variable between group P and a group of 10 control subjects confined under the same conditions in the same building throughout the period of the experiment was the ingestion of water specimen GW. The same series of liver function tests was conducted with the same frequency over the same period of time on the two groups. On the basis of these criteria, no significant indications of hepatic dysfunction were detected in the control subjects during the period of observation.

Results in Group P: On November 5, thirty days after collection, 7,000 cc. of water specimen GW was ingested by each of 5 volunteers (group P) over a period of thirty-six hours. Between the 61st and 71st days after the ingestion of this water, 4 of the 5 men developed mild illnesses characterized by nonspecific symptoms and signs associated with laboratory evidence of hepatic dysfunction. Since none of these men developed overt jaundice and because of the critical nature of this experiment, the data pertaining to the liver function tests on these men and the results of certain other related studies and experiments are presented:

(1) *Liver Function Studies.*—For convenience in description, the days after the ingestion of water specimen GW have been numbered in sequence.

W. H.: The liver function tests which showed deviations from the normal after the ingestion of water specimen GW are shown in chart 2. Sixty-five days after inoculation, the test for urine urobilinogen was positive in a urine dilution of 1 to 100 and the total serum bilirubin concentration had risen to

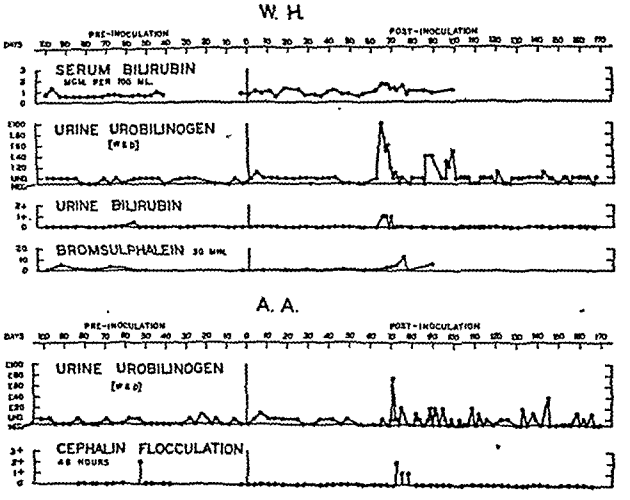


Chart 2.—Results of liver function tests in volunteers W. H. and A. A. before and after their inoculation with water specimen GW (water from well in girls' section of camp). Vertical line at 0 days indicates time of inoculation. Values for serum bilirubin indicate concentration of total serum bilirubin per hundred cubic centimeters. Urine urobilinogen readings represent highest dilution of urine with which positive reaction was obtained. Urines giving a positive reaction for urobilinogen with only the undiluted specimen are indicated at level UND on the ordinate. Urine bilirubin reactions are graded 0 to 4 plus. One plus urine bilirubin readings indicate that both the Harrison and the diazo spot tests were weakly but definitely positive. The results of sulfobromophthalein tests are expressed in percentage retention after 30 minutes. The cephalin cholesterol flocculation tests are read from 0 to 4+ depending on the degree of flocculation and clearing of the supernatant at 48 hours.

1.64 mg. per hundred cubic centimeters. The qualitative van den Bergh reaction was delayed direct and the tests for urine bilirubin were positive. The increased excretion of urine urobilinogen continued intermittently for thirty-four days, the maximum excretion being represented by a positive test with the 1:100 dilution. The total serum bilirubin concentration remained elevated for ten days, the values of the 67th, 68th and 75th days being 1.62, 1.54 and 1.44 mg. per hundred cubic centimeters respectively, all associated with delayed direct qualitative van den Bergh reactions. The tests for urine bilirubin continued to be positive until the 69th day. On the 75th day, sulfobromophthalein retention was 12 per cent at thirty minutes.

Based on the preinoculation studies, the normal response of W. H. to each of these procedures was as follows: (*a*) For 18 determinations of the total serum bilirubin concentration, the mean was 0.69 mg. per hundred cubic centimeters (S. D. ± 0.2; mean plus 2 S. D. — 1.09); (*b*) qualitative van den Bergh reaction (3 tests) negative; (*c*) the mean thirty minute sulfobromophthalein retention for 7 tests was 1.4 per cent (S. D. ± 1.9; mean plus 2 S. D. — 5.27); (*d*) urine urobilin-

(25 tests) was never positive in dilutions of 1 to 10 or greater; (*c*) urine bilirubin was absent with 23 of 24 tests; the 1 test showed an atypical color reaction and was read as suggestive (±). Compared with these, the "postinoculation" results were significantly abnormal. On the basis of the criteria cited previously, the occurrence of significantly abnormal results with 4 liver function tests during the same period has been regarded as evidence of hepatic dysfunction.

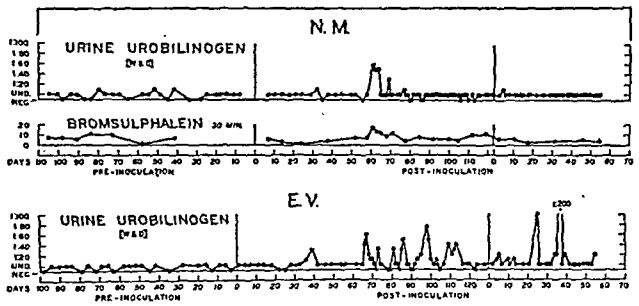


Chart 3.—Results of liver function tests in volunteers N. M. and E. V. before and after first inoculation with water specimen GW and after second inoculation with feces pool 1 FIH. Vertical line at 0 days to left of subject's initials indicates time of inoculation with water specimen GW. Vertical line at 0 days to right of subject's initials indicates time of inoculation with feces pool 1 FIH. See chart 2 for complete legend.

A. A.: The results of the tests on this subject, which were abnormal following inoculation, also are shown in chart 2. On the 71st day the test for urine urobilinogen was positive in a urine dilution of 1:75 and the test for urobilin was strongly positive. Slightly increased excretions of urine urobilinogen and urobilin continued intermittently until the 145th day. On the 72d, 75th and 78th days the cephalin cholesterol flocculation tests gave readings of 2+, 1+ and 1+ respectively.

None of the 30 preinoculation tests for urine urobilinogen were positive in dilutions greater than 1:10. Compared with preinoculation results for urine urobilinogen, the postinoculation results are significantly abnormal. Only 1 of the 13 preinoculation cephalin cholesterol flocculation tests gave a positive reaction. The degree of flocculation was read as 2+ after forty-eight hours and this was not associated with symptoms or abnormalities in any of the other tests of liver function. With the exception of this one positive test fifty-two days prior to inoculation, no flocculation had been observed with 24 subsequent tests until that observed on the 72d day. The probability is small that a positive response to the cephalin flocculation test would occur simultaneously with abnormally increased urobilinogenuria in this subject as a result of the operation of chance. The probability of this combination occurring three times in succession as the result of chance is very much smaller. The simultaneous occurrence of abnormal results with 2 different tests of liver function has been regarded, therefore, as evidence of hepatic dysfunction.

N. M.: The liver function tests showing deviations from the normal in this subject are shown in chart 3. On the 61st day the test for urine urobilinogen was positive in a dilution of 1:60 and the test for urobilin was positive. Increased excretion of urobilinogen and urobilin continued intermittently until the 69th day. Sulfobromophthalein tests on the 61st, 63d and 65th days revealed retentions of 17, 13 and 12 per cent respectively.

With the 26 tests for urine urobilinogen performed during the 105 day preinoculation period, no reaction was obtained with urine dilutions greater than 1 to 10. The mean retention for 7 sulfobromophthalein tests was 7.2 per cent (S. D. ± 3.2; mean plus 2 S. D.—13.6; range 2 to 11 per cent). Compared with these, the postinoculation results showed significant deviations from the normal. On the basis of the criteria cited, the occurrence of abnormal responses during the same period with two different liver function tests has been regarded as evidence of hepatic dysfunction.

E. V.: The only tests of liver function that showed deviations from the normal after inoculation were those for urine urobilinogen and urobilin. The results of the tests for urobilinogen in this subject are also shown in chart 3. With 25 tests during the 100 day preinoculation period, no reaction was obtained with urine dilutions of 1:10 or greater. On the 39th day post inoculation the test for urine urobilinogen was positive with a urine dilution of 1:30, and the test for urobilin was positive. No further abnormalities occurred until the 66th and 67th days, when the urobilinogen tests were positive with urine dilutions of 1:40 and 1:60 respectively. Increased excretions of urinary urobilinogen and urobilin continued intermittently for forty-seven days. The maximum urobilinogen excretion was represented by a positive test with the 1:75 dilution on the 98th day. The other liver function tests showed no significant abnormalities, but this person had somewhat more specific clinical symptoms, including an elevation of temperature ranging from 100 to 101.2 F. (rectal) on the 68th and 69th days, anorexia, nausea and two episodes of vomiting. Because of these symptoms and the occurrence of pathologic urobilinogenuria over a period of time corresponding to that in which hepatic dysfunction was present in 3 other members of the same group, the findings in this subject have been regarded as evidence of hepatic dysfunction.

(2) *Demonstration of Transmissible Agent in Feces of W. H., N. M. and E. V.*—Portions of feces specimens collected from these men (group P) during the first ten days after the onset of the illness produced by the "water agent" were pooled and a suspension in distilled water (pool 4 FIH) was prepared in the same manner as pool 1 FIH. Ten cc. of pool 4 FIH was administered orally to 5 previously uninoculated volunteers (group R). After fifty-four days 1 (J. B.) of the 5 men developed symptoms and signs similar to those which had been observed in the men of group P. The results of the tests which showed deviation from the normal are shown in chart 4. On the 54th day the test for urine urobilinogen was positive in a urine dilution of 1:40 and the test for urobilin was positive. Increased excretions of urobilinogen and urobilin in the urine occurred intermittently until the 66th day. The maximum excretion of urobilinogen was represented by a positive test with a urine dilution of 1 to 100 on the 66th day. The Harrison and diazo spot tests for bilirubin in the urine were positive on the 62d day only. A slight increase in sulfobromophthalein retention was found on the 58th and 61st days. On the 65th day he experienced a chill, and during the following twenty-four hours his temperature varied between 98 and 104 F. (rectal). Anorexia and pruritus were pronounced. The clinical symptoms and signs persisted for approximately a week with the exception of the temperature, which remained in the normal range after the 66th day. The other 4 men in group R have shown no significant symptoms or laboratory abnormalities during the period of six months which has elapsed. The incubation period and laboratory findings in the case of J. B. were similar, therefore, to those observed in the 4 men of group P following the ingestion of water specimen GW.

(3) *Electrophoretic Patterns of the Serum Proteins.*—Using the electrophoretic apparatus of Tiselius, studies were made on specimens of serum obtained at frequent intervals before and after the onset of hepatic dysfunction in N. M. and E. V. During the period of hepatic dysfunction, definite changes in the patterns of the serum proteins were found, and the sequence of changes was the same in the 2 cases. The sequence of changes also was the same as that observed in cases of hepatitis with jaundice produced by feces pool 1 FIH. The details of the protein alterations will be reported elsewhere.[11]

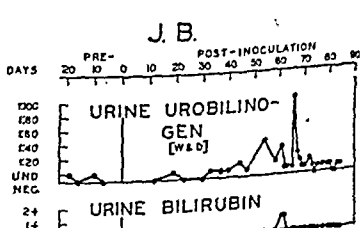


Chart 4.—Results of liver function tests on volunteer J. B. before and after inoculation with feces pool 2 FIH (specimens obtained from W. H., N. M. and E. V. during illnesses that followed ingestion of water specimen GW). See chart 2 for complete legend.

11. Chambers, L. A., and others: Electrophoretic Studies of the Serum Proteins in Hepatitis, to be published.

(4) *Testing of N. M., E. V., A. A. and J. B. for Immunity to Hepatitis Agent Excreted in Feces of Camp Patients.*—After complete recovery from the hepatic disturbances produced by the "water agent," these 4 men and 9 normal control subjects were inoculated with equivalent oral doses of feces pool 1-FIH. Seven of the 9 control subjects developed typical infectious hepatitis with overt jaundice after incubation periods of 19 to 26 days, whereas not one of the 4 men (N. M., E. V., A. A., J. B.) previously ill from the "water agent" has had symptoms of any illness during the 4 months elapsing to date. Subject E. V. showed an increased excretion of urobilinogen (chart 3) on the 24th and 38th days, but this was not associated with symptoms or abnormalities in the results of other liver function tests. Subjects N. M. (chart 3), A. A. and J. B. showed no deviations from the normal in the results of any of the liver function tests. The failure of any of these 4 men to develop definite evidence of hepatitis represents a statistically significant difference (chi square 4.01) from the results obtained in the 9 normal controls. This difference provides significant evidence that N. M., E. V., A. A. and J. B. were immune to the hepatitis agent responsible for the camp epidemic.

C. THE TRANSMISSION EXPERIMENTS

The results of the transmission experiments provide considerable information concerning the source of the camp agent and its possible methods of transmission.

The nasopharyngeal washing and urine pools contained specimens from 26 and 38 infected persons respectively. Specimens obtained both before and after the onset of hepatitis were included. If the causative agent were commonly present in the nasopharynx or urine, it should have been present in these pools. The experience with other materials make improbable the possibility that the agent, if present, was destroyed by the procedure of collection or during the period of storage. Relatively large doses were used because of the possibility that the concentration of the agent, if present, was low. That the volunteers included susceptibles is indicated by the fact that five months after inoculation with pool 2 NPIH 1 of the men was inoculated with feces pool 1 FIH and developed hepatitis with jaundice after 22 days. The evidence indicates, therefore, that the causative agent probably was not present in the nasopharyngeal washings and urine of 26 and 38 patients respectively. This, in turn, suggests that the main source of the agent at the camp was not the nasopharynx or the urine of the infected persons.

The oral transmission experiments showed that the agent was present in serum. However, parenteral injection of serum (and the Seitz filtrate of feces) known to contain the agent has not produced the disease in the 132 days that have elapsed at the time of writing. Parenterally injected blood or serum, therefore, hardly could be responsible for the large number of early cases appearing at the camp within 42 days after arrival. Since the members of the camp group could not have received blood or serum orally, the results of these experiments indicate that the majority of the camp cases were not infected after arrival by serum or blood.

The oral transmission experiments showed that a hepatitis agent was excreted in the feces of infected persons. The results in groups H and N, representing two human passages of this agent in feces, clearly show that the agent was transmissible, and the results in group L show that it passed through a Seitz filter. Furthermore, the oral administration of these materials consistently produced the disease after incubation periods of 19 to 37 days, indicating that direct or indirect transmission of the agent from feces could have been responsible for the camp epidemic.

The results in groups H, I and J compared with those in groups K and L suggest that the length of the incubation period may be influenced by the amount of the agent administered orally. Although methods of measuring the concentration of hepatitis agent in a given material have not been developed, it is known that Seitz filtrates of materials containing other viruses have a lower concentration of those viruses than the unfiltered materials.[12] It is probable, therefore, that the 2 cc. dosage of the Seitz filtrate of pool 1 FIH (group L) contained a smaller amount of the hepatitis agent than the quantities of the unfiltered material given to groups H, I and J. It also seems reasonably certain that the men of group K received a smaller amount of the hepatitis agent than did the men in groups H, I and J. The mean incubation period for the combined groups H, I and J (11 cases) was 21.5 days and the longest incubation period was 26 days. For the combined groups K and L (5 cases) the mean incubation period was 32 days and the shortest incubation period was 28 days. The absence of any significant differences in the severity of the illnesses of the men in groups H, I and J as compared with those of the men in group L affords some evidence that the longer incubation periods in the men of group L probably were due to smaller doses of the agent rather than to a change in its virulence resulting from the filtration process. However, the illnesses in the men of group K were much milder than those of the men in groups H, I, J and L, suggesting that the virulence, as well as the concentration, of the agent received by group K may have been decreased by the treatment to which it was subjected. Although these groups are too small for the results to be conclusive, the available evidence suggests that the length of the incubation period may be related inversely to the quantity of ingested hepatitis agent and possibly to its virulence.

As previously stated, the water from the girls' well showed bacteriologic evidence of fecal contamination. Since the hepatitis agent was excreted in feces, the contamination of this water with feces strongly suggests that water may have been the means of transmission of the agent at the camp. However, the occurrence, after the usual incubation period, of hepatitis in human volunteers following the ingestion of this water under controlled conditions would constitute the only conclusive proof that the water contained the hepatitis agent. For this reason the conclusions regarding the method of transmission of the agent at the camp depend to a considerable extent on the interpretation of the results obtained by the administration of water specimen GW to volunteers (group P). The occurrence of illnesses associated with hepatic dysfunction in 4 of the 5 men at nearly the same time after ingestion of this water and the absence of any similar disturbance among control subjects living under the same conditions definitely relate the illnesses in these men to the one variable, namely the ingestion of water specimen GW. The individual liver function tests giving abnormal results in this group of men during their illnesses included those for urine urobilinogen, urine urobilin, urine bilirubin, serum bilirubin, qualitative

12. Henle, W.: Personal communication to the authors.

van den Bergh reaction, cephalin cholesterol flocculation and sulfobromophthalein excretion. Abnormal results with this group of tests can be regarded as unquestionable evidence of hepatic dysfunction, regardless of the cause. The demonstration of the presence of an agent capable of producing the same illness when administered to other volunteers (group R) in the feces of these men indicated that the illnesses were due to a transmissible agent. Since the chances of isolating two different transmissible agents that produced hepatic dysfunction, one from the feces of the camp patients and the other from the camp water supply, would be extremely small, it is logical to assume that the "water agents" and the "feces agent" were the same. This assumption is supported by: (*a*) The electrophoretic studies, which showed that the illness produced by the "water agent" and the hepatitis produced by the "feces agent" were associated with the same sequence of changes in the serum proteins.[13] The significance of the sequence of changes occurring in the serum proteins during hepatitis has not yet been established. However, in 5 cases (with jaundice) studied to date the sequence

TABLE 4.—*Incubation Periods in Persons with Limited Periods of Exposure*

	Exposure				Incubation Period	
Case	Date or Dates	Duration	Place	Date of Onset	Minimum	Maximum
A	7/27/44	2 hours	Camp	9/ 2/44	37	37
B	7/27/44	12 hours	Camp	8/12/44	34	34
C	7/29/44	12 hours ±	Camp	8/28/44	30	30
D	8/3 to 8/8/44	5 days	Camp	9/ 2/44	25	30
E	7/9 to 7/19/44	8 days	Camp	8/12/44	26	34
2	6/30 to 7/7/44	8 days	Camp	7/24/44	20	28
F	8/25 to 9/2/44	8 days	Philadelphia	10/ 3/44	31	39
G	8/7 to 8/13/44	7 days	Hospital	8/21/44	8	14

of changes has been the same and thus appears to be a characteristic occurrence in hepatitis. Whether the same sequence of changes occurs in other diseases is not known, so that these findings cannot be regarded as characteristic only of hepatitis. (*b*) The experimental evidence showing that N. M., E. V., A. A. and J. B., after recovery from the hepatic disturbances produced by the "water agent," were immune to the "feces agent."

However, the illness produced in the men of groups P and R by the "water agent" differed from that produced by the agent in the feces of the camp patients in the following two ways: (*a*) None of the 5 men developed overt jaundice; (*b*) the incubation periods ranged from 54 to 71 days. The fact that hepatitis may occur without jaundice is now well established. The ratio of cases with jaundice to those without jaundice apparently varies in different epidemics from approximately 2.7 to 1 as observed in this epidemic to estimates of 1 to 2 or more in Italy.[17] Thus the failure of the men in groups P and R to develop overt jaundice does not constitute evidence that they did not have hepatitis. However, if the "water agent" was the same as the "feces agent," at least 1 of the 5 men might have been expected to develop overt icterus unless a decrease in virulence of the agent had occurred. At the time of collection of water specimen GW, no water had been pumped from the well for at least 5 weeks and the camp had been closed for 8½ weeks. The water specimen then was stored in a laboratory at room temperature in plain glass water bottles, unprotected from light, for another month before it was administered to group P. These conditions could have resulted in attenuation of the hepatitis agent. In addition, it is reasonable to assume that the concentration of the agent in this water probably was low, and the results of the transmission experiments in groups H, I and J, and in groups K and L have indicated that the length of the incubation period may vary inversely with the amount of the agent ingested. Additional evidence that the quantity of virus administered to human beings may influence the length of the incubation period is provided by the recent report of the Commission on Acute Respiratory Diseases.[18] The investigators found that the incubation period of primary atypical pneumonia produced experimentally in volunteers by the administration of a filtered material was approximately one week longer than that following the administration of the same amount of this material prior to the filtration. The longer incubation periods and the mildness of the disease observed in groups P and R could be explained, therefore, by a low concentration of attenuated virus.

D. CONCLUSIONS BASED ON TRANSMISSION EXPERIMENTS

1. The main source of the hepatitis agent at the camp probably was the feces of infected persons.

2. The agent in feces was transmissible to human beings.

3. The agent in feces passed through a Seitz filter.

4. The evidence indicates that water from the girls' well contained a hepatitis agent which probably was the same as that excreted in the feces of the camp patients.

5. The agent probably was present in the blood of infected persons at some stage of the disease.

6. Nasopharyngeal droplets or secretions and urine probably were not common sources of the agent at the camp.

III. EPIDEMIOLOGIC OBSERVATIONS

In this report, only the factors related to the sources of the agent and its method or methods of transmission at the camp will be considered.

A. INCUBATION PERIOD

The most satisfactory data on the length of the incubation period are those pertaining to a few persons who had a more limited period of exposure than the members of the camp group (table 4). In 3 persons who visited the camp for only 2 to 12 hours on 1 day (patients A, B and C) the incubation periods were 30, 34 and 37 days. In 2 who visited for 5 and 8 days (patients D and E), the minimum periods were 25 and 26 days and the maximum were 30 and 34 days respectively. The female counselor (patient 2) who was exposed to the initial case for the first 7 days

13. The changes in the various protein components demonstrated by the electrophoretic method were not shown by quantitative chemical determinations on the same specimens.

Footnotes 14, 15 and 16 deleted on proof.

17. Barker, M. H.: Personal communication to the authors.

18. Commission on Acute Respiratory Diseases: Transmission of Primary Atypical Pneumonia to Human Volunteers, J. A. M. A. 127:145 (Jan. 20) 1945.

developed the disease after a minimum period of 20 and a maximum period of 28 days. After a boy camper had returned to his home, his cousin (patient F) visited him in his home for a week and left the day before he developed the initial symptoms of hepatitis. Case F developed the disease after a minimum period of 31 and a maximum incubation period of 39 days. The shortest incubation period apparently was that of a hospital nurse (patient G) who was never at camp but who constantly attended a boy camper for 7 days during the preicteric period of his illness. Her first symptoms occurred after a minimum period of 8 and a maximum period of 14 days. However, overt jaundice did not appear for 24 days after her first symptoms. Finally, 53 persons (chart 1) developed the disease during the 6th week of the camp season. Since it is unlikely that these persons were all infected immediately on arrival, the incubation periods were probably less than 42 days. Thus the possible range of the incubation periods in these 61 cases of hepatitis was 8 to 42 days, and in 3 of those in which exposure was limited to 1 day it was 30 to 37 days.

The incubation periods observed in volunteers experimentally infected with feces pool 1 FIH (specimens obtained from camp group) ranged from 19 to 37 days, thereby substantiating the foregoing observations.

These data on incubation periods, those reported by others [19] and the evidence of infection of visitors to the camp provide support for the basic assumption necessary for a discussion of the method or methods of transmission, namely that the majority of the camp group acquired the infection after arrival at camp. This assumption is supported by the fact that many of those involved early were from different cities and towns. Their nearly simultaneous infection with a hepatitis agent by natural means before coming to the camp would therefore be almost impossible. The data on incubation periods also indicate that patient 1, who developed hepatitis only 3 days after arrival, was infected elsewhere.

B. SOURCE OF HEPATITIS AGENT

Since hepatitis had not occurred at this camp in previous years and no other source of the agent has been detected, it is reasonable to assume that it originated from patient 1, who developed the disease 3 days after the opening of the camp. This is supported by the following facts: (1) the second person (patient 2) to develop the disease lived in the same cabin (A) and was therefore closely exposed to case 1 before and after the onset of hepatitis; (2) in relation to the time of onset in case 1, the epidemic began after an interval of time that is compatible with the observed length of the incubation period of the disease.

The source of the infection of patient 1 is unknown. She had had no recognized exposure to patients with hepatitis and no injection of a homologous blood product.

C. CHARACTERISTICS OF THE EPIDEMIC

As shown in chart 1, the early cases occurred predominantly in the female group. The first 2 persons (patients 1 and 2) to develop the disease lived in the same cabin (A). The onset in case 1 was on the 3d day of the season and in case 2 the disease developed 24 days later but approximately 10 days before the explosive appearance of the epidemic. This suggests that patient 2 was infected earlier and possibly by a different method than the others. However, the 40 persons in the female group who developed signs of the disease during the 6th week were quartered in a number of different cabins and had no unusual exposure to the earlier cases. In fact, as patient 1 was confined to cabin A from the 4th to the 6th day and to the girls' infirmary from the 7th to the 10th day and left for her home on the 11th day, the period during which the female group as a whole could have been exposed to her was limited to the first 3 days. Furthermore, the 13 persons in the male group who developed hepatitis during the 6th week also lived in different cabins and included young campers who would have had little or no chance of being exposed to the early cases in the female group. Thus, a relatively large number of the female group and a small number of the male group apparently were infected at nearly the same time by some method that did not require personal contact. Furthermore, the low incidence of secondary cases previously mentioned indicates that the agent was not easily transmitted to contacts. The data on the incubation period of the disease show that it did not exceed 42 days in the 61 cases on which satisfactory data are available. Thus, the fact that the disease continued to appear in members of the camp group over a period of at least 70 days suggests that, although a number of persons in both the male and female groups were probably infected at nearly the same time, others were probably infected at different times. This is indicated also by the facts that the majority of the cases in the female group occurred earlier than the majority in the male group and the incidence curves in both groups showed two distinct peaks (chart 1). For these reasons a source of infection must have been present over a period of time. The occurrence of hepatitis in persons who arrived at or visited camp during the 2d, 4th, 5th and 6th weeks indicates that a source of infection was present for at least the first 6 weeks.

Thus, the chief epidemiologic characteristics requiring explanation are (1) the unusually high incidence of the disease in the entire camp group, which appears to be the highest that has been reported in any group in this country during a similar period of time; (2) the higher total incidence in the female than in the male group; (3) the predominance of the early cases in the female group and the later cases in the male group; (4) the simultaneous infection of a number of persons at the camp who had not been in close personal contact; (5) the infection of others after a longer period of residence at the camp; (6) the apparent ease with which the infectious agent was acquired at the camp in contrast to the apparent lack of ease with which it was acquired by those in contact with infected persons away from the camp.

D. POSSIBLE METHODS OF TRANSMISSION OF THE CAUSATIVE AGENT

In order to obtain a satisfactory explanation for the described characteristics of the epidemic, the various methods by which the infectious agent might have been transmitted at the camp have been investigated. The evidence for and against these methods, as provided

[19] Epidemic Infective Hepatitis, editorial, Brit. M. J. 2:680 (Nov. 27) 1943. Ford, J. C.: Infective Hepatitis, Lancet 1:675 (May 29) 1943.

by the observations made at the camp and by the results of the transmission experiments in volunteers, is as follows:

Transmission by Air.—The members of the camp group lived in cabins accommodating 7 to 10 campers and 1 to 2 counselors. Circulation of air in and out of cabins was free. Beds were approximately 3 feet apart. The entire male and female groups ate at one time in their respective dining rooms, each of which consisted of a single large airy room with many small tables accommodating 10 to 12 persons. Thus there was ample opportunity for transmission of an infectious agent by air. However, the explosive type of the onset of the epidemic, the infection soon after arrival at camp of some persons in the male group who had not been in close personal contact with the female group, the lack of ease with which the agent was acquired away from the camp and the failure of nasopharyngeal washings to produce the disease in volunteers all indicate that the majority of persons were not infected by an air borne agent.

Transmission by Fomites.—Because of the well known tendency of young persons to use articles in common, spread of the infectious agent by this means would have been quite possible in groups such as these. Undoubtedly certain articles in the cabins were used by several or all of the residents. Dishes and eating utensils were washed by hand, rinsed in hot water and then in a germicidal solution (Roccol-Winthrop Chemical Company). However, the care with which this procedure was carried out was subject to individual variation and, in view of the known resistance of the hepatitis agent to some methods which destroy bacteria, the agent might have survived the cleansing process. For these reasons, transmission by fomites may have been the method responsible for the infection of some persons at the camp and also for the 5 persons who had not been at the camp. However, the same observations cited under transmission by air indicate that fomites probably were not responsible for transmitting the agent to the majority of the persons at the camp.

Transmission by Biting Insects.—Since extremely small amounts of serum injected parenterally have transmitted a hepatitis agent to volunteers [20] and evidence has been obtained that suggests transmission by the minute amounts of serum remaining in improperly sterilized syringes and needles,[21] it might be possible for biting insects to transmit mechanically the agent in blood from one person to another. Since "stable flies," "deer flies" and mosquitoes were unusually abundant at the camp from the beginning of the season, there would have been ample opportunity for this type of transmission. However, parenteral injection of a pooled serum and a Seitz filtrate of feces (both known to contain the camp hepatitis agent) into previously uninoculated volunteers (groups C and M) has not resulted in hepatitis in the 132 days that have elapsed to date. This provides reasonable evidence that the many persons developing hepatitis within 40 days after arrival at the camp were not infected from blood carried by biting insects. This method, therefore, probably was not responsible for transmitting the agent to the majority of the cases, although it cannot be eliminated as a possible means of infection of some persons who developed the disease in the later weeks of the epidemic. One other observation also suggests that the agent was not transmitted by biting insects. A number of persons spent varying amounts of time during the camp season at a small boarding house located adjacent to the camp. The distance between this boarding house and the girls' section was no greater than that between the midpoints of the boys' and girls' sections. The source of water for the boarding house was different from that of the camp. Questionnaires were sent to 42 persons who had not visited at the camp but had resided at the boarding house during the camp season. None had subsequently developed hepatitis. If the agent had been transmitted by biting insects, it would seem that some of these persons also would have been infected.

Direct Transmission from Person to Person.—Ample opportunities for this method of spread obviously would be present in groups such as those at the camp. Although some persons may have been infected in this way, direct transmission would not account for the explosive type of onset of the epidemic, involving persons, in both the female and male groups, who apparently had not been in close personal contact with other infected persons. It is unlikely, therefore, that direct transmission of the infectious agent from person to person was responsible for the majority of the camp cases.

The evidence cited has indicated that in the majority of the early cases at the camp infection probably did not occur by an agent transmitted directly from person to person, or indirectly by air, fomites or biting insects. The explosive type of onset of the epidemic suggests that a large number of persons were infected at approximately the same time. This indicates that the infectious agent was acquired from a common source to which a large number of persons were exposed at nearly the same time. In epidemics of other diseases which have been characterized by an explosive onset a common source of infection usually has been found, and the source usually has been contaminated food, milk, water or other materials which had been ingested by, or injected into, a number of persons within a short period of time. Since the members of the camp group had not been injected with any material before or after arrival, food, milk or water remained as possible sources of infection.

Transmission by Food.—The camp food supplies were procured from outside sources and were delivered to the boys' camp. The food supplies for the girls' section were obtained from the storeroom in the boys' section and all food, with the exception of pastries and desserts, was prepared and cooked by different personnel in the respective kitchens of the two sections. Pastries and desserts were prepared in the "boys' kitchen" and sent to the girls' section. Thus food was sent from the boys' to the girls' section, but no food was transferred from the girls' to the boys' section. Since the epidemic originated in the girls' section and no food was sent from there to the boys' section, the early cases in the boys' section could not have been caused by a food borne agent. It is also improbable that infection in the early cases in the female group were caused by a food borne agent for the following reasons: (*a*) none of the early cases in the girls' section had had any contact with food supplies, and eating utensils contaminated by those involved were not a probable means of infection of the majority of cases for reasons previously discussed; (*b*) none of the food handlers were among the early cases of hepatitis and none had had the disease previously, at least not in a recognizable form; (*c*) none of the cooks, all of whom were in the older age group, developed the disease before or after the onset of the epidemic; (*d*) the persons involved in the explosive onset of the epidemic, although predominantly females, also included a number of the male group; (*e*) contamination of food in both sections with an infectious agent carried by insects was not likely because insects had little or no access to feces which the transmission experiments have indicated was the probable source of the infectious agent; (*f*) several persons who visited the camp for only a few hours on one or more days, but did not eat there, subsequently developed hepatitis. These observations indicate that food probably was not the carrier responsible for transmission of the agent to the persons involved in the early phases of the epidemic.

Transmission by Milk.—All milk was obtained from the same dairy and was delivered to the kitchens of both sections of the camp. If the milk had been contaminated prior to arrival at the camp, the outbreak of the disease should have occurred simultaneously in the two sections. Also other camps in the

20. Oliphant, J. W.; Gilliam, A. G., and Larson, C. L.: Jaundice Following Administration of Human Serum, Pub. Health Rep. **58**: 1233 (Aug. 13) 1943. Oliphant, J. W.: Jaundice Following Administration of Human Serum (Harvey Lecture), Bull. New York Acad. Med. **20**: 429 (Aug.) 1944.

21. Salaman, M. H.; King, A. J.; Williams, D. I., and Nicol, C. S.: Prevention of Jaundice Resulting from Antisyphilitic Treatment, Lancet **2**: 7 (July 1) 1944. Sheehan, H. L.: Epidemiology of Infective Hepatitis, ibid. **2**: 8 (July 1) 1944.

vicinity, using the milk from the same dairy, had no cases of hepatitis. These observations justify the exclusion of milk, contaminated prior to arrival at the camp, as a source of the infectious agent. That milk contaminated after arrival at the camp probably was not the source of infection in the early cases is indicated by the observations relating to food as described.

Transmission by Lake Water.—During the camp season, nearly every one bathed in the camp lake at one time or another. This lake was used only by the camp group and was fed by streams which were not subject to any known source of contamination. Since many persons bathed in this lake prior to the onset of the epidemic, it is possible that the water might have been contaminated with the hepatitis agent from them, resulting in the infection of some persons. However, patient 1 did not bathe in the lake because of the onset of her illness 3 days after arrival. Furthermore, a few persons who did not bathe in the lake developed the disease in the early phases of the epidemic. Finally, several persons who visited the camp for only a few hours on one day and did not go into the lake subsequently developed hepatitis. Thus, it is not likely that, in the early cases at least, the infection was acquired from the lake water.

Since food, milk and the lake water apparently would not account for some of the main features of the epidemic, drinking water alone remained a possible source of the infection.

Transmission by Drinking Water.—The water used for drinking and washing purposes at the camp all came from two driven wells, one (approximately 220 feet deep) located in the girls' section and the other (approximately 190 feet deep) located in the boys' section. The girls' section was supplied entirely by water pumped directly from their well into the lines or from their reservoir located adjacent to the well. However, the supply from the boys' well was often inadequate and therefore was supplemented frequently by water pumped directly from the girls' well to a reservoir located in the boys' section. Thus the water used by the female group came only from their well, whereas that used by the male group came from both wells. Water from the girls' well first was pumped into the boys' reservoir during the first week of the season and thereafter was pumped into this reservoir at frequent intervals until the camp was closed. Thus contamination of the water from the boys' well with the hepatitis agent would not account for the epidemiologic phenomena. However, contamination of the water in the girls' well would satisfactorily explain (*a*) the higher total incidence in the female than in the male group; (*b*) the predominance of the early cases in the female group and the later cases in the male group; (*c*) the infection of a number of persons in both groups soon after their arrival at camp; (*d*) the persistence of a source of infection during at least the first 6 weeks; (*e*) the apparent ease with which the agent was acquired at the camp in contrast to the apparent lack of ease with which it was acquired away from the camp; (*f*) the unusually high incidence of the disease in the entire group within a period of 7 weeks.

In addition, continuous, and possibly increasing, contamination of the water in the girls' well with the hepatitis agent would provide an explanation for the two peaks in the weekly incidence curves of both groups (chart 1). Sufficient amounts of agent could have been provided by the feces of patients 1 and 2 to account for the early infection of a considerable number of persons in the female section where the well water was not "diluted" with water from other sources. In the male section, most of the water was provided by their own well, the proportion contributed by the girls' well being relatively small. This would explain the occurrence of only a few cases in the boys' section during the week in which the highest incidence was observed in the girls' section. Continued contamination of the boys' water with that from the girls' well would result in the eventual infection of a sufficient number of persons to explain the first peak in the male epidemic curve. The delayed secondary peaks in both groups would be best explained, however, by not only continuous, but also increasing, contamination of the water. An increased contamination would have been most apt to occur when the early cases in the female section were admitted to the infirmary (see Sources of Contamination of Girls' Well Water). This explanation is supported by the fact that the two peaks in the incidence curves of both groups were separated by an interval of 4 weeks, which is equivalent to the length of the incubation period. The lower height of the secondary peak in the female group as compared with that in the male group might be explained by the facts that (*a*) the chance of acquiring the agent early was greater in the female section and the number of female susceptibles, therefore, was reduced more rapidly, (*b*) the length of the period during which the agent might have been acquired was shorter as a result of the earlier closure of this section, and (*c*) the total number of persons in the group was smaller. Although the secondary peaks can be explained satisfactorily on the basis of continued, and possibly increasing, contamination of the water, the large number of early cases also provided increasing opportunities for acquiring the agent from sources other than water. The interval between the primary and secondary peaks also supports this possibility. On the other hand, the apparent lack of easy transmissibility of the agent, as observed away from the camp, suggests that the sources other than water probably were not, by themselves, responsible for the secondary peaks. It is quite possible, however, that these sources contributed to the height of these peaks.

From the evidence cited to date, transmission by water from the girls' well appears to be the only method which, on theoretical grounds alone, could satisfactorily explain the chief characteristics of this epidemic. The theoretical explanation has been substantiated by the following facts: (*a*) The transmission experiments showed that the causative agent was excreted in feces; (*b*) the water from the girls' well showed bacteriologic evidence of fecal contamination on two different occasions; (*c*) the transmission experiments provided evidence that water from this well contained a transmissible agent that produced in volunteers an illness associated with hepatic dysfunction and an immunity to the agent excreted in the feces of the camp patients. The combined results of the epidemiologic and bacteriologic studies and the transmission experiments in volunteers have led to the conclusion that the infectious agent was transmitted to the majority of the camp cases by water from the girls' well.

Possible Sources of Contamination of Water from Girls' Well.—On the basis of the foregoing conclusion, attempts were made to locate a source of contamination of the water from the girls' well. The toilets were of a type that would not permit "back flow" of fecal material into the water lines. The water reservoir was covered and was not subject to contamination except from the entering water. The well was covered at its surface, and contamination could not have entered from above. A search for leaks in the pipe lines revealed none. For these reasons the contaminating material probably entered the well below its surface. The only apparent sources of contaminating material were a number of cesspools located within a radius of 200 feet from the well. These cesspools were 6 to 8 feet in depth and had open bottoms, stone walls and cement tops. Each cesspool received the sewage and waste water from one to three cabins. None of the cesspools had overflowed prior to the start of the epidemic. In fact, although in use for a number of years, drainage of the cesspools had never been necessary, indicating that the contents had diffused into the ground. The ground layer of the area, varying in depth from a few inches to approximately 4 or 6 feet, consisted of ordinary top soil overlying a layer of "hardpan." The exact nature of the underlying rock was not determined, but it was said to consist of red shale and limestone. In certain places where the rock layer protruded through the soil and could be inspected, many cracks and fissures were apparent.

As shown in chart 5, the girls' well was nearly surrounded by cesspools. The sewage from cabins C and D was received by cesspools 3 and 4, located 200 and 100 feet respectively from the well. None of the persons living in these cabins were among the earliest to acquire hepatitis. However, cesspool 1,

located 150 feet from the well, received all the sewage from cabin A and the girls' infirmary. As mentioned previously, patient 1, who developed hepatitis 3 days after the opening of the camp, and patient 2, who developed hepatitis 27 days after the opening of the camp and approximately 1 week before the onset of the epidemic, both lived in cabin A. Furthermore, most of the early cases of hepatitis were "hospitalized" in the girls' infirmary. Thus cesspool 1 probably received feces containing the hepatitis agent almost continuously after the opening day of camp. Since the girls' well water must have been contaminated with the hepatitis agent soon after the opening of the camp to result in the explosive onset of the epidemic during the 6th week, and cesspool 1 was the only one relatively certain to have contained the hepatitis agent during the first few weeks, it is highly probable that cesspool 1 was the source of contamination. Another possible source of the hepatitis agent after the 6th week would have been cesspool 2, located only 75 feet from the well. This pool received sewage from the girls' lodge. Prior to the epidemic, the lodge was used only on the infrequent rainy days. In the 6th and 7th weeks, however, the number of cases of hepatitis exceeded the capacity of the girls' infirmary, and during that period approximately 45 hepatitis patients were quartered in the lodge. Thus during and after the 6th week either or both cesspool 1 and 2 could have provided increasing amounts of the hepatitis agent.

Unfortunately the probable relationship between the epidemic and cesspool 1 (and possibly cesspool 2) did not become apparent until the analysis of the epidemiologic data had been completed (November 1944). By that time the contamination of the well water had ceased,[22] possibly because of the lack of use of the cesspools after August 20. Thus the opportunity of obtaining additional evidence of a connection between the well and the cesspools was missed.

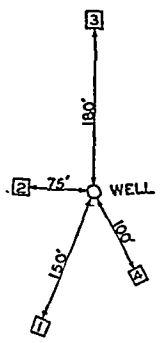


Chart 5. — Approximate location of cesspools in relation to well in girls' section of camp. Well is indicated by circle at point of convergence of arrows. Cesspools are indicated by numbered squares. Numbers on arrows represent approximate distance in feet from cesspools to well. Cesspool 1 received the sewage from cabin A and the female infirmary. Cesspools 2, 3 and 4 received the sewage from cabin B, the female lodge and cabin C respectively (see text).

The epidemiologic observations and the results of the experimental studies have led to the following conception of the pathogenesis of this epidemic: The hepatitis agent was brought into the camp on the first day of the season by patient 1. By means of a connection between cesspool 1 and the well in the girls' section, the water supply was contaminated with this agent. The majority of persons in both groups and some visitors probably acquired the agent from the water. Some persons may have acquired the agent (*a*) from feces, directly or indirectly; (*b*) possibly from blood carried by biting insects.

IV. COMMENT

On the basis of the epidemiologic observations alone, water from the girls' well appeared to be the only means of transmission of the hepatitis agent at the camp which could satisfactorily account for the chief characteristics of this epidemic. The transmission experments showed that the hepatitis agent was excreted in feces, and the bacteriologic studies provided evidence of fecal contamination of the girls' well water. Finally, the transmission experiments provided experimental evidence that this water contained a transmissible agent which probably was the same as that excreted in the feces of the camp patients. It is possible that the agent was transmitted to some persons at the camp (*a*) directly from infected persons, (*b*) indirectly by contaminated fomites or lake water and (*c*) in blood carried by biting insects. However, the data provided by the epidemiologic observations, the bacteriologic studies and the transmission experiments in volunteers all lead to the conclusion that the hepatitis agent was transmitted to the majority of the camp cases by water from the girls' well.

The evidence presented herein of the excretion of the hepatitis agent in the feces of patients with the disease confirms that previously reported by others.[23] It seems certain, therefore, that feces is the source of the agent responsible for many epidemics of infectious hepatitis and that anything subject to contamination with feces is a potential means of transmission of this disease.

The results of this investigation suggest that the agents responsible for some of the past epidemics of infectious hepatitis may have been water borne. Fraser[24] and Hallgren[25] have reported epidemics of infectious hepatitis in which transmission by water was suspected because of bacteriologic evidence of fecal contamination. However, the epidemic reported herein appears to be the first epidemic of infectious hepatitis in which experimental evidence of the method of transmission has been obtained.

It is apparent that the prevention of future epidemics of hepatitis may depend in part on the control of the agent (or agents) in water. In view of the known resistance of this agent to procedures which usually eliminate or destroy bacteria,[26] the effect of the current methods of water disinfection on this agent becomes a question of importance. Evidence recently has been obtained that the agent of infectious (epidemic) hepatitis in contaminated water was not inactivated by treatment of the water with sufficient chlorine to provide a residual concentration of 1 part per million after 30 minutes' contact. It also may have survived, in a much attenuated form, the treatment of contaminated water with sufficient chlorine to provide a residual concentration of 15 parts per million after 30 minutes' contact.[10] It is probable, therefore, that special measures, yet to be determined, will be required to eliminate the hazard of transmission of this agent by water.

The outbreak of "gastrointestinal upsets" that occurred in the camp group 1 to 3 weeks prior to the onset of the epidemic of acute hepatitis is of interest. It is possible that these manifestations were entirely unrelated to the epidemic disease. However, it seems probable that some relationship existed. If so, they may have been due to an agent, other than the hepatitis agent, that also was present in the water as a result of fecal contamination. On the other hand, it is possible that these symptoms and signs represented the first manifestations of the hepatitis agent. A number of the group who developed hepatitis 3 to 4 weeks after returning home reported similar transient upsets 1 to 3 weeks prior to the abrupt onset of acute hepatitis. Furthermore, 3 of the volunteers inoculated with feces pool 1 FIH had similar transient episodes 1 to 2 weeks before the onset of acute hepatitis. One of the 3 had

22. Bacteriologic examination of water obtained from the girls' well on Nov. 28, 1944 and of 3 specimens obtained during March and April 1945 showed no evidence of contamination.

23. MacCallum, F. O., and Bradley, W. H.: Transmission of Infective Hepatitis to Human Volunteers, Lancet **2**: 228 (Aug. 12) 1944. Havens, W. P., Jr.; Ward, R.; Drill, V. A., and Paul, J. R.: Experimental Production of Hepatitis by Feeding Icterogenic Materials, Proc. Soc. Exper. Biol. & Med. **57**: 206 (Nov.) 1944.

24. Fraser, R.: A Study of Epidemic Catarrhal Jaundice, Canad. Pub. Health J. **22**: 396, 1931.

25. Hallgren, R.: Acta med. Scandinav., Supp. 140, 1942.

26. Havens, W. P., Jr.: Properties of the Etiologic Agent of Infectious Hepatitis, Proc. Soc. Exper. Biol. & Med. **58**: 203 (March) 1945. MacCallum and Bradley.[23]

bilirubinuria for 2 days during that period. In a previous report, evidences of the occurrence of transient symptoms and signs associated with mild hepatic dysfunction 1 to 3 months prior to the onset of acute homologous serum hepatitis has been presented.[4] These observations suggest that the "gastrointestinal upsets" observed at the camp prior to the epidemic of hepatitis may have been the first manifestations of the disease.

V. SUMMARY

During the late summer of 1944 an epidemic of infectious hepatitis occurred in a large summer camp for boys and girls. Three hundred and fifty of 572 persons developed hepatitis within a period of 13 weeks. The onset of the disease in 344 of the 350 patients was within a period of 7 weeks. This appears to be the highest recorded incidence of this disease in any group in this country over a similar period of time. Of the 350 patients with hepatitis 255 had overt jaundice and the remaining 95 had the nonicteric form of the disease. At least 9 persons who visited the camp for short periods during the first 6 weeks of the season subsequently developed hepatitis. Approximately 175 persons returned to their homes after the onset of hepatitis at the camp, and approximately 175 others developed the disease as late as 5 weeks after their return home. Among the many friends and relatives who had not visited the camp but subsequently were exposed at home to infected persons from the camp, only 5 secondary cases have been reported. No deaths occurred.

The outstanding characteristics of the epidemic were (1) the unusually high incidence of the disease, (2) the higher total incidence in the female than in the male group, (3) the predominance of the the early cases in the female group and of the later cases in the male group, (4) the simultaneous infection of a number of persons at the camp who had not been in personal contact with one another and (5) the apparent ease with which the infectious agent was acquired at the camp in contrast to the apparent lack of ease with which it was acquired by those in contact with infected persons away from the camp.

In order to determine the source of the causative agent and the method or methods of transmission at the camp, an epidemiologic survey was made and human volunteers were inoculated with serum, nasopharyngeal washings, urine and feces collected from the camp patients, and with water, and a preparation made from flies, obtained at the camp.

The transmission experiments in volunteers provided the following information concerning the source of the agent and its methods of transmission: (1) Nasopharyngeal droplets or secretions and urine probably were not common sources of the agent because of the failure of these materials to produce the disease in volunteers; (2) the agent was present in the blood and feces of infected persons; the agent in these materials produced the disease in volunteers, indicating that it was transmissible; (3) serum produced the disease in human volunteers after an incubation period similar to that observed at the camp only when given by the oral route; normal volunteers injected parenterally with the same serum have not developed hepatitis during the 132 days which have elapsed to date; (4) the chief source of the agent at the camp probably was the feces of infected persons; (5) a preparation made from flies trapped at the camp did not produce the disease in volunteers, suggesting that these flies were not carrying the caustive agent; (6) the production of the disease in volunteers by a filtrate obtained by the passage of feces through a Seitz filter indicated that the agent was filtrable; (7) a decrease in the quantity of the agent administered orally apparently resulted in an increase in the length of the incubation period; (8) water from one of the camp wells (female section) produced in 4 of 5 volunteers a mild illness associated with hepatic dysfunction. These illnesses and hepatitis produced in other volunteers by the "feces agent" were associated with the same sequence of changes in the electrophoretic patterns of the serum proteins. A second human passage of the "water agent" was accomplished by the administration to other volunteers of feces obtained from the men infected with the "water agent." After recovery from their infection with the "water agent" the 4 men tested showed evidence of immunity to the "feces agent."

The epidemiologic observations and the results of the transmisison experiments provided evidence that the causative agent probably was not transmitted to the majority of the persons at the camp by air, fomites, biting insects, food, milk, the lake water or directly from infected persons. On the basis of the epidemiologic observations alone, water from the well in the girls' section appeared to be the only potential carrier of the infectious agent that could satisfactorily explain the outstanding characteristics of the epidemic. The transmission experiments showed that the hepatitis agent was excreted in feces, and the bacteriologic studies provided evidence of fecal contamination of the girls' well water. Finally, the transmission experiments provided experimental evidence that this water contained a transmissible agent which was probably the same as that excreted in the feces of the camp patients. The data provided by the epidemiologic observations, the bacteriologic studies and the transmission experiments in volunteers all lead to the conclusion that the infectious agent was transmitted to the majority of the cases at the camp by water from the girls' well. The source from which the well water was contaminated with the hepatitis agent was not demonstrated, but the available evidence indicates that the source was a cesspool, located near the well, which received the excreta from 1 or more infected persons almost continuously after the first day of the camp season.

CONCLUSIONS

1. The evidence indicates that the agent responsible for this epidemic was water borne.

2. The causative agent of infectious hepatitis is excreted in the feces of persons with the disease. The evidence presented herein confirms the observations of others in this respect.

3. Anything subject to direct or indirect contamination with feces provides a potential means of transmission of this disease.

4. This appears to be the first epidemic of infectious hepatitis (not homologous serum hepatitis) in which experimental evidence of the method of transmission has been obtained. As far as known, this also appears to be the first satisfactory evidence of the natural transmission to man of any virus agent by water.

DISINFECTION OF WATER CONTAINING CAUSATIVE AGENT OF INFECTIOUS (EPIDEMIC) HEPATITIS

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During the past few years the incidence of infectious (epidemic) hepatitis has increased to such an extent that the disease has become one of the most serious medical problems of the present war. The development of effective methods for its prevention and control has been prevented by the lack of definite knowledge concerning the sources of the causative agent and the factors involved in its transmission. However, recent investigations [1] have shown that the causative agent is excreted in the feces of infected persons. This has suggested that feces may be a common source of the agent and that anything subject to fecal contamination may be a potential means of transmission of the disease. More recently, evidence has been obtained that the agent from feces may be transmitted by drinking water.[2] It has seemed important, therefore, to determine the effect on the hepatitis agent of methods commonly used for the disinfection of drinking water. For this reason, an initial experiment concerned with the effect on the hepatitis agent of a concentration of chlorine commonly used for the emergency disinfection of drinking water was conducted. Because the results showed that the hepatitis agent was not destroyed by this treatment, the effect of a higher concentration of chlorine was tested. Also an attempt was made to remove the agent from contaminated water by coagulation and adsorption with sodium carbonate, aluminum sulfate and activated carbon. The present report deals with the methods and results of these investigations.

MATERIALS

EXPERIMENT A (*Effect of Chlorination*).—Ten cc. of a 10 per cent feces suspension (pool 1 FIH), known to contain the agent of infectious hepatitis and described in detail elsewhere,[2] was added to each of two bottles (water specimens 1 and 2) containing 18,000 cc. of distilled water. Each water specimen thus contained approximately 55 parts of feces per million parts of water.

1. Water Specimen 1: This water was not subjected to further treatment.

2. Water Specimen 2: This was treated with chlorine in accordance with a technic commonly used for the rapid disinfection of drinking water under emergency conditions. The technic requires the addition of sufficient chlorine to provide a residual chlorine concentration of 1 part per million after a contact period of thirty minutes. The procedure was carried out as follows:

The chlorine demand of the contaminated water was determined by testing a number of portions for residual chlorine (starch-potassium iodide method; titration with sodium thiosulfate) thirty minutes after the addition of varying amounts of chlorine. The amount required to provide a chlorine residual of 1 part per million after thirty minutes' contact with this water was found to be approximately 2.5 parts per million. Accordingly, 2.5 parts per million of available chlorine (90 cc. of a chlorine solution prepared by dissolving grade A calcium hypochlorite in distilled water and standardized so as to contain 500 parts per million of available chlorine) were added to the 18,000 cc. of contaminated water. Thorough mixing was accomplished by rotation and agitation. The chlorine residual in this water after the thirty minute contact period was 1.08 parts per million.

The results of experiment A indicated the need for additional investigations. For this reason experiments B and C were carried out. The latter were started about four weeks after experiment A was completed.

EXPERIMENT B (*Effect of Superchlorination*).—To each of three bottles (water specimens 3, 4 and 5) containing 19,000 cc. of distilled water, 10.5 cc. of the same feces suspension [3] was added. Each water specimen thus contained approximately 55 parts of feces per million parts of distilled water. Two cc. of a suspension of Escherichia coli in isotonic solution of sodium chloride also was added to the contents of each bottle so that this organism could be used as an index of the effect on bacteria of the subsequent treatment of the specimens. The contaminated specimens were mixed thoroughly by rotation and agitation and then were allowed to stand for twenty-four hours at room temperature. Portions removed from each specimen then were pooled. Portions of this untreated pooled specimen were used for chemical and bacteriologic tests, for coagulation studies (unstrained portion) and for preliminary chlorine demand tests (strained portion). The subsequent treatment of the three specimens was as follows:

1. Water Specimen 3. Twenty-four hours after preparation, the specimen again was mixed thoroughly and then was strained through several layers of gauze and cotton. This constituted the only treatment of the specimen. The final strained water was opalescent and had a faint brown color and a strong hydrogen sulfide odor. Chemical studies showed that the straining process had resulted in a 32 per cent decrease in the concentration of organic solids and a slight decrease in turbidity.

2. Water Specimen 5: Twenty-four hours after its preparation, this specimen was strained through several layers of gauze and cotton. Chlorine demand and chlorine residual experiments on an untreated strained portion of the pooled specimen indicated that a concentration of approximately 25 parts per million of chlorine in the specimen would be required to oxidize completely all of the substances having a demand for chlorine, as shown by the "breakpoint" on a chlorine dosage-chlorine residual curve. Accordingly, sufficient chlorine (930 cc. of freshly prepared calcium hypochlorite solution standardized to contain 500 parts per million of available chlorine) to provide the 18.6 liter specimen with 25 parts per million of available chlorine was added and thoroughly mixed

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This investigation was made possible by the cooperation of the administrative staffs of Selective Service (Camp Operations Division), the National Service Board for Religious Objectors and the American Friends Service Committee. Invaluable assistance also was rendered by Mrs. Carolyn Rudd, R.N., and by members of the laboratory staff: Misses Dorothy Feinberg, Arvilla Howley, Catherine Fowler, Alda Ruth Johnson, Mrs. Jean Flick and Mrs. Alberta Hartman. Members of Civilian Public Service Unit 140 (Philadelphia) served as experimental subjects and other members of the unit assisted materially in the conduct of the investigation.

1. MacCallum, F. O., and Bradley, W. H.: Transmission of Infective Hepatitis to Human Volunteers, Lancet **2**:228, 1944. Havens, W. P., Jr.; Ward, R.; Drill, V. A., and Paul, J. R.: Experimental Production of Hepatitis by Feeding Icterogenic Materials, Proc. Soc. Exper. Biol. & Med. **57**:206 (Nov.) 1944. Neefe, J. R.; Stokes, J., Jr., and Reinhold, J. G.: Oral Administration to Volunteers of Feces from Patients with Homologous Serum Hepatitis and Infectious (Epidemic) Hepatitis, Am. J. M. Sc., to be published.

2. Neefe, J. R., and Stokes, J., Jr.: An Epidemic of Infectious Hepatitis Apparently Due to a Water Borne Agent: Epidemiologic Observations and Transmission Experiments in Human Volunteers, this issue, p. 1063.

3. This preparation, feces pool 1 FIH, was stored at — 5 to — 20 C. between the experiments.

with the water. After a thirty minute contact period the chlorine residual was found to be 15.23 parts per million. This indicated that approximately 0.25 Gm. of available chlorine was contained in the remaining 16.6 liter specimen after withdrawal of samples for chemical tests and bacteriologic examination. Since this concentration of chlorine in drinking water would not be tolerated, the specimen was dechlorinated as promptly as possible, after the thirty minute contact period, by the addition of 0.44 Gm. of sodium sulfite. This quantity of sodium sulfite was based on the requirement of 1.78 parts by weight of sodium sulfite for the neutralization of 1 part of chlorine. The sodium sulfite immediately reduced the chlorine residual to less than 1 part per million, and this was accomplished within forty-five minutes after the chlorine had been added. Additional small quantities (not measured) of sodium sulfite were introduced until the residual chlorine was completely neutralized. Complete dechlorination of the specimen was accomplished within sixty minutes after the chlorine had been added, completing the treatment of this water. The final specimen was colorless but had about the same degree of opalescence as water specimen 3.

The concentration of total organic solids and the turbidity of this specimen were approximately the same as those of specimen 3, indicating that the changes, as compared with the untreated pooled specimen, were due chiefly to the straining procedure. The treatment did decolorize the specimen and lowered the p_H from 6.7 to 6.52.

EXPERIMENT C (*Effect of Coagulation and Adsorption*).—A commonly used method for removing extraneous materials from drinking water involves coagulation of the water by sodium carbonate and aluminum sulfate. For this reason water specimen 4, twenty-four hours after its preparation, was coagulated[4] by adding 166 cc. of a solution of sodium carbonate containing 1.712 Gm. per 500 cc. and 332 cc. of a solution of aluminum sulfate containing 1.712 Gm. per 500 cc. These amounts provided the 16.6 liter specimen with 2.0 and 4.0 grains (0.13 and 0.26 Gm.) per gallon respectively of sodium carbonate and aluminum sulfate. The sodium carbonate was added first, and after thorough mixing the aluminum sulfate was introduced. Because of the possibility that activated carbon might aid in the removal of the hepatitis agent, 0.415 Gm. (equivalent to 25 parts per million in 16.6 liters) of activated carbon (Nuchar C-115) was added immediately after the aluminum sulfate and before the latter was mixed thoroughly with the water. The specimen then was agitated gently by rolling the bottle for approximately fifteen minutes. This distributed the carbon particles evenly throughout the mixture. A heavy flocculum, to which the carbon particles became attached, gradually formed and began to settle. The specimen was permitted to stand without disturbance for one hour. By that time all of the flocculated material and carbon had settled to the bottom of the bottle. The supernatant then was removed by a sterile siphon apparatus and was strained through a sterile gauze and cotton "filter" into a sterile bottle. This completed the treatment of the specimen. The strained supernatant was clear, colorless and odorless.

The chemical studies on water specimen 4 showed that coagulation and adsorption by means of the sodium carbonate-aluminum sulfate-activated carbon treatment, followed by sedimentation and straining, had removed 85 per cent of the total organic solids and had eliminated the turbidity, leaving the water crystal clear in appearance. The treatment also lowered the p_H of the specimen from 6.7 to 6.44.

Bacteriologic Studies on Water Specimens 3, 4 and 5.—These consisted of presumptive and confirmatory tests for Escherichia coli and total 37 C. bacterial counts (twenty-four hours) conducted according to a standard technic.[5] Presumptive tests for Escherichia coli in the untreated pooled specimen and in specimens 3 and 4 were positive, 40, 25 and 30 per cent gas formation being observed after twenty-four hours in the lactose fermentation tubes inoculated with 0.1 cc. of the respective specimens. Positive evidence of the presence of Escherichia coli in this portion of the three specimens was shown on confirmed and completed tests. The bacteria were so numerous that it was not possible to count the number of colonies developing after twenty-four hours at 37 C. on plates inoculated with 1 cc. of the three specimens. This would suggest that the sodium carbonate-aluminum sulfate-activated carbon treatment had failed to decrease the concentration of Escherichia coli. However, 37 C. bacterial counts on dilutions of this specimen were not made and a considerable decrease in bacterial count could have occurred without being apparent in the test of the undiluted water.

No bacterial growth was obtained in lactose tubes or on plates inoculated with water specimen 5, indicating that the bacteria had been destroyed by the chlorination procedure.

No bacterial studies of water specimens 1 and 2 were made at the time they were prepared and consumed. However, in order to obtain information concerning the effect on bacteria of treatment similar to that of water specimen 2, a portion of the untreated pooled specimen was treated with 2.5 parts per million of chlorine. After thirty minutes' contact, the chlorine residual was found to be 0.74 part per million. The presumptive test on this specimen was positive, the lactose tube inoculated with 0.1 cc. showing 60 per cent gas formation after twenty-four hours. However, the confirmatory test for Escherichia coli was negative, and the 37 C. count showed only four colonies per cubic centimeter of the undiluted specimen. No colonies developed on the plate inoculated with 1 cc. of a 1 to 10 dilution of the specimen. This specimen differed from water specimen 2 in that the former was inoculated with 2 cc. of a suspension of Escherichia coli in addition to the feces suspension and then was allowed to stand for twenty-four hours. The difference in thirty minute chlorine residuals in this and water specimen 2, 0.74 part per million and 1.08 parts per million respectively, probably was due to the development of a greater chloride demand with standing. The findings that the treatment of this specimen with 2.5 parts per million of chlorine apparently destroyed the Escherichia coli organisms and greatly reduced the bacterial count indicate the probable effect of this treatment on the bacteria in water specimen 2.

METHODS

The only known method of determining the presence of the hepatitis agent in a given material is by demonstrating the ability of that material to produce hepatitis in human volunteers. Thus the effect on the hepatitis agent of the water treatment was estimated by comparing the incidence, incubation periods and severity of hepatitis following the ingestion of the treated water by volunteers with the same factors following the ingestion of untreated water by other volunteers (controls).

Volunteers.—The volunteers selected as subjects for these experiments were all under 33 years of age. They had no previous history of jaundice and no evidence of liver dysfunction detectable by history, physical examination and liver function tests.

4. The amounts of sodium carbonate and aluminum sulfate required for satisfactory coagulation of the water were determined by tests on the untreated pooled specimen.

5. American Public Health Association: Standard Methods of Water and Sewage Analysis.

Inoculation of Volunteers.—The various water specimens were administered to groups of volunteers as follows:

1. EXPERIMENT A.—Forty minutes after the chlorine solution had been added, 400 cc. of water specimen 2 was ingested by each of 5 healthy male volunteers (group II). At the same time 400 cc. of water specimen 1 (untreated) was ingested by each of 5 other healthy male volunteers (group I). During a period of thirty-six hours a total of 3,600 cc. of the appropriate water was ingested, under supervision, by each subject.

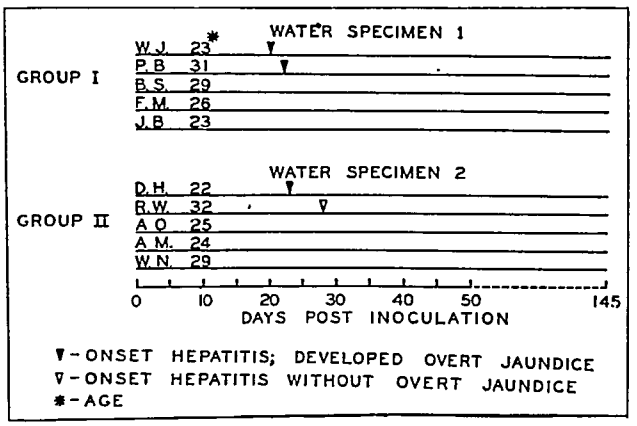


Chart 1.—Incidence and time of onset of hepatitis in volunteers after ingestion of water specimens.

2. EXPERIMENT B.—Twenty-eight hours after its preparation and four hours after it was strained, 400 cc. of water specimen 3 was ingested by each of 5 male volunteers (group III). Thirty-two hours after its preparation and fifteen minutes after it had been completely dechlorinated, 400 cc. of water specimen 5 was ingested by each of 5 male volunteers (group V). During a period of twenty-four hours, each of the volunteers in groups III and V ingested, under supervision, a total of 2,900 cc. and 2,800 cc. respectively of the appropriate water.

3. EXPERIMENT C.—Twenty-nine hours after its preparation and two hours after sedimentation following the addition of the sodium carbonate-aluminum sulfate-activated carbon mixture, 400 cc. of water specimen 4 (strained supernatant) was ingested by each of 5 male volunteers (group IV). During a period of twenty-four hours the men of group IV ingested a total of 2,725 cc. of water specimen 4. Group III served as the control group for both groups IV and V.

Isolation of Volunteers.—The various groups of volunteers were isolated from one another, and from other persons, during and after the period of inoculation; however, the members of each group were not isolated from one another. The groups were confined to separate quarters and had separate dining rooms, eating utensils and toilet facilities. No articles were exchanged between the groups.

Detection of Hepatitis.—Each subject was studied at frequent intervals by means of the group of liver function tests described elsewhere.[6] These studies had been conducted at frequent intervals during a three to six week preinoculation period in order to establish, as far as possible, the physiologic variation in the response of each person to each of these tests. After inoculation, all subjects were observed closely for symptoms and signs of any illness and the liver function tests were performed two or more times weekly. Temperatures were taken twice daily.

6. Neefe, J. R.; Stokes, J. Jr.; Reinhold, J. G., and Lukens, F. D. W.: Hepatitis Due to Injection of Homologous Blood Products in Human Volunteers, J. Clin. Investigation **23**: 836 (Sept.) 1944.

RESULTS.

Effect of Chlorination (Experiment A).—As shown in chart 1, 2 of the 5 controls (group I) who ingested 3,600 cc. of water specimen 1 (untreated) developed infectious hepatitis[7] during the 4th week after inoculation. During the same period 2 of the 5 men (group II) who ingested 3,600 cc. of water specimen 2 (chlorinated) also developed infectious hepatitis. Three of the 4 men who contracted hepatitis had moderately severe jaundice. The 4th (R. W.), who had received chlorinated water, did not develop overt jaundice, but the occurrence of typical symptoms and elevation of temperature to 102 F., strongly positive tests for bilirubin in the urine, 43 per cent retention of sulfobromophthalein after forty-five minutes, a 4 plus cephalin flocculation reaction and a significant decrease in the concentration of esterified serum cholesterol confirmed the diagnosis of hepatitis in this case. Subject D. H. (chlorinated water) had slight elevations of temperature and mild symptoms of malaise, anorexia and abdominal discomfort periodically after the 8th postinoculation day. On the 23d day acute symptoms and signs of the infection suddenly developed. These included a chill, an oral temperature of 104 F., a scarlatiniform rash, abdominal pain, anorexia, nausea and vomiting. By the 27th day he was obviously jaundiced. It is of interest that the earliest, and subsequently the most severe, manifestations occurred in this volunteer who had received the chlorinated water.

Effect of Superchlorination (Experiment B).—Four of the 5 controls (group III) who ingested 2,900 cc. of water specimen 3 (untreated except for straining) developed moderately severe infectious hepatitis after incubation periods of 19, 19, 19 and 22 days (chart 2). All of these 4 men developed overt jaundice. The highest total bilirubin concentration in each was 6.3, 7.2, 9.3 and 10.2 mg. per hundred cubic centimeters of serum. All had moderate to pronounced liver tenderness during the active disease. The 5th man in this group has shown no clinical or laboratory manifestations of hepatitis during the 80 days which have elapsed since ingestion of the water.

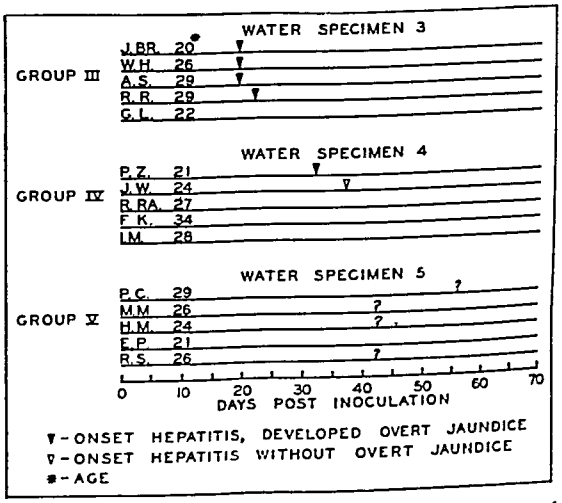


Chart 2.—Incidence and time of onset of hepatitis in volunteers after ingestion of water specimens.

7. The diagnosis of infectious hepatitis was based on the occurrence of typical symptoms and signs of the disease in association with typical changes in the responses to the various liver function tests.

None of the 5 men (group V) who ingested 2,800 cc. of water specimen 5 (superchlorinated, then dechlorinated) have had symptoms or physical signs of any illness during the 80 days which have elapsed.

However, serums obtained from subject H. M. on the 42d, 49th, 52d, 53d, 57th, 64th and 67th days gave cephalin cholesterol flocculation reactions of 2+/3+,[8] 1+/2+, ±/2+, 2+/2+, ±/2+, 2+/3+ and 2+/3+ respectively. Six tests performed on different days during a three week preinoculation period gave readings of 0/±, 0/0, 0/1+, 0/0, 0/0 and 0/0 respectively. During the postinoculation period all the other liver function tests performed in association with the cephalin tests gave normal results.

Serums obtained from subject M. M. on the 42d, 49th, 59th and 67th days gave cephalin cholesterol flocculation readings of 0/1+, 0/1+, ±/3+ and 1+/2+ respectively. Twenty tests performed on different days prior to the 42d day had given negative readings at both twenty-four and forty-eight hours. On the 56th day the serum esterified cholesterol constituted 39 per cent of the total cholesterol. With several previous determinations the esterified fraction had constituted 57 to 68 per cent of the total cholesterol. The other tests of liver function have shown no abnormalities during the eighty days which have elapsed.

Serums obtained from subject R. S. on the 42d, 59th and 67th days gave cephalin flocculation readings of 0/1+, 0/1+ and 1+/2+ respectively. Many previous cephalin tests had shown no flocculation. The other tests of liver function showed no abnormalities during the postinoculation period.

Serum obtained from subject P. C. on the 56th day gave a cephalin cholesterol flocculation reading of 2+ at forty-eight hours. All previous and subsequent cephalin tests were negative. The other tests of liver function revealed no abnormalities during the postinoculation period.

Subject E. P. has shown no clinical or laboratory manifestations of any illness during the eighty days which have elapsed to date.

Effect of Coagulation-Adsorption (Experiment C).—Two of the 5 men (group IV) who received 2,725 cc. of water specimen 4 (treated with sodium carbonate, aluminum sulfate and activated carbon) developed mild infectious hepatitis after incubation periods of thirty-three and thirty-seven days (chart 2).

Mild symptoms and fever appeared in subject P. Z. on the 33d day, but the diagnosis of hepatitis could not be established until the 41st day, when bilirubinuria, sulfobromophthalein retention and cephalin cholesterol flocculation simultaneously appeared. Although his total serum bilirubin concentration never exceeded 1.9 mg. per cubic centimeter, the other tests of hepatic function revealed the presence of considerable hepatic disturbance as indicated by (*a*) bilirubinuria 4+, (*b*) sulfobromophthalein retention 42 per cent at forty-five minutes, (*c*) cephalin cholesterol flocculation 4+, (*d*) serum colloidol gold reaction 4+, (*e*) thymol turbidity test 10 units, (*f*) serum esterified cholesterol 36 mg. per hundred cubic centimeters (15 per cent of total). Faint scleral icterus was observed for a few days, but no tenderness or enlargement of the liver was detected at any time. The only significant gastrointestinal symptom was anorexia. Nausea and vomiting did not occur. The most prominent symptoms were malaise and headache associated with mild pain in the eyeballs on movement. At the onset, his temperature reached 103 F. (oral), but it returned to normal within thirty-six hours and remained normal thereafter.

The symptoms and signs in subject J. W. were even less pronounced that those of P. Z. On the 37th day he developed slight malaise, anorexia, vague abdominal discomfort, slight headache, mild diarrhea and an elevation of temperature to 100 F. (oral). The headache, fever and diarrhea persisted only twenty-four hours, but the malaise, anorexia and vague abdominal discomfort lasted for approximately ten days. No abnormal physical findings were detected at any time. During the illness, the cephalin cholesterol flocculation test gave responses varying from 1 to 3+ (previously always negative), the thymol turbidity test gave a reading of 3 units (highest previous reading was 1.5 units) and the concentration of esterified serum cholesterol decreased to 29 per cent of the total cholesterol (previously 53 to 63 per cent of the total). The other tests of liver function showed no significant abnormalities.

No significant clinical or laboratory abnormalities have been observed in the other 3 men of this group during the eighty days which have elapsed.

8. 2+/3+ signifies the twenty four and forty-eight hour readings respectively.

COMMENT

In experiment A no significant differences in incidence, incubation period or severity of the disease were observed between the groups receiving the untreated and the chlorinated water. The results indicate, therefore, that this causative agent of infectious hepatitis was not inactivated or attenuated by a forty minute period of contact with sufficient chlorine to provide a residual chlorine concentration of 1 part per million after thirty minutes' contact. Thus this technic for emergency disinfection of drinking water does not assure protection against the agent of infectious hepatitis.

The results in group V (experiment B) indicate that superchlorination resulted in a definite attenuation of the hepatitis agent. None of the men ingesting the superchlorinated water have had symptoms or physical signs of any illness. However, between the 42d and 67th days after inoculation, positive cephalin cholesterol flocculation tests were obtained with serums from 4 of the 5 men. The significance of the positive tests under these conditions is most uncertain. Positive tests were not obtained with normal serums tested simultaneously, and no change was made in the technic of performing the test during this period. Thus the possibility that the positive tests in these men were due to subclinical hepatic disturbances, produced by an attenuated hepatitis agent, cannot be excluded. For this reason the results of this experiment do not permit the conclusion that the hepatitis agent was inactivated completely by superchlorination. However, the results do warrant the conclusion that the hepatitis agent, at the least, was much attenuated by superchlorination.

The results in group IV (experiment C) indicate that the hepatitis agent was not completely removed or inactivated by treatment of the contaminated water with sodium carbonate, aluminum sulfate and activated carbon. However, the incidence of hepatitis was lower, the incubation periods were longer and the disease was much less severe than in the control group (group III). Although the groups were too small for these differences to be conclusive, the differences were consistent. The results suggest, therefore, that the treatment procedure may have resulted in either or both a decrease in concentration and a decrease in virulence of the hepatitis agent. Previous studies [2] have afforded some evidence that a decrease in the amount of orally administered hepatitis agent does not necessarily influence the severity of the disease but may result in a prolonga-

tion of the incubation period. Thus the mildness of the disease in the men of group IV may have been due to an attenuating effect of this treatment procedure on the hepatitis agent.

The results of these studies suggest that the control of the hepatitis agent in contaminated water may require modification of certain methods commonly used for water disinfection. They also suggest that the methods used may affect the concentration and the virulence of the hepatitis agent. These effects may result in modification of the incubation period and the severity of the disease. The possible prolongation of the incubation period should be borne in mind in the interpretation of epidemiologic data. It also is possible that the ratio of icteric to nonicteric cases in epidemics due to water borne agents may be influenced by the treatment to which the water has been subjected.

SUMMARY

Three experiments (A, B and C) were conducted on the disinfection of water containing the causative agent of infectious hepatitis. In experiment A, 2 equal volumes of distilled water were contaminated with feces known to contain the causative agent of infectious (epidemic) hepatitis. One specimen (water specimen 2) was treated with sufficient chlorine to provide a chlorine residual of 1 part per million after thirty minutes' contact. The other specimen (water specimen 1) was not subjected to further treatment. Two of the 5 volunteers (control group) who ingested 3,600 cc. of the untreated water developed infectious hepatitis after incubation periods of twenty-one and twenty-three days. Two of the 5 volunteers who ingested 3,600 cc. of the chlorinated water developed infectious hepatitis, 1 with and 1 without overt jaundice, after incubation periods of twenty-three and twenty-eight days respectively.

The results of experiment A led to experiments B and C. Three equal volumes of distilled water were contaminated with feces containing the hepatitis agent as in experiment A. The only treatment of 1 specimen (water specimen 3) consisted in straining it through a gauze and cotton "filter." Another specimen (water specimen 5) after similar straining was treated with sufficient chlorine to reach the chlorine "breakpoint" and provide a chlorine residual of 15 parts per million after thirty minutes' contact (superchlorination). The remaining specimen (water specimen 4) was treated with sodium carbonate, aluminum sulfate and activated carbon; after settling, the supernatant was strained through gauze and cotton. Four of the 5 volunteers (control group) who ingested 2,900 cc. of water specimen 3 (untreated except for straining) developed moderately severe infectious hepatitis with overt jaundice after incubation periods of nineteen, nineteen, nineteen and twenty-two days. None of the 5 men ingesting 2,800 cc. of water specimen 5 (superchlorinated) have developed clinical symptoms or physical signs of hepatitis during the eighty days which have elapsed. However, 4 of the 5 men developed positive cephalin cholesterol flocculation tests between the 42d and 67th days after their inoculation. One of these 4 also showed a decrease in the concentration of esterified serum cholesterol. Other liver function tests revealed no other evidences of hepatic dysfunction at any time. Two of the 5 men who ingested 2,725 cc. of water specimen 4 developed mild infectious hepatitis, 1 with scleral jaundice and 1 without overt jaundice, after incubation periods of thirty-three and thirty-seven days respectively.

CONCLUSIONS

1. Treatment of contaminated water with sufficient chlorine to provide a chlorine residual of 1 part per million after thirty minutes' contact did not inactivate or attenuate the causative agent of infectious hepatitis.

2. Treatment of contaminated water with sufficient chlorine to provide a residual chlorine concentration of 15 parts per million after a thirty minute contact period resulted in a definite attenuation of the hepatitis agent.

3. Treatment of contaminated water with sodium carbonate, aluminum sulfate and activated carbon did not completely remove or inactivate the hepatitis agent. However, the treatment may have resulted in a decrease in concentration and possibly some decrease in virulence of this agent.

4. The concentration and/or virulence of the hepatitis agent in water may be so affected by these treatment procedures as to result in some modification of the disease produced. The available evidence suggests that a decrease in either or both concentration and virulence may be associated with a prolongation of the incubation period. A decrease in virulence also may be associated with a decrease in the severity of the disease.

5. The complete inactivation of the causative agent of infectious hepatitis in drinking water may require further modifications of methods used for water disinfection.

TOXIC EFFECTS OF DIODOQUIN

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AND
ALAN LESLIE, M.D.
NEW ORLEANS

According to previously published reports of cases of amebic dysentery treated with diodoquin, the use of this drug has not been accompanied by any toxic or disagreeable symptoms. Craig,[1] in recommending the use of diodoquin for the prophylaxis of amebiasis, stated that ". . . *diodoquin is not accompanied* by any disagreeable symptoms, even when administered in large doses over a longer period of time." Silverman[2] reported 25 cases of acute and chronic amebic colitis and observed no toxic effects after a high dosage of twelve tablets a day. Hummel[3] treated 20 patients with nine tablets a day for twenty days without observing any evidence of toxicity. D'Antoni[4] made no mention of drug reaction in 84 cases of amebiasis treated with diodoquin. Bercovitz[5] in his recent textbook, referring to diodoquin, states that "the drug is nontoxic and nonirritating to the bowel mucosa." In view of such statements made by competent workers the following manufacturer's advertisement claim does not seem extravagant. In the G. D. Searle & Co. advertisement

From the Gastro-Intestinal Department, Touro Infirmary.

1. Craig, C. F.: The Medicinal Prophylaxis of Amebiasis, Am. J. Trop. Med. **20**: 799 (Nov.) 1940.

2. Silverman, D. N.: The Treatment of Amebic Colitis with Diodohydroxyquinoline (Diodoquin), Am. J. Digest. Dis. **4**: 281 (July) 1937.

3. Hummel, H. G.: A Critical Appraisal of the Newer Amebicides and the Results of Treatment of Amebiasis with Di Iodo-Hydroxyquinoline (Diodoquin), Am. J. Digest. Dis. **6**: 27 (March) 1939.

4. D'Antoni, J. S.: Further Observations on Amebic and Bacillary Colitis in the New Orleans Area, Am. J. Trop. Med. **23**: 237 (March) 1943.

5. Bercovitz, Z. T.: Clinical Tropical Medicine, New York, Paul B. Hoeber, Inc., 1944, p. 25.

appearing on page 9 of the advertisement section of the June 17, 1944 issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION this statement is made: "Whenever amebiasis is suspected, the high iodine amebicide . . . DIODOQUIN (5, 7-diiodo-8-hydroxyquinoline) . . . can be used without fear of untoward effects—its toxicity is negligible. . . . May be given in large doses over prolonged periods." In order to correct any misapprehension as to the absence of toxicity of this drug, without attempting to controvert its therapeutic efficacy, we believe that it is important to present 3 cases of toxic reactions following the administration of diodoquin, especially since these hitherto incontestable claims of freedom from toxicity have been made in THE JOURNAL, a medium widely circulated to the medical profession.

REPORT OF CASES

CASE 1.—P. F., a white man aged 52, admitted to the hospital with a six month history of bowel disturbance and with motile amebas in the stool, was given simultaneous emetine hydrochloride and diodoquin therapy, the former drug being administered intramuscularly in a dose of 30 mg. (½ grain) daily for five days only. Diodoquin was administered for nineteen days in a dosage of four tablets of 0.2 Gm. (3.2 grains) each three times a day. Shortly after chemotherapy was commenced the patient became asymptomatic. Eight days after discontinuation of the diodoquin, examination of the saline purged stool failed to reveal the presence of amebas. Twelve days later a furuncle appeared over the left temporal region. This furuncle ruptured spontaneously. Two months after the drug was stopped the patient returned with a recent history of two episodes of chills and fever and right upper quadrant distress. With a presumptive diagnosis of amebic hepatitis, and pending admission to the hospital, diodoquin was again prescribed in the same dosage as previously. Three days later a furuncle appeared over the left anterior superior iliac spine. This was incised and drained. The diodoquin was immediately discontinued, but two more furuncles, which ruptured spontaneously, made their appearance. Carbarsone was substituted for the diodoquin, and the emetine hydrochloride, which was started on admission to the hospital, was continued. Diarrhea which appeared was attributed to the carbarsone. This drug was discontinued, and the diarrhea subsided. At the time of discharge from the hospital the patient was asymptomatic. No amebas were seen in the saline purged stool, but it was thought that too little time had elapsed since the discontinuation of chemotherapy to warrant a definite statement as to the status of the patient.

CASE 2.—O. B. C., a white man aged 42, a pipefitter, had a history of "bowel trouble" of twenty years' duration. Stool examination revealed the presence of trophozoites of Ameba histolytica. Emetine hydrochloride and diodoquin therapy, as outlined in the first case, was instituted. The former was administered daily for four days. After eight days of diodoquin therapy the patient developed a severe generalized furunculosis necessitating multiple incisions and drainage. Although the drug was discontinued at once, the furunculosis persisted for a considerable time. Examination of the saline purged stool six months after therapy was discontinued failed to reveal the presence of amebas. The patient became asymptomatic, so despite the toxicoderma and short therapeutic course it is believed that a cure was obtained.

CASE 3.—M. R., a white woman aged 51, Spanish born, with amebic infection of the bowel, proved by feces examination, received twelve tablets of diodoquin daily for twenty-three days. The day after discontinuation of the drug the patient complained of sore throat and chilly sensations. A fine skin rash appeared; this rapidly developed into a blotchy erythema involving the entire body. The patient was readmitted to the hospital one week after completing the course of diodoquin. The temperature, which ranged up to 101.6 F. (oral), subsided after seven days of expectant treatment. Laboratory studies including blood culture showed no significant abnormality. The process subsided and the patient was discharged ten days after admission. One year later she was well and free from amebas.

COMMENT

In the first case no furuncles were observed except in association with diodoquin therapy, so it is reasonable to infer that a cause and effect relationship existed. Although the action of diodoquin is in the main topical, it is apparent that at least in certain inidviduals a sufficient degree of absorption takes place to result in what purported to be an iodine toxicoderma. This patient demonstrated a hypersensitivity not only to the iodine contained in diodoquin but to the arsenic contained in carbarsone and typifies the sort of drug sensitive individual not infrequently encountered. In the second case the role of diodoquin in the etiology of the furunculosis was so obvious as to leave little room for question. Of interest in this case was the apparently high iodine absorption and retention with delayed excretion from a preparation which is generally considered to be absorbed slightly or not at all. The type of reaction in the third case differed from those in the first two presented in that there was a systemic as well as a cutaneous toxicity exhibited and that the skin reaction was erythematous rather than pustular. We believe, however, that in this as well as the other cases idiosyncrasy to the iodine contained in the drug was the basis for the toxic manifestations.

The reason for the difference between the experience of other observers, as well as the early experience of one of us (D. N. S.), and the recent observations reported herein is not entirely clear. The dose originally recommended was one or two tablets of diodoquin three times daily. It was observed by Silverman that a larger dosage of the drug was required for maximum results. A dosage of three or four tablets three times a day was found to be effective in the eradication of amebas when the smaller dosage was not; this with no apparent introduction of toxic effects on the host. The element of statistical chance may account for the difference in question, for although the 3 cases were observed within a period of less than a year the overall incidence of toxic reactions is low. This report does not in any way attempt to negate the claims for the therapeutic efficacy of the drug in the treatment of amebiasis, since we as well as many others have used the drug with considerable success. It is, however, the desire to call attention to the possibility of symptoms of drug poisoning appearing during the treatment of amebiasis with diodoquin.

1521 Delachaise Street.

Development and Use of Cocaine.—The development and use of cocaine as a local anesthetic agent was chiefly the work of Carl Koller. When Koller was house surgeon at the Vienna General Hospital, his friend Sigmund Freud was studying the possibility of curing patients addicted to morphine by treating them with cocaine. Both Koller and Freud studied the physiologic aspects of cocaine. Freud turned his attention away from these investigations. Koller, however, continued his studies. He injected a weak solution of cocaine into the eye of a frog and noticed that the eye became insensitive to pain. On Sept. 15, 1884 Koller reported his observations to the Ophthalmological Congress held in Heidelberg. Soon afterward cocainization of the eye for the production of local anesthesia was generally adopted.—Keys, Thomas E.: The History of Surgical Anesthesia, New York, Schuman's, 1945.

LOEFFLER'S SYNDROME ASSOCIATED WITH CREEPING ERUPTION (CUTANEOUS HELMINTHIASIS)

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We have had the opportunity of observing 9 cases of creeping eruption in the dermatology wards and clinics of the Army Service Forces Regional Hospital, Camp Blanding, Florida, that have developed transient pulmonary infiltration during the course of their infection. A preliminary report of these observations is indicated since (*a*) standard textbooks [1] lead one to believe that this nematodal infection (usually Ancylostome braziliense) is a localized intradermal invasion; (*b*) a review of the available literature does not reveal a report of associated pulmonary involvement; (*c*) the clinical course, laboratory and x-ray findings are similar to the migratory pulmonary infiltrations with eosinophilia reported by Loeffler and others.[2]

The dermatologic manifestation of creeping eruption is an accepted clinical entity adequately described in standard textbooks. Kirby-Smith [3] suggested the nematodal origin of these lesions. The larvae wandering through the layers of the skin produce the serpiginous, elevated reddish tunnels that are characteristic of the disease. Dove and White [4] proved that the filariform larvae of Ancylostoma braziliense produce these lesions. The dog and cat are natural hosts for these nematodes and inoculate the soil with their feces. The filariform larvae remain viable for long periods in soil that is moist, sandy and shady, awaiting an opportunity for contact with the human skin.

During the past twelve months 26 cases of creeping eruption with classic cutaneous manifestations have been seen. Fifteen of these cases were observed for a period of fourteen days or more. Nine of these 15 cases during their period of observation demonstrated transient migratory, pulmonary infiltration, peripheral eosinophilia and paucity of clinical signs or symptoms of systemic disease, fulfilling the criteria of Loeffler's syndrome. In this series chest roentgenograms were made every three days for at least fourteen days. Our experience corroborates Loeffler's original observation that serial x-rays are necessary to detect the transient migratory pulmonary infiltration.

These 9 cases were afebrile during the entire period of observation. Physical findings were minimal. Slightly decreased resonance, roughened breath sounds and insignificant increase in the respiratory rate were the only positive findings. Rales were not heard at any time. Except for local skin irritation and a mild cough that occurred in only 4, these patients were not aware of any illness.

Differential counts on peripheral blood smears revealed an eosinophilia varying from 1 per cent to 32 per cent. The degree of eosinophilia roughly approximated the extent of the skin and pulmonary lesions and tended to persist after these lesions had subsided.

Roentgen examination of the chest revealed a patchy infiltration, transient and often migratory in nature, usually not appearing before the seventh day of the skin invasion. When erroneous diagnosis or procrastination in therapy of the local skin lesions occurred, the pulmonary infiltration continued a migratory course over a period of weeks.

Vital capacity studies performed in 5 cases on several occasions failed to reveal any diminution, though chest x-rays were positive at the time. This fact, together with lack of dyspnea and/or cyanosis, tends to support the contention that the infiltrative process is an interstitial one rather than a true alveolar exudative or atelectatic consolidation.

Sedimentation rates by the Wintrobe method repeated every three days on 5 of the 9 patients with pulmonary infiltration were within normal limits except in 2 cases complicated by secondary infection and cellulitis about the cutaneous lesions. The rate in these 2 cases returned to normal as soon as the secondary infection

TABLE 1.—*Observations in Case 1*

Day of Disease	Date	Blood Eosinophilia, %	Sputum Eosinophilia, %	X-Ray of Chest, Site of Infiltration	60 Minute Sedimentation Rate, Mm.
1	8/ 2/43	6	..	.....	..
8	8/ 9/43	..	..	Patchy, bilateral, central hilar	..
11	8/11/43	15	..	.....	20
13	8/13/43	..	..	Patchy, bilateral, decrease.....	..
15	8/15/43	23	— 0	Negative.....	..
17	8/17/43	..	..	.....	40
20	8/20/43	2	..	.....	..
21	8/21/43	..	35	.....	..
23	8/23/43	26	..	Patchy, bilateral, minimal.....	29
24	8/24/43	..	75	.....	..
25	8/25/43	..	90	.....	..
26	8/26/43	..	90	Patchy, bilateral, minimal.....	38
28	8/28/43	..	90	.....	..
30	8/30/43	19	80	.....	..
31	8/31/43	..	80	Residual infiltration remains patchy, bilateral	31
32	9/ 1/43	..	90	.....	..
34	9/ 3/43	..	..	.....	24
35	9/ 4/43	20	70	.....	..
37	9/ 6/43	21	70	Negative.....	8
41	9/10/43	13	65	.....	20
44	9/13/43	13	90	Negative.....	21
47	9/16/43	6	..	.....	4
51	9/20/43	10	..	.....	8
54	9/24/43	8	..	.....	11
57	9/27/43	7	..	.....	4
60	9/30/43	..	..	.....	12
64	10/ 4/43	1	..	.....	1
68	10/ 8/43	7	..	.....	6

Patient admitted Aug. 2, 1943 with diagnosis of trichophytosis pedis, secondary cellulitis, bilateral, severe. On eighth hospital day the diagnosis of creeping eruption was made.

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4. White, G. F., and Dove, W. E.: The Causation of Creeping Eruption, J. A. M. A. **90**: 1701 (May 26) 1928. Kirby-Smith, J. L.; Dove, W. E., and White, G. F.: Some Observations on Creeping Eruption, Am. J. Trop. Med. **9**: 179 (May) 1929. Dove, W. E.: Further Studies on Ancylostoma Braziliense and the Etiology of Creeping Eruption, Am. J. Hyg. **15**: 664 (May) 1932.

subsided despite persistence of the pulmonary infiltration.

By persistent effort 8 patients produced 39 sputum specimens at some time during their illness. Eosinophil counts on these specimens varied from 2 per cent to 90 per cent.

TABLE 2.—*Observations in Case 2*

Day of Disease	Date	Blood Eosinophilia, %	Sputum Eosinophilia, %	X-Ray of Chest. Site of Infiltration	60 Minute Sedimentation Rate, Mm.
14	6/28/44	— 0	..	L. L. L., R. U. L.....	10
18	8/ 2/44	3	— 0	L. L. L. (—), R. U. L...	1
21	7/ 5/44	1	10	L. L. L.....	6
24	7/ 8/44	18	20	L. L. L. reduction.....	15
27	7/11/44	19	..	L. L. L. reduction.....	14
30	7/14/44	26	..	L. L. L. reduction.....	13
33	7/17/44	16	35	L. L. L., R. U. L.....	5
36	7/20/44	30	25	R. U. L., R. L. L.....	10
39	7/23/44	32	20	R. M. L.....	9
42	7/26/44	30	25	R. M. L. reduction.....	..
45	7/29/44	38	10	R. M. L. residual.....	6
50	8/ 3/44	31	80	Negative.....	9
53	8/ 6/44	23	..	Negative.....	4

Patient admitted with painful, itchy, weeping, secondarily infected serpiginous dermatitis typical of creeping eruption over buttocks. Lesions present fourteen days prior to admission. Mild cough developed day after admission.

Examination of 81 stool specimens from the 26 patients encompassing periods of observation from ten days to three months failed to reveal presence of ova or parasites in any specimen. This corroborates the findings of Smith, Dove and White and others that intestinal infestation by this nematode in the human being is rare.

Brunner [5] found in immunologic studies of human parasitic infections that Ascaris extract is representative of the nematode group. He also proved that intradermal testing with extracts of nematodal parasites had a practical value as a diagnostic aid in that positive reactions were indicative of past or present infestation. Because of these findings, Ascaris and Trichina extracts standardized for nitrogen content were used for intradermal testing in all cases. Positive results were obtained with at least one of these extracts in 23 of the 26 cases varying from 1 to 4 plus. No correlation between degree of skin test sensitivity and clinical findings was observed. Similarly no specificity as to reaction with Ascaris or Trichina extracts was noted.

TABLE 3.—*Observations in Case 3*

Day of Disease	Date	Blood Eosinophilia, %	Sputum Eosinophilia, %	X-Ray of Chest. Site of Infiltration	60 Minute Sedimentation Rate, Mm.
21	6/22/44	13	..	Negative.....	..
26	6/27/44	..	..	Negative.....	..
28	6/29/44	..	..	Negative.....	..
32	7/ 3/44	..	..	R. U. L.....	..
36	7/ 7/44	9	..	Negative.....	..
39	7/10/44	16	..	R. M. L., R. L. L.....	..
42	7/13/44	12	..	Negative.....	..
45	7/16/44	20	..	R. L. L.....	..
49	7/20/44	9	..	R. L. L.....	9
52	7/23/44	23	..	Negative.....	7

Patient admitted on twenty-first day of disease with creeping eruption burrows over glutei, bilateral and on anterior abdominal wall. No cough. No sputum.

The migratory character of the pulmonary infiltration and the eosinophil variation in blood and sputum are summarized in 4 typical cases in tables 1 through 4.

COMMENT

The cases herein reported fulfil the criteria of Loeffler's syndrome predicated on the triad of a transient and migratory pulmonary infiltration, paucity of symptoms and physical signs and peripheral eosinophilia.

Similar findings have been reported associated with tuberculosis,[6] Ascaris infection,[7] Trichinosis,[8] asthma,[9] Malta fever,[10] Endameba histolytica infection [11] and pollinosis.[12] Such a diversified list of etiologic factors lends credence to the view that Loeffler's syndrome is an allergic phenomenon.

Additional proof of an allergic basis for Loeffler's syndrome and helpful points in its differential diagnosis from inflammatory lesions of the lung are peripheral and sputal eosinophilia, normal sedimentation rate, normal leukocyte count, absence of fever and systemic manifestations, migrating pulmonary infiltration, normal vital capacity and positive skin reactions to nematode antigens in cases associated with helminthiasis.

TABLE 4.—*Observations in Case 3*

Day of Disease	Date	Blood Eosinophilia, %	Sputum Eosinophilia, %	X-Ray of Chest. Site of Infiltration	60 Minute Sedimentation Rate, Mm.
7	6/27/44	2	..	R. L. L., L. L. L.....	..
10	6/30/44	7	..	R. L. L., L. L. L.....	..
13	7/ 3/44	..	..	R. L. L., L. L. L.....	..
16	7/ 6/44	..	..	R. L. L. (—), L. L. L. (—)..	..
18	7/ 8/44	..	..	Negative.....	..
22	7/12/44	..	..	Hilar, R and L.....	..
25	7/15/44	13	..	Hilar, R and L (—).....	..
27	7/17/44	..	..	Negative.....	..
30	7/20/44	..	10	.....	..
34	7/24/44	..	..	Negative.....	..

Clinic patient, first seen on seventh day of disease. Chief complaints pruritus and secondary infection of serpiginous burrows on dorsal surfaces both hands. No cough. No appreciable sputum.

SUMMARY

1. Nine cases of cutaneous helminthiasis have been observed with clinical findings fulfilling the criteria of Loeffler's syndrome.

2. These cases present a hitherto unreported etiologic factor in the production of Loeffler's syndrome.

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MENTAL AND PERSONALITY DISORDERS IN SELECTIVE SERVICE REGISTRANTS

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The diagnosis of mental and personality disorders or serious potentialities for their development has resulted in the rejection of more Selective Service registrants than has any other defect. It must be understood that by mental and personality disorders is meant any variation in the emotional capacity of the individual to adjust to his situation which results in symptoms indicating, in this instance, the possibility of maladjustment to military life.[1] Among white registrants no other defects approach mental and personality disorders in importance as a cause for rejection, while for Negroes they are exceeded only by mental deficiency and syphilis. In addition, mental and personality disorders have accounted for more disability discharges from the armed forces than any other defects.

TABLE 1.—*Estimated Number of Registrants Aged 18-37 in Rejected Classes Because of Mental and Personality Disorders, Jan. 1, 1945* *

Race	Total Rejected	Rejected for Mental and Personality Disorders	
		Number	Per Cent of Total
All races	4,493,000	801,700	17.8
White †	3,621,000	708,000	19.6
Negro	872,000	93,700	10.7

* Includes those in class IV-F and also those transferred from class IV-F to the occupationally deferred classes, II-A(F), II B(F) and II C(F).
† Includes all races other than Negro.

The standards for the rejection or acceptance of men for military service have been the responsibility of the armed forces. Most of the rejections for mental and personality disorders have been made by psychiatrists at the armed forces' induction stations. However, the more serious cases such as those which have necessitated institutionalization have nearly always been rejected by Selective Service local board physicians; and during peacetime many of those with less serious mental and personality disorders were also rejected at local boards in accordance with the armed forces' physical standards.

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This report is based on sample studies of the results of examination recorded on DSS Forms 200, Reports of Physical Examination, for Selective Service registrants physically examined at local boards in peacetime, and DSS Forms 221, Reports of Physical Examination and Induction, for registrants examined at local boards and induction stations during wartime. Coverage of the sample studies varies from 10 to 25 per cent of the examinations.

1. Mental and educational deficiency are not included in this report. The major subdivisions of mental and personality disorders as used in this report were determined to a large extent by Medical Circular No. 1 revised by the Selective Service System May 19, 1941, which divided mental and personality disorders into five categories. They are (1) grave mental and personality disorders, such as schizophrenia (dementia precox), paranoia and their various manifestations, (2) major abnormalities of mood, such as abnormal fluctuations in mood and constant states of depression and elation, (3) psychopathic personality, including constitutional psychopathic inferiority characterized by the record of certain types of recurrent social, sexual or legal difficulties, (4) psychoneurosis, including hysteria, morbid anxiety, hypochondriasis and the so-called psychosomatic disorders such as gastrointestinal and cardiovascular disorders due primarily to mental and personality difficulties and (5) alcoholism and drug addiction, including psychoses due to these states.

NUMBER CURRENTLY REJECTED

On Jan. 1, 1945 an estimated 801,700, or 17.8 per cent of the 4,493,000 registrants aged 18-37 in the rejected classes, were so classified because of mental and personality disorders (table 1). This figure does not include the thousands of registrants rejected for such disorders at one time or another but who were later reexamined and either inducted into the armed forces or rejected for some reason other than mental and personality disorders. These defects accounted for a greater proportion of white registrants rejected than of Negroes.

More than 8 out of every 10 rejections for mental and personality disorders were due to psychoneurotic disorders or psychopathic personality. While most of the registrants rejected for these defects are not sufficiently incapacitated to prevent their following a useful vocation in civilian life, it was determined by Army and Navy medical examiners that military life would probably aggravate their condition. The remaining registrants who were rejected for mental and personality disorders had the more serious disorders or history of such conditions. It is estimated that approximately 30,000 of these had been rejected by local board physicians because of an obviously disqualifying mental or personality disorder. The basis for this disqualification was authentic information that the registrant had been under treatment or in an institution at one time or another.

REJECTION RATES FOR MENTAL AND PERSONALITY DISORDERS

Rejection rates for mental and personality disorders have increased with each successive year of Selective Service operations.[2] During 1940 and 1941 approximately 22 of every thousand registrants examined were rejected for this defect (table 2). In 1942 the rate increased to 50, in 1943 to 74 and in 1944 to 120 per thousand examined.

From November 1940 on, no appreciable changes have been made in the armed forces' actual standards for acceptance of men with mental and personality disorders as prescribed in Mobilization Regulations 1-9. However, with the gradual increase of psychiatrists on the staffs of armed forces' examining stations during wartime there was a stricter interpretation and application of the standards, which resulted in increased rejections for mental and personality disorders. In addition, three factors have operated to increase the rejection rate for mental and personality disorders. They are (1) changes in physical examination procedure, (2) lowering of standards in other defect categories and (3) actual increased nervous tension among the examined registrants as a result of the entry of the United States into the war and as the war progressed. These factors make it difficult to determine the effect of the changes in the ages of the examined registrants during each of the four years on the rejection rate for mental and personality disorders.[3]

The first two factors, which produced apparent but not real increases, were partially responsible for the

2. Additional data on rejection rates and the prevalence of mental and personality disorders are to be found in the following bulletins published by the Selective Service System: Medical Statistics Bulletin No. 1, Nov. 10, 1941, Medical Statistics Bulletin No. 2, Aug. 1, 1943 and Medical Statistics Bulletin No. 3, Nov. 1, 1944.

3. During 1940 and 1941 the majority of examined registrants were in the age group 21-35, in 1942 the age group was enlarged to 20-44; in 1943 and 1944 only registrants aged 18-37 were examined. During 1944, however, the average age of the examined registrants was lower than in 1943.

increase in the rate from 1940-1941 to 1942. During peacetime most of the registrants who were rejected were examined only by the general practitioner giving the local board examination, and comparatively few rejections were made for mental and personality disorders. Beginning in 1942 the local board physician gave only a screening examination, and most of the rejections were made after the induction station examination, which included an interview with a psychiatrist. The result was that the psychiatrist diagnosed many cases of mental and personality disorders which probably would have been missed by the general practitioner.

The second factor, the lowering of standards in other defect categories, operated with the first to produce an apparent increase in rejections for mental and personality disorders. Thus during peacetime tooth and eye standards were very high and tooth and eye defects were the leading causes for rejection. With the lowering of tooth and eye standards in 1942 the probability of being rejected for mental and personality disorders increased, since many registrants who would have been rejected for the more obvious tooth or eye defects also had mental and personality disorders of a disqualifying nature.

The third factor, increased nervous tension of registrants after the entry of the United States into the war, was partially responsible for the pronounced rise in the rejection rate for mental and personality disorders from 1942 through 1944. How much of the rise is due to this third factor is difficult to evaluate because of the changes in physical standards in other defect categories and the variations in the application and interpretation of the standards for mental and personality disorders. As the war progressed there was also the possibility that within the extremely limited time allotted for the psychiatric interview and the increasing efforts of the armed forces to maintain at a minimum discharges for psychiatric reasons, some psychiatrists may have been overcautious in excluding borderline cases from the armed forces.

For both races, rejection rates for mental and personality disorders increased with each succeeding year; the rate for Negroes increased more rapidly than for white registrants. In 1940-1941 and 1942 the Negro rates were 40 per cent and 60 per cent as great as the white rates. In 1943 and 1944 the rates for the two races were approximately equal. This greater increase for Negroes is mainly attributable to the fact that beginning in 1943 a greater proportion of Negroes were examined by psychiatrists than in 1942, as a result of the relaxed venereal standards.[4]

MAJOR SUBGROUPS OF MENTAL AND PERSONALITY DISORDERS

This section deals with the occurrence of the major subgroups of mental and personality disorders among all examined registrants whether or not they were rejected and as causes for rejection among rejected registrants only. The prevalence data afford a more nearly complete picture of the disorders than data on causes for rejection, since (1) in some cases registrants with mild mental or personality disorders such as transient psychoneurosis because of anxiety over the outcome of the examination were found acceptable for service if otherwise physically fit and (2) some registrants with both physical defects and mental and personality disorders were rejected primarily for physical defects and hence would not be counted in the rejections.[5]

During 1940 and 1941 approximately 26 out of every thousand white registrants examined were recorded as having some form of mental or personality disorder, while for Negroes the defect was found one third as often (table 3). Psychoneurotic disorders were the most frequent type of disorder recorded for both races —the bases for more than half of these diagnoses were functional disorders of expressive movements (tics, stammering, stuttering) and neurocirculatory asthenia. The prevalence rate for this defect among white registrants was more than four times that for Negroes. Psychopathic personality was next in order of importance, but the white rate was only twice the Negro rate.

TABLE 2.—*Estimated Rejection Rates for Mental and Personality Disorders by Race, 1940-1944* *

Year	All Races	White †	Negro
1940-1941	22.3	24.5	9.9
1942	49.6	52.4	32.4
1943	73.7	73.8	73.0
1944	120.2	119.3	126.7

* Rate per thousand examined.
† Includes all races other than Negro.

TABLE 3.—*Prevalence of Mental and Personality Disorders and Percentage Distribution of Rejections for These Defects Among Registrants Physically Examined at Local Boards, 1940-1941* *

Major Subgroup	Prevalence per 1,000 Examined			Per Cent Distribution of Rejections		
	All Races	White †	Negro	All Races	White †	Negro
Total	23.7	25.7	7.8	100.0	100.0	100.0
Grave mental or personality disorders	1.6	1.8	0.5	13.5	13.6	11.6
Major abnormalities of mood	0.6	0.6	0.2	3.1	3.1	1.9
Psychopathic personality	2.7	2.8	1.7	11.2	10.9	19.2
[illegible]	14.9	16.3	3.7	49.2	49.8	34.6
[illegible] diction	1.5	1.6	0.7	5.9	5.7	9.6
M[illegible]	2.4	2.6	1.0	17.1	16.9	23.1

* Corresponding data for induction stations are not available for the period 1940-1941.
† Includes all races other than Negro.

Studies made on obvious defects indicate that slightly less than one half of those diagnosed as having grave mental or personality disorders had been treated in hospitals for the mentally ill. In other words, the basis for the diagnoses in many of those "obvious" cases was an affidavit from a physician or a mental hospital.

Statements of institutional treatment for unspecified mental conditions and indefinite descriptions of mental or personality disorders are included in the subdivision "Mental and Personality Disorders Not Classifiable Elsewhere." More than one half of those so classified had "obvious" defects and in all likelihood had either a manic-depressive psychosis or schizophrenia or a history of one of these conditions.

The importance of the various subgroups as causes for rejection at local boards as shown in table 3 reveals that almost one half of the rejections were due to psychoneurotic disorders; the next largest groups were

4. In 1942 syphilis was the leading cause for rejection among Negroes, and the great majority of these rejections were based on local board screening examinations. During 1943 registrants with venereal diseases were inductible into the armed forces, so that registrants with these defects were forwarded to induction stations, where they received a psychiatric examination as part of the induction station routine.

5. Methods used in selecting the principal cause for rejection are explained in Edwards, T. I., and Hellman, L. P.: Methods Used in Processing Data from the Physical Examination Reports of the Selective Service System, J. A. Statistical A. 39: 165-182 (June) 1944.

mental and personality disorders not classifiable elsewhere and grave mental or personality disorders. Psychopathic personality ranked fourth in importance as a cause for rejection, in contrast to second place as a recorded defect among all examined registrants.

Psychoneurotic disorders accounted for only one third of the Negro rejections for mental and personality disorders, in contrast to one half for white registrants. A higher proportion of Negro than white rejections were for mental and personality disorders not classifiable elsewhere, psychopathic personality and chronic inebriety and drug addiction. In the case of psychopathic personality, particularly, the proportion of rejections for this defect among Negroes was twice as great as that among white registrants.

The prevalence of mental and personality disorders during 1942 and 1943 was 67.5 per thousand registrants examined (table 4). They were diagnosed relatively more frequently among white registrants than among Negroes. Psychoneurosis and psychopathic personality were the most frequently recorded mental and personality disorders. Psychopathic personality was the only subgroup which was recorded relatively more often for Negroes than for white registrants. The other specific mental and personality disorders, of a more serious nature, were found only one third as often among Negroes as among white registrants.

Psychoneurosis was the most frequent cause for rejection for mental and personality disorders among both races during 1942 and 1943, with psychopathic personality next in importance. Among white registrants, psychoneurosis accounted for twice as many rejections as psychopathic personality. Both defects were equally important as causes for rejection of Negroes, accounting for 9 out of every 10 rejections for mental and personality disorders. Grave mental or personality disorders, although next in importance, accounted for relatively few rejections among both races.

TABLE 4.—*Prevalence of Mental and Personality Disorders and Percentage Distribution of Rejections for These Defects Among Registrants Physically Examined at Local Boards and Induction Stations, 1942-1943*

Major Subgroup	Prevalence per 1,000 Examined			Per Cent Distribution of Rejections		
	All Races	White*	Negro	All Races	White*	Negro
Total	67.5	70.6	50.3	100.0	100.0	100.0
Grave mental or personality disorders	5.6	6.3	2.1	8.2	8.7	4.6
[illegible]	1.2	1.3	0.2	2.1	2.2	0.8
[illegible]	18.2	17.6	21.5	29.3	27.1	44.9
[illegible]	37.0	39.3	24.1	54.3	55.5	46.2
Chronic inebriety and drug addiction	4.0	4.5	1.1	4.3	4.7	1.8
Mental and personality disorders not classifiable elsewhere	1.5	1.6	1.3	1.8	1.8	1.7

* Includes all races other than Negro.

THE AGE FACTOR

In general, it can be stated that with increasing age the rejection rate for mental and personality disorders increased. However, the specific diagnoses differed in importance as causes for rejection when considered in relation to age. During 1944 the three leading diagnoses of mental and personality disorders were psychoneurosis, emotional instability and asocial and amoral trends. In addition, for the 18 year olds, emotional immaturity was one of the more important diagnoses.[6] The distribution of these diagnoses in relation to total mental and personality disorder rejections by age is shown in table 5.

The importance of psychoneurosis as a cause for rejection increased with increasing age—out of every hundred 18 year olds rejected for mental and personality

TABLE 5.—*Percentage of Mental and Personality Disorder Rejections Due to Selected Diagnoses, by Age* *

Age	Total	Psychoneurosis	Emotional Instability	Asocial and Amoral Trends	Emotional Immaturity	Other Mental
			All Races			
All ages	100.0	59.1	20.3	11.4	2.5	6.7
18	100.0	30.3	24.3	11.9	22.7	10.8
19	100.0	42.2	25.8	11.2	8.9	11.9
20-24	100.0	56.1	22.1	13.0	0.4	8.4
25-29	100.0	64.0	19.6	10.9	†	5.5
30-37	100.0	64.7	18.8	10.9	†	5.6
			White ‡			
All ages	100.0	62.5	19.0	9.3	2.8	6.4
18	100.0	31.1	24.0	9.8	25.1	10.0
19	100.0	44.6	24.5	8.5	9.9	12.5
20-24	100.0	60.5	21.0	10.2	0.5	7.8
25-29	100.0	68.2	18.0	8.6	†	5.2
30-37	100.0	67.8	17.5	9.2	†	5.5
			Negro			
All ages	100.0	35.6	29.4	25.8	0.9	8.3
18	100.0	25.3	26.3	25.0	7.1	16.3
19	100.0	28.7	32.8	26.4	3.4	8.7
20-24	100.0	34.5	28.0	26.9	...	10.6
25-29	100.0	36.8	30.5	26.4	0.1	6.2
30-37	100.0	38.9	30.2	24.9	...	6.0

* Based on a sample of Reports of Physical Examination and Induction for registrants inducted or rejected during February 1944-May 1944.
† Less than 0.05 per cent.
‡ Includes all races other than Negro.

disorders approximately 30 were rejected for psychoneurosis, whereas the corresponding number among those 30 years of age and over was approximately 65. For emotional instability the situation was just the reverse—relatively more of the younger registrants rejected for mental and personality disorders had emotional instability diagnosed than the older registrants. With respect to asocial and amoral trends, relatively more of the rejections occurred among those under 25 than among those 25 and over. Emotional immaturity was the second leading diagnosis of mental and personality disorders among the 18 year olds, accounting for over one fifth of the mental rejections. As would be expected, its importance was negligible for those over 19 years of age. These age trends held for white registrants. Among Negroes, however, the only distinct age trends were for psychoneurosis and emotional immaturity.

Emotional immaturity and psychoneurosis accounted for a larger proportion of the mental rejections among white registrants, age for age, than among Negroes, while the reverse was true for emotional instability and asocial and amoral trends. The difference between the races was more pronounced with respect to asocial and amoral trends than for emotional instability.

THE OCCUPATIONAL FACTOR

The relationship of occupation and rejections for mental and personality disorders is shown in table 6. In evaluating these data it should be borne in mind that Selective Service policies with regard to occupational deferment have resulted in physical examination of relatively fewer men in some occupational groups than

6. Data on mental and personality disorders of 18 and 19 year old registrants examined during December 1942-February 1943 are included in Rowntree, L. G.; McGill, K. H., and Edwards, T. I.: Causes of Rejection and Incidence of Defects Among 18 and 19 Year Old Registrants, J. A. M. A. **123**: 181-185 (Sept. 25) 1943.

in others, and that, therefore, the occupational groups vary in their representativeness with respect to physical or mental condition. The farm group is probably the least representative of their group in the general population, owing to the passage of the Tydings Amendment, which deferred certain classes of agricultural workers. At the other extreme are the clerical, sales and service workers, and the emergency workers and unemployed.

Rejections for mental and personality disorders were highest among farmers and farm managers (143.4 per thousand examined) and emergency workers, unemployed and nonclassifiable (142.5). Students had the lowest rejection rate for this condition (72.9). The low rejection rate for students is probably due to their youth more than to any other factor.

Psychoneurosis rejection rates were highest for the professional and managerial and lowest for students. Farmers and farm managers had a rate 50 per cent higher than that for farm laborers. Rejections for reasons other than psychoneurosis were highest for the emergency workers, unemployed and nonclassifiable and lowest for professional and managerial. It can also be noted that farm laborers, students and emergency workers, unemployed and nonclassifiable were less apt to be rejected for psychoneurosis than for other mental conditions, which consist mainly of emotional instability and asocial and amoral trends, and that the reverse was true for all other occupations. In addition, a comparison of the rejection rate for craftsmen with that for operatives and laborers reveals a higher rejection rate for psychoneurosis and a lower rate for other mental disorders among the skilled workers than among the semiskilled and unskilled.

If only gainfully employed workers are considered (thus excluding students and the emergency worker group) it can be seen that professional and managerial workers had the highest psychoneurosis rejection rate and the lowest rate for all other mental conditions, while farm laborers had the lowest rate for psychoneurosis and the highest for all other mental conditions.

TABLE 6.—*Rejection Rates for Mental and Personality Disorders per Thousand Registrants Examined, by Occupation* *

Occupation	Total	Psychoneurosis	Mental and Personality Disorders Excluding Psychoneurosis
All occupations	113.1	63.0	50.1
Professional and managerial	109.9	85.2	24.7
Farmers and farm managers	143.4	80.9	62.5
Clerical, sales and service workers	106.4	67.9	38.5
Craftsmen	109.4	71.5	37.9
Operatives and laborers, except farm	111.0	60.6	50.4
Farm laborers	118.7	53.8	64.9
Students	72.9	32.1	40.8
Emergency workers, unemployed and nonclassifiable †	142.5	57.7	84.8

* Based on a sample of Reports of Physical Examination and Induction for registrants examined during November 1943-December 1943.
† Nonclassifiable constitute a negligible proportion of this group.

MEDICAL SURVEY PROGRAM

During the operation of the Selective Service System much information has been provided by the system bearing on the mental and personality status of registrants. This information has furnished the basis in many instances for acceptance or rejection of registrants by the armed forces. Prior to Oct. 4, 1943 many of the states developed some plan for obtaining medical and social histories of each registrant facing induction. On Oct. 4, 1943 a Medical Survey Program was initiated by the Selective Service System to coordinate and unify procedures for obtaining (1) additional medical and social histories on registrants classified or about to be classified into a class immediately available for service and (2) education histories from secondary schools for potential registrants 15 years of age and over and registrants classified or about to be classified into a class immediately available for service.[7]

Salient features of the medical survey program include (1) appointment on a voluntary basis of one or more persons in each local board area who are qualified to do health or social work as medical field agents and (2) procurement by the state director of educational histories of registrants for use by the induction stations. The medical field agents obtain medical and social histories of registrants from such sources as the registrant's personal physician, social service exchanges, hospitals and clinics and correctional institutions or agencies. At present there are more than 9,000 medical field agents, and medical survey information is being supplied for a substantial percentage of the registrants considered for induction.

SUMMARY

A review of prevalence and rejections for mental and personality disorders among Selective Service registrants shows that:

1. The majority of rejections for mental and personality disorders were made by armed forces' psychiatrists; these rejections were made on the basis of unfitness for military life, although not all the disorders were handicapping in civilian life.

2. Mental and personality disorders were the principal cause for rejection of 801,700, or approximately 17.8 per cent, of registrants aged 18-37 in rejected classes on Jan. 1, 1945.

3. The rejection rate for this type of disorder increased from 22.3 per thousand examined in peacetime to 120.2 per thousand examined in 1944.

4. The rise in the rejection rate was not solely due to increased nervous tension among examined registrants. Other factors to be considered are changes in examining procedure, lowering of standards in other defect categories and stricter interpretation of standards for mental and personality disorders by the armed forces' psychiatrists.

5. Relatively more white registrants than Negroes have been rejected for mental and personality disorders.

6. Psychoneurotic disorders and psychopathic personality account for more than 8 out of every 10 rejections for mental and personality disorders.

7. Psychopathic personality is more prevalent among Negroes than among white registrants, while the reverse is true for psychoneurosis.

8. With increasing age, relatively more registrants are rejected for psychoneurotic disorders.

9. Among 18 year olds more than one fifth of the rejections for mental and personality disorders are due to emotional immaturity.

10. Of those gainfully employed, the psychoneurosis rejection rate was highest for professional and managerial workers and lowest for farm laborers, while the rate for other mental and personality disorders (consisting mainly of emotional instability and asocial and amoral trends) was lowest for the former and highest for the latter.

7. Full details are given in Medical Circular No. 4, issued by the Selective Service System on Oct. 18, 1943.

THE USE OF FIBRIN FILM AS A DURAL SUBSTITUTE

AND IN THE PREVENTION OF MENINGOCEREBRAL ADHESIONS

FURTHER STUDIES AND CLINICAL RESULTS

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The need for a material which acts as a substitute for excised or injured dura mater and at the same time prevents meningocerebral adhesions has long been one of the most pressing in neurologic surgery. Numerous dural substitutes have been tried with varying degrees of success. On long-range study not one has proved adequate to fill these requirements.[1] In spite of this, the results secured when no material is employed have been so unsatisfactory that most neurosurgeons prefer to use one or another of the available dural substitutes, whatever their shortcomings may be.

In the course of a program devoted to the fractionation of human blood plasma,[2] large quantities of human

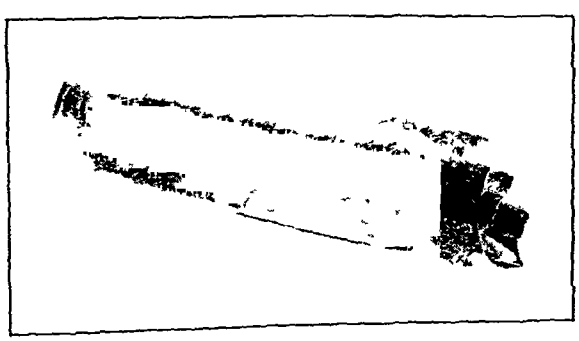


Fig 1.—Dry fibrin film after removal from the glass ampule

fibrinogen and thrombin have become available.[3] From these proteins it has been possible to prepare a material, fibrin film,[4] which has been subjected to experimental and clinical trial as a dural substitute.[5]

A variety of films may be prepared from solutions of thrombin and fibrinogen by varying the conditions under which clotting takes place and by changing the amount and character of the plasticizer present.[4] One type has been selected as most suitable as a dural substitute in physical properties and tissue reactions. It has been prepared with a low water content, so

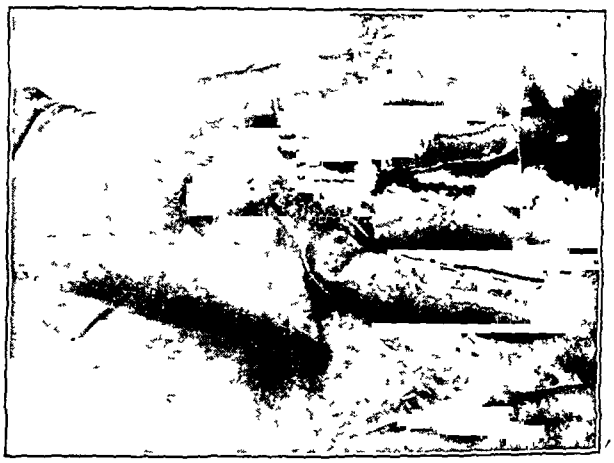


Fig 2.—Fibrin film after soaking in saline solution for fifteen minutes. It has become flexible and is easily handled

that it can safely be used a long time after distribution.[6] In this state fibrin film is translucent, firm and somewhat brittle when dry (fig. 1). After immersion in saline solution for fifteen minutes the physical properties are once more those of a moist membrane. The wet film is almost transparent but has become flexible (fig. 2) and elastic, returning to its original size and shape when stretched for 100 per cent of its length (fig. 3). Microscopic study of the fibrin film shows that it consists of a uniform sheet without interstices visible with oil immersion lenses. Diglycine passes through steam-sterilized fibrin film but hemoglobin does not.[7]

As prepared for distribution, fibrin film is packaged dry in a glass ampule (fig. 4). Sterilization has been

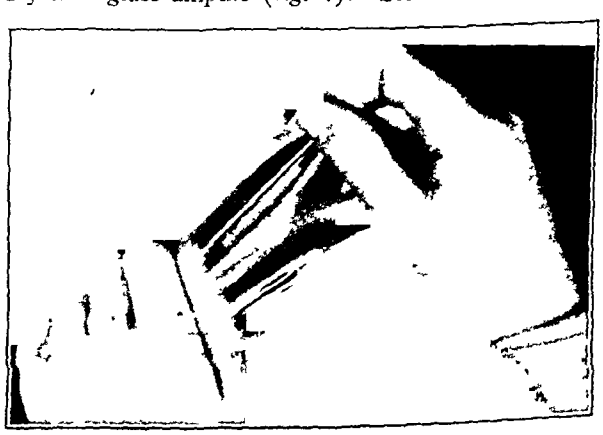


Fig 3.—Fibrin film is elastic

carried out in the ampule, and the fibrin film may not be resterilized.

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This work has been carried out under contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and Harvard University.

This paper is No. 37 in the "Studies of Plasma Proteins" of the Harvard Medical School, Boston, on products developed by the Department of Physical Chemistry from blood collected by the American Red Cross.

1. Pudenz, R. H., and Odom, G. L.: Meningocerebral Adhesions: An Experimental Study of the Effect of Human Amniotic Membrane, Amniоplastin, Beef Allantoic Membrane, Cargile Membrane, Tantalum Foil and Polyvinyl Alcohol Films, Surgery 12: 318-344, 1942.

2. Cohn, E. J.; Oncley, J. L., Strong, L. E., Hughes, W. L., Jr., and Armstrong, S. H., Jr.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma. Fractionation. I. The Characterization of the Protein Fractions of Human Plasma, J. Clin. Investigation 23: 417-432, 1944.

3. Edsall, J. T., Ferry, R. M., and Armstrong, S. H., Jr.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma. Fractionation. XV. The Proteins Concerned in the Blood Coagulation Mechanism, J. Clin. Investigation 23: 557-565, 1944.

4. Ferry, J. D., and Morrison, P. R.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma. Fractionation. XVI. Fibrin Clots, Fibrin Films and Fibrinogen Plastics, J. Clin. Investigation 23: 566-572, 1944.

5. Bailey, O. T., and Ingraham, F. D.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma. Fractionation. XVII. Fibrin Films in Neurosurgery, with Special Reference to Their Use in the Repair of Dural Defects and in the Prevention of Meningocerebral Adhesions, J. Clin. Investigation 23: 597-600, 1944. Ingraham and Bailey.[5]

6. Physical and chemical studies leading to the development of the present product, which is steam sterilized in the final containers before distribution, have been carried out by Dr. J. D. Ferry and Mr. P. R. Morrison in the Department of Physical Chemistry, Harvard Medical School, in collaboration with Drs. J. D. Porsche and R. L. Kutz of the Armour Laboratories under contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and Harvard University.

7. Ferry, J. D., and Morrison, P. R.: Personal communication to the authors.

ANIMAL EXPERIMENTS

When fibrin film first became available for trial as a dural substitute, sterilization was carried out in glycerol, a procedure practical on a small scale in the laboratory but cumbersome in large-scale production. Experiments with these films have been reported in detail elsewhere.[8]

After trying various methods of sterilization, it was found possible to sterilize fibrin film in the final container by steam under pressure.[6] Although films treated in this way were similar in physical properties to the glycerol-sterilized films, it seemed advisable to repeat the experimental studies before using steam-sterilized fibrin films on human patients.

The following procedure was carried out on 15 monkeys (Macaca mulatta):

After shaving the scalp, the field was cleansed with alcohol and zephiran. A midline incision was made in the scalp and a large temporoparietal decompression was performed on each side of the skull with sacrifice of the bone. On the left, a circular area of dura approximately 1.2 cm. in diameter was removed. A piece of fibrin film slightly larger than the dural defect (about 1.5 cm. in diameter) was placed over the intact arachnoid, the excess film being placed under the edges of the dura without suture. On the right the same

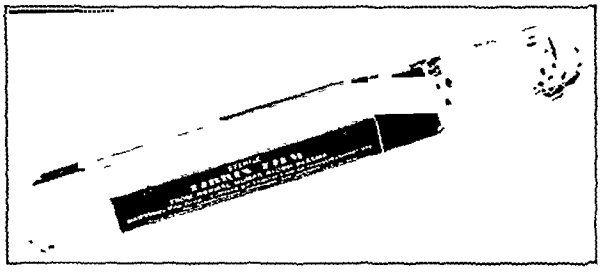


Fig. 4.—Unopened ampule of fibrin film.

procedure was carried out with the variation that in several areas a curved French needle was inserted through the leptomeninges into the outer layers of the cerebral cortex and then pulled out so as to lacerate the arachnoid, pia and the superficial cerebral tissues. The temporal muscles were closed over the fibrin films on both sides and the superficial tissues sutured with black silk.

The monkeys were killed at intervals of one day, two weeks and one, two, three, five and six months after operation. No abnormalities were noted in any of the monkeys during the survival period.

Pathologic studies indicated that the fibrin films were gradually replaced by a neomembrane of fibrous tissue without the formation of meningocerebral adhesions. In a few of the monkeys the fibrin film had slipped somewhat, so that a portion of the dural defect was covered by fibrin film and the rest by temporal muscle. Adhesions formed between the muscle and the arachnoid but did not form between the fibrin film and the arachnoid. Absorption of the fibrin film was almost complete at three months, and no film remained at five and six months after operation (fig. 5). The histologic sequences involved in the replacement of the steam-sterilized fibrin films were identical with those induced by glycerol-sterilized films; these have been discussed elsewhere.[8]

These experimental studies indicated that fibrin film as now distributed was safe for clinical trial as a dural substitute and in the prevention of meningocerebral

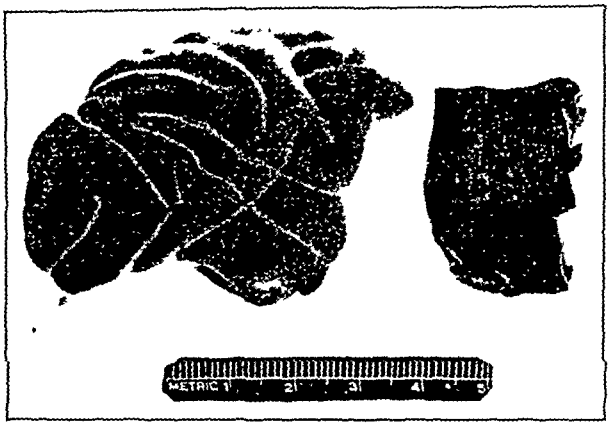


Fig. 5.—Brain of monkey six months after the use of fibrin film as a dural substitute. Note the absence of adhesions and the normal appearance of the cortical structures. At the right is the portion of dura in which a circular defect was covered by fibrin film. The neomembrane replacing the fibrin film blends with the dura and is almost indistinguishable from it.

adhesions. They also suggested that the experience gained from the use of the original films was applicable to the present material.

CLINICAL STUDIES

The clinical evaluation of any new material for use as a dural substitute is exceedingly difficult. Of the numerous substances suggested from time to time, experience has shown that favorable results may be obtained in a series of patients, only to be followed by untoward sequelae in other patients as the series is extended, or by late complications when the result had appeared at first satisfactory.[1]

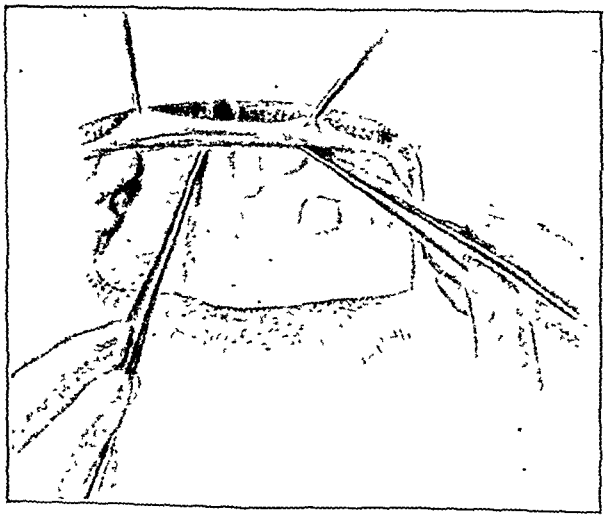


Fig. 6.—Technic used to hold the fibrin film in place without sutures. Although a portion of the cortex is shown uncovered by film in the drawing, a piece of fibrin film larger than the defect is used in the operation.

We have attempted to evaluate fibrin film as a dural substitute in the following ways: (1) by using it in as large a series of patients as possible, (2) by making use of it in many different types of neurosurgical procedures, (3) by following the patients until the fibrin film has been absorbed and (4) by studying

8. Ingraham, F. D., and Bailey, O. T.: The Use of Products Prepared from Human Fibrinogen and Human Thrombin in Neurosurgery: Fibrin Foams as Hemostatic Agents; Fibrin Films in Repair of Dural Defects and in Prevention of Meningocerebral Adhesions, J. Neurosurgery 1:23-39, 1944.

the films or regions in which they have been used at secondary operations or at necropsy. This report is based wholly on our personal experience.

The glycerol-sterilized films have been used as dural substitutes in 59 neurosurgical procedures and the steam-sterilized films in 35. Since the animal experiments suggest that the tissue reactions of the two types of films are very similar, it may be permitted to combine these figures, giving a total series of 94 instances in which fibrin film has been employed by us as a dural substitute and for the prevention of meningocerebral adhesions. This series would seem sufficiently large to give a definite indication of the advantages and limitations of the material.

Furthermore, the neurosurgical procedures have been carried out in the treatment of a variety of lesions (table 1) and in different regions of the central nervous system (table 2). They include operations for tumors of the brain and spinal cord, congenital malformations, degenerative diseases and traumatic lesions. The results have been uniformly favorable, regardless of the nature of the lesion which made advisable the use of a dural substitute. It should be pointed out that in the large majority of the patients fibrin film was used in a presumably sterile operative field. While

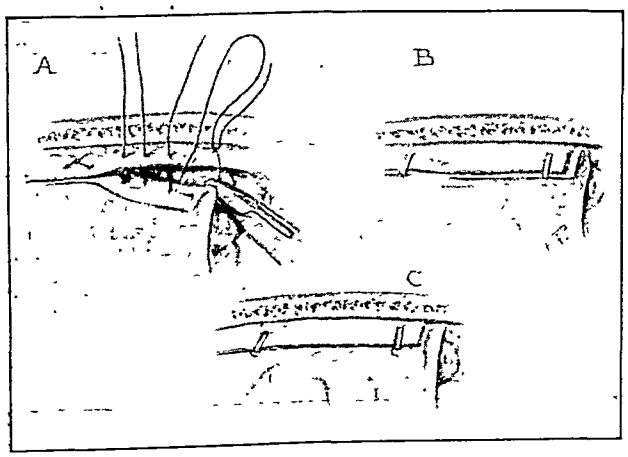


Fig. 7.—*A*, technic of suturing fibrin film; the cuff of film is easily sutured to the overlying dura. *B*, film held in place by applying widely spaced silver clips to the cuff. *C*, the fibrin film is held in place by inserting one prong of a silver clip through an opening in the fibrin film. While portions of uncovered cortex are shown in each of the drawings to illustrate the appearance of a cross section, a piece of fibrin film larger than the dural defect is used in the operating room.

it has been employed successfully in compound fractures, brain abscess and extradural abscess, our experience is not sufficient to make positive statements concerning the behavior of fibrin film in the presence of infection.

The crucial test of any dural substitute lies in the results sufficiently long after operation for the material to have been completely absorbed. As judged by animal experiments, fibrin film is largely removed in three months and completely removed in six months. As shown in table 2, 33 patients have been followed for six months or more after fibrin film was put in place as a dural substitute. All of them have remained free from symptoms referable to the fibrin film; in not a single instance have untoward sequelae developed. Furthermore, it has been evident that there was less cortical irritation as the result of the pathologic lesions present than would have been expected if no protective covering had been used.

As a final criterion, attempts have been made to study at secondary operation or at necropsy the site in which fibrin film had been placed. This has been possible in 19 patients in whom glycerol-sterilized fibrin film had been used, the times varying from fourteen hours to eighty-one days. The site of operation has also been studied a few hours to three months later in 8 instances in which steam-sterilized fibrin film had been left in place. Those recovered within two months after operation showed little change from their original appearance, and the underlying brain or spinal cord was not adherent to the fibrin film. In 1 patient a piece of steam-sterilized film was used to cover a large suboccipital defect created in an operation for medulloblastoma of the cerebellum, and another piece was wrapped about a Torkildsen tube put in during the procedure. At necropsy three months later the fibrin film over the cerebellum was completely absorbed; the arachnoid was smooth without adhesions to the neomembrane replacing the fibrin film. In portions of the operative field not covered by a dural substitute there were many dense adhesions. Some fibrin film was still present about the Torkildsen tube. It was thinner than it was at the time of operation but otherwise was unchanged in appearance and was not adherent to adjacent structures.

TABLE 1.—*Lesions Treated*

Diagnosis	Total Number	Glycerol Sterilized Film	Steam Sterilized Film	Duration <6 Mos.	Duration >6 Mos.
Skull fracture	5	3	2	3	2
Subdural hematoma	2	1	1	1	1
Jacksonian epilepsy	4	3	1	1	3
Brain abscess	2	1	1	2	0
Extradural abscess	1	1	0	0	1
Tuberculous meningitis	2	2	0	2	0
Chronic arachnoiditis	1	1	0	1	0
Encephalitis	1	0	1	1	0
Chronic progressive encephalopathy	2	1	1	2	0
Lead encephalitis	6	6	0	4	2
Arnold Chiari malformation	4	3	1	3	1
Spina bifida and cranium bifidum	9	3	6	6	3
Scaphocephaly	4	1	3	3	1
Hydrocephalus	9	5	4	6	3
Tumors of brain and spinal cord	42	28	14	26	16
Total cases	94	59	35	61	33

TABLE 2.—*Location of Lesions*

Type of Film	Region	Total	Duration <1 Mo.	1-6 Mo.	6-12 Mo.	12-18 Mo.	18-24 Mo.
Glycerol sterilized	Frontal	6	1	1	0	2	2
	Parietal	22	8	3	2	5	4
	Temporal	14	5	2	0	2	5
	Occipital	3	1	1	0	1	0
	Posterior fossa	8	4	1	1	0	2
	Cervical cord	2	1	0	0	0	1
	Thoracic cord	3	0	1	0	0	2
	Lumbar cord	1	0	0	0	0	1
Steam sterilized	Frontal	5	1	4	0	0	0
	Parietal	3	1	1	1	0	0
	Temporal	8	1	7	0	0	0
	Posterior fossa	16	4	10	2	0	0
	Lumbar cord	3	0	3	0	0	0
Total		94	27	34	6	10	17

In view of these experiences, it would appear that fibrin film is the most satisfactory material now available for use as a dural substitute and in the prevention of meningocerebral adhesions.

TECHNICAL CONSIDERATIONS

Fibrin film is packaged in a glass tube (fig. 4), which should be kept in an ice box if possible, though it may be left at room temperature for many weeks without detectable evidence of deterioration. When

it is to be used as a dural substitute, the outside of the tube is sterilized by soaking in alcohol or other germicide. The tube is then washed with cool sterile saline solution (i. e. at room temperature) to remove any adherent germicide. The constricted band on the tube is scored with a file and the top struck sharply. Before the film is removed, the tube is filled with cool sterile saline solution and allowed to soak fifteen minutes. This is important because the film is brittle and difficult to handle when dry. After soaking, the film and paper wrapped about it are removed together by means of forceps. The paper is discarded and the film is immersed in cool saline solution until it is required. The film should not be allowed to dry at any time and must be kept well moistened even in the operative field. It should be used the same day the tube is opened.

At operation a piece is cut from the fibrin film corresponding in shape to the dural defect and somewhat larger than it. In the majority of instances it is not necessary to secure the fibrin film in place. A satisfactory result is obtained merely by placing the edges of the fibrin film carefully under the cut edge of the dura. (fig. 6). When dealing with a small defect or one in which the surgeon for any reason is concerned about displacement of the fibrin film, its position can be maintained by carefully placed mattress sutures. This procedure is best carried out by folding the edge and suturing the cuff thus obtained (fig. *7 A*). A cuff of the fibrin film may also be affixed to the dura by widely placed silver clips (fig. *7 B*). An alternative method is to make a small opening in the fibrin film and to insert one prong of a silver clip through it (fig. *7 C*). If sufficient care is used and the film is kept moist, the material is not difficult to suture or to clip, but if it is allowed to dry it is almost impossible to hold the fibrin film in place by any fixation method. It should be emphasized that instances requiring sutures or silver clips to hold the fibrin film in place are rare; in most instances, tucking an edge of the fibrin film under the dura gives the best results.

After the fibrin film is in place, the wound is closed by the same technic which would have been used had no dural substitute been employed.

COMMENT

Fibrin film has been shown to have the physical properties desirable in a dural substitute. In monkeys it not only leads to the formation of a neomembrane which forms a satisfactory protective covering but it also prevents the formation of meningocerebral adhesions. A thorough clinical trial indicates its safety and value in many locations and in the treatment of a variety of lesions.

While dural substitutes are required in a relatively small percentage of peacetime neurosurgical procedures, the situation is different in military neurosurgery. Reports indicate that the necessity of a dural substitute in head wounds is so great that the available materials, such as fascia lata and preserved human dura, are used even by those neurosurgeons who are well aware of the fact that the materials produce widespread meningocerebral adhesions. This is because they feel that the late clinical complications would be even more severe if no dural substitute was employed. These facts indicate that any dural substitute better than fascia lata or preserved human dura could be used by the armed forces to advantage.

The clinical and experimental studies of fibrin film show that it has great advantages over any other dural substitute now available. In addition it is prepared on a large scale; it is stable at ice box temperature for over a year and at room temperature for many months; it is easy to use in the operating room. It is still far too soon to assert that fibrin film is the ideal dural substitute; it does not seem too soon to state that it has important advantages over other dural substitutes now available.

SUMMARY

Fibrin film, prepared from human fibrinogen and thrombin, is now available for use as a dural substitute and in the prevention of meningocerebral adhesions.

Clinical and experimental studies indicate that it has many advantages over other dural substitutes now available.

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TRANSFUSION OF O BLOOD

CONDITIONED BY THE ADDITION OF BLOOD GROUP SPECIFIC SUBSTANCES

FURTHER CLINICAL INVESTIGATIONS

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AND
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Group O blood has been used extensively as universal blood. Carefully investigated reactions to group O blood, published by workers with extensive experience in the field of blood transfusion, have caused many physicians to object to this method as a general procedure, granting that the Rh factor is given proper consideration as a source of reactions. It is reasonable to assume that isoagglutinins introduced into the circulation of human beings harboring the corresponding agglutinogens in the cells and plasma should combine with both, and it is a surprising fact that damaging reactions are not observed more frequently. Aubert, Boorman and Dodd [1] have demonstrated the occurrence of intravascular agglutination and hemolysis in a significant percentage of cases following the transfusion of serum of group O into recipients belonging to group A. On the basis of such observations the indiscriminate use of universal blood for transfusions into patients of different blood groups does not appear to us to be a recommendable procedure at present.

To overcome the objections to the use of group O blood with potent isoagglutinins as a universal blood, we have recommended the addition of the purified blood group specific substances A and B as a means of reducing the isoagglutinin titers to low levels.[2] In our early series of 147 cases [3] we were unable to demonstrate any untoward effect attributable to the addition of the blood group specific substances. A few of these patients received several transfusions at intervals of from ten days to three weeks.

From the Buffalo General Hospital and the Department of Bacteriology and Immunology, University of Buffalo School of Medicine.

1. Aubert, E. F.; Boorman, K. E., and Dodd, B. E.: The Universal Donor with High Titer Isoagglutinins, Brit. M. J. **1**: 659 (May 30) 1942.
2. Witebsky, E.; Klendshoj, N. C., and Swanson, P.: Preparation and Transfusion of Safe Universal Blood, J. A. M. A. **116**: 2654 (June 14) 1941.
3. Klendshoj, N. C.; McNeil, C.; Swanson, P., and Witebsky, E.: Transfusion of Conditioned Universal Blood, Arch. Int. Med. **70**: 1 (July) 1942.

To give further consideration to the problem of safety in conditioning of O blood with blood group specific substances, we have compared an additional series of 389 transfusions of O blood containing the purified group specific substances with 1,830 transfusions of homologous blood (belonging to the same blood group as the patient's blood) given under identical conditions. We added 5 to 10 cc. of a previously standardized solution of the blood group specific substances [4] to each pint of O blood either immediately before the transfusion was given or at the time the blood was made available for storage in the blood bank. The 389 transfusions of universal blood, conditioned by the addition of the A and B substances, were given without selection to recipients of all blood groups, frequently as an emergency procedure to avoid loss of time in typing and cross matching. We also prefer this method outside regular laboratory hours, as it eliminates the dangers inherent in blood matching by interns with limited experience in such work. Regarding specific technic, we refer to previous publications.[5]

Distribution of Reactions

Type of transfusion	Homologous		"Conditioned" Universal	
Total number of transfusions	1,830		389	
Reactions	No.	%	No.	%
Pyrogenic				
Grade 1	18	1	0	0
Grade 2	12	0.7	4	1
Grade 3	50	2.7	10	2.6
Hemolytic	5	0.3	0	0
Allergic	28	1.5	5	1.3
Circulatory	3	0.2	0	0
Undetermined	3	0.2	0	0
Total number of reactions	119	6.5	19	4.9

We have established a definite routine to secure recording of sufficient data for every transfusion on which classification of transfusion reactions may be based. For this purpose a special transfusion sheet is filled out by the house physician in charge of the transfusion and by the assisting nurse. Frequent determinations of temperature, pulse rate and blood pressure over a period of six to eight hours following transfusion are requested. In case of a reaction, determinations of icterus index, quantitative van den Bergh, cell counts and examinations of urine for hemoglobinuria are carried out routinely. The respective blood groups of donor and patient are rechecked and possible interference of the Rh factor is investigated. These determinations enable us in most instances to draw a conclusion as to the likely cause of the reactions.

We classify our transfusion reactions into five major groups according to suspected cause: pyrogenic, hemolytic, allergic, circulatory and undetermined.

Temperature reactions with no other untoward manifestations are recorded in the conventional group of pyrogenic reactions and subdivided into three grades: grade 1, a temperature rise of 1 to 2 degrees, grade 2, a rise of 2 to 3 degrees, and grade 3, a rise in temperature of more than 3 degrees or any reaction with a chill. In febrile cases we have excluded higher than normal temperatures as reactions to transfusions, unless comparison of temperature diagrams over a period of several days preceding and following the transfusion demonstrates definite deviation at the time of the transfusion from the patient's general temperature pattern.

The accompanying table shows the distribution of reactions in two groups: transfusions with homologous blood and transfusions with group O blood "conditioned" by the addition of the blood group specific substances A and B.

Comparison between the group of homologous blood transfusions with that of conditioned universal blood shows reaction rates of probable statistical identity. The hemolytic reactions which occurred only in the "homologous" group require comment. One of these reactions was due to administration of B blood to an O recipient by mistake as the result of an unfortunate similarity of names. The intern recognized his mistake before the transfusion had progressed very far. Of the remaining four hemolytic reactions three occurred in Rh negative patients, and there is good reason to believe that the Rh factor was responsible for these reactions. The ideal universal blood consists, therefore, in Rh negative O blood conditioned by the addition of blood group specific substances.

[illegible]ers have been found to increase in erroneous transfusion of incompatible blood. We have used intravenous injections of the purified blood group specific substances to increase isoagglutinin titers for purposes of producing potent typing serum.[6]

Theoretically the possibility exists that transfusion with "conditioned" universal blood might "sensitize" the patient to subsequent administrations of such blood or that even an initial transfusion of "conditioned" blood might cause untoward effects. It should be remembered that the specific substances A and B are added to O blood for the purpose of neutralizing the corresponding antibodies, and they are thus, presumably at least, partly present in combination with these antibodies. However, a biologic response on the part of the patient to injection of the combination is not necessarily excluded.

Further study of these points may be accomplished by a more detailed analysis of the reactions in the group of 389 conditioned universal blood transfusions, as recorded in the table. A total of 308 transfusions were given to patients who had had no previous exposure to the purified A and B substances. We encountered altogether 14 reactions in this group, distributed as follows: 3 (1 per cent) pyrogenic reactions, grade 2; 7 (2.3 per cent) reactions, grade 3, and 4 (1.3 per cent) allergic reactions. These reaction rates conform within statistical limitations to the general reaction rates for the homologous blood. The remaining 81 transfusions in the group of conditioned universal blood were administered to 48 patients who all had received previous transfusions of blood containing the purified A and B substances. The interval between these transfusions varied from a few days to several months. We encountered 5 reactions in these 81 transfusions corresponding to a total reaction rate of 6.2 per cent. The distribution of these reactions was as

4. Prepared by the Eli Lilly Company.
5. Witebsky, Klendshoj and Swanson:[2] Klendshoj, McNeil, Swanson and Witebsky.[3]

6. Witebsky, E.; Klendshoj, N. C., and McNeil, C.: Potent Typing Sera Produced by Treatment of Donors with Isolated Blood Group Specific Substances, Proc. Soc. Exper. Biol. & Med. 55:167 (March) 1944.

follows: 1 pyrogenic grade 2, 3 pyrogenic grade 3 and 1 allergic. There are no significant differences in these rates and those obtained during the first transfusion of conditioned universal blood.

COMMENT

The problem of the safety of our transfusion procedure parallels in principle the question of transfusions of pooled plasma versus plasma of heterologous blood groups. Quantitatively the problem may be somewhat different, as the amounts of blood group specific substances we add are presumably large in proportion to the amounts naturally contained in plasma. Levine and State[7] reported that they had observed skin reactions to cutaneous injections of plasma derived from various groups. They attributed positive tests to the interaction of the group specific substances in plasma with the corresponding isoantibodies present in the circulation of the person tested, and they explained reactions following transfusion of plasma into persons exhibiting a positive skin test on the same basis as the skin test. To our knowledge their results have not been corroborated, and the explanation has not been accepted. The allergic nature of certain serum and plasma reactions seems to be satisfactorily explained by recent observations of Maunsell.[8]

SUMMARY

A series of 1,830 blood transfusions was compared with a series of 389 transfusions of group O blood to which group specific substances A and B had been added. Special attention was given to the classification and recording of blood transfusion reactions. In spite of rigid and critical observations, no harmful effect was observed attributable to the group specific substances employed. The addition of the purified specific substances A and B to O blood as a means of reducing the corresponding isoagglutinin titers to a low level can therefore be recommended as a safe and effective procedure.

7. Levine, M., and State, D.: A and B Substances as a Cause of Reactions Following Transfusions, J. A. M. A. **120**: 275 (Sept. 26) 1942.
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The Idea of Big Numbers.—We know that one scientist may be worth ten thousand soldiers. The ancient Romans found it out when they attacked Syracuse in Sicily in 212 B. C. only to have their ships fired by burning glasses, smashed by stones from short and long range catapults, pulled out of the water and overturned by iron beaked cranes. All these fearful engines of war, not to mention such useful machines of peace as the water screw for irrigating land and pumping mines, the cogwheel and pulley for launching ships, were the inventions of an "absent minded" mathematician, Archimedes, who considered them "mere diversions of geometry at play." Whether or not he ran naked from his bath shouting "Eureka (I have found it)" on discovering that cunning goldsmiths had defrauded his relative King Gelon of Syracuse by substituting silver for gold in the king's crown, the fact remains that he did work out the laws of floating bodies and fluid displacement ("Archimedes' principle") on which the disclosure of such fraud depended. Among the other primarily mathematical, but later practical, problems which engaged his interest were the laws of the lever ("Give me a place to stand and I will move the earth") and the theory of big numbers, more important in a billion dollar modern world than when Archimedes anciently discussed it in "The Sand Reckoner."—The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co., Inc., 1945.

HYPOPROTHROMBINEMIC ACTION OF QUININE SULFATE

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For some time we have been studying blood prothrombin levels in human beings. It seemed of particular interest to one of us (L. P.) to investigate the effect of certain drugs which are administered prophylactically or therapeutically over long periods on the prothrombin level. Among the most widely used compounds of this type are the antimalarials, and the present paper deals with the effect of quinine on the prothrombin time.

Five normal male subjects ranging in age from 18 to 43 years were chosen. Their nutritional state was satisfactory and they were advised to maintain a well balanced diet. The prothrombin time was normal in all instances. Two to four premedication controls, performed in each case, were in agreement within the range of normal variations. In carrying out the estimations the Page[1] method was used. According to this technic viper venom and calcium chloride are added to plasma obtained by centrifuging the decalcified venous blood. The very sharp end point is characterized by the formation of fibrin particles clearly visible in the agitated test tube.

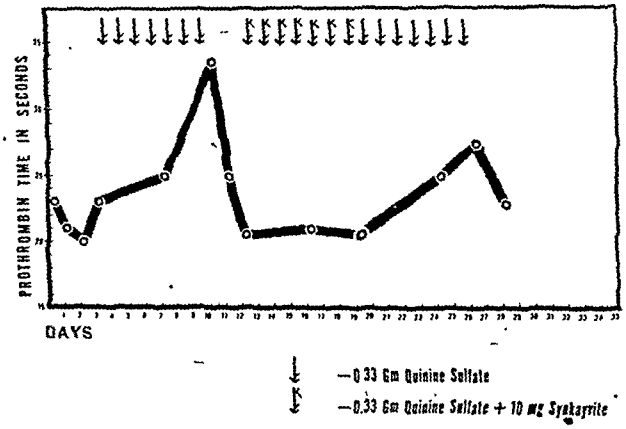


Chart 1.—Representative effects of quinine sulfate on prothrombin time and protective action of vitamin K in S. S., a white man aged 33. In this chart and in chart 2 it is shown that quinine sulfate produces prolongation of the prothrombin time; concurrent vitamin K administration counteracts quinine-induced prothrombinopenia; continuation of quinine sulfate without vitamin K causes another rise of the prothrombin time.

Quinine sulfate in single daily doses of 0.33 Gm. (5 grains) was administered by mouth for periods varying from six to sixteen days. One subject received 0.3 Gm. during the first phase of observation. In all subjects there was a significant rise of the prothrombin time, indicating a prothrombin lowering effect of quinine sulfate. The prolongations varied from 5 to 11.8

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Dr. Harry Neivert made it possible for the authors to conduct this work in his laboratory. Burroughs-Wellcome & Co., Inc., New York, provided the "Stypven" Russell Viper Venom used for the prothrombin estimations.

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seconds. On discontinuation of quinine sulfate the raised prothrombin times regressed promptly and approximated the respective control values within a few days.

Subsequently 4 of these subjects were placed on the combined oral medication of 0.33 Gm. of quinine sulfate and 10 mg. of a vitamin K compound daily, and this dosage was continued at least over the period of time in which quinine sulfate alone had produced a significant prolongation of the prothrombin time. The vitamin K compound used in this study was 2-methyl-1,4-naphthohydroquinone-diphosphoric acid ester tetrasodium salt, Synkayvite "Roche." The concurrent administration of vitamin K afforded full protection in all subjects against quinine-induced prothrombinopenia. The dose of vitamin K was an arbitrary one. The minimal amount required to render ineffectual the hypoprothrombinemic action of a given quantity of quinine remains to be determined.

In 2 subjects the combined quinine sulfate-vitamin K medication was followed immediately by a third experimental phase in which again a daily dose of 0.33 Gm. of quinine sulfate alone was given over a period of seven and eight days respectively. Both subjects promptly exhibited another pronounced elevation of the prothrombin time. The accompanying charts portray the experimental procedure, the dosages employed and the results obtained.

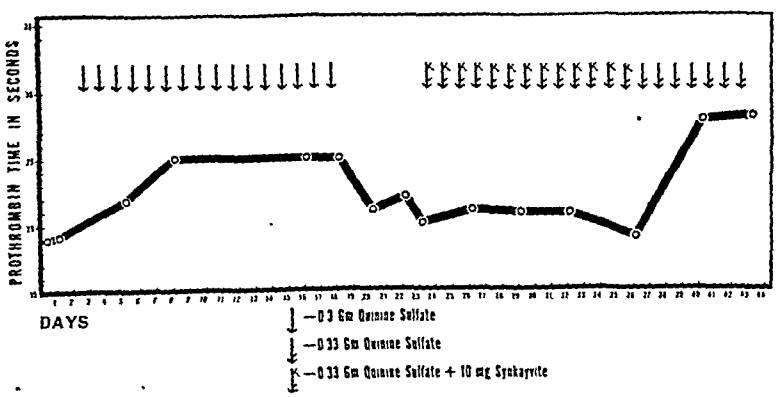


Chart 2.—Representative effects of quinine sulfate on prothrombin time and protective action of vitamin K in M. G., a white man aged 38.

Quinine hydrochloride was employed in two experiments not referred to before instead of quinine sulfate, which was used in the experiments described in this report. The hydrochloride salt also has an unquestionable hypoprothrombinemic action.

The evaluation of the significance of the findings reported awaits further study. While "there are no fixed levels of prothrombinopenia at which bleeding is known to be established" (Shapiro [2]), serious consideration must be given to the thought that prolonged administration of quinine, particularly if larger doses are employed, will interfere with normal blood coagulation. Neivert [3] recently demonstrated that acetylsalicylic acid induced hypoprothrombinemia is one of the most important etiologic factors of late tonsillar hemorrhage. He cautions that where there is wound healing by second intention a hypoprothrombinemic state should be avoided.

According to Sollmann [4] quinine still outranks all other drugs for the routine suppressive and curative treatment of malaria, in view of its effectiveness and low toxicity. Also for mass treatment without adequate medical supervision quinine therapy is most suitable. Strong [5] states that "in certain rural districts the free distribution of quinine has been almost the only important antimalarial measure that it was practicable to conduct."

With the world's most productive cinchona plantations in enemy hands, allied armies fighting in malarious regions are largely dependent on atabrine. For instance, Russell [6] of the Tropic Disease Control Section, Office of the Surgeon General of the U. S. Army, states that "under present conditions quinine prophylaxis is to be used only for men who cannot tolerate atabrine." At any rate the prothrombin blood level of those soldiers, sailors and marines fighting in malaria infested areas who do receive preventive treatment with quinine will be subnormal. If these men are wounded, normal blood coagulability will be impaired, resulting in prolonged bleeding. Later on, oozing from the wounds may occur, particularly if quinine medication is continued. Concurrent vitamin K administration is shown to counteract quinine induced prothrombinopenia. Consequently the combined medication would eliminate the danger of undue bleeding in these subjects.

Also all those malaria patients who, for corrective treatment, receive large doses of quinine for a long time may appropriately be given vitamin K regardless of whether or not there is any likelihood of being wounded. Manson-Bahr,[7] discussing the hemorrhagic forms of malaria, mentions that "hemorrhages may occur in almost any organ." Since quinine because of its prothrombinopenic effect—a property which, preliminary results indicate, is also exhibited by quinidine—is likely to increase the tendency to hemorrhage occasionally present in malaria, the combined administration of quinine and vitamin K will reduce the danger of hemorrhagic manifestations in these patients.

The relation of the present findings to the prothrombinopenic action of the salicylates is of interest. The action of the latter is firmly established [8] and the protective effect of vitamin K against such hypoprothrombinemia has been demonstrated.[9] It is worthy of note that quinine and the salicylates, which have entirely different constitutions, display a certain similarity with regard to their antipyretic action. But this does not

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extend to the antimalarial effect which is peculiar to quinine. The prothrombinopenic action of the two drugs presumably is not related to their main or therapeutically desirable actions, and it is therefore surprising that quinine affects the prothrombin level the same way as do the salicylates.

SUMMARY

Quinine sulfate induces hypoprothrombinemia which can be prevented by concurrent administration of vitamin K. The concurrent administration of vitamin K to combat troops receiving quinine has been suggested for the purpose of eliminating the danger of prolonged, prothrombinopenia-induced bleeding from wounds. The routine administration of vitamin K in conjunction with quinine given for curative treatment is also proposed.

Clinical Notes, Suggestions and New Instruments

NASAL CONGESTION FROM FREQUENT USE OF PRIVINE HYDROCHLORIDE

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Our first clinical experience with privine hydrochloride intranasally in allergic and infectious rhinitis gave us the impression that it was the most effective vasoconstrictor available. The continued use of this drug in our practice, however, began to give us increasing evidence that in addition to its vasoconstrictor action there was a congestive phase. In the last year or so we have been impressed with the large number of patients in whom symptoms of nasal congestion have been aggravated or prolonged by the continued use of privine.

We have seen at least 75 patients, with additional numbers being added every week, whose nasal congestion has been aggravated or maintained by privine. The usual course of events is as follows: The patient having hay fever or perennial allergic rhinitis begins to use privine for relief. Occasionally this start of the continued use of the drug may have its origin in the attempt to relieve the symptoms of a common cold. The medication may have been obtained without order from a physician, usually is prescribed by a physician but refilled without his knowledge, and in some instances was prescribed by us as long as one or two years ago. The patient notices that his nasal congestion is becoming increasingly pronounced, obstruction more complete and lasting and the immediate effect from the drops shorter in duration. Finally the turgescence becomes so severe that he finds it necessary to instil drops every hour or two, even during the night. In the vast majority of instances the privine still continues to show some vasoconstrictor action, so that the sufferer, observing this temporary benefit, does not realize that the same drug is responsible for the increasing congestion of his nasal tissues. Intranasal inspection shows considerable turgescence of the inferior turbinates, giving the typical appearance of vasomotor rhinitis. Smears of the nasal secretion almost always show eosinophils. The exact interpretation of these findings is still open to debate, however, since practically all such cases that we had the opportunity to observe were those of allergic rhinitis in which the condition was aggravated by the use of privine. What the findings would be in persons under similar circumstances is something we hope to be able to report in the future.

In essentially all instances the discontinuance of privine results in much improvement in a week or less. Some patients are reluctant to discontinue what they feel is the only source of relief available. During the first two or three days after the drops are discontinued the nasal obstruction may be severe. During this period it may be advisable to prescribe a sedative to aid sleep; we have used either seconal or pentobarbital sodium. Ephedrine orally may be of some aid, and in occasional cases one may have to allow the sparing use of 1 per cent isotonic solutions of ephedrine sulfate.

Privine hydrochloride is marketed in 0.05 per cent and 0.10 per cent solution, the former being recommended "for children or patients with an extremely sensitive nasal mucosa." Chemically it is 2-naphthyl-methyl-imidazoline hydrochloride, a colorless substance readily soluble in water or saline solution. The marketed solution is isotonic and has a p_H of 6.2, approximating that of the normal nasal secretion. The action of privine, as of other sympathomimetic drugs, is by constriction of the peripheral vascular bed through stimulation of the sympathetic nerve endings. Prolonged action, isotonicity and compatibility with ciliary action are features stressed by the manufacturers. Its vasoconstricting effect is produced rapidly, lasts from two to six hours (in the beginning of its use) and is free of any tingling, burning or smarting.

The congestive effect from continued use of privine might be attributable to one or more possible actions of the drug: 1. It could be assumed that this substance has a vasodilator component in addition to its vasoconstrictor action. 2. The increased vasomotor changes might be due to an allergy to the drug induced by repeated use. 3. The irritability of the tissue could be explained on the basis of chemical irritation or injury if the drug was a primary irritant. 4. The vasodilatation could be due to a simple reaction following an intense and prolonged vasoconstriction.

Epinephrine possesses both a vasoconstrictor and a vasodilator element, referred to as sympathin E and sympathin I, respectively. While the vasodilator effect is weaker, it has a more prolonged action than the vasoconstrictor component. Thus when the vasoconstrictor effect has ceased the dilator factor still operates. Evidence of the presence of these two factors may be found in the so-called "epinephrine reversal," in which ergotoxine or yohimbine is used to paralyze the receptor mechanism in smooth muscle which ordinarily responds to the excitatory action of epinephrine. The administration of epinephrine in yohimbine or ergotoxine treated animals results in immediate vasodilatation without preceding vasoconstriction. For this reason, and probably also because of the dilatation secondary to intense vasoconstriction, epinephrine has been found unsuitable for routine intranasal application. According to Goodman and Gilman,[1] neither ephedrine nor amphetamine (benzedrine) possesses this vasodilator factor. Craver, Chase and Yonkman[2] demonstrated recently that blood pressure reversal was never obtained with privine in yohimbine treated animals. It is interesting to note also that these workers showed that cocaine, unlike its action in combination with epinephrine, does not have any potentiating effect on privine.

It has been inferred by some that the secondary congestive action of privine is due to an allergy induced by the continued local use of the drug. Support for such an explanation of the dilator mechanism lacks good evidence. Other sympathomimetic drugs have shown allergic responses very rarely. Scratch tests with 0.1 per cent privine solution on a number of persons having the typical congestive effect from this drug have been entirely negative. No other manifestations of allergy, such as dermatitis of the skin of the upper lip, asthma or urticaria have ever been noted by us in any users of this drug. It is true that in almost all instances we have found eosinophils in the nasal smear; however, it should be remembered that in our practice we were dealing almost exclusively with patients who were primarily allergic.

Nasal congestion depending on a primary chemical irritation is not a satisfactory explanation of the behavior of privine. This solution is isotonic, has a p_H physiologically compatible with the nasal secretions and is singularly free from smarting, burning or other evidence of primary irritation.

From the Department of Medicine, Division of Allergy, Northwestern University Medical School.

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Vasodilatation as a reaction of intense vasoconstriction is the most plausible mechanism of the action of privine. Increased vasodilatation after constriction is a common phenomenon in exposure to cold, fright and other stimuli. It is to be expected that the degree of such vasodilatation would be dependent on the intensity and duration of the vasoconstrictor action. The relative pressor potency of privine is from one fifth to one third that of epinephrine, while its duration of action is two to three times that of the latter.

A number of other reports have been made dealing with the congestive effect of nasal vasoconstrictors, some of these including or singling out privine. In 1934 Scarano[3] studied the secondary reactions (returgescence, atony and bogginess) following a weekly period of three times daily nasal instillation of ephedrine or amphetamine in oil. Varying degrees of secondary reactions were noted in 5 of 25 cases with ephedrine, while reactions from amphetamine were virtually negligible. During a period of six years Sternberg[4] observed and followed up 32 patients whose nasal discharge and obstruction were more responsible to the continued use of vasoconstrictors than to the underlying allergic condition A total of eleven different vasoconstrictors was used and the authors observed no evidence as to which one produced most of the damage. Sprays were found to be less harmful than drops. Kully[5] likewise is of the opinion that not one of the sympathomimetic drugs is free from the secondary congestive effect. He states that the degree of congestion is proportionate to the intensity of the vasoconstrictor action and the frequency and duration of its use. He makes the emphatic statement that in many years of observation he has not encountered a single patient who used any of the vasoconstrictors to excess and remained free from the typical after-congestion.

Gollom[6] reported 30 cases in which nasal obstruction was prolonged by the use of privine. The typical histories of his cases are very much like ours, except that apparently in most of his cases the protracted use of the drug followed the attempted relief of a cold Schiller,[7] in a note to the editor of the *New England Journal of Medicine*, has called attention to the prolonged congestive effect of privine when used in seasonal hay fever. The author states that he has never seen such reactions and addiction following the use of ephedrine or other constrictors He believes that privine should not be used for a longer time than four or five days

Even prior to the foregoing reports on privine, in the book one of us[8] published in April 1944 the following statement was made: "We have noted that not infrequently the prolonged use of this drug (privine) establishes a reflex 'rebound,' i. e, an increased congestion after the effect of a single topical application has subsided" This preliminary note, written almost two years ago, has been amplified many times in our subsequent experience. As a matter of fact, the vasomotor rhinitis ensuing from the prolonged use of privine has become one of our most common medical problems in our office practice. The definite amelioration of this troublesome congestion following the discontinuance of the drops has been one of the most dramatic experiences we have witnessed.

SUMMARY

1. Privine hydrochloride, used in nose drops, commonly results in a rebound congestion of the mucosa. This action is due primarily to the vasomotor dilatation as a reaction from the intense vasoconstriction.

2. Other nasal vasoconstrictors may perhaps also produce similar effects, but to a less striking degree. In our practice, however, congestion from the continued use of other constrictors has been noted rarely.

3. The discontinuance of all nasal medication usually results in the alleviation of congestion in a week or less.

4. It is recommended that the use of privine in commonly used concentrations be discouraged in all cases in which prolonged nasal medication is desired. It is possible that further experimentation may indicate that weaker solutions may be better tolerated.

185 North Wabash Avenue.

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THE TREATMENT OF IMPETIGO CONTAGIOSA WITH SULFATHIAZOLE IN AN ALCOHOLIC PLASTIC VEHICLE

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LIEUTENANT MICHEL PIJOAN (MC), U S.N.R.

The treatment of impetigo contagiosa has always been an acute problem particularly in children, owing to the extreme contagiousness of the disease. This disease has been reported among war refugees[1] and has recently assumed military importance.[2]

The etiology of impetigo is somewhat obscure and there is no uniform agreement regarding the agent responsible for the disease. Some[3] regard the streptococcus as the etiologic agent, others[4] believe a virus responsible, but the more general opinion[5] is that staphylococci, so prevalent in the lesions, are responsible for the disease In spite of the fact that reinfection is common among children, one of us (Pijoan) was unable to infect himself with material from impetiginous lesions in various stages of development.

The methods of treating impetigo have been extensive. To the lesions have been applied tinctures of mercurial disinfectants, copper sulfate-zinc,[6] solutions of ferric chloride,[7] boric acid-zinc ointment,[8] staphylococcus toxoid,[9] silver nitrate cautery[10] and the mechanical effect of adhesive plasters[11] There are also numerous reports dealing with the classic treatment with ammoniated mercury. The successful employment of these chemotherapeutic agents requires the use of surgical dressings. These dressings are difficult to apply especially to such anatomic areas as the ear, nose, mouth and eyelid They require a great amount of time and often become soiled, moist and loosened.

The use of sulfonamides in the treatment of impetigo has assumed prominence in the last few years. Effective therapy has been accomplished by oral administration[12] and topical application in ointments,[13] powders and microcrystals.[14] More uniform results have been obtained with sulfonamides than with other agents, and these appear to be the drugs of choice for the treatment of impetigo.

Mr. F V Worman secured patients for this study
From the Naval Medical Research Institute, Bethesda, Md
This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U S Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department

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Sulfonamides have also been successfully used in the treatment of impetigo,[15] without the use of dressings, by incorporating them in an aqueous plastic vehicle consisting of dimethoxy cellulose or polyvinyl alcohol. These preparations when topically applied dry slowly, leaving a transparent water soluble film through which the lesion may be readily seen. The presence of exudate seems to liberate the drug from the water soluble plastic. While these films are therapeutically effective, the chief disadvantage is their slow drying time from ten to fifteen minutes.[16] The patients, usually children, often become restless and disturb the drying film. This disadvantage has been overcome by the addition of 70 per cent alcohol to the vehicle, which results in a much shorter drying time. While dimethoxy cellulose and polyvinyl alcohol are probably not completely soluble in 70 per cent alcohol, a satisfactory stable dispersion can be obtained by use of the proper technic.

PREPARATION OF SULFATHIAZOLE PLASTIC JELLY

The alcoholic plastic vehicle was prepared by adding dimethoxy cellulose (Dow-Methocel 15 cps.) or polyvinyl alcohol (Du Pont PVA-RH623 low viscosity) to 70 per cent alcohol containing the dissolved sulfathiazole in the proportions given in the following formulas. The preparations are thoroughly mixed in a Waring blendor and allowed to stand for about twelve hours to secure a homogeneous dispersion of the plastic. The methocel mixture is best kept in the refrigerator at + 5 C. during this period, while the polyvinyl alcohol may be slightly heated.

The addition of a small amount of plasticizers to the vehicle is necessary to secure a flexible film which will adhere properly to the skin. Triethanolamine and carbowax and glycerin are used in the formulas given. These preparations have a jelly-like consistency and are best dispensed from a collapsible metal tube.

The addition of 70 per cent alcohol to polyvinyl alcohol (RH-623) or dimethoxy cellulose (cps. 15) shortens the time required for drying as well as to increase the viscosities of these solutions.

The use of 70 per cent ethyl alcohol as a solvent for the preparation of the jellies yields products which are satisfactory in regard to their physical properties. The increase in viscosity results in a more viscous jelly as compared to preparations in which water is used as a solvent. Furthermore, a current of air from a fan hastens drying considerably; environmental conditions modify the drying of any substance which depends on evaporation for a result. Excellent adhesiveness is achieved with the plasticizers used, and it is to be supposed that other agents besides sulfathiazole can be incorporated in these jellies. The dry material or film is still water soluble and will dissolve in the presence of exudate and thus liberate a chemotherapeutic agent. When such jellies are spread on skin rather than on lesions they tend to dissolve in sweat, and reapplication may be necessary.

TABLE 1.—*Comparison of Viscosities and Drying Time of Cellulose and Polyvinyl Alcohol and Water Solutions*

	Ingredients as Gm. or Cc. for Preparation of Jelly			
	Dimethoxy Cellulose		Polyvinyl Alcohol	
0.2 Gm. celluose or 0.1 Gm. PVA used on skin area 6 cm. by 6 cm.	(15 cps.).....10.0 Sulfathiazole..... 1.0 Carbowax (1,500) 3.0 Glycerol..... 1.0		(RH-623).....20.0 Sulfathiazole..... 1.0 Triethanolamine 3.0	
Solvent to a final volume of 100 cc.	70% ethyl alcohol	Water	70% ethyl alcohol	Water
Viscosity (cps.).....	17,378	11,458	4,490	494
Drying time (minutes)..... Wet bulb 60 F. Dry bulb 75 F.	1.5-2.0	4.5-5.0	2.0-3.0	7.0-8.0

METHOD OF APPLICATION

The impetiginous lesion and surrounding area are soaked with hydrogen peroxide applied with a cotton pledget. Several applications may be necessary to loosen the crusts, which are removed by gentle débridement. Rough handling should be avoided, since it will result in increased scar formation. The lesion and surrounding area should be wiped free from excess peroxide and allowed to dry for several minutes. The sulfathiazole jelly is applied in a thin even layer and allowed to dry. One application may be sufficient; however, if further treatment is necessary the jelly may be reapplied without the use of hydrogen peroxide or débridement.

TABLE 2.—*Comparison of Therapeutic Results in the Treatment of Impetigo Lesions*

	Location of Lesions					
	Ear	Nose	Circumoral	Scalp	Extremities	Trunk
Number of lesions.....	26	18	30	16	36	15
Sulfathiazole in alcoholic dimethoxy cellulose jelly:						
Number of applications.....	3	1	1	1	1	1
Healing time (days).....	4	3	3	3	2	2
Sulfathiazole in alcoholic PVA jelly:						
Number of applications.....	3	1	1	5	1	1
Healing time (days).....	4	3	3	6	2	2
Ammoniated mercury:						
Number of applications.....	9	6	8	21	5	13
Healing time (days).....	11	6	8	26	7	16
Gentian violet:						
Number of applications.....	13	5	6	20	8	None
Healing time (days).....	19	8	8	24	8	used
Sulfathiazole ointment:						
Number of applications.....	7	13	11	15	5	11
Healing time (days).....	7	8	8	14	7	10

RESULTS

Through the courtesy of F. V. Worman, B.S., M.S.,[17] a bacteriologist collaborating with Dr. E. S. Stong,[17] 54 children with numerous impetiginous lesions were used for study. Approximately the same number of lesions were treated with each of five different preparations.

The therapeutic agents used were the two sulfathiazole plastic jellies, formulas 1 and 2, 3 per cent ammoniated mercury ointment, 3 per cent tincture of gentian violet and 5 per cent sulfathiazole ointment. Bandages were not used with any of the preparations. No difference was noted in the effectiveness of the two sulfathiazole formulas 1 and 2. A comparison of the results obtained with these preparations is shown in table 2.

The therapeutic results obtained by using sulfathiazole plastic jellies varied according to the location of the lesions. The shortest average period required for healing was two days and the longest was six days. The minimum time required to obtain healing with the other therapeutic agents was five days and the longest twenty-six days. In comparing the sulfathiazole jellies with other therapeutic agents without the use of dressings, it should be pointed out that somewhat better results would have been obtained with the other agents had dressings been used.

COMMENT

The topical application of sulfathiazole in an alcoholic plastic vehicle has the distinct advantage of drying rapidly and not requiring a bandage to retain the therapeutic agent in contact with the lesion.

15. Pijoan, M.; Worman, F., and Pijoan, J.: The Treatment of Impetigo Contagiosa with Sulfadiazine-Plastic Preparations and the Exclusion of Dressings, Southwest. Med. 27:118, 1943. Worman and Stong.[16]

16. Worman, F. V., and Stong, E. S.: The Treatment of Impetigo Contagiosa by Allantoin-Sulfathiazole in a Polyvinyl Alcohol Vehicle, Rocky Mountain M. J., to be published.

17. Adams State Teachers College, Alamosa, Colo.

The effectiveness of sulfathiazole in plastic jelly in the treatment of impetigo appears to be due to limiting the spread of infection by the plastic film and the bacteriologic effect of sulfathiazole. The presence of exudate liberates the sulfathiazole from the water soluble film at the proper site.

CONCLUSION

Sulfathiazole in an alcoholic plastic jelly is highly effective in the treatment of impetigo contagiosa. The sulfathiazole jelly may be quickly applied, dries rapidly, is soluble in exudate and obviates the necessity for bandaging the lesions.

SUICIDE BY INGESTION OF AMPHETAMINE SULFATE

MAJOR O. L. GERICKE
MEDICAL CORPS, ARMY OF THE UNITED STATES

Death by taking an overdose of amphetamine sulfate is sufficiently rare to warrant reporting such an occurrence. Hertzog, Karlstrom and Bechtel,[1] state that the only fatal case they were able to find reported in the literature was that of Smith[2] in 1939, and they go on to present the case of a 1 year old child who accidentally consumed a minimum of four tablets, or 40 mg., of the drug with fatal outcome.

The comprehensive review of the pharmacology of amphetamine sulfate by Ivy and Krasno[3] cites the case of a student who died a few hours after taking a 10 mg. dose, and the cause of his death remained conjectural in spite of an autopsy.

The present case with death following the deliberate consumption of an estimated 120 mg. of amphetamine sulfate points to the fact that the substance is a therapeutic aid with dangerous potentialities and that the indications for its use should be carefully evaluated before it is prescribed in heroic dosages for narcolepsy, torticollis and other neuropsychiatric conditions.

REPORT OF CASE

A white man aged 36, American, a soldier, was referred for neuropsychiatric consultation by the psychologist during routine screening of absentees because of the unusual finding of his score of 150 on the Wechsler Intelligence Test—in spite of only eight years of schooling and a history of alcoholic spree drinking. The subject related that his childhood was unhappy because his parents were strict devotees of a religious faith which forbade their children modern pleasures, such as attendance at moving pictures, and maintained discipline through the liberal application of corporal punishment. One of the subject's most vivid childhood recollections was of his parents' customary evening journey to religious services, after impressing on the children their firm belief that the end of the world might come in their absence. The children remained fraught with fear during the parents' nocturnal devotions. The patient left this uncongenial home at the earliest opportunity and obtained employment at the age of 16 at a race track in Tijuana, where part of his daily routine for a three month period consisted in the consumption of a quart of whisky. He subsequently did laboring work, served one enlistment in the Regular Army and was a salesman, filling-station operator and fisherman, operating his own boat. In the meantime he married, had a son, was divorced, remarried, and at the time of his interview had also a paramour and an illegitimate child. By now the patient had gained a superficial insight into his personality and recognized the fact that he had periods when he felt "blue" and could gain surcease from his dysphoria by drinking himself into a week-long stupor. Isolation from other people by a solitary fishing expedition was equally efficacious and a much more profitable cure for the "blues." Ultimately, the mutual and sympathetic understanding of his paramour proved able to tide him over his moody spells.

Because of the man's intelligence and interest in his own problem he was given frequent interviews, and therapeutic reading was prescribed, as well as amphetamine sulfate to mitigate his enforced abstinence and avowed feeling of depression. Physical examination was within normal limits, and there was no evidence of psychomotor retardation or depressed facies.

On April 18, 1945 the patient was seen briefly, and he stated that he had had no difficulty in sleeping the previous night, but he complained of loss of appetite. He was given specific directions to take only 5 mg. of amphetamine in the morning and to continue with that dosage until his supply of drug was exhausted.

About 10 p. m. April 18 the soldier attracted the attention of one of his noncommissioned officers and told him he felt ill, whereupon he was transferred to the hospital for admission. A search of his possessions revealed the following letter addressed to the psychiatric social worker, given here as written:[4]

Dear Mr.————,

Ive just made a decision that will seem to you a very weak way of solving this blue-spell, and don't even find reason to really justify it myself but at least you'll not be bothered with having to listen to my crazy explanations that dont even make sense to me.

I've already taken 4 of the pills and Im going to take the rest sometime before morning, I know its going to spoil the Majors experiment by taking these pills this way, but they weren't doing any good the other way. I'll be over *this* blue-spell any way I just cant sweat it out any longer, honestly I did try in every way and tried to co-operate with you and the Major in finding the cause, but its no use I just cant think straight even when I try to tell either of you how I feel and I just feel like a damn fool instead. Thanks any way for all you did, and maybe I did help you in at least understanding a little bit more about the next case you have like mine.

The following running comment was also found and apparently terminated at the time he began to feel so ill that he called for aid:

Its been about 20 min since I took the first 4, dont feel nothing yet but just got through taking 8 more maybe I'll get that elated feeling one more time at least, if a dozen dont do it Ill keep taking them 4 at a time till they do. If I live through this, I'll at least know how it feels to come from the depths to the hieghts. its made me belch twice that all, well of all the places to feel a sensation my right foot feels like its getting numb. my heart is pounding and I feel a pulse in my head that seems to start from behind and go around counter clock-wise and stop about even with my left ear. I sure as hell dont feel any elation though only a determination to carry this through and stop these blues once and for all. If they know very little about them with all their knowledge how the hell can I ever know whats causing it. Its funny but I dont feel sorry for myself or that Im a martyr about this. I always figured that people who took this way out were weak and yet I dont feel that way about myself, must be ego I guess. Ive no new feelings so Im going to take 4 more. my temples are pounding now and it feels like my legs were away off

The soldier was admitted at 10:15 p. m. and the admitting officer noted that he was in a dazed condition. His pulse rate was 58, strong and full. The pupils reacted to light and in accommodation and he complained of an intense headache, frontal in type. A mannerism of continually sweeping the left hand over the forehead and left eye was present. The nurse's notes give the additional information that the patient appeared wide awake on entry but seemed very nervous. At 11:30 the nurse noted that the patient's right leg and arm were paralyzed; he had difficulty with breathing and was involuntary. At 12:30 a. m. the pulse rate was 56; respiration was not labored, and the blood pressure was 140/80. Questions were answered with difficulty. The right leg and arm appeared paralyzed; however, reflexes were present. His condition remained the same, the pulse becoming somewhat stronger, and at 2:30 the pulse rate was 80, the color was good and respiration was not labored. His condition remained stationary until 4 o'clock, when an attack of vomiting occurred. The vomitus consisted of a brownish fluid. At 4:05 the rectal temperature was 103.8 F. Caffeine and sodium benzoate and administration of oxygen failed to bring about any improvement in his condition. The respirations were labored, the pulse was over 100 and the patient's condition became steadily worse until he died, at 4:55 a. m. on April 19.

Autopsy showed no gross findings of interest until the cranial vault was removed and the dura exposed, when the autopsy surgeon noted that the cerebral hemispheres showed a flattening of the convolutions, and there was a dark hemorrhagic

1. Hertzog, A. J.; Karlstrom, A. E., and Bechtel, M. J.: Accidental Amphetamine Sulfate Poisoning, J. A. M. A. **121**:256 (Jan. 23) 1943.
2. Smith, L. C.: Collapse with Death Following Use of Amphetamine Sulfate, J. A. M. A. **113**:1022 (Sept. 9) 1939.
3. Ivy, A. C., and Krasno, L. R.: Amphetamine (Benzedrine) Sulfate: A Review of Its Pharmacology, War Med. **1**:15 (Jan.) 1941.

4. Such errors in grammar and spelling as are found in the letter had not appeared in the previous writing of the patient. Their appearance here may be ascribed to his physiologic state.

area approximately 4 cm. wide extending from the right temporal lobe upward and backward along the central fissure to the longitudinal fissure. A small cut section through this area revealed the hemorrhage to be about 1 cm. in depth, and it extended above the arachnoid space into the brain tissue. There was a blood clot approximately the size of a walnut in the cerebellopontine angle. The entire brain was removed for further section. The brain tissue was so extremely soft and friable that it could not be preserved intact.

The pathologist, on examination of tissue submitted to him, noted a mass of clotted blood measuring 7 by 4.5 by 2.5 cm. beneath the dura on the right side. Over the right cerebral hemisphere there was considerable subarachnoid hemorrhage involving the parietal and anterior portion of the occipital lobes. There were no areas of contusion involving the brain substance. Considerable congestion throughout the white matter of the cerebral hemispheres was observed, and several tiny petechiae were present. There were multiple small hemorrhages of the pons. The cerebellum showed a few tiny "ring" hemorrhages. The final diagnosis was:

Cardiovascular: Coronary arteriosclerosis.

Respiratory: Pulmonary congestion and edema. Pulmonary emphysema.

Spleen: Congestion of spleen.

Genitourinary: Congestion and hemorrhages of kidney.

General nervous system: Subdural and subarachnoid hemorrhage, right parietal and occipital lobes. Petechial hemorrhages of cerebrum and cerebellum. Hemorrhage of pons.

An analysis of the stomach contents was negative for amphetamine sulfate.

SUMMARY

Death of a 36 year old man followed the ingestion of an estimated 120 mg. of amphetamine sulfate taken with suicidal intent. The immediate cause of death was subdural and subarachnoid hemorrhage of the parietal and occipital lobes.

Council on Industrial Health

MASS HEALTH SURVEYS IN INDUSTRY

This statement has been prepared by the Council on Industrial Health and approved for publication.

C. M. PETERSON, M.D., *Secretary.*

An important component of industrial health examinations is the discovery of nonoccupational disease, often in incipient and readily manageable stages. Early detection of illness and prompt adequate treatment are in the best interests of the worker, the employer, the community and the medical profession.

Increasingly in recent years official and voluntary health agencies have regarded industry as a convenient avenue for special case-finding campaigns—especially tuberculosis, syphilis and defective vision. All have important relations to the general public health or are designed to improve production and earning power or to reduce troublesome absenteeism and wastage.

The Council on Industrial Health believes that these case-finding campaigns conducted in industry by outside agencies merit support and cooperation from the medical profession provided certain general principles are observed:

1. The local medical profession, health authorities and other affected community health facilities should be fully advised well in advance about the purposes and scope of the survey.

2. The personnel undertaking the survey must be professionally competent and employ acceptable equipment and procedure. Results of examinations should be interpreted by physicians of experience and training in the methods employed.

3. Mass health surveys are essentially screening operations. Unless preliminary agreement suggests otherwise, the details of confirmatory diagnosis should be regarded as responsibilities of the established medical, clinic or laboratory facilities in the community.

4. Full consideration needs to be given to the disposition of individuals with clinically significant findings. They should be promptly referred to personal physicians or other authorized community agency for additional study and individualized treatment.

5. Means for isolation, hospitalization or other essential treatment need careful evaluation in advance of the survey.

6. Reporting and epidemiologic investigation of communicable disease should conform with the regulations of the health department having jurisdiction.

7. Surveys should be conducted only after the plant medical service has had an opportunity to study the proposed activity and given its approval. The details of case finding should conform to accepted industrial health procedure and be integrated with the regular activities of the plant medical department. The industrial physician should be consulted particularly (*a*) on discovery of coincidental disease or disability having suspected occupational etiology, (*b*) regarding plans for referral of patients and follow-up and (*c*) about the details of reemployment, especially placement in suitable occupations of individuals with residual impairment.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

HEXAVITAMIN TABLETS.—"Hexavitamin Tablets contain in each tablet not less than 2,500 U. S. P. units of vitamin A from natural (animal) sources, 200 U. S. P. units of vitamin D from natural (animal) sources, or as activated ergosterol or activated 7-dehydrocholesterol 37 mg. of ascorbic acid, 1 mg. of thiamine hydrochloride, 1.5 mg. of riboflavin and 10 mg. of nicotinamide."—U. S. P.

For description and standards see the U. S. Pharmacopeia XII First Bound Supplement under Tabellae Hexavitaminarum.

Actions, Uses and Dosage.—For prophylaxis and treatment of conditions arising from deficiency of vitamins A and D and ascorbic acid, thiamine, riboflavin and nicotinic acid. See articles on the various vitamins concerned (N. N. R. 1944, pp. 604-625).

INTERNATIONAL VITAMIN CORPORATION, NEW YORK

Tablets Hexavitamin: Each tablet contains 2,500 U. S. P. units of vitamin A, 200 U. S. P. units of vitamin D, 37 mg. of ascorbic acid, 1 mg. of thiamine hydrochloride, 1.5 mg. of riboflavin and 10 mg. of niacin amide.

NICOTINAMIDE (See New and Nonofficial Remedies 1944, p. 617).

The following additional dosage form has been accepted:

GEORGE A. BREON & CO., INC., KANSAS CITY, MO.

Tablets Nicotinamide: 100 mg.

TRIASYN B.—"Triasyn B Capsules and Tablets contain in each capsule or tablet not less than 1 mg. of thiamine hydrochloride, 1.5 mg. of riboflavin and 10 mg. of nicotinamide."—U. S. P.

For description and standards see U. S. Pharmacopeia XII First Bound Supplement under Capsulae Triasyni B and Tabellae Triasyni B.

Actions, Uses and Dosage.—For prophylaxis and treatment of conditions arising from deficiency of thiamine, riboflavin and nicotinic acid. See articles on the various vitamins concerned (N. N. R. 1944, pp. 606-615).

PREMO PHARMACEUTICAL LABORATORIES, INC., NEW YORK

Tablets Triasyn B: Each tablet contains 1 mg. of thiamine hydrochloride, 1.5 mg. of riboflavin and 10 mg. of nicotinic acid amide.

Capsules Triasyn B: Each capsule contains 1 mg. of thiamine hydrochloride, 1.5 mg. of riboflavin and 10 mg. of nicotinic acid amide.

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SATURDAY, AUGUST 11, 1945

FEDERAL PROGRAMS TO PROMOTE SCIENTIFIC RESEARCH

Under the Organization Section in this issue of THE JOURNAL appears an analysis of legislation pending in the 79th Congress to implement the recommendations regarding research contained in the report recently submitted to President Truman by Dr. Vannevar Bush. In addition to the proposals analyzed in this article, several others have been introduced with a view to continuance in the postwar period of the coordinated and intensified research that did so much for the advancement of medical and other sciences during the war. For instance, one measure introduced by Mr. Thomas of Utah on July 26 is designed toward increasing interest in children while they are in secondary schools.

The number and diversity of the measures proposed are themselves an evidence of the difficulty of finding a formula for the purpose that will accomplish the desirable objectives without introducing factors harmful both to research and to our system of government. Surely every one concerned would wish to avoid bureaucratic domination of research, inhibition of investigations carried on under private initiative, in industry, in schools and colleges or even by individuals, and the spending of funds without any reasonable likelihood of adequate return. Practically all the measures propose to develop a national research foundation as an independent agency in the executive branch of the government, yet there is no obvious consensus as to the way in which such an agency should be established, the funds that should be granted to it, the technic of its operation, the choice of its personnel, the duration of its activities or the manner in which it would cooperate with existing governmental and private organizations. Senator Kilgore himself recognized these difficulties in his hope that joint hearings might be held so that the issues presented by these bills could be clarified.

While these measures propose to coordinate and intensify research in various scientific fields, they would seem to demand a certain amount of coordination within their own proposals. Among the objectives sought are the stimulation of research in physical sciences, medicine and the national defense. Obviously advancement of medical science is a contribution to the national defense, as are no doubt also advances in the physical sciences. Nevertheless discoveries related to bombing, chemical warfare, new weapons and new technics of defense, aviation and transportation are somewhat remote from the control of infectious diseases, the detection of viruses and the prevention and cure of epidemic diseases. Discoveries in physics, chemistry and related sciences are often promptly explored for such benefits as they will yield in the diagnosis, prevention and treatment of disease, yet these are quite certainly not as closely related to medicine as are anatomy, physiology, pathology, bacteriology and immunology. The advancement of research in the medical sciences is indissolubly associated with undergraduate and graduate medical education, the functions of the hospitals and the practice of medicine. Some of the proposals completely ignore these necessary relationships.

Most of the proposals request a managing board of limited numbers with subsidiary advisory boards in the fields that have been mentioned. Without specific allocation of funds or influence to these subsidiary fields, the pressure of public opinion rather than the immediate good to the public may be the determining factors in the allocation of such funds as are made available. One of the dangers inherent in federal assistance is the possibility of a type of federal control over research and the results of research that would prevent the dissemination of new information and inhibit rather than stimulate investigative activities. Moreover, bureaucratic direction may serve to monopolize personnel to the extent of depriving private industry, private educational and research institutions and other nongovernmental agencies of the opportunity to secure workers in a field in which the number of competent investigators is always less than the demand for them.

Already agitation is obvious in behalf of the social sciences, sociology, psychology, economics and similar fields of learning. Surely such sciences might also benefit by the type of aid that government can render, yet the possibilities even with the physical sciences and with medical science have not been explored. The establishment of a pattern for action by the government in stimulating science might well be developed by the experimental technics of science before application is made to every phase of human life and learning.

The considerations that are here merely suggested are only a few of hundreds of questions that have already arisen in the minds of all those concerned with these projects. The least that Congress could do, under the circumstances, would be to provide for extensive hearings under proper conditions with representation from many interests before a measure that would include what seemed to be the most desirable features of all the proposals could be compiled. Even this measure when finally developed should be again submitted to new hearings before definite action by the Congress would seem to be warranted. Such delay as would be required might seem unfortunate, particularly now when all the world recognizes the accomplishments of science during the war and when every one would wish to retain in the postwar world the advantages that have been gained by coordinated and intensified research. Nevertheless the harmful potentialities in these projects are sufficiently apparent to require at least enough time for careful consideration before definite action is taken.

THE MATERNAL AND CHILD WELFARE ACT OF 1945

Senator Pepper and nine other members of the Senate Committee on Education and Labor have introduced a bill (see Organization Section, page 1112, this issue) designed to extend the provisions of the Social Security Act by increasing materially the funds available for maternal and child health services, services for crippled children, child welfare services, and an increased personnel of the Children's Bureau necessary for administration. Included are suggestions for research and for education of personnel. This bill is perhaps the official opening of a campaign to make permanent some of the activities that prevail under the so-called EMIC program.

Early in the establishment of EMIC, THE JOURNAL predicted that the Children's Bureau would not be happy until permanence had been given to this tremendous expansion of its activities. As with much other legislation for social welfare, few would oppose the objectives sought, namely promotion of the physical and mental health of mothers during maternity and of their children, preventive health work and diagnostic services for children, school health services, the care of sick children and the correction of physical defects. The allotment of federal funds to the individual states is now a well established principle in our government. The public has a right to ask that need be established before funds are allocated. The wisdom of placing control in the Children's Bureau through insistence that plans must be approved by the chief of that bureau before funds can be granted is subject to doubt. The chief of the Children's Bureau is to formulate the policies after consultation with the state health officers and an advisory committee. Nothing in the act says that the advisory committee is to have any authority or that its advice need necessarily be followed. THE JOURNAL has previously criticized adversely the political technic which permits the chief of a government bureau to select his own advisory committee and then even to disregard the advice of the committee that he himself selects.

In submitting the bill, Senator Pepper offered some interesting estimates. Thus he said:

> Medical care and health supervision of children is costly in dollars. Reliable authorities estimate it comes to somewhere in the range of $25 to $40 a year for each child in the United States. With 40,000,000 children under 18 that represents a total of at least $1,000,000,000 for the country. A federal appropriation of $75,000,000 for maternal and child health and for crippled children for a year cannot go very far in meeting these all-over health needs of children.

Almost coincidentally with the offering of this proposal came an announcement in the press indicating that Secretary Schwellenbach of the Department of Labor desired to see the Children's Bureau removed from that department and possibly incorporated in a new department of the government to be devoted to health and welfare. Whether or not President Truman, in his apparent wish to consolidate government agencies, will suggest the establishment of a new department in the cabinet to include the Children's Bureau, that agency long since should have been integrated with the other health activities of the nation.

ARMY ROUTINE IN TREATMENT OF MALARIAL ATTACKS

Discharged soldiers who have had malaria may have clinical attacks many months after leaving the service. Most of these attacks will be due to vivax infections. Of 18,171 analyzed attacks occurring in the United States in soldiers infected while oversea, 98 per cent were due to Plasmodium vivax alone. The attacks are generally mild and respond quickly to adequate treatment. Among 32,292 admissions for malaria to army hospitals in the United States in 1944 two deaths were attributed to the disease.

Febrile illnesses in discharged soldiers who have served in malarious regions should raise the suspicion of malaria. Thick blood films should be examined for parasites in such cases. The possibility of malarial relapses in ex-soldiers who undergo surgical operations must be kept constantly in mind. While it may occasionally be necessary to treat patients without an accurate laboratory diagnosis, such practice is dangerous and should not become routine. Other diseases for

which specific therapy is essential, such as pneumonia or meningitis, may be overlooked, with tragic results.

In general, the Medical Department of the Army on the basis of a huge experience prefers to use atabrine in treating usual cases of malaria. The standard Army treatment consists of 1 Gm. in divided doses in the first twenty-four hours, followed by 0.1 Gm. three times a day for six days.

As an alternative to atabrine for patients who do not tolerate atabrine, quinine, when available for oral use, or totaquine, which is freely available, may be used. The dosage of both of these drugs, as used in the Army, consists of 1 Gm. three times a day for two days, followed by 0.6 Gm. for five days. In civilian practice it is believed that this dosage could with safety be reduced slightly, especially for relapses of vivax malaria. Clinical studies by the Army both in the United States and overseas show that, in the dosage given, totaquine U. S. P. gives results as satisfactory as those secured with quinine.[1]

Many helpful details with regard to diagnosis and treatment, including the management of complicated and severe cases requiring parenteral treatment, are given in a recently published War Department Technical Bulletin.[2]

Available treatment will not prevent relapses of vivax malaria. Investigations by the Medical Department have shown clearly that courses of treatment like those given for clinical attacks are useless between relapses. To avoid the occurrence of attacks in close succession the Medical Department recommends that treatment for attacks be continued with small doses of an antimalarial for a variable period, usually at least ninety days. Atabrine is usually employed. The continuation dosage, which should not be exceeded, is 0.1 Gm. a day. On this dosage relapses rarely occur. If quinine is used, the Army found 0.6 Gm. a day necessary in oversea practice. This is a troublesome amount of quinine to take continuously, but breakthroughs were fairly common overseas when smaller doses were taken. Further information on this aspect of the subject is provided in another Technical Bulletin, Med. 136, on the Avoidance of Relapses of Vivax Malaria by Use of Suppressive Medication.

Physicians should exercise care in the choice of an antimalarial drug. Individuals who are sensitive to atabrine or seriously intolerant of it should receive totaquine or, if available, quinine. Similarly, persons who are sensitive to totaquine or quinine should receive atabrine. It should be remembered that totaquine U. S. P. contains about 10 per cent quinine. Persons sensitive to both atabrine and the cinchona alkaloids are seen only rarely.

1. Bull. U. S. Army M. Dept. number 84, January 1945, p. 51, number 89, June 1945, p. 21.
2. Treatment of Clinical Malaria and Malarial Parasitemia, Tech. Bull. Med. 72, War Dept.

Current Comment

DISCHARGE OF MEDICAL OFFICERS

In this issue of THE JOURNAL appears the official statement of the Army Medical Department relative to the discharge of medical officers. The Connecticut State Medical Society late in July adopted a resolution which was sent to the Board of Trustees of the American Medical Association and presumably to the officers of other state medical societies, urging that the American Medical Association "press the reactivation of the Procurement and Assignment Service in a workable and liberal advisory authority concerning the separation of medical officers and restore to it the same responsibility it exercised during the period of recruitment of medical officers." The resolution urged further that the American Medical Association and its components should seek the interest of the Congress of the United States in providing a clear and productive separation policy for medical officers. . . ." The policy presented in this issue of THE JOURNAL is one on which the officials of the United States Army and of the Army Medical Department have been working for some time. Recently the Michigan State Medical Society took action similar to that of the Connecticut State Medical Society. The organization known as the Association of American Physicians and Surgeons, Inc., according to the press, has sent a resolution to numerous officials of the government. This resolution lists a number of rumors, most of which are without the slightest foundation in fact. The officials of the Association of American Physicians and Surgeons could have found out how completely unwarranted these statements were before giving them publication and thus promoting dissatisfaction and disintegration of morale without the accomplishment of any conceivable worthwhile objective. Meanwhile word comes from Washington that the War Department has assigned Col. William P. Holbrook to help the Military Affairs Committee of the Senate investigate charges of overstaffing of doctors in the Army. Colonel Holbrook is to assemble all pertinent statistics on medical personnel and to have them ready for the committee when Congress reconvenes on October 8.

HEALTH LEAGUE OF CANADA

A report of the twenty-fifth annual meeting of the Health League of Canada, with headquarters at Montreal, is sent out in anticipation of the league's twenty-sixth annual meeting, scheduled for September 1945.[1] The silver anniversary publication reflects public health progress in Canada. The league has five technical divisions, dealing with immunization, industrial health, venereal disease, nutrition and pasteurization of milk. These are considered the five major challenges to health in Canada. Under these various headings important

1. Report of the Twenty Fifth Annual Meeting of the Health League of Canada at Montreal, Nov. 23 24, 1944.

needs are stressed, such as medical examination before marriage and antepartum examinations. These objectives are being attacked by the usual methods in health education: pamphlets, films, posters and local meetings and letters. Under the heading of Immunization, the educational attack was on diphtheria, smallpox, whooping cough and, in some provinces, scarlet fever; 20,000 lines of sponsored advertising in forty Canadian newspapers featured this campaign. The industrial health division has functioned mainly through the distribution to industry of posters, pay envelop inserts and instructive booklets; conferences also have been held. Production of a nutrition calendar was a prominent activity. Little progress is reported toward pasteurization of milk; only the province of Ontario requires the pasteurization of all milk. The Health League of Canada represents in Canada many of the activities which are carried on in the United States by special independent agencies known as voluntary health agencies. In view of current agitation of the issue of consolidation or federation of voluntary health agencies in the United States, the functioning of the Health League of Canada for a quarter of a century should offer interesting examples. While nations differ, there are probably no two peoples more alike than those of Canada and the United States. The Health League of Canada has an official publication, *Health*, which is published quarterly and reaches a coast to coast audience "of well over thirteen thousand readers."

RADIO TRANSCRIPTIONS FOR HEALTH GROUPS

On page 1114 of this issue of THE JOURNAL the Bureau of Health Education announces the seventh series of electrically transcribed radio broadcasts for local use by medical societies or by local health or welfare groups with the approval of the local medical society. With the addition of these transcriptions, this important and growing service now represents a well rounded coverage of the field in health education. A series titled Medicine Serves America deals with medical progress. Live and Like It, a dramatized series, considers the everyday health problems, such as weight control, sleep, prompt medical care and superstitions. Before the Doctor Comes is a series of informal question and answer discussions with doctors about common symptoms occurring in the family, such as cough, rash, earache, bleeding and similar minor but perplexing problems which must be faced while doctors are scarce. There is a series of twelve programs called Dodging Contagious Diseases: this title is self explanatory. For local societies desiring to remain on the air through the summer, twelve transcriptions are available under the title Keep Cool, which deal with summer problems such as suntan, swimming, bugs, poison ivy and hay fever. Health problems of middle age are dealt with in a series of thirteen platters featuring interviews with thirty-three prominent public health experts. The health problems of middle age form the subject of the series More Life for You, in which twenty-four medical and surgical authorities are interviewed. These seven series, a total of eighty-eight broadcasts, will suffice to keep a medical society or other local group on the air weekly without interruption for almost two years. The diversification of subjects allows for scheduling with regard to seasonal timeliness. The diversity of approach, including interviews, round table and dramatization, will lend variety and interest to the local series. Further information may be had by addressing the Bureau of Health Education, 535 North Dearborn Street, Chicago 10.

NARCOTIC PRESCRIBING BY TELEPHONE

The United States Commissioner of Narcotics has called attention to the difficulty that has resulted throughout the country because of the frequency with which physicians telephone their narcotic prescriptions. This practice, he reports, has resulted in abuse and in illicit traffic, many pedlers and addicts using this means to obtain morphine. In at least one community the practice has resulted in a federal grand jury investigation. The report of this grand jury, after describing the facts developed during the investigation as disclosing "a rather shocking disregard of the law" and as reflecting a condition "intolerable and wholly unwarranted," continued:

> We do not wish to place ourselves in a position or attempt to determine when or under what manner or in what quantities a person may need narcotics for the alleviation of pain or suffering, but we feel that we are in position to say that the conditions above referred to are intolerable and wholly unwarranted and, if continued, can only result in an indictment wherever warranted. It has been stated in defense of this condition that the doctors are overworked and prescriptions by telephone are time savers. We are conscious of the overworked condition of most of our physicians, but we disagree with the contention that such practice is warranted in order to save time. It is a matter of obeying or violating the law.
>
> We are making this report at this time in the hope that these abuses, as well as any others not mentioned herein, may be speedily corrected. We propose to pursue this investigation further when next called and will then take such action as the facts and circumstances warrant at that time.

Under existing regulation, the furnishing of narcotics pursuant to telephone advice of physicians is prohibited, whether prescriptions covering such orders are subsequently received or not, except in an emergency. In such an emergency, a druggist may deliver narcotics through his employee or responsible agent pursuant to a telephone order only if the employee or agent is supplied with a properly prepared prescription before delivery is made and this prescription must be turned over to the druggist and filed by him as required by law. Physicians will aid materially in preventing the abuse referred to by the Commissioner of Narcotics if they restrict orders for narcotics by telephone strictly to actual emergency cases.

MEDICINE AND THE WAR

REDEPLOYMENT AND SEPARATION OF MEDICAL DEPARTMENT OFFICERS

NOTE.—*Following is the text of the official announcement released by the Office of the Surgeon General, U. S. Army, relative to the discharge of Medical Officers.*—ED.

V-E Day found the War Department with approximately 65 per cent of its Medical Corps officers overseas, the largest number in the European and Mediterranean theaters, the others principally in the Pacific. Some time prior to the announcement of V-E Day the War Department had completed its planning for redeployment, readjustment and discharge. This plan provided for discharges of enlisted personnel in relation to the declining requirements of a one front war, based on length of service, length of overseas service, combat activity, decorations and number of dependents. The composite score was known as the Adjusted Service Rating. The separation of officers was not tied down initially to a specific Adjusted Service Rating although the War Department desired that, within the limits of military necessity, substantially the same type of equitable, objective considerations should govern.

The War Department's pre-V-E Day planning also laid down the principles to govern the movement of personnel out of the European and Mediterranean theaters once victory was achieved. Military necessity, governed by consideration of transportation and the strategic requirements of the Pacific, scheduled the movement of a considerable number of troops directly from Europe to the Pacific. This was particularly true of service troops—the Engineers, Signal and, to a lesser degree, Medical Personnel—which were to prepare the way for the large inflow of divisions which would arrive in the Pacific after a short period of furlough and retraining in the United States.

Within the limits of military necessity, which govern here as in every other phase of redeployment and discharge policy, men with the lowest Adjusted Service Ratings were to go to the Pacific directly. Those with a large number of points were to go to the Pacific via the United States or were to remain in the United States as a strategic reserve until a final decision could be reached concerning the need for them during the remainder of the Japanese war. Men with a still larger number of points would remain in Europe as the Army of Occupation, while those with the highest points would be returned to the United States as surplus. It did not follow that the surplus group would necessarily be discharged, since it was possible—in fact, probable—that some of these men might have lower scores and therefore be less entitled to discharge than others who had returned from overseas at an earlier date or were now in the Pacific awaiting replacement before they could be returned. To permit the discharge of men with low scores because the war in Europe was over and they could be brought home, while men with substantially higher scores would be forced to continue fighting in the Pacific, was clearly inequitable. A responsible policy had to provide for sending replacements to the Pacific to permit the return of their high score personnel for discharge.

While V-E Day found the Medical Department with approximately 35 per cent of its Medical Corps strength in the United States, the same did not hold for other arms and services. All of the divisions were out of the country, and the same was true of the Signal Corps, Engineer and other service personnel. The Medical Department had considerably more of its personnel in the United States because of the fact that the definitive care which the battle wounded received is given them, not in overseas hospitals, but in the large general and convalescent hospitals in this country. Likewise there remain many hospitals in the United States which provided medical care for the Service and Air Force troops still in this country as well as for the inductees and trainees. These hospitals had to be manned, and it had not been feasible nor desirable during the relatively short European war to exchange personnel between the United States and Europe. Extreme exigencies in shipping had placed great difficulties on exchange with the Pacific.

In working out the over-all plans for redeployment, it was logical to envisage that most personnel adjustments would be made in Europe, with the divisions cleared for the Pacific on embarkation, permitting the pesonnel a thirty day leave in the United States and providing for them a short retraining period to prepare them for the differences in Pacific warfare. There was no room in this plan for adjusting personnel once the divisions returned to the United States, since there was no one left here for exchange purposes, except a few raw recruits.

The Medical Department picture was, however, markedly different. Cognizant of these differences the Surgeon General requested and received permission to exchange personnel in the units coming through the United States to the Pacific on the condition that the units would be able to perform their mission at the time they left this country.

Over-all planning of the Surgeon General went beyond this one step of restaffing units in the United States.

During the spring of 1945, when the European war was reaching its climax and the Pacific war was accelerating, the Surgeon General had stripped the United States of all personnel that could possibly be spared to provide the fighting fronts with the maximum number of medical personnel. However, as the war in Europe began to draw to a close every effort was made to bring back the battle wounded as rapidly as possible, so as to avoid the errors of World War I, when the wounded were forced to wait for many months because of shipping stringencies. Not only was care taken to avoid a repetition of this, but it was essential that many European and Mediterranean hospitals be cleared quickly so that they could meet the early dates set for direct movement to the Pacific. Early 1945 found the European Theater with more than 191,000 patients; by the end of June this figure was approximately 65,000. May and June saw the return to the United States of 98,000 patients, all but 24,000 of whom came from the European and Mediterranean theaters.

During the first half of 1945, when the maximum numbers of medical personnel were being sent overseas, the number of patients remaining in the general hospital system in the United States, which treats almost exclusively overseas casualties, increased from 133,000 to 240,000.

With personnel flowing out and patients flowing in, the Surgeon General had planned long before V-E Day to request the return of Medical Corps officers as soon as the fighting in Europe ceased. A substantial requisition was placed on the European theaters shortly after V-E Day, but the tremendous

personnel shift in the theater and the uncertainty regarding individual scores, which were not available until almost six weeks after V-E Day, made it difficult for the theater to return personnel as rapidly as desired. Such personnel has by this time returned or is en route.

Permission to restaff the units coming through the United States and the early return of personnel to assist in the operation of the hospitals in the United States constitute but two of the four phases of the Surgeon General's plan. Realizing that the units which had to go from the European and Mediterranean theaters directly to the Pacific had to be filled not only in number but also with the proper types of specialists so that they could perform their mission on arrival, and realizing further that the Mediterranean in particular would have to dip down into personnel which had two or more years' overseas service to find specialists to balance these units, the Surgeon General recommended exchanges between the European and Mediterranean theaters to avoid sending high score personnel to the Pacific. After some delays this policy was put into effect, but it will not completely obviate the unfortunate situation in which certain scarce specialists will have to proceed directly to the Pacific without passing through the United States because the exigencies of war permitted no delay in shipping dates.

The final point in the Surgeon General's plan was to prepare the groundwork for an accelerated exchange of personnel with the Pacific, as soon as part of the surplus personnel in the European and Mediterranean theaters was returned to the United States, so that replacements could be sent from the United States to the Pacific.

To implement the restaffing of units scheduled for the Pacific coming through the United States, a complete census was undertaken of all personnel stationed in the United States. On the basis of this census and in light of experience to date, criteria were established for withdrawing personnel from units passing through the United States and for assigning personnel now in the United States to the units scheduled for the Pacific.

These are only general rules and are subject to exception in any case due to military necessity, and to change if subsequent developments should make such action necessary. They are not to be understood as creating any right in an officer to continue on duty in this country if military needs now or later should require his assignment to other duty. Subject to these qualifications, the plan for withdrawal of officers from units and for new assignments is shown in the accompanying table.

The fact that more stringent criteria for withdrawal and assignment were established for Medical Corps officers than for other Medical Department Corps reflected smaller availabilities of Medical Corps officers than of other Medical Department Corps.

Because there is nothing in this plan of medical redeployment which takes precedence over considerations of military necessity, it will not be possible to apply the withdrawal principle to Commanding Officers and Executive Officers of hospital units or to certain Medical Department personnel attached to divisions because adequate replacements cannot be found and trained within the available time.

Moreover, there is nothing in the plan which stands in the way of volunteering. If an individual desires service in the Pacific, he can go if he passes the physical qualifications, irrespective of age, score or prior overseas experience.

Despite the above qualifications, it is hoped that the criteria outlined in the preceding table can be followed in the case of the vast majority of Medical Department officers returning through the United States for redeployment to the Pacific.

Intimately associated with the problem of redeployment are problems of readjustment and discharge. Reference has already been made to the fact that the original plan of the Surgeon General contemplated the sending of replacements to the Pacific at the earliest possible date, in order to permit the return to the United States of personnel who have had long overseas service. One phase of this plan is already in operation. Large numbers of nurses who have been in the tropics for two or more years will soon have the opportunity of returning to the United States while the theater will have the benefit of a group that has not yet suffered from the exhaustions incident to life in the tropics and to combat.

At first glance it might appear difficult to understand how it happens that several months after V-E Day, with the scale of combat having shrunk from a two to a one front war, the Army has only now begun to separate Medical Corps officers and other Medical Department personnel. The 98,000 patients who were brought back to the United States in May and in June were preceded in March and April by 89,000 patients, or a total of 187,000 patients during a four month period. On the basis of detailed experience tables for World War II, the average overseas casualty returned to the United States for definitive treatment remains in a hospital in this country for five to six months. This means that, although there have been only Pacific casualties since V-E Day, there were a sufficient number of casualties prior to V-E Day to keep the general and convalescent hospitals in this country operating at or near peak until late fall of this year. The Medical Department personnel that are attached to divisions in Europe and in the Mediterranean have, of course, not been busy with the care of casualties since V-E Day, although a considerable number were forced to assume the job of caring for the thousands of sick and wounded displaced persons in the areas overrun by the American armies. However, this "divisional" personnel has for the most part been busy dismantling forward hospitals and moving to the staging areas for embarkation either directly to the Pacific or through the United States. In addition, there are many thousands of Medical Department officers at the present moment on the high seas and many other thousands on leave in the United States preparatory to taking up assignments in this country, so that others who have not yet been overseas can go.

When hostilities ceased in Europe, the worldwide medical picture was this: an expanded war in the Pacific with vastly increased requirements, not only to cope with the engagements that were to be launched, but to facilitate the return to the United States of large numbers of personnel who have had long service in the Pacific for reassignment or separation. The United States had a peak patient load and would soon have thrust upon it a substantially increased medical processing load incident to the return of troops for redeployment to the Pacific or for discharge. This meant that the surplus brought about by a shrinkage from a two to a one front war was largely in Europe, where it could not be used for any of the strategic purposes for which it was needed: that is, to permit the separation of high score personnel, which could only take place

Plan for Withdrawal and Assignment of Officers

Corps	Age		A. S. R.		Overseas Service V-E Day (Months)	
	Withdrawal	Assignment	Withdrawal	Assignment	With-drawal	Assign-ment
Medical Corps	45 or over	44 or under	75 or over	74 or under	12	0
Dental Corps	40 or over	39 or under	50 or over	49 or under	6	0
Medical Administrative Corps	40 or over	39 or under	50 or over	49 or under	6	0
Sanitary Corps	40 or over	39 or under	50 or over	49 or under	6	0
Veterinary Corps	40 or over	39 or under	50 or over	49 or under	6	0
Army Nurse Corps	40 or over	39 or under	30 or over	29 or under	6	0
Physical Therapists Corps	40 or over	39 or under	30 or over	29 or under	6	0
Medical Department Dietitians	40 or over	39 or under	30 or over	29 or under	6	0

after such personnel had been returned to the United States, to take up assignments in the United States and help carry the peak load or to serve as replacements for individuals to be sent to the Pacific so that the latter could return its high score personnel to the United States for separation.

The keynote to the separation policy was therefore to give consideration to the participation of all theaters and to be certain that the surplus theaters—European and Mediterranean—would return their personnel at the earliest possible moment. At the end of World War I, with the war terminating for all at the same time, demobilization could be haphazard and yet substantially equitable: Off the gang plank and out. Such a procedure after V-E Day would have been unthinkable. There was a complication over and beyond the necessity of including the Pacific and providing for its participation in any separation plan. As was true of redeployment, military necessity had to govern and take precedence over any individual's score. The keynote to the efficient medical service in this war has been the careful marshaling of the limited number of key specialists who, despite every effort that has been made to utilize their skills to the full, have proved insufficient in number.

The separation plan of the Surgeon General had to deal, therefore, not only with numbers but also with classes of personnel. On the basis of detailed studies it was decided that it would be best to establish two classes—one for scarce specialists, the other for nonscarce specialists and general duty officers—and to set a definite score for each, so as to keep under strict control the outflow of scarce specialists. Consideration was given at one stage of the planning to prohibit the release of any officers in the scarce class, but it was believed better to plan where possible to release very high score individals as well as those over 50 years of age, irrespective of specialty, so long as the number of such releases would not endanger the efficiency of the medical service. The list of scarce specialists was kept to a minimum, after a review of worldwide requirements and availabilities.

Although readjustment regulations place responsibility on the Chief of each Technical Service for the establishment of separation policies, the Surgeon General felt it incumbent on him to establish a representative Separations Board and to charge this board with developing a series of objective criteria which would insure the continuation of high medical standards during the Pacific war and, at the same time, provide an equitable basis for the separation of surplus officers. The Deputy Surgeon General was designated Chairman of the Separations Board, and representatives of the three major forces—Army Air Forces, Army Ground Forces and Army Service Forces—were made members of the Board.

Establishment of Separations Board

The Board thoroughly explored all aspects of the separation policy and had at its disposal comprehensive statistical material before deciding the criteria for separation.

The Board decided to establish definite criteria for separation, subject, as above stated, to the limits of military necessity which governs all discharge policy. These criteria, therefore, create no vested right in any officer to discharge but constitute the goal to be sought, and the general rules to be applied in the absence of supervening military necessity. Such necessity may exist as to the time when, in any individual case, this step can be taken. Also it may arise from the possible need for a relatively few officers with irreplaceable experience whose usefulness is so great as to transcend individual consideration. Separations will be considered by the Surgeon General's Office and granted within the above principles wherever possible. The criteria hereafter set forth and all provisions of the present statement of separation policy must be read and understood as subject to the above qualifications.

Criteria for Separation from the Service

1. Medical Corps officers returned by a theater or declared surplus by a major force (except those with primary military occupational specialties listed in paragraph below) are eligible for release from active duty if their Adjusted Service Rating is 100 or above.

2. Medical Corps officers in certain scarce military occupational specialties are eligible for release from active military duty if they have an Adjusted Service Rating of 120 or more:

Gastroenterology	Neuropsychiatry
Ophthalmology and Otolaryngology	Neurosurgery
Cardiology	Thoracic Surgery
Dermatology	Plastic Surgery
Allergies	Orthopedic Surgery
Anesthesia	Clinical Laboratory

3. Medical Corps officers over 50 years of age, irrespective of their specialty classification, are eligible for relief from active military duty if they are returned to the United States by a theater or declared surplus by a major force.

4. No Medical Corps officer with an efficiency index of 41 or more who desires to remain on active military duty will be relieved, irrespective of age, military occupational specialty or Adjusted Service Rating.

Paragraph four is in keeping with the spirit of readjustment regulations which provide that individuals who desire to remain on active duty will be given every consideration.

Because of the fact that the general hospitals in the United States are now at peak and because the Surgeon General desires to send replacements to the Pacific as quickly as possible, the age provision is not being put into effect at the moment for personnel in the Army Service Forces, and *no Medical Corps officers in the nonscarce category is being released who has less than 110 points (except those who returned from overseas since V-E Day).* However, it is hoped that when more of the surplus personnel is returned from the European and the Mediterranean theaters, this temporary expedient can be lifted.

Subject to the general qualifications stated, the accompanying table summarizes the criteria for separation established for all Medical Department Corps.

Criteria for Separation

Corps	*Age*	*A. S. R.*
Medical Corps *	50 or over	100 or over
Dental Corps	45 or over	100 or over
Medical Administrative Corps	45 or over	90 or over
Sanitary Corps	45 or over	90 or over
Veterinary Corps	50 or over	110 or over
Army Nurse Corps †	40 or over	65 or over
Physical Therapists Corps †	50 or over	65 or over
Medical Dietitians Corps †	50 or over	65 or over

* Scarce categories, A. S. R. 120.

† The following additional provisions cover separations: dependent children under 14; married to demobilized allied personnel.

As in the case of Medical Corps officers, the Army Service Forces, for the time being, have not placed into effect the age provision for Dental Corps officers, and they are operating under a score of 110. But it is hoped that this exception can be removed later.

The foregoing criteria outlined have been established for an initial period of several months, and the point score will be reduced when the number of surplus personnel returned from the European and the Mediterranean theaters makes this possible.

During recent weeks every effort has been made to speed the return of surplus personnel from the European and Mediterranean theaters so that a maximum number of Medical Department officers, especially Medical Corps officers, can be returned to the United States for reassignment and separation.

Although the original plans provided that the last of the surplus personnel would not be returned until the middle of 1946, it now appears probable that the entire surplus will be in this country shortly after the end of 1945. The major factors influencing the return of personnel from the Mediterranean and European theaters are the rate at which troops leave those theaters and the availability of shipping for the

return of Medical Department personnel. So long as large numbers of troops remain, a part of the surplus personnel must remain to furnish them medical care.

The rates at which Medical Corps and other Medical Department officers are separated are conditioned largely by the Pacific. If the Pacific did not exist, or if it could be ignored, as it clearly cannot, separations could be accelerated by approximately five months or more. When a surplus officer with a high score returns from Europe, he could be discharged. But if there are individuals with higher scores in the Pacific, a different procedure is indicated. The officer returning from the European theater, instead of being separated upon arrival, is granted a thirty day leave, plus an allowance for travel time from the port to home and from home to his new station. The individual who has not yet been overseas is granted a preembarkation leave of approximately fifteen days, which, when added to his travel time to the port and the period preparatory to sailing, amounts to approximately one month. Here we have two months. The trip overseas requires just under a month, or a total of three months. Travel time from the port to the new station in the Pacific, overlap on the job and travel time to the port of the officer returning to the United States eat up another month, or a total of four months. The trip home requires another month, or a total of five months. This is the minimum if the officer is separated on arrival. But if his points should be below those of an officer currently assigned in the United States, the process continues. The officer returning from the Pacific will receive a month's leave, additional travel time to and from his home, and only after he has been at his new station for approximately two weeks will the high score individual be released for separation. Here we had a total of seven months. Equity in separations means delay in separations of between five and seven months. Here is the explanation for the apparent paradox of how it happens that two months after V-E Day surplus medical personnel is just beginning to be released from the Army and why it will take many months before all of the surplus is finally separated. However, it is the Surgeon General's firm belief that the American public and the entire medical profession feel that the War Department's basic program of readjustment which includes the Pacific is sound and just.

Within the limitations of logistical requirements, especially transportation, the plan contemplates that the Army will point toward a reduction in the strength of the Medical Corps by approximately 7,000 by May of 1946. Because of the need to absorb the leave and travel time of replacements to the Pacific, not more than 4,000 of this number can be separated by the end of this year.

The transfer of several hundred thousand medical personnel in the midst of war, under great urgencies, involving three continents, represents the single largest undertaking of its kind in the history of the world and is dwarfed only by the still greater transfer involved in moving all Army personnel. To cope with this situation of unparalleled magnitude, the Surgeon General has evolved, after the most careful consideration, a detailed plan which he believes will secure the end desired by all—the finest medical service for the American soldier and the highest degree of equity for the officers and men of the Medical Department who are provided this service.

ARMY AWARDS AND COMMENDATIONS

Lieutenant Colonel Manuel E. Lichtenstein

Lieut. Col. Manuel E. Lichtenstein, formerly of Chicago, was recently awarded the Brazilian decoration "Medal de Guerra." The presentation was made by General Mascarenhas on May 29, 1945 in the name of the President of Brazil. Dr. Lichtenstein organized the medical staff of the Brazilian expeditionary force assigned to an evacuation hospital and successfully established the practice of modern surgical methods for the care of battle casualties among Brazilian troops during the Italian campaign. Dr. Lichtenstein is also the recipient of the Bronze Star (THE JOURNAL, April 21, 1945, p. 1059). He graduated from Rush Medical College, Chicago, in 1925 and entered the service Oct. 15, 1942.

Major Brendan P. Phibbs

For meritorious service in supervising and aiding in the organization for the evacuation of the wounded, Major Brendan P. Phibbs, formerly of Winnetka, Ill., was recently awarded the Bronze Star. As a surgeon with the headquarters of the combat command battalion of the 12th Armored Division, Major Phibbs frequently exposed himself to enemy fire to see that evacuation was accomplished expeditiously and by the safest routes. Dr. Phibbs graduated from Northwestern University Medical School, Chicago, in 1942 and entered the service in June 1942.

Captain Sherwood P. Burr Jr.

Capt. Sherwood P. Burr Jr., formerly of Eugene, Ore., was recently commended by Major Gen. Robert Douglass, commanding the 7th A. A. F., for his work with the 11th bombardment group, which participated in almost every major move of the offensive that has rolled the Japanese back more than 3,000 miles. Dr. Burr graduated from the University of Oregon Medical School, Portland, in 1939 and entered the service Sept. 5, 1941.

Major Leonard S. Shemanski

Major Leonard S. Shemanski, formerly of Menasha, Wis., was recently awarded the Bronze Star for "meritorious achievement in connection with military operations against the enemy in Luzon, Panay and Negros, Philippine Islands, from Jan. 9, 1945 to May 1, 1945." Dr. Shemanski graduated from Marquette University School of Medicine, Milwaukee, in 1934 and entered the service July 15, 1941.

Captain George C. Blanchard Jr.

Capt. George C. Blanchard Jr., formerly of Augusta, Ga., was recently awarded the Bronze Star. The citation accompanying the award reads, in part, "Captain Blanchard, a battalion surgeon, was faced with the problem of setting up an advanced aid station in Strass, Germany, to take care of a large number of wounded infantrymen while the town and approaches to this town were yet under heavy shell fire. Vehicles which had attempted to get into the town, including tanks, had been knocked out and evacuation was impossible, initially. To minimize suffering and to prevent all possible loss of lives, Captain Blanchard made his way into the town before all the enemy resistance had been reduced. He was unable to find time to rest for many hours. His action saved the lives of many and his action is a credit to the medical profession and to the service." Dr. Blanchard graduated from Cornell University Medical College, New York, in 1942 and entered the service July 3, 1943.

Captain John B. Condon

Capt. John B. Condon, formerly of Chicago, was recently awarded the Bronze Star "for meritorious service in connection with military operations against the enemy from Feb. 4, 1945 to Feb. 12, 1945 in France, while located at Fortschwihr, when the clearing station under Captain Condon's command was forced to operate considerably under strength. Casualties required the constant care of this medical officer, and exceedingly adverse weather conditions added considerably to Captain Condon's problems, as he was forced to operate in tents. The superior performance of duty rendered by this officer reflects great credit on himself and on the Medical Corps." Dr. Condon graduated from Loyola University School of Medicine, Chicago, in 1940 and entered the service Jan. 5, 1943.

Captain George A. French

The Silver Star was recently awarded to Capt. George A. French, formerly of Appleton, Wis., for gallantry in the European theater, April 4, "when he advanced across a bridge under direct enemy observation and a rain of fire to care for the wounded until evacuation was possible." Dr. French graduated from Marquette University School of Medicine, Milwaukee, in 1942 and entered the service Aug. 11, 1943.

VETERANS

OUTPATIENT TREATMENT FOR VETERANS

Thirty-one mental hygiene clinics and intensive treatment courses in nineteen neurosis centers connected with general medical and surgical hospitals have been authorized by Brig. Gen. Frank T. Hines, Administrator of Veterans Affairs, for the outpatient treatment of veterans with service connected disabilities. The clinics will make treatment readily available to veterans disabled in service who are in need of reorientation and will aid the veteran in returning to normal life and a gainful occupation in the shortest time possible. The outpatient clinics will be located at the following hospitals or regional offices: Boston; Hartford, Conn.; New Orleans; Cleveland; New York; Pittsburgh; Providence, R. I.; St. Louis; Washington, D. C.; Louisville, Ky.; Minneapolis; San Francisco; Atlanta, Ga.; Cincinnati; Dearborn, Mich.; Indianapolis; Newark, N. J.; Milwaukee; Denver; Jackson, Miss.; Seattle; Huntington, W. Va.; Bay Pines, Fla.; Columbia, S. C.; Des Moines, Iowa; Omaha; Memphis, Tenn., and Batavia, N. Y., though this clinic may be in either Syracuse or Buffalo.

Neurosis centers will be located at Aspinwall (Pittsburgh); Atlanta, Ga.; Batavia, N. Y.; Bay Pines, Fla.; Brecksville (Cleveland); Bronx (New York); Des Moines; Fort Howard, Md.; Hines (Chicago); Huntington, W. Va.; Indianapolis; Jefferson Barracks (St. Louis); Kecoughtan, Va.; Portland, Ore.; Minneapolis; San Francisco; West Roxbury (Boston), and Wood (Milwaukee).

Each outpatient clinic will be fully equipped for diagnosis and treatment, with facilities on hand for x-ray and clinical laboratory examination. The neurosis centers will be equipped for intensive therapy of the severely affected neuropsychiatric patient and will have available equipment for therapy embracing psychotherapy both for the individual and for the group; narcoanalysis and hypnotism for the purpose of exploring the subconscious in the same manner used in Army and Army Air Forces hospitals abroad for the treatment of the severely affected psychoneurotic.

In both types of clinic occupational therapy, psychotherapy, recreational therapy and social services, all aimed at an early reestablishment of the veteran in his home community, will be provided.

The clinics and neurosis centers will be placed in operation just as rapidly as qualified personnel can be obtained. Some psychiatrists and other personnel have been attending courses in the Army's Mason General Hospital, Long Island, N. Y., and other personnel is being sought by the Veterans Administration through recruitment.

ARMY

A VOICE FOR THE BATTALION SURGEON

To the Editor:—I would appreciate the following being printed. With the consideration to Major Gen. P. R. Hawley's open letter "Correspondence Concerning the Medical Department," in the Medical Bulletin ETO Number 30, April 1945, I feel that I can speak for my colleagues, the battalion surgeons, many of whom have endured the yoke far longer and with better grace and equanimity than I.

The Medical Department has done a wonderful job during the emergency. Those of us who came in as reserve officers early in 1942 realized the urgency of our then precarious military position and cooperated fully. Troop units had to be manned with competent agreeable and vigorous doctors. There is admittedly nothing professional about the work of a doctor with troops. The work is further complicated by manifest and deliberate attempts on the part of some low moral calibered soldiers to shirk their attendant responsibilities in the line. Moreover, the lack of apparatus for diagnosis, the uncertainty of supply, the desire of some commanders to delimit the size of sick call by devious means, including coercion and the threat of extra duty, plus the pitiful dependence of the first echelon surgeon on rear echelons who are inclined to look down their noses on this poor relation colleague who so rarely can make the correct anatomic and pathologic diagnosis, being without the instruments, x-rays or laboratory facilities for such, makes the first echelon medical officer bitter in time, especially since, having done so much with so little for so long, he becomes indispensable in this assignment and is never made available when and if in his meager opportunity to associate in professional channels he does meet a former teacher colleague or class mate who is in a position to offer a more fertile field for professional endeavor.

The ultimate control of the military destiny of a medical officer by a field officer is unjust. The practice of keeping medical officers either in hospitals or in field units is unjust, more especially when the time period concerned runs into its fourth year. I realize that any medical officer can do well in a hospital. I also realize that many medical officers cannot do well in the field, either through defects in health or by deliberate misapplication. I realize too that the talents of many true specialists would be wasted in such field units and I do not contemplate such waste. I speak only for that horde of little men whose professional, political and military friends are not highly placed; those young men with excellent education, training and military records of efficiency behind them who, because of a T. O., can never rise higher in rank, who because of being members of A. G. F. are not eligible for transfer to hospital units of the A. S. F. I speak of men who can only lose professional skill by this enforced, and now after three full years, unwilling further retention in that type of medical service which many younger men could carry out to much better military advantage. I speak of those men who, when they return to civilian practice, will return at a great professional disadvantage from pure lack of association, lack of opportunity for doing and seeing and reading, engendered almost entirely by a short sighted policy of assignment, reassignment and rotation, which no belated special superficial and impersonal refresher course will ever to able to overcome.

WALTER E. VOGT JR., CAPTAIN, M. C., A. U. S.

NOTE.—The communication of Capt. Walter E. Vogt Jr. has been discussed with various leaders in the field of military medical services. The consensus seems to be that the ordinary young doctor without special training can be rotated. The young man who has had two or three years of residency in a specialty is more valuable to the patient than one without such training and is therefore more valuable to the Army Medical Department for services in its specialized hospitals. Since hospitals are, for the most part, staffed with trained men, only general practitioners are left for purposes of rotation. Years of experience have shown that it is impossible to place any physician in a front line unit without training in a number of subjects which are never taught in medical schools. These have to do with the subjects of self protection under fire, cooperation with troops and similar matters. Medical officers in general cannot agree with the statement of Captain Vogt that "there is admittedly nothing professional about the work of a doctor with troops." If this was true the Army could easily put lawyers and railway engineers in positions now occupied by many physicians. Even men especially trained under medical leadership as first aid assistants find certain medical conditions which require the personal attention of a physician.—ED.

NEW CHIEF AT VALLEY FORGE

Lieut. Col. Steige D. Blackford, Charlottesville, Va., was recently appointed chief of the medical service at Valley Forge General Hospital, Phoenixville, Pa. He succeeds Lieut. Col. Maurice A. Schitker, Toledo, Ohio, who has left for an overseas assignment.

Colonel Blackford recently returned to this country after thirty months' service as chief of the medical service of the 8th Evacuation Hospital in North Africa and Italy. He was awarded the Legion of Merit for his work with that hospital.

ORGANIZATION SECTION

PROPOSED FEDERAL PROGRAMS TO PROMOTE SCIENTIFIC RESEARCH

An Analysis of Legislation Pending in the Seventy-Ninth Congress

Prepared by the Bureau of Legal Medicine and Legislation, American Medical Association

Identical bills are pending in the Senate and the House of Representatives to implement the recommendations contained in the report recently submitted to President Truman by Dr. Vannevar Bush, director of the Office of Scientific Research and Development, and other collaborating scientists, outlining a suggested federal program to promote scientific research. The Senate bill, S. 1285, introduced on July 19 by Senator Magnuson of Washington, was referred to the Senate Committee on Commerce, of which Senator Bailey of North Carolina is chairman. The House bills, H. R. 3852, introduced on July 19 by Representative Mills of Arkansas, and H. R. 3860, introduced on July 20 by Representative Randolph of West Virginia, have been referred to the House Committee on Interstate and Foreign Commerce, of which Representative Lea of California is chairman.

On July 23 Senator Kilgore of West Virginia, for himself and Senator Johnson of Colorado, and Senator Pepper of Florida, introduced S. 1297, which embodies principles which the Subcommittee on War Mobilization of the Senate Military Affairs Committee, on the basis of extensive studies made over the past two years, has set up as desirable in any legislation designed to meet the postwar scientific needs of the nation. The bill is pending in the Senate Committee on Military Affairs, of which Senator Thomas of Utah is chairman.

Representative May of Kentucky has introduced another bill relating to scientific research, H. R. 3440. This bill would authorize an appropriation of not to exceed $8,000,000 annually to enable the National Academy of Sciences, through a research board for national security consisting of representatives of the Army, Navy and civilians of outstanding accomplishments, to provide for scientific research and advancement determined by the board to be desirable in the interest of national security. It has passed the House of Representatives and is pending in the Senate Committee on Naval Affairs.

Another pending bill, S. 825, was introduced by Senator Byrd of Virginia on April 4 and was referred to the Senate Committee on Naval Affairs, of which Senator Walsh of Massachusetts is chairman. It would create a Research Board for National Security to include representatives of the Army and Navy, the chairman of the National Advisory Committee for Aeronautics and civilian scientists, engineers or industrialists. It will be the duty of the board to formulate programs of scientific research and development relative to problems of national security. The term "science" as used in the bill includes the employment of scientific methods of analysis, experiment and test in any "branch of science or technology, including engineering, medicine, dentistry, psychology and biology." This bill was favorably reported to the Senate July 28, with amendments.

Another bill has been introduced in the Senate by Senator Fulbright, Arkansas, S. 1248. It proposes to establish a Bureau of Scientific Research in the Department of Commerce "to aid, encourage, and protect the research and enterprise of inventors, scientists, technicians, scientific and educational institutions, and research laboratories engaged in scientific and technical work, and to make their resultant discoveries and data more readily available, without discrimination, to all sections of industry, agriculture, and the public in order to promote full employment and higher standards of living." This bill is pending in the Senate Committee on Commerce, of which Senator Bailey, North Carolina, is chairman.

With the exception of the three bills designed to implement the recommendations contained in the Bush report, these proposals differ in many details; that fact was given recognition by Senator Kilgore at the time he introduced his bill. After referring to the other pending legislation, he expressed the hope that arrangements could be made for joint hearings "so that the issues presented by these different bills can be clarified and agreement reached at an early date on the scope of research needed in the interest of national security and also on the details of organization and administration so essential to the success of any national program of scientific research."

There follows a factual analysis of the Magnuson-Mills-Randolph bill and the Kilgore bill.

THE MAGNUSON-MILLS-RANDOLPH BILL

This legislation would create a National Research Foundation as an independent agency in the executive branch of the government to secure the full development and application of the nation's scientific and technical resources for national defense, prosperity, health and welfare.

Administrative Board.—The powers and duties of the foundation will be exercised by a board of nine members appointed by the President without regard to political affiliations and solely on the basis of their demonstrated interest in and capacity to promote the purposes of the foundation. The board will be authorized to employ a director at a salary of $15,000 a year, who will be the principal executive officer of the foundation. Two deputy directors may be appointed by the director, each of whom will receive compensation at the rate of $12,000 a year. The members of the board will serve without compensation but will be allowed actual and necessary traveling and subsistence expenses when engaged, away from home, in the duties of their office.

Divisions Within Foundation.—Within the foundation there will be a minimum of five divisions as follows: (1) a Division of Medical Research to carry out programs relating to research in biologic science, including medicine and the related sciences; (2) a Division of Physical Sciences to carry out programs relating to research in the mathematical and physical sciences; (3) a Division of National Defense to carry out programs relating to scientific research on military matters; (4) a Division of Scientific Personnel and Education to carry out the program relating to the grant of scholarships and fellowships in the mathematical, physical and biologic sciences, and (5) a

Division of Publications and Scientific Collaboration to carry out programs relating to the public dissemination of scientific information among scientists. Additional divisions may be created by the board.

Committees Within Divisions.—In each division will be a committee of not less than five members appointed by the board after receiving recommendations from the National Academy of Sciences. The committee within the Division of National Defense, in addition, will include a member designated by the Secretary of War and a member designated by the Secretary of the Navy.

The appointed members will receive compensation at the rate of $50 a day while engaged in the business of the foundation plus expenses when engaged, away from home, in the duties of their office. Each committee will make recommendations to and advise and consult with the board and the director with respect to matters of its division. Additional powers and duties may be devolved on the committees by the board.

Powers and Duties of the Foundation.—In carrying out the purposes of the bill, the foundation will be authorized and directed:

(1) to develop and promote a national policy for scientific research and scientific education;

(2) to initiate and support basic scientific research and scientific development in the mathematical, physical and biologic sciences through contracts, grants or other forms of assistance;

(3) to initiate and support scientific research and scientific development on matters relating to the national defense through contracts, grants or other forms of assistance;

(4) to discover and develop scientific talent, particularly in American youth;

(5) to grant scholarships and fellowships in the mathematical, physical and biologic sciences;

(6) to foster the interchange of scientific information among scientists in this country and abroad; and

(7) to correlate the foundation's scientific research and scientific development programs with those undertaken by public and private research groups.

Authority of Foundation.—The foundation will be specifically authorized (1) to prescribe such rules and regulations as it deems necessary; (2) to enter into contracts, or amendments or modifications of contracts without legal consideration, without performance or other bonds in the case of all contracts which relate to scientific research or scientific development; (3) to make advance, progress and other payments which relate to scientific research or scientific development; (4) to acquire by purchase or otherwise, hold and dispose of by sale, lease, loan or otherwise real and personal property of all kinds necessary for or resulting from scientific research or scientific development without regard to the provisions of law relating to the acquisition, holding or disposition of property by the United States; (5) to receive and use funds donated by others, provided such funds are donated, without other restriction, in furtherance of one or more of the general purposes of the foundation; (6) to publish or arrange for the publication of scientific and technical information so as to further the full dissemination of information of scientific value consistent with the national interest; (7) to accept and utilize the services of voluntary and uncompensated personnel and to pay the actual and necessary traveling and subsistence expenses, including in lieu of subsistence per diem at a rate not in excess of $10, of such personnel incurred in the course of such services; (8) to prescribe the extent to which vouchers for funds expended under contracts for scientific research and development shall be subject to itemization or substantiation prior to payment, without regard for the limitations of other laws relating to the expenditure of public funds and accounting therefor; (9) to establish a National Science Reserve in which will be enrolled all those who receive scholarships and fellowships in science and medicine from the foundation. Members of the National Science Reserve will be available for call into the service of the government for scientific and technical work in time of war or other national emergency as declared by the Congress or proclaimed by the President.

Appropriations.—The bill will authorize to be appropriated annually to the foundation such sums as may be necessary to carry out its provisions. Funds appropriated for the foundation will, if obligated during the fiscal year for which appropriated, remain expendable for a period of four years. After such a four year period, the unexpended balances will revert to the treasury.

General Provisions.—The bill specifically provides that the foundation shall not itself operate any scientific or technical facilities of its own.

There will be transferred to the foundation all powers, functions and duties of the Office of Scientific Research and Development and its constituent committees. All personnel, property, records, funds, contracts, assets and liabilities of the Office of Scientific Research and Development, and of its constituent committees, will also be transferred to the foundation. This transfer will take effect at such time as the President directs.

Members of the board and members of the committees within the divisions may engage in private and gainful employment, but no compensation for such employment may be received in any form by any such member (1) from any profit-making organization which receives funds under contract, or otherwise, within the cognizance of the division or divisions of the foundation with which such member is concerned or (2) in respect of any particular matter which directly involves the foundation or in which the foundation is directly interested.

The director will be authorized to appoint and fix the compensation of necessary personnel, subject to the provisions of the civil service laws and regulations and the Classification Act of 1923. Technical and professional personnel may be employed without regard to the provisions of the Classification Act. The director, the deputy directors and the members of the committees within the divisions will also be appointed without reference to the civil service laws or the Classification Act.

The foundation will be required to submit an annual report in writing to the President and the Congress and the bill, if enacted, will be cited as the "National Research Foundation Act of 1945."

THE KILGORE BILL

The title of the Kilgore bill, S. 1297, indicates its purpose, namely, to promote the progress of science and the useful arts, to secure the national defense and to advance the national health and welfare.

National Science Foundation.—An independent agency of the federal government to be known as the National Science Foundation will be created. It will be administered by a director appointed by the President, by and with the advice and consent of the Senate. His salary will be $15,000 a year.

The director will be required to consult and advise with a National Science Board on all matters of major policy or program. The board will consist of the director as chairman, the heads of the Departments of War, Navy, Justice, Interior, Agriculture, Commerce and Labor, and the Federal Security Agency or their designees, plus eight public members appointed by the President by and with the advice and consent of the Senate.

Promotion of Research and Development.—The foundation will be required to give particular attention to promoting research and development activities relating to (1) national defense, (2) health and medicine, (3) the basic sciences, (4) the conservation, development and use of the natural resources of the nation, (5) the development of methods and processes beneficial to small business enterprises and (6) the adaptation to peacetime use of wartime research and facilities.

Not less than 20 per cent of the funds to be made available to the foundation for research and development activities will

be expended for research and development in each of the following fields: (1) national defense and security and (2) health and medicine.

The bill requires the foundation to consider the desirability of utilizing facilities available in departments and agencies of the federal government, state and local governments, educational institutions, research institutions, private industrial organizations, and individual scientists particularly qualified to carry out such projects. Not less than 50 per cent of the total funds appropriated by the Congress for research and development activities under the bill must be expended for engaging the facilities of qualified nonprofit educational institutions and research institutions.

Committees Within Foundation.—A minimum of two committees within the foundation are to be established: (1) a Research Committee for National Defense consisting of a chairman to be appointed by the President by and with the advice and consent of the Senate, whose salary will be $12,000 a year, and nine members at large, three to be designated by the Secretary of War, three by the Secretary of the Navy and three by the director with the advice and approval of the board; and (2) a Research Committee for Health and the Medical Services, consisting of a chairman appointed by the President by and with the advice and consent of the Senate, whose salary will be $12,000 a year, and nine members at large, of whom three shall be designated by the administrator of the Federal Security Agency and six by the director with the advice and approval of the board.

The members at large to be appointed by the Secretaries of War and the Navy and the administrator of the Federal Security Agency may be civilian or military employees of the government or public members. The director will be required to advise with these two committees with respect to the formulation of overall research and development programs in the fields of national defense and health and medicine and must secure the approval of the committees with respect to the determination of specific projects and the selection of specific facilities.

Additional advisory committees may be set up by the director, and members of such committees will be appointed by the director by and with the advice and consent of the board and, in appointing such members, the director may request appropriate national scientific organizations to submit panels of candidates from which he may make his selection.

Scholarships and Fellowships.—The foundation will be authorized to grant scholarships and fellowships to persons showing special aptitude, for one year's study at a nonprofit institution of higher education or other nonprofit institution. Scholarships and fellowships are to be renewable for a period up to five years at the option of the foundation.

Survey of Federal Scientific Activity; Dissemination of Research Findings.—The foundation will be required to make and maintain a comprehensive survey of federally financed research and development activities. Any agency engaged in such activities will be required, on request by the director, to furnish whatever data and reports may be needed. The foundation must evaluate such survey data and make recommendations to the President and the agencies concerning improvements.

Each contracting organization or institution or individual, as a condition to receiving financial support from the foundation, will be required to make available full data on all inventions, discoveries and other significant findings. The foundation will be directed to collect, edit, publish and disseminate pertinent data on all inventions, discoveries and other findings resulting from federally financed research and development activities. It must take such steps as necessary to disseminate such data to the public, including the preparation of abstracts, translations, bibliographies and microfilm reproductions of research and development reports and publications.

The foundation will be required to do what it can to eliminate restraints on the free expression of scientific truths and to insure ample freedom in the exercise of creative talents and in the development of promising new ideas in connection with all research and development projects promoted, financed or otherwise supported by the federal government.

All materials or equipment purchased or furnished by federal funds in connection with research and development projects, and any invention, discovery or finding resulting from such federally financed projects shall be the property of the federal government.

Restriction on Dissemination of Information.—The Defense Committee must declare secret or restricted any scientific or technical information, data, patents, inventions or discoveries in or coming into the possession or control of the foundation, the secrecy or restriction of which the President or his designee or designees certify as being essential in the interest of national defense.

Patents.—The director will be required to patent all significant inventions or discoveries resulting from research and development projects. Any citizen, corporation or other organization desiring to use any invention, discovery or patent which is or may hereafter become the property of the United States will, on proper application, be granted without further limitation a nonexclusive license for which there will be no charge. The foundation will be required, however, to refuse to grant a license to any applicant on a finding in writing by the Department of Justice to the director that the granting of such license will tend to promote or result in a monopoly or a practice which is in restraint of trade.

Appropriations.—Such sums as may be necessary to carry out the provisions of the bill may be annually appropriated by the Congress to the foundation. In addition, the foundation may solicit and receive financial grants, personal services and any other aid furthering scientific and technical progress, may enter into contracts and make expenditures for personnel, equipment and services as it may deem necessary. The foundation may not itself or through its own employees operate any laboratories, pilot plants or other such scientific or technical facilities which it may acquire.

Employment of Personnel.—The director will be authorized to appoint and fix the compensation of necessary personnel. Appointments and compensation shall be made in accordance with the provisions of the civil service laws and the Classification Act, except that technical and professional personnel may be employed without regard to such laws.

Public members of the board and of any advisory committee will serve without remuneration except for per diem allowances, transportation and other necessary expenses incurred. No employee of the foundation or member of any advisory committee may participate in any decision or recommendation affecting his personal financial interest or the activities of any organization in which he has a financial interest or by which he is employed.

"Research and Development" Defined.—These terms are declared to mean not only theoretical analysis, exploration and experimentation but also the extension of investigative findings and theories of a scientific or technical nature into practical application, including the preparation of plans, specifications and standards for various goods and services, the undertaking of related economic and industrial studies, the experimental production and testing of models, and the building and operation of pilot plants.

Miscellaneous.—The director must render an annual report in writing to the President and to Congress, summarizing the activities of the foundation and containing such recommendations as he may deem appropriate. The foundation will be granted the free use of the mails. As used in the bill, the term "federally financed" means financed in whole or in part by the federal government. The bill, if enacted, will be cited as the "National Science Foundation Act of 1945."

THE MATERNAL AND CHILD WELFARE ACT OF 1945

An Analysis Prepared by the Bureau of Legal Medicine and Legislation, American Medical Association

Senator Pepper, Florida, for himself and nine other members of the Senate Committee on Education and Labor, has introduced a bill, S. 1318, to provide for the general welfare by enabling the several states to make more adequate provision for the health and welfare of mothers and children and for services to crippled children and for other purposes. Joining Senator Pepper in sponsoring this legislation were Senator Walsh, Massachusetts; Senator Thomas, Utah; Senator Hill, Alabama; Senator Chavez, New Mexico; Senator Tunnell, Delaware; Senator Guffey, Pennsylvania; Senator LaFollette, Wisconsin; Senator Aiken, Vermont, and Senator Morse, Oregon. The bill was referred to the Senate Committee on Education and Labor, of which Senator Murray, Montana, is chairman.

An appropriation of $100,000,000 will be authorized for the fiscal year ending June 30, 1946: $50,000,000 earmarked for maternal and child health services, $25,000,000 for services for crippled children, $20,000,000 for child welfare services and $5,000,000 for expenses necessary to enable the Children's Bureau to administer the provisions of the bill and to develop and promote effective measures for carrying out its purposes, including "studies, demonstrations, investigations and research, the training of personnel for federal, state and local service, and the payment of salaries and expenses of personnel detailed at the request of state agencies to cooperate with and assist such agencies" in carrying out the objectives of the legislation. Thereafter such sums will be made available as the Congress shall decide.

The bill, which Senator Pepper has described as "a modest beginning," has five titles:

TITLE I. MATERNAL AND CHILD HEALTH SERVICES

The stated objectives of this title are to provide and maintain services and facilities to promote the physical and mental health of mothers during the maternity period and of children, including medical, nursing, dental, hospital and related services and facilities required for maternity care, preventive health work and diagnostic services for children, school health services, care of sick children, and correction of defects and conditions likely to interfere with the normal growth and development and the educational progress of children. The development of more effective measures for carrying out the purposes of the title is contemplated, including demonstrations and the training of personnel for state and local maternal and child health services.

Of the total appropriation to be made available under this title, $5,000,000 will be allotted by the Secretary of Labor to the several states, and allotments must be matched dollar for dollar by state or state and local funds. In determining what amount each state shall be allotted, the Secretary of Labor will take into consideration the number of children under 21 years of age in such state in relation to the total number of children under 21 years of age in the United States.

The remainder will be allotted to the states by the Secretary of Labor after taking into consideration for each state such factors as the number of mothers and children under 21 years of age in the state for whom the services and care are to be made available, and the cost of furnishing such services and care to them, the special problems of maternal and child health and the financial need of the state for assistance in carrying out the state plan.

Approval of State Plans.—Allotments will be paid to those states whose plans for developing programs and for providing care and services have been approved by the chief of the Children's Bureau. In order for a plan to be approved by the chief of the Children's Bureau, it must:

1. Provide for financial participation by the state.

2. Provide for a statewide program or for extension of the program each year so that it will be in effect in all political subdivisions by July 1, 1955.

3. Provide that services and facilities shall be available to all mothers and children in the state or locality who elect to participate in the benefits of the program. There must be no discrimination because of race, creed, color or national origin, and no residence requirements.

4. Provide for the administration of the plan by the state health agency, or for the supervision of the administration of the plan by the state health agency, and for appropriate coordination of the plan with the general public health and medical care program of the state health agency which will be authorized to develop agreements or cooperative arrangements with other state or local public agencies whose functions include the provision of services similar or related to those furnished under the state plan.

5. Be made part of the state plan for maternal and child health services submitted in accordance with the provisions of title V, part 1, of the Social Security Act.

6. Provide effective methods of administration, including the establishment and maintenance of personnel standards on a merit basis, standards for professional personnel rendering medical, dental, nursing and related types of care or service, and standards for hospital and other institutional care and services. Standards are to be established by the state health agency after "consultation" with professional advisory committees appointed by the state health agency. Mothers and children, or persons acting in their behalf, will be permitted to select, from among those meeting standards prescribed by the state health agency, the physician, hospital, clinic or health service agency of their choice. Where no such selection is made, the state plan must set forth the method by which the care will be made available. The bill provides that the physician, hospital, clinic or health service agency selected may refuse to accept the case.

A state plan must provide for adequate remuneration for the persons and institutions providing medical care and related services, must provide opportunities for postgraduate training of professional and technical personnel, and for such use of health centers, hospitals, clinics and health service agencies, public and voluntary, as will achieve the satisfactory distribution and coordination of preventive, diagnostic, consultative and curative services provided by general practitioners, specialists, public health personnel, laboratories and others.

A state plan must provide payments to individual physicians for care furnished under this title on a per capita, salary, per case or "per session" basis or, in the case of consultations or emergency visits, on a fee-for-service basis. A state plan must furthermore provide for the purchase of care from public or voluntary hospitals and other health service agencies included under the state plan on a basis related to cost for providing the care.

7. Provide for adequate dissemination of information with regard to the maternal and child health services to be made available under this title.

8. Provide for reports to the chief of the Children's Bureau.

9. Provide for cooperation with medical, health, hospital, nursing, education and welfare groups and organizations in the state.

10. Provide (*a*) for a general advisory council appointed by the state health agency and composed of members of the professions or agencies, public and voluntary, that furnish care or services under the state plan, and other persons representing the public who are informed on the need for and problems related to the provision or receipt of maternal or child health services and medical care of mothers and children, and (*b*) for technical advisory committees appointed by the state health agency composed of medical and other professional groups concerned with the administration or operation of a state plan. If the state health agency administers a program for services to crippled children, the same general advisory council shall serve both the maternal and child health and the crippled children programs.

11. Provide for a fair hearing before the state health agency for any mother or other person acting in behalf of a child whose claim for services is denied or for any physician or other person, organization or institution participating or desiring to participate in furnishing services or facilities under the plan.

Federal Advisory Committees.—The chief of the Children's Bureau will formulate general policies for the administration of this title after "consultation" with a conference of state health officers and an advisory committee composed of professional and public members and, as necessary, technical advisory committees which "he" shall appoint.

TITLE II. SERVICES FOR CRIPPLED CHILDREN

The stated objectives of this title are to enable each state to provide and maintain services and facilities for the care and treatment of children who are crippled, otherwise physically handicapped or suffering from conditions which lead to crippling or physical handicaps, including services for locating such children, for providing medical, surgical, corrective and other services and care, and facilities for diagnosis, hospitalization and after-care for such children. Demonstrations and the training of personnel for state and local crippled children's services are contemplated.

Out of the total appropriation authorized under this title, the Secretary of Labor will allot to each state such part of $2,500,000 as he finds that the number of children under 21 years of age in such state bore to the total number of children under 21 years of age in the United States in the latest calendar year for which the Bureau of the Census has available statistics. Such allotments must be matched dollar for dollar by state or state and local funds made available for services for crippled children.

The remainder of the appropriation will be allotted to the states by the Secretary of Labor after taking into consideration for each state such factors as (1) the number of crippled children under 21 years of age in the state for whom services and care are to be made available and the cost of furnishing such services and care to them, (2) the special problems of crippled children and (3) the financial need of the state for assistance in carrying out the state plan.

Approval of State Plans.—Allotments will be made to the states which have submitted to and had approved by the Children's Bureau state plans for developing programs for crippled children. As in the case of state plans developed under title I, the bill indicates the contents a state plan must have to be approved. Such a state plan for services for crippled children must meet essentially the same requirements specified for plans developed under title I except that, if a state agency other than the state health agency is designated by state law to administer the program for crippled children, that agency may continue as the state administrative agency until July 1950, after which the state health agency must have jurisdiction. Services to be provided under this title must be available to all crippled children without regard to financial status, race, creed, color or national origin, and there may be no residence requirement. Individual physicians will be paid as indicated in title I, except that title II makes no provision for payment on a per capita basis.

Federal Advisory Committees.—The chief of the Children's Bureau will formulate all general policies for the administration of this title after "consultation" with (1) a conference of executive officers of state agencies administering the program for crippled children under this title and (2) an advisory committee composed of professional and public members and, as necessary, technical advisory committees, which "he" shall appoint.

TITLE III. CHILD WELFARE SERVICES

The declared purpose of title III is to assist each state public welfare agency to develop effective statewide child welfare programs and measures, including the training of personnel, for extending and strengthening public child welfare services, and for providing suitable care and protection for children without parental care and supervision, and children who are dependent, neglected or delinquent, or in danger of becoming neglected or delinquent.

For each of the fiscal years ending June 30, 1946 and June 30, 1947 the Secretary shall allot to each state such part of $10,000,000, and for the fiscal year ending June 30, 1948 and for each fiscal year thereafter such part of three fourths of the total amount appropriated for child welfare services as he finds that the number of children under 21 years of age in such state bore to the total number of children under 21 years of age in the United States in the latest year for which the Bureau of the Census has available statistics. Such allotments must be matched dollar for dollar by state or state and local funds made available for child welfare services.

For the fiscal year ending June 30, 1946 and for each fiscal year thereafter the remainder of the sum appropriated for child welfare services will be allotted to the several states by the Secretary of Labor, taking into consideration for each state such factors as (1) the number of children under 21 years of age in the state for whom child welfare services are to be made available and the cost of providing such services and care to them, (2) the special problems of child welfare and (3) the financial need of the state in carrying out the state plan.

Approval of State Plans.—Allotments will be made to states which have submitted to and had approved by the Children's Bureau state plans for child welfare services. The chief of the Children's Bureau will be required to approve any state plan which meets the following conditions:

(1) Financial participation by the state.

(2) A statewide program, including at least guidance and social service to or in behalf of children who are dependent, neglected or delinquent, or in danger of becoming neglected or delinquent, or for the extension of the program each year so that such guidance and service will be available to all children in need thereof, in all political subdivisions of the state not later than July 1, 1955.

(3) Services and care furnished under the plan must be made available to all children without regard to financial status, race, creed, color or national origin, and without residence requirements.

(4) Administration or supervision of the plan by the state public welfare agency and coordination of the plan with the general public welfare program of the state public welfare agency which will be authorized to develop agreements or cooperative arrangements with other state agencies whose functions include the provision of services related to the services furnished under the state plan.

(5) The state plan must be made a part of the plan for child welfare services submitted in accordance with the provisions of title V, part 3, of the Social Security Act.

(6) The plan must provide such methods of administration as are found by the chief of the Children's Bureau to be necessary for the proper and efficient operation of the plan, including methods relating to the establishment and maintenance of personnel standards on a merit basis.

(7) The state public welfare agency must make such reports in such form and containing such information as the chief of the Children's Bureau may from time to time require.

(8) Appropriate cooperation must be provided for with state and local agencies, public and private, concerned with child health, education, child welfare and related subjects.

(9) The plan must provide for a program of training for personnel rendering child welfare services.

Definitions.—As used in this title, the term "child welfare services" means (1) guidance and social service to or on behalf of children who are dependent, neglected or delinquent, or in danger of becoming neglected or delinquent; (2) placement, supervision and maintenance of children in foster family homes; (3) temporary care of children who are dependent, neglected or delinquent, or in danger of becoming neglected or delinquent, especially in areas where children would otherwise be detained in jail or would be deprived of necessary protection and shelter or study of their special needs; (4) specialized services needed to strengthen and improve the programs of public institutions caring for children; (5) care in foster homes or day care centers for children whose mothers are employed or whose home conditions require care outside their own homes during any part of the twenty-four hour day, including services necessary to

assure proper use of day care facilities and to safeguard children receiving care; (6) payment of the cost of returning nonresident children to their own communities; if such return is desirable and the cost thereof cannot otherwise be met, and (7) cooperation with state and community agencies in improving conditions affecting the welfare of children.

TITLE IV. ADMINISTRATION

If the Secretary of Labor finds that in the administration of any plan approved under the bill there is a failure to comply substantially with any requirement specified as necessary for inclusion in a state plan, he may withhold further allotments.

The Children's Bureau will be directed to make and aid the financing of such studies, demonstrations, investigations and research as will promote the efficient administration and operation of the legislation.

TITLE V. GENERAL PROVISIONS

The chief of the Children's Bureu, subject to the approval of the Secretary of Labor, will make and publish such rules and regulations as are necessary to the efficient operation of the legislation and will be required to submit each year to the Congress a full report of such administration.

As used in the bill, the term "state" means any state of the United States, the District of Columbia or any territory or possession of the United States.

Medical Legislation

MEDICAL BILLS IN CONGRESS

International Health Organization

Senator Pepper, Florida, for himself and Senator Wagner, New York, Senator Murray, Montana, Senator Capper, Kansas, Senator Ball, Minnesota, and Senator Smith, New Jersey, has introduced S. J. Res. 89 relating to the formation of an International Health Organization. After referring to the fact that the United Nations Conference at San Francisco adopted a recommendation to convene a conference to draw up the statutes of an International Health Organization, this joint resolution expresses the sentiment of Congress that there should be a speedy convening of such conference and the early formation of such an International Health Organization. If the joint resolution is adopted, the President, on behalf of the government of the United States, will be authorized to take immediate steps to hasten the convening of the conference and the formation of the organization.

Scientific Research

Senator Kilgore, West Virginia, for himself and Senator Johnson, Colorado, and Senator Pepper, Florida, proposes by S. 1297 to promote the progress of science and useful arts, to secure the national defense and to advance the national health and welfare. This bill would create a National Science Foundation to promote scientific research as an independent agency of the federal government.

Another bill relating to the same subject matter has been introduced by Senator Fulbright, Arkansas, S. 1248. This bill would create a Bureau of Scientific Research in the Department of Commerce.

The Byrd bill, S. 825, proposing to establish a Research Board for National Security, was favorably reported to the Senate, July 28.

Miscellaneous

A bill proposing an annual appropriation of not to exceed $100,000,000 to provide assistance to the states in establishing, maintaining, operating and expansion of school lunch programs, S. 962, has been reported to the Senate with recommendation that it pass.

Senator Langer, North Dakota, proposes by S. 1262 that the American Red Cross be authorized to award meat and fat ration tokens, shoe ration coupons and sugar ration coupons to persons donating blood to the American Red Cross for use by members of the armed forces.

Another bill introduced by Senator Langer, North Dakota, S. 1332, would provide maternity leave for government employees.

H. R. 3761, introduced by Representative Welch, California, proposes to amend in several respects the Longshoremen's and Harbor Workers' Compensation Act. One of the amendments would authorize an injured employee to select to treat him any physician authorized by the commission to render medical care to beneficiaries of the act. The commission would be authorized to establish such panels of qualified physicians, surgeons, specialists, consultants, "laboratory x-ray or other technicians," compensation medical bureaus and laboratories as may be necessary and would be authorized to establish schedules of fees to be charged by those rendering services to beneficiaries.

Official Notes

ELECTRICAL TRANSCRIPTIONS ON PUBLIC HEALTH

Effective August 14 the Bureau of Health Education offers an additional series of electrically transcribed radio programs for use by local medical societies or by local health agencies approved by such local societies.

The new series of health platters is entitled Guardians of Your Health. It consists of interviews and round table discussions featuring thirty-three public health authorities, including health officers of cities and states, laboratory directors, nurses and federal health officials. The theme of the series is medical and public health cooperation for the better health of the nation. The programs were prepared under the supervision of the Bureau of Health Education; scripts were written by Harriet Hester, who also interviewed the speakers; each program is summarized by Dr. W. W. Bauer, Director of the Bureau of Health Education. The titles and speakers are as follows:

1. Doctors Guard Your Health: Haven Emerson, M.D., New York; W. W. Bauer, M.D., Chicago.

2. Health in Your Town: M. R. French, M.D., Paw Paw, Mich.; Gertrude Cromwell, R.N., Des Moines, Iowa; Major Joel I. Connolly, Chicago.

3. The Healthy State: A. J. Chesley, M.D., St. Paul; Stanley Osborn, M.D., Hartford, Conn.

4. Guarding the Nation's Borders: Thomas Parran, M.D., Surgeon General, James P. Leake, M.D., C. C. Applewhite, M.D., U. S. Public Health Service.

5. Health in Our Hemisphere. John A. Ferrell, M.D., New York; Hugh S. Cumming, M.D., Pan American Sanitary Bureau.

6. Health in the Schools: Ruth Grout, Ph.D., Minneapolis; Charles C. Wilson, M.D., New York.

7. Sanitation—An Unfinished Job: H. G. Callison, M.D., South Carolina; F. C. Beelman, M.D., Kansas; Huntington Williams, M.D., Baltimore.

8. Guarding the Food Front: P. A. Dunbar, Ph.D., U. S. Food and Drug Administration; Willard H. Wright, M.D., U. S. Public Health Service.

9. Trained Public Health Workers: William P. Shepard, M.D., San Francisco; Agnes Fuller, R.N., New York.

10. The Public Health Laboratory: W. D. Stovall, M.D., Madison, Wis.

11. Controlling Contagious Diseases: Carl A. Wilzbach, M.D., Cincinnati; Thurman B. Rice, M.D., Indianapolis; Commander Dean F. Smiley, U. S. Navy.

12. Popular Health Crusades: Charles E. Lyght, M.D., Don W. Gudakunst, M.D., Walter F. Clarke, M.D., Philip Platt, C.P.H., New York.

13. Health Education: Donald Armstrong, M.D., New York; Thomas G. Hull, Ph.D., Chicago; Lester Taylor, M.D., Cleveland.

These platters are available on loan by application to the Bureau of Health Education. The series will be lent only as a whole and for broadcasting purposes only. There is no charge to the local group except payment of return shipping costs. All local broadcasting arrangements must be made by local groups. Scripts accompany platters; but material to be offered to listeners, if such offers are to be made, must be provided locally.

Washington Letter

(From a Special Correspondent)

Aug. 6, 1945.

War Department to Restaff Medical Units Deployed to Pacific

The War Department has announced that plans are being worked out to restaff all Army Medical Department units deployed through the United States to the Pacific with doctors who have not seen overseas service. It is also revealed that 1,000 medical officers have been requisitioned from Europe for return at the end of this month to relieve a shortage of doctors in army hospitals in this country. Recently Secretary Stimson informed Chairman Thomas of the Senate Military Affairs Committee that 7,000 doctors would be released during the next nine months for return to civilian practice. Senators have protested about the "leisurely attitude" of the Army toward the demobilization of doctors. Only 900 have been discharged since January 1. The Army explains that there will be an initial lag in the discharge of doctors over other officers because sick and wounded soldiers remain in hospitals long after the fighting is over. The War Department denies that the Army is overstaffed with medical officers by pointing out that personnel is slightly below the 45,000 ceiling set in September 1944, which was 5,000 below the ceiling set for the Army by the War Manpower Commission. The present ceiling will be cut by 7,000 in ensuing months and is said to be far under requirements set forth by Congress in its ratio of 6.5 doctors per thousand men.

Veterans Administration Medical Staff to Expand

Expansion of the entire Veterans Administration medical staff, professional and lay, is predicted in the next few years as more veterans of this war require hospitalization. Gen. Omar N. Bradley takes over the agency on August 15, heading one of the few federal agencies that will grow rather than shrink after the war. The administration had more than 63,000 at last report and it needs 2,000 nurses at once and 600 more doctors by the end of October. When the war ends, between 7,000 and 8,000 soldiers who are on detached service as orderlies, attendants, clerks and in other capacities will have to be replaced by civilians. Actuaries say that veterans' hospitals must be staffed to take care of 300,000 patients within twenty years. Considerable legislation, affecting veterans as well as reorganization of the agency, awaits recommendations of General Bradley when Congress returns from its recess early in October.

Proposed Control of Newly Discovered Synthetic Drugs

The Senate has passed and sent to the House legislation to allow the Treasury Narcotic Bureau to control the sale of numerous newly discovered synthetic drugs which are said to have the "dangerous, habit forming" qualities of morphine and cocaine. The present procedure requires that Congress pass a special law each time a new drug of this sort is placed on the market before the Treasury can issue regulations to control it. Chairman Walter F. George of the Senate Finance Committee said that the Treasury expected a number of new habit forming synthetic drugs to appear on the market any day. The proposed law would enable the Narcotic Bureau to act at once "before any great quantity" reaches the market, he said.

Further Requests for Better Artificial Limbs for Wounded Servicemen

Severe criticism of the artificial arms and legs which the government is supplying to wounded service men has been expressed editorially in Washington newspapers and in others throughout the country. The Washington *Daily News* said editorially "We don't know what's wrong or what specific steps should be taken to remedy the situation. We do know that some of the men who have given their arms and legs for this country feel deeply that they are not getting the proper appliances. This country, which has made efficient airplanes and rocket bombs, apparently hasn't produced workable artificial arms and legs." Newspaper comments further state that what the amputees want now is action, through coordinated research and effort, rather than a multiplicity of suggestions on what might be done. One newspaper said that "maybe we ought to have a Baruch report on artificial arms and legs. Not necessarily made by Mr. Baruch—perhaps by some leading doctors or medical institution, like the Mayo Clinic or Johns Hopkins." The government has appealed for new ideas on how to make better artificial arms and legs for wounded servicemen. An official of the National Inventors Council, a government agency set up to receive suggestions to help win the war, said "We need more ideas from the general public as well as inventors. The American people have always been inventive and ingenious. Maybe there is some plan not yet tried which would make better limbs." Research is now being conducted by the Army and Navy and in some private laboratories under auspices of the National Research Council. Several recently made suggestions are now being acted on.

Army Doctors in Pacific Find Replacements Delayed

Although the Army says it is relieving as speedily as possible its doctors who have been stationed for long periods in the Pacific, it is disclosed that delayed replacements from Europe have prolonged service of these medical officers. Some have been in the Pacific theater for as long as three years, enduring hardships and bad climate. The Surgeon General's Office estimates that it requires four to five months for a doctor to be shipped from Europe, furloughed in the United States and moved on to the Pacific on assignment relacement. A month is required after a doctor is relieved from permanent duty in Europe until he boards a home bound ship, and on reaching this country two weeks must elapse before he starts his thirty day furlough. Travel time then has to be figured for movement to a West Coast shipping center. Another thirty days is required crossing the Pacific to reach the ultimate destination. Then, before the Pacific Army doctor can leave for home, two weeks must be spent to acquaint the new man with the job.

Flood Interrupts Research on Tropical Disease

Medical research on tropical diseases was seriously disrupted when a "flash flood" drowned more than 200 experimental animals, including monkeys, dogs, cats, rats and mice, at the National Institute of Health near Bethesda, Md. Dr. R. E. Dyer, director of the institute, reported a loss in equipment and property of between $75,000 and $100,000. This, he said, was "nothing compared to the loss of strains of disease kept alive and under study in those animals. Some of them were flown here from China." Dr. Dyer said that records of much of the work were also lost. The disease under study is schistosomiasis, a tropical disease which attacks the liver. It was encountered by troops in the Southwest Pacific, infecting whole areas including the Philippines, the China Coast and Japan. The institute will have to send for more animals and start this special research all over again. The most serious loss is one of time.

U. S. War Casualties Total 1,061,648

The War Department reveals that war casualties for the week ended July 29 were 2,806, making a total of 1,061,648 since December 1941. Army losses are 197,676 killed, 570,766 wounded with 351,317 returned to duty, 34,734 missing and 117,741 prisoners of war, with 95,709 exchanged or returned to military control, making a total of 920,917. Navy losses are: Navy, 31,498 killed, 23,054 wounded, 10,547 missing, 2,038 prisoners, total 67,137; Marines, 19,385 killed, 50,465 wounded, 909 missing, 1,719 prisoners, total 72,478; Coast Guard, 808 killed, 213 wounded and 95 missing, total 1,116.

Civilians Clamor for Supplies of DDT

Since the revelation in the press that DDT, the magic insect killer, can be easily produced from nonpriority materials, drug stores throughout the country have been deluged with civilian requests for supplies. Already newspapers have printed news and feature stories describing in detail the formula and method of producing DDT. Official authority is awaited before large scale production for civilian use will be launched on a nation-wide scale.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Medical School Opens.—The Medical College of Alabama, Birmingham, opened officially June 4 with instruction of a junior class. On October 8 the School of Basic Medical Sciences on the University campus, where the first and second years are given, established in 1920, and its faculty will be absorbed into the new Medical College of Alabama. The School of Basic Sciences, direct successor in 1920 of the Medical College of Alabama at Mobile, organized in 1859, ceases to exist in October. The new Medical College of Alabama was established by action of the 1943 state legislature as a division of the University of Alabama. It was located in Birmingham in 1944 by vote of a special governor's commission. In 1945 it assumed title to Jefferson Hospital, Hillman Hospital, outpatient department, nurses home and all other city and county property of Jefferson County. In addition, the county and city gave to the university one block of property directly west, one half of which will be the site of a new health department building supported by state, county and city and to be affiliated with the Medical College of Alabama. Also two other blocks of adjacent property have been acquired by purchase by the university to serve as sites for other hospitals such as the Children's Hospital, the Crippled Children's Clinic and the Negro hospital, thus creating a four block medical center. In a fifth block south the university has purchased and remodeled apartment houses to provide living quarters for faculty and students. Under a ninety-nine year contract between the university and the county of Jefferson the Medical College of Alabama assumes responsibility for care of all indigent patients of county and city, maintenance of which is paid to the university on a per diem basis by the county. The 1943 appropriation included one million dollars for the building and equipment of a new medical school, which will be erected as early as possible after the war and connected under one roof with the new Jefferson Hospital. Under its contract the medical college receives authority for the appointment of the entire staff, medical and otherwise, of the combined hospitals.

CALIFORNIA

Position Available as Chief of Tuberculosis.—The California State Personnel Board is requesting applications to fill the position as chief of the state bureau of tuberculosis. Applications must be filed by August 30, and an examination will be held September 13. California residence has been waived. Candidates who are successful in the examination must obtain a license to practice medicine in California before they will be considered eligible for appointment. Education must include graduation from an approved medical school, completion of one year internship in a recognized hospital and completion of one year's graduate course in a recognized school of public health as well as three years' experience in the practice of medicine, including one year of full time experience as resident or associate physician in a tuberculosis sanatorium or hospital with a capacity of at least 50 beds. The salary will be $480 a month. Additional information may be obtained from the California State Personnel Board, 1015 L Street, Sacramento 14.

LOUISIANA

Dr. Brown Resigns as Director of Tuberculosis Control.—Dr. Reuben Alec Brown, New Orleans, has resigned as director of the division of tuberculosis control of the Louisiana State Board of Health. Newspapers reported that Dr. Brown will enter private practice in Houston, Texas.

Veterans' Psychiatric Service.—A veterans' psychiatric service has been established at the Veterans' Information Center, New Orleans, under the sponsorship of the Louisiana Society for Mental Health. The service will be available for the benefit of mentally disturbed veterans who cannot afford the cost of the services of a private psychiatrist. Dr. Milton E. Kirkpatrick, New Orleans, is clinical director with Dr. Walker Thompson, New Orleans, and Major H. Halbert Leet, M. C., assisting him.

NEW YORK

Provisions for Mental Care.—Plans for a $120,000,000 mental hospital construction program have been filed with the state postwar planning commission by Dr. Frederick MacCurdy, New York City, commissioner of mental hygiene, in anticipation of a large increase in the number of postwar patients, according to the New York *Times*. The commission on July 20 had approved $45,000,000 of these proposals, and early approval is expected for the others. The patient population of the state hospitals increased from 38,294 in 1920 to 83,053 in 1942. There were 82,108 under care on June 1. The recent decline is ascribed to the fact that more than 1,000,000 residents of the state are in military service and many persons who obtained employment during the war might have become patients had they remained idle.

Cornell Adopts Compulsory Physical Training Program.—On July 21 Cornell University, Ithaca, announced the adoption of a permanent compulsory physical education training program "designed to make such training enjoyable rather than a chore and emphasizing games and particularly carry-over sports beneficial to health after graduation." The program, evolved after study of three years' experience in conditioning army and navy trainees, was recommended as a requirement for all first and second year civilian men by the department of physical education and athletics. Effective with the opening of the current term the program, which normally will affect 3,000 underclassmen, is tied in with a cooperative venture of the university's medical department to provide corrective exercises. Freshmen and sophomores will be required to devote three hours weekly to the program.

New York City

Tuberculosis Admission Bureau Has New Offices.—The Tuberculosis Admission Bureau of the New York City Department of Hospitals, formerly located at 125 Worth Street, now has its offices at 535 East Eightieth Street. Application cards should be sent to the new address. All tuberculosis applications of the greater city of New York clear through the bureau.

Personal.—The degree of doctor of science was conferred on Dr. Margaret Barclay Wilson, Washington, D. C., professor emeritus of physiology and hygiene, at the recent commencement of Hunter College.——Dr. Trigant Burrow was given a Jubilee diploma by Fordham University during its recent commencement. The diploma is conferred on those who have been graduated fifty years from Fordham.

Ledyard Fellowship Available.—The Society of the New York Hospital announces that the Lewis Cass Ledyard Jr. Fellowship is now available. Applications should be addressed before November 15 to the committee of the Lewis Cass Ledyard Jr. Fellowship, Society of the New York Hospital, 525 East 68th Street, New York 21. The fellowship was established in 1939 by Mrs. Ruth E. Ledyard in memory of her late husband, Lewis Cass Ledyard Jr., who was a governor of the New York Hospital. The income, amounting to approximately $4,000 annually, will be awarded to an investigator in the fields of medicine and surgery or in any closely related field. Of this amount $3,000 will be applied as a stipend and approximately $1,000 for supplies or expenses of the research. In making the award, preference will be given to younger applicants who are graduates in medicine and who have demonstrated fitness to carry on original research of high order.

Restrict Sale of Penicillin and Other Antibiotic Drugs.—On July 24 the New York City Board of Health added a new section to the sanitary code restricting the sale of preparations containing penicillin or other antibiotic drugs to persons presenting a written prescription of a physician, dentist, podiatrist or veterinarian except in the cases of preparations which the board of health at some future date may specifically exempt from the provisions of the section. The new ruling became effective on August 1. In announcing the change Dr. Ernest L. Stebbins, health commissioner, gave three principal reasons for the board's action: Undertreatment may alleviate the symptoms of the illness without curing the disease, which in turn may continue to be communicable to other persons and to produce damage to the infected person; "there is also accumulating evidence of possible importance of the development of penicillin fast strains in persons who are inadequately treated," and, finally, these antibiotic drugs have been recently developed and there has not been sufficient time to determine the possible toxic reactions.

Orthopedic Hospital Merges with Columbia-Presbyterian Center.—The New York Orthopaedic Dispensary and Hospital and the Presbyterian Hospital at the Columbia-Presbyterian Medical Center were consolidated on July 23. The new corporation will be known as the Presbyterian Hospital in the City of New York. The orthopedic hospital will remain at its present site, 420 East 59th Street, until the fifth floor of the Presbyterian Hospital at 622 West 168th Street, part of the medical center, has been cleared of 70 student nurses housed there temporarily. The facilities of the orthopedic hospital eventually will be transferred completely and the building will be sold, the New York *Times* stated. The 70 student nurses will live in two additions to Maxwell House, now being built as part of the medical center's eight million to nine million dollar expansion program, which, it is estimated, will take about two and one-half years to complete. The orthopedic hospital erected its present quarters in 1916, with additions in 1925 and 1931 providing its present capacity of 145 beds in private rooms and wards. The Columbia-Presbyterian Medical Center currently combines services and facilities of the Presbyterian Hospital, Sloane Hospital for Women, Vanderbilt Clinic, Babies Hospital, Neurological Institute, Harkness Pavilion, Institute of Ophthalmology, J. Bentley Squier Urological Clinic, School of Nursing and the teaching facilities of the College of Physicians and Surgeons of Columbia University. Announcement was made also that a new 75 bed convalescent hospital for orthopedic patients would be built on property in King Street, Port Chester, N. Y., belonging to the orthopedic hospital. The Mary Harkness Home for Convalescent Care is on the 80 acre tract in Port Chester.

PENNSYLVANIA

Medical Club Observes Twenty-Fifth Anniversary.—The Bethlehem Medical Club celebrated its twenty-fifth anniversary in Bethlehem on June 7. Dr. Arno R. Zack, president, was toastmaster. Among the speakers were Dr. William L. Estes Jr., first president of the club, who recalled the initial steps taken by the Bethlehem physicians to organize a club in 1910 to "eliminate professional jealousy and to promote good fellowship."

Philadelphia

New Professor of Pathology.—Dr. Mollie A. Geiss has been appointed professor of pathology at the Woman's Medical College of Pennsylvania to succeed Dr. Helen Ingleby, who resigned in June to accept the position of pathologist at the Jewish Hospital (THE JOURNAL, July 7, p. 743). Dr. Geiss has been on the faculty of the college since 1923 and associate professor of pathology since 1932.

Temple Commencement Activities.—On June 21, during the commencement exercises of the Temple University School of Medicine, the degree of doctor of medicine was conferred on 127 young men and women coming from twenty different states, also Puerto Rico and the Hawaiian Islands. Eighty of the graduates were commissioned first lieutenants in the medical corps of the Army of the United States and 32 as lieutenants, junior grade, in the U. S. Naval Reserve. The commencement address was delivered by Charles F. Kettering, D.Sc., vice president and head of the research department of General Motors. Robert Silvercruys, Belgian ambassador to the United States, also delivered an address. Honorary degrees were conferred on both of these speakers. Eight physicians completed three years of postgraduate work and were awarded the degree of master of science in the specialty studied. Henning W. Prentis Jr., president of the Armstrong Cork Company, Lancaster, Pa., gave the principal address at the 121st annual commencement of Jefferson Medical College of Philadelphia, June 22. His subject was "The R's of Professional Education." He was given the honorary degree of doctor of laws. The present graduating class of 152 members brings the total number of graduates up to 17,507 during the 121 years of existence. The members of the graduating class were registered from twenty-one different states and two insular possessions. Ninety-five members of the graduating class received first lieutenant commissions in the medical corps, Army of the United States. Four members received first lieutenant, medical reserve corps, commissions. Presentation of commissions was by Lieut. Col. Frederick Hubbell Mills, M. C. These students received commissions after completing the requirements of the Army Specialized Training Program. Forty-one members of the graduating class received lieutenant, junior grade, commissions in the U. S. Naval Reserve. The commissions were presented by Capt. Lemuel M. Stevens, U. S. Navy, retired. Nineteen members of this group went on active duty as U. S. Naval interns. The presentation by the graduating class of 1945 of a portrait of Dr. Edward L. Bauer, professor of diseases of the child, was reported in THE JOURNAL, June 9, page 454.

GENERAL

Kansas Accident Report.—The 1945 edition of the "Kansas Accidental Death Report," which has been compiled annually for a little more than a decade, established trends and patterns in the occurrence of accidents. The state of Kansas, being industrial, agricultural, urban and rural, furnishes all kinds of situations in which accidents can occur.

Lawrence Linck Named Executive Director of Crippled Children Society.—Lawrence J. Linck, Chicago, has resigned as director of the Illinois division of services for crippled children to become executive director of the National Society for Crippled Children. Simultaneous with this report was one announcing the removal of the executive offices of the society from Elyria, Ohio, to Chicago. Mr. Linck will take over his new work September 1, at which time the new quarters are expected to be opened.

Research Fund Named for Sir Alexander Fleming.—The University of Pennsylvania on July 25 was selected to administer an $80,000 research fund established by American manufacturers of penicillin for Sir Alexander Fleming, discoverer of the drug. According to the New York *Times* the selection was a tribute to the role played in the development of the drug by Dr. Alfred N. Richards, vice president of the university in charge of medical affairs, who is credited with starting the program of producing the drug commercially. Under the terms of the trust, Sir Alexander has the widest latitude in administration of the money for scientific purposes. The results of the research will be free to any one. The work will be carried on by Sir Alexander at St. Mary's Hospital Medical School, University of London.

Meetings Canceled.—The council of the American Pharmaceutical Association has voted to postpone indefinitely the meeting of the council originally scheduled to be held in Chicago in September.——The executive council of the Association of Military Surgeons of the United States has voted to cancel the annual meeting, which was to have been held in Detroit October 24-27. The council further voted to retain in office the present officers of the association and to hold the 1946 meeting in Detroit.——The convention of the Aero Medical Association of the United States scheduled for September 24-26 at the Palmer House, Chicago, has been postponed.——The fifth International Assembly of the International College of Surgeons, which was announced for September 10-12 in Lima, Peru, has been postponed. The assembly will be held as soon as travel facilities become available. Dr. Max Thorek, 850 West Irving Park Road, Chicago 13, is international general secretary of the International College of Surgeons.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended July 28 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Division and State	Week Ended 7/28, 1945	Week Ended 7/29, 1944
New England		
Maine	6	..
New Hampshire	2	1
Vermont	2	..
Massachusetts	13	8
Rhode Island	..	..
Connecticut	11	3
North Atlantic		
New York	72	237
New Jersey	32	3
Pennsylvania	16	64
East North Central		
Ohio	14	40
Indiana	2	20
Illinois	3	15
Michigan	8	30
Wisconsin	..	6
West North Central		
Minnesota	..	8
Iowa	2	4
Missouri	2	..
North Dakota	..	..
South Dakota	..	..
Nebraska	..	1
Kansas	4	9
South Atlantic		
Delaware	..	1
Maryland	8	17
District of Columbia	5	4
Virginia	22	39
West Virginia	1	5
North Carolina	2	57
South Carolina	7	2
Georgia	4	8
Florida	6	3
East South Central		
Kentucky	3	79
Tennessee	29	10
Alabama	9	13
Mississippi	1	1
West South Central		
Arkansas	..	..
Louisiana	6	11
Oklahoma	12	3
Texas	40	8
Mountain		
Montana	1	1
Idaho	..	..
Wyoming	2	..
Colorado	1	..
New Mexico	..	..
Arizona	1	1
Utah	11	2
Nevada	..	..
Pacific		
Washington	9	1
Oregon	1	12
California	21	13
Total	391	740
First 30 weeks:		
1945 and 1944	2,439	3,060
Median, 1940-1944	1,526	

Advisory Council for Insurance Research Fund.—An advisory council of eight members has been appointed for the life insurance medical research fund including the following:

Dr. Francis G. Blake, dean, Yale University School of Medicine, New Haven, Conn.

Dr. Ernest W. Goodpasture, dean, Vanderbilt University School of Medicine, Nashville, Tenn.

Albert Baird Hastings, Ph.D., Hamilton Kuhn professor of biochemistry, Harvard Medical School, Boston.

Dr. Eugene M. Landis, George Higginson professor of physiology, Harvard Medical School.

Dr. Robert F. Loeb, professor of medicine, Columbia University College of Physicians and Surgeons, New York.

Dr. Cyril N. H. Long, Sterling professor of physiologic chemistry, Yale University School of Medicine.

Dr. Seeley G. Mudd, professor of experimental medicine, University of Southern California School of Medicine, Los Angeles.

Dr. Cecil J. Watson, professor of medicine, University of Minnesota Medical School, Minneapolis.

The creation of the research fund was sponsored by the American Life Convention and the Life Insurance Association of America (THE JOURNAL, June 23, p. 606). A newly appointed council was nominated by a committee of four physicians including Drs. Alan Gregg, director of medical sciences, Rockefeller Foundation, New York; Alfred N. Richards, vice president in charge of medical affairs, University of Pennsylvania School of Medicine, Philadelphia; Lewis H. Weed, director, school of medicine, Johns Hopkins University, Baltimore, and Dr. Blake.

CANADA

National Immunization Week.—September 30-October 6 has been designated National Immunization Week, according to the Health League of Canada, which is sponsoring the observance in cooperation with health departments. The week is devoted to intensifying efforts to promote immunization against diphtheria, smallpox, whooping cough and scarlet fever.

Annual Meeting of Health League.—The twenty-sixth annual meeting of the Health League of Canada, formerly known as the Canadian Social Hygiene Council, will be held at the King Edward Hotel, Toronto, September 26-28. The theme of the meeting will be disease prevention, with separate sessions to discuss immunization, industrial health, nutrition, pasteurization and venereal diseases.

Degree Course in Physical Education.—McGill University, Montreal, has established a degree course in physical education, the first class to start in September. The course will be of four years' duration following junior matriculation or three years following senior matriculation or its equivalent. Open to both men and women students, it will lead to a degree of bachelor of science in physical education. The curriculum will include courses in English, physics, chemistry, zoology, anatomy, physiology, psychology, sociology, education, bacteriology, organization and administration, history, development and present day requirements in mental health, preventive medicine, nutrition and the technical application of physical medicine. Progressively arranged throughout the four years will be the technical and professional material involving basic technics in neuromuscular activity, principles of physical education, analysis and practice of activity, methods and analysis of teaching, curriculum content and planning, and practice teaching. The school of physical education at McGill, said to be the oldest of its kind in Canada, was established in 1912. The new program will be the first degree course offered by the school, which is an integral part of the faculty of medicine.

FOREIGN

Pasteur Institute Receives Grant for Penicillin.—The French government has made a grant of 10,000,000 francs to the Pasteur Institute, Paris, to enable it to develop research into the preparation of penicillin, it is reported.

Memorial Service for Dr. Thierry de Martel.—Impressive religious services were held June 14 at Neuilly-sur-Seine in memory of Dr. Thierry de Martel, formerly chief surgeon at the American Hospital of Paris. Dr. de Martel had reached his sixty-fifth birthday in June 1940, when the Germans entered Paris. On the night of June 13-14 he took his own life, thus obviating practically certain imprisonment and compulsion to work for the Germans against his own countrymen.

Personal.—Major Greenwood, D.Sc., has retired as professor of epidemiology and vital statistics at the University of London School of Hygiene. Because of a change in the distribution of teaching and the steady increase in the volume of research work and teaching within the field of medical statistics, the title of the chair has been altered to that of medical statistics and A. Bradford Hill, since 1933 leader in medical statistics in the university, has been appointed to succeed Dr. Greenwood, who has been given the title of professor emeritus in epidemiology and vital statistics.

Government Services

Care of Children in Liberated Countries

Support of the National Commission on Children in Wartime to the policies of the United Nations Relief and Rehabilitation Administration in the care of children in the liberated countries was expressed in a statement prepared by a committee of the commission and released recently. In view of the frightful things that have happened and are happening to children and the need for prompt action in identifying children and restoring them wherever possible to their families, the statement urged that the policies be developed immediately by the highest army authorities and UNRRA in regard to the services to be rendered by the latter in dealing with displaced children in territories under military control. In addition to expressing concern as to the fate of thousands of homeless children, the committee in its conference with Herbert Lehman, director general of the UNRRA, June 12, stressed the need for arousing the people of this country to the fact that children in Europe are starving or near starvation because they do not have the protective foods, particularly meat and milk, to which this country must be looked as the main source of supply. The committee included Mr. Leonard W. Mayo, Cleveland, head of the committee of the National Commission on Children in Wartime and president of the Child Welfare League of America; Katharine F. Lenroot, Washington, D. C., chief of the Children's Bureau, U. S. Department of Labor; J. Milton Patterson, Chicago, American Public Welfare Association; Maxwell Hahn, New York, Field Foundation, and Dr. Leona Baumgartner, New York, American Public Health Association.

Meeting of the National Advisory Health Council

At a meeting of the National Advisory Health Council at the headquarters of the U. S. Public Health Service, Bethesda, Md., June 19-20, to discuss current and future activities of the several bureaus of the public health service, recommendations were made that:

A committee of the council be appointed to act with designated officers of the service in the development of a program of clinical research in the Public Health Service.

The Public Health Service strengthen its control of the interstate spread of disease through consultant services to public health laboratories and through maintenance of a $1,000,000 emergency fund to be used in epidemics and disasters.

The Public Health Service undertake demonstrations in selected communities of generalized public health nursing programs, including bedside care.

The Public Health Service establish a training program for its own personnel, which would include orientation, work experience, observation, in-service training, and opportunities for state and local personnel to participate.

The program of grants-in-aid and technical services to the states in the field of industrial hygiene be expanded.

The Public Health Service seek appropriations for grants-in-aid for general research to be allotted to qualified institutions and individuals.

When the federal government undertakes grant-in-aid programs related to public health and sanitation, the Public Health Service be empowered to conduct investigations for determination of the nature and extent of the problems involved and to approve the allocation of funds, functional effectiveness and placement of plants, installations and constructions required of such programs.

The council also recommended the approval of a grant in aid of $92,000 to the University of Utah for research on muscular dystrophy, which, according to an announcement, is the first grant-in-aid for general research projects to be made under the provisions of the public health service act of 1944 (P. L. 410). This is the law that authorized the council, which had been serving in only an advisory capacity, to have the legal responsibility to:

. . . advise, consult with and make recommendations to the Surgeon General on matters relating to health activities and functions of the service; and to serve in other capacities as requested.

Recommend research projects for grants-in-aid in scientific fields other than cancer research, and recommend other procedures for the advancement of scientific research.

Recommend the adoption of regulations by the service with respect to interstate quarantine for the prevention of communicable diseases, including regulations for the apprehension, examination and detention of persons who are spreading disease.

The council will hold regular meetings twice a year, special meetings to be called as needed. Members of the council are to serve as chairmen of special committees dealing with specific subjects.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 21, 1945.

The Slowness of Medical Demobilization: Government Criticized by the British Medical Association

For some reason which the government will not explain, demobilization of the fighting services is very slow. In the case of medical service great dissatisfaction has been expressed by the British Medical Association. At a meeting held at the headquarters of the association Dr. Guy Dain, chairman of the council of the association, who presided, explained that the association could not find out which groups of doctors were likely to be demobilized. The position with regard to the civilian population was very difficult. Doctors were very badly needed and the profession had been driven to great lengths to meet that need. Doctors were not able to get back to their practices, and the association was getting many letters of protest from men who were serving but so far had not been able to get any satisfaction. The profession had carried on at home with the ratio of 1 doctor to 3,000 civilians in urban areas and 1 to 2,400 in rural areas, whereas in the fighting forces there was on an average 1 doctor to every 350 men.

Dr. Charles Hill, secretary of the British Medical Association, said that unless at least 5,000 doctors were released for work among the civilian population next winter a grave situation might arise in the event of an epidemic. In a letter to the *Times* he pointed out that approximately one third of the doctors in the country are serving with the forces. The Central Medical War Committee of the association suggested the continuance of recruitment after the end of the German war in order to facilitate demobilization, and the government accepted this. Although recruitment is proceeding, the committee has not been informed of the quota of doctors to be supplied for 1945. Accordingly it does not know the extent to which, if at all, the recruitment will find expression in accelerated release. In spite of repeated requests the committee has not been informed of any time table for demobilization apart from certain groups. Until a long term program is announced, the intense dissatisfaction which now exists will continue. The government has decided, against the protest of the committee, not to continue to recruit medical women. This decision will hamper recruitment and so delay demobilization.

Great Success of Medical Measures in the Burma Campaign

The campaign in the malarious jungles of Burma has been a serious problem for the army medical service. In the early days sickness, largely due to malaria, was as high as 300 per cent annually. Whole units were incapacitated at a time. But, thanks to new methods vigorously applied, the rate has been reduced to only 4 per cent. Only two years ago 70 per cent of all army sickness was due to malaria. Last year this rate fell to 36 per cent and in the first four months of the present year to 27 per cent. The malaria rate has been reduced to 17 per cent of what it was at the corresponding time last year.

This astonishing improvement is due to the thoroughness of the antimalaria measures. Close behind the advancing troops both the ground and the air forces send out men to survey malarious tracts of country, select camp sites and plan the work of the malaria control units. Camp areas are sprayed with the insecticide DDT. Trickling jungle streams, the seepage of swamps, are canalized or attacked with DDT, for these are the breeding places of Anopheles minimus, the cause of the high malarial rate in Assam. Brackish swamps and lagoons near the sea are the breeding places of another variety of mosquito, Anopheles sundaicus, which infects the Arakan coast. These places are oiled or drained by deep channels into tidal streams. Last year three new measures were adopted: the administration of mepacrine to the troops; the introduction of DDT, which is not only sprayed in tents and buildings but over malarious tracts of country by low flying aircraft, and the use by forward troops of fish net veils soaked in "scat," the American repellent dimethyl phthalate. Under military discipline every soldier takes daily a tablet of mepacrine and wears long trousers and buttoned sleeves to reduce the risk of mosquito bites.

Another advance is the sending of supplies by air. When the medical officer commanding an advanced unit requires anything, he radios to the base and within a few hours is supplied by parachute. Even blankets and stretchers are dropped by air, and surplus supplies are returned with the wounded. Under this system the amount of stock that need be kept on hand by the unit is much reduced and the advantage is gained that the unit can travel light.

Great Development of Rehabilitation Treatment

As reported previously in THE JOURNAL, rehabilitation has received much increased attention as a result of war injuries. The present position is summarized in an address by the minister of health, Mr. Willink, to representatives of the British Council for Rehabilitation. In the Emergency Medical Service (established during the war mainly for the treatment of civilian casualties due to German air raids) more than 11,000 patients are taking daily courses of remedial exercises in their beds. In addition 20,000 are attending hospitals for special exercises and remedial games. Of these 31,000 persons receiving rehabilitation, 15,000 are taking part in some form of occupational therapy. Since the Ministry of Health made a special survey with the object of extending these facilities, the number of hospitals providing rehabilitation for their patients has increased from 150 to 300. The great majority of the sick and wounded from the fighting services are receiving their medical rehabilitation in the hospitals of the Emergency Medical Service. More than 250 doctors have been given special training, and for hospitals handicapped by lack of accommodation the ministry has provided thirty-four prefabricated buildings. Conferences have been held throughout the country for leaders of industry, personnel managers, welfare officers and industrial medical officers, to explain the whole process of rehabilitation and the part which industry has to play in the resettlement of patients.

The minister of health added that there is no intention to relax this campaign. Wartime progress must not be lost in peacetime. The success of rehabilitation methods would lead to increased demand which hospitals throughout the country were already getting ready to meet. The Ministry of Health would retain its Rehabilitation Department and was fully prepared to continue to encourage and assist the development of these facilities as an integral part of the health services. The British Council for Rehabilitation could perform a most useful work in bringing together the medical and industrial points of view.

Science Under the Nazis in Denmark and Norway

Prof. A. V. Hill, secretary of the Royal Society, has returned from a visit to Norway and Denmark to present to the academies of the two countries the greetings of the society and copies of all that it has published since 1940. He reports that science has not suffered under the Nazis in Denmark as badly as in most countries. Until the autumn of 1943 they were on their best behavior, but then the Gestapo became active and students ceased to attend the colleges. Professor Rehberg, zoologist, was brutally mishandled for lack of cooperation and, with many other scientists, was imprisoned. The chief scientific need is books and journals and English textbooks for students. But so

quickly have the Danes reestablished themselves that they are contemplating an expedition for marine biologic investigation off the west coast of Africa.

Norway has suffered more than Denmark. The president of the academy, Professor Bull, was three years in a concentration camp. The scientific laboratories were stripped of equipment, and scientific work suffered and the Norwegians have great difficulties in getting their courses started again. Medicine attained a high standard in Norway before the war. The Danes are taking a large number of Norwegian medical students, and Norway is anxious that some of her best postgraduate students should study over there. In both countries the most friendly relations exist with Britain, and English bids fair to become a second language. Both desire to use our books and scientific instruments in place of those formerly imported from Germany.

Visit of Brazilian Plastic Surgeon

Dr. David Adler, consulting plastic surgeon to the Air Force Hospital, Rio de Janeiro, is in this country on a six months visit, arranged by the British council. During his visit he will work with Sir Harold Gillies, the leading British plastic surgeon.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, June 30, 1945.

Penicillin in the Treatment of Frambesia

Dr. A. Marques da Cunha and Dr. A. Area Leão, at the Oswaldo Cruz Institute, have been conducting extensive studies and experimentation for several months on the therapeutic effects of penicillin in some important tropical diseases. One series of studies relates to frambesia, or yaws, a disease in which the extensive skin lesions and the abundance of treponemes permit objective evaluation of the results of treatment. The first experiments were performed with barium penicillin solution prepared at the institute. Seven patients treated with penicillin alone were clinically and microscopically cured in twelve to forty-four days. The penicillin was injected at intervals of four to six hours, 200 Oxford units being used each time. The total dose per patient varied from 9,600 to 52,000 units. In spite of the frequency and the number of injections, no toxic effects were noted. The patients were maintained during six months under weekly immunologic control.

The second group of experiments involved 5 patients treated with dried sodium penicillin of American make. The same dose of 200 units was used, adding up a total which varied from 24,000 to 54,000 units for each patient. The healing of the skin lesions and the disappearance of the subjective symptoms were obtained as in the first series of patients. The immunologic cure in all the cases of the two series did not immediately accompany the clinical cure: it took a few months to develop negative Wassermann reactions in all the 12 cases.

Revision of the Pan American Sanitary Code

The tenth Pan American Conference of National Directors of Health, held in Washington in 1944, decided to amend the present Pan American Sanitary Code, adopted twenty-five years ago by the nations of the Western Hemisphere. In fact, the present code in many points is not in accordance with the advancements of the medical sciences and is quite inadequate in some others to meet the conditions created by the rapid development of air transportation. Furthermore, some new subjects, in addition to the control of transmissible diseases, need to be included in the code as the sanitary activity has been expanded to comprehend a few modern problems. According to that decision Dr. Hugh S. Cumming, director of the Pan American Sanitary Bureau, appointed Dr. J. de Barros Barreto, director general of the National Department of Health of Brazil, Dr. Solon Nunez, secretary general of health of Costa Rica, Dr. Rafael Schiaffino, director of the department of health of Uruguay, and Dr. Garza Brito, professor at the School of Public Health of Mexico, to prepare a draft of a new code, to be presented to the twelfth Pan American Sanitary Conference, to be held in Caracas, Venezuela, in 1946. The committee is now working at Rio de Janeiro under the chairmanship of Dr. Barros Barreto.

Experimental Infection with Leishmaniasis Americana

The experimental infection with leishmaniasis americana is a subject not yet sufficiently studied. Dr. A. Marques da Cunha of the Oswaldo Cruz Institute has just published an interesting paper on an experimental study in which he succeeded in infecting the rhesus monkey with the agent of the disease (Leishmania brasiliensis), causing the production of mucous lesions similar to the ones described in man. The causative agent of leishmaniasis americana should not be confused with the agent of American kala-azar, or visceral leishmaniasis, i. e. Leishmania chagasi. The inoculations were made intradermally about the superciliary arches or into the skin of the nose. The incubation period ranged from one to two months. The course of the infection varied according to whether the lesions were limited to the skin or also invaded the mucous membranes. In the former the infection lasted from three to eight months and always terminated in spontaneous cure. When the lesions were also present in the mucous membranes they tended to persist and evolve, while the skin lesions observed in the same animal became regressive and tended to healing and cure. Dogs also were inoculated, with positive results, the incubation period being about two months and the skin lesions tending always to terminate by cure. Other tropical monkey-like animals, such as Dasyprocta agouti, when inoculated never showed the infection. One rhesus monkey which recovered from an infection by L. brasiliensis could not be infected when inoculated with another strain of the same parasite. The extent of the lesions of the mucous membranes in experimental infections of rhesus monkeys by Leishmania brasiliensis, a fact not yet observed with Leishmania tropica, constitutes a strong argument in favor of the independence of the two species.

Marriages

DONALD EWING TINKESS, Greenwich, Conn., to Mrs. Clyde Manson Trotter of Chattanooga, Tenn., in Columbia, S. C., June 16.

ANIBAL ROBERTO VALLE, Charlottesville, Va., to Miss Rose Mary Keupper of Gillespie, Ill., in Washington, D. C., June 25.

RICHARD PHILLIPS BELL, Staunton, Va., to Lieut. Hilda Steele Franklin, A. N. C., of Fieldale, May 26.

MALCOLM C. TODD, Lawrenceville., Ill., to Miss Ruth Holle Schlake of Chicago in London, England, June 12.

FRANCIS MICHAEL SMITH JR., Vicksburg, Miss., to Miss Betty Thibaut of Donaldsonville, La., in June.

JAMES LEONIDAS CAMP III, Franklin, Va., to Miss Jane Elizabeth Geuting in Philadelphia in May.

FREDERICK WILLIAM WOOD JR. to Miss Patricia M. Wright, both of Garden City, N. Y., June 15.

ROBERT LOFTUS BRERETON, Kirkwood, Mo., to Miss Ann Van Dyke of St. Louis, June 23.

WILLIAM PARKS BLACKMON, Atlanta, to Miss Dorothy Mae Ware of Mayo, Fla., June 21.

GUSTAV JULIUS BECK to Miss Rita Levitiss, both of Gloversville, N. Y., May 12.

ORVILLE W. WINTERS to Miss Ruth Mae Weber, both of Cincinnati, July 28.

GEORGE C. TRUMAN, Mesa, Ariz., to Lieut. Dorothy Hinson recently.

LYNN McIVER to Miss Elva Bryan, both of Sanford, N. C., June 5.

Deaths

James Bertram Overton, Talmage, Calif.; Washington University School of Medicine, St. Louis, 1931; began active duty as a captain in the medical corps, Army of the United States, on Nov. 13, 1942; assigned to chief neuropsychiatric service at Stockton; transferred to several other fields, serving also at Denver; relieved from active duty because of physical disqualification on June 25, 1944, honorably discharged Dec. 21, 1944; at one time associated with the U. S. Public Health Service Reserve; interned at the State of Wisconsin General Hospital in Madison and Johns Hopkins Hospital in Baltimore; interned at the Evansville (Ind.) State Hospital, where he also served a residency, served a residency at the Arizona State Hospital, Phoenix, New Mexico State Hospital, Las Vegas, Weston State Hospital, Weston, W. Va., Utah State Hospital, Provo, and at the Mendocino State Hospital, where he had been a member of the regular staff; died in Ukiah March 28, aged 40, of cerebral hemorrhage.

William Hamilton Jefferys, Haverford, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; formerly a medical missionary in China, where he served for many years as professor of surgery, lecturer on tropical diseases and dean at St. John's University and associated with the Blind in Philadelphia for many years; served as executive superintendent of the Home for Consumptives in Chestnut Hill; retired superintendent of the Philadelphia Protestant Episcopal City Mission; formerly editor of the *China Medical Journal*; author of several books and articles on Christian mysticism; died in Philadelphia May 14, aged 73.

Orley Mason Vaughan Jr., Covert, Mich.; Northwestern University Medical School, Chicago, 1911; chairman of the board of the Tri-County Telephone Company, which he organized in 1924, serving as its president in 1940; instrumental in organizing the Michigan Independent Telephone Association; a director of the United States Independent Telephone Association; past president of the board of education of Covert; instrumental in creating the Covert Consolidated school district, of which he was also president; served as chairman of the county poor commission; died in Fort Lauderdale, Fla., April 23, aged 60, of cerebral hemorrhage.

John Mark O'Farrell, Houston, Texas; Memphis (Tenn.) Hospital Medical College, 1891; member of the American Medical Association and of its House of Delegates in 1920; honorary member of the State Medical Association of Texas; past president of the South Texas Medical Association; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; a member of the first state board of health; served on the staffs of the Memorial, Methodist and St Luke's and St. Elizabeth's hospitals in Shanghai; fellow of the College of Physicians of Philadelphia; past president of the American Association of China, honorary fellow of the China Medical Society; chairman, instruction committee, and vice president of the Pennsylvania Institute for Instruction of Jefferson Davis hospitals; for many years surgeon for the Santa Fe Railroad; died May 23, aged 79.

Harvey Arbuckle, Boonton, N. J.; College of Physicians and Surgeons, Baltimore, 1904; died May 13, aged 71, of congestive heart disease and pernicious anemia.



LIEUT. ANTHONY GUS KERASOTES
(MC), U.S.N.R., 1912-1944



LIEUT. (JG) JOHN F. KINCAID JR.
(MC), U.S.N.R., 1917-1945



LIEUT. COMDR. DANIEL J. MCCARTHY
(MC), U.S.N.R., 1908-1945

KILLED IN ACTION

Anthony Gus Kerasotes, Springfield, Ill.; St. Louis University School of Medicine, 1940; member of the American Medical Association; interned at St. Mary's Group of Hospitals in St. Louis; entered the medical corps of the U. S. Naval Reserve as a lieutenant (jg) on Sept. 10, 1942; received training at Parris Island, N. C., and served as medical officer at Savannah, Ga., naval base; participated in the invasions of North Africa and Sicily and the landings in Italy, served on board the U. S. S. *Leary* when the vessel was torpedoed in the Atlantic area while engaged in an antisubmarine patrol; promoted to lieutenant; reported missing in action as of Dec. 24, 1943, presumptive date of death Dec. 25, 1944, aged 32.

John Franklin Kincaid Jr., Leesburg, Va.; Duke University School of Medicine, Durham, N. C., 1942; diplomate of the National Board of Medical Examiners; interned at the Johns Hopkins Hospital in Baltimore; began active duty as a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on July 10, 1943; died in the Asiatic area April 12, aged 27, of blast concussion.

Daniel Joseph McCarthy, Savannah, Ga.; St. Louis University School of Medicine, 1935; member of the American Medical Association; interned at St. Louis City Hospital; served as assistant resident surgeon at St. Joseph Hospital; entered the medical corps of the U. S. Naval Reserve as a lieutenant (jg) on Oct. 2, 1940; began active duty in the same grade on July 28, 1941, assigned to Charleston, S. C.; later promoted to lieutenant and lieutenant commander; died in the Pacific area February 22, aged 36, of fragment wound of the upper extremities.

Henry George Blanchard, Fairmont, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; member of the American Medical Association; died in the Community Hospital April 13, aged 76, of chronic myocarditis and arteriosclerosis.

Charles H. Burton, Iva, S. C.; University of Georgia School of Medicine, Augusta, 1903; formerly mayor of Iva; died May 2, aged 68, of coronary thrombosis.

George Harold Carpenter, Marion, Ohio; Toledo Medical College, 1912; died April 9, aged 61, of pneumonia.

Henry Clinton Cooney ✠ Princeton, Minn.; College of Physicians and Surgeons of Chicago, 1887; fellow of the American College of Surgeons; served as president of the Northern Minnesota Medical Association and the East Central Minnesota Medical Society; until March 1944 local health officer; for many years local surgeon for the Great Northern Railway; owner and medical director of the Northwestern Hospital; died April 1, aged 81, of cardiac decompensation.

Charles Aaron Hull, Omaha; Denver College of Medicine, 1893; formerly assistant professor of surgery at the University of Nebraska College of Medicine; fellow of the American College of Surgeons; at one time on the staff of the Immanuel Hospital; served during World War I; died May 8, aged 75, of bronchopneumonia and cerebral hemorrhage.

James Riley Kinney, Fort Valley, Ga.; Southern Medical College, Atlanta, 1889; at one time mayor of Fort Valley; died May 9, aged 81, of chronic myocarditis and arteriosclerosis.

Frederick Willer Meyer ✠ Capiz, P. I.; Yale University School of Medicine, New Haven, Conn., 1919; fellow of the American College of Surgeons; a member of the House of Delegates of the American Medical Association, 1937-1938; a missionary of the American Baptist Foreign Mission Society; director and chief surgeon, Emmanuel Hospital; died on the Island of Panay Dec. 20, 1943, aged 51, while in the custody of the Japanese.

Davis Strom Porter, Andrews, S. C.; Atlanta College of Physicians and Surgeons, 1910; served as mayor and councilman; for many years physician and surgeon for the Atlantic Coast Lumber Corporation and the Seaboard Railroad; died in a Florence hospital March 31, aged 62, of nephritis and cardiac decompensation.

Otto William Schwalb, Fort Lauderdale, Fla.; University of Georgia Medical Department, Augusta, 1928; member of the American Medical Association; served as secretary of the Georgia Medical Society; director of the Broward County Health Department; member of the tuberculosis board of Broward County; formerly city physician of Savannah, Ga.; died April 17, aged 42, of coronary thrombosis.



Capt. Aaron Emil Oswald
M. C., A. U. S., 1914-1945



Capt. Leroy William Yolton,
M. C., A. U. S., 1900-1945



Lieut. Charles W. Pfeiffer
M. C., A. U. S., 1918-1944

KILLED IN ACTION

Aaron Emil Oswald, Casper, Wyo.; College of Medical Evangelists, Los Angeles, 1941; interned at St. Luke's Hospital in Denver; served as assistant chief resident physician at Kern General Hospital in Bakersfield; commissioned a first lieutenant in the medical corps, Army of the United States, on May 27, 1942; later promoted to captain; bomber squadron flight surgeon; during the nearly two years that he was overseas he had been twice decorated for valor, the first for "meritorious achievement" while participating in aerial flights in the Southwest Pacific area from Jan. 5 to Oct. 3, 1944, and the second decoration, the Soldiers' Medal, was awarded to him in August 1944 for saving a gunner from burning plane wreckage; died February 24, aged 30, from a bomb-load explosion that followed his rescue of a pilot trapped in a burning plane on Morotai Island in the Pacific.

Leroy William Yolton ✠ Bloomington, Ill.; Rush Medical College, Chicago, 1931; interned at St. Luke's Hospital in Chicago, where he served a residency; began active duty as a captain in the medical corps, Army of the United States, on Sept. 3, 1942; killed in action in Luzon, P. I., February 3, aged 44.

Charles William Pfeiffer, Racine, Wis.; University of Chicago School of Medicine, 1942; interned at the Augustana Hospital in Chicago; at the age of 21 was commissioned a second lieutenant in the Field Artillery, since he was an R. O. T. C. member after graduating from Culver; on receiving his medical degree was transferred to the Medical Officers Reserve Corps with the rank of first lieutenant; began active duty on Dec. 30, 1943 as a first lieutenant in the medical corps, Army of the United States, and was assigned to the O'Reilly General Hospital in Springfield, Mo., for two months; transferred to Mason General Hospital in Brentwood, Long Island, for a three month course in neuropsychiatry; after a few months at Longview, Texas, went to Camp Atterbury, Ind., where he joined the 331st medical battalion of the 106th Infantry division; arrived in England about the middle of November 1944; wounded in the battle of Ardennes, Dec. 21, 1944; reported dead on Dec. 23, 1944, aged 26, while a prisoner of the German government.

Correspondence

SURGICAL-PATHOLOGIC COOPERATION IN LOWERING OPERATIVE INCIDENCE OF SO-CALLED CHRONIC APPENDICITIS

To the Editor:—The great discrepancy that exists between the clinical diagnosis of chronic appendicitis and many apparent nonpathologic appendixes subsequently reported by some pathologists as chronic appendicitis presents a serious and challenging problem to all clinicians and especially to surgeons.

In no other field of surgery is there tolerated so flagrant a violation of diagnostic and pathologic fundamentals. The growth of this pernicious practice is due to three errors: First, inadequate and hasty study by the clinician. All too frequently we find the first and easiest diagnosis to be chronic appendicitis, whereas the correct approach would be to proceed on the basis that this is the last possible diagnosis and should be arrived at only after all studies and adequate consultations have ruled out other diseases which may easily simulate chronic appendicitis. Only after this are we justified in subjecting the patient to surgery. The wisdom of the phrase "Error is always in haste" is often apparent as we review diagnostic errors. Failure to carry out adequate diagnostic study is the clinician's responsibility.

The second error is the lamentable trend shown by many pathologists to report slight alteration from the normal pattern as a diseased appendix for no other apparent reason than the fact that it was removed surgically. In the majority of cases this same pathologist, without knowing the operative history or the surgeon, could call these specimens normal appendixes. This is the pathologist's responsibility.

The third error is the indifference or inability of the clinician and pathologist to review the surgical specimen which is found to be normal. The clinician profits immensely by wholesome discussion of his problem, and an occasional admission of a diagnostic error will help to develop his future clinical judgment. This is demonstrated by the successful clinicopathologic conferences held today in many institutions. "From the errors of others a wise man corrects his own."

Although my own observations are limited to areas along the Eastern seaboard, the magnitude of this problem is well emphasized by the experience of the professor of medicine in one of our large Eastern medical colleges. After completing a transcontinental clinical trip he expressed alarm over the extraordinarily large number of appendectomies performed for chronic appendicitis through the entire country.

A pathologist in a distant community recently finished a study on a series of 335 appendixes removed for acute and chronic appendicitis. Of this group 72 per cent definitely showed gross and microscopic changes justifying the preoperative diagnosis. The remaining 28 per cent that did not show demonstrable disease was broken down for more critical analysis, using a code for each surgeon in order to maintain a critical attitude. The results showed beyond the slightest doubt that the better qualified surgeon removed infinitely fewer so-called chronic appendixes.

One institution has succeeded in reducing the rate of operative procedures for chronic appendicitis from 46 per cent to 10 per cent within the space of a few months by application of the aforementioned criteria for diagnosis; it would seem that this example might well be followed by many more hospitals.

EDWIN J. GRACE, M.D., Brooklyn.

NEOSTIGMINE METHYLSULFATE FOR PREECLAMPSIA

To the Editor:—The employment of neostigmine in the treatment of preeclampsia as suggested by Woodbury and his associates in THE JOURNAL, June 23, is based on principles underlying recent orientation on the etiology of the late toxemia of pregnancy (Hofbauer, J. I.: *West. J. Surg.* **49**:615 [Nov.] 1941; *Cincinnati J. Med.* **23**:107 [May] 1942; *Am. J. Surg.* **45**:361 [Sept.] 1944). The many theories advanced during past decades have failed to receive obstetric approval elucidating the true nature of the disorder.

While in the past the placenta was generally considered the chief characteristic of the pregnant state and, in toxemia, the principal factor responsible for the elaboration of "toxins," the new tenet inclines to the view that the pregnant state is essentially conditioned by the altered basic endocrine pattern. Notable among the hyperplastic changes occurring in the ductless glands during pregnancy are the phenomena in the adrenal cortex, the thyroid and the anterior hypophysis. In the present discussion the demonstration of increased secretion of the basophils during the last trimester of normal gestation and of cortical structures has first call in view of the clinical evidence that the adrenal cortex as well as the pituitary basophils may serve as factors in the genesis of hypertension (Rinehart, J. F.; Williams, O. O., and Cappeller, W. S.: Adenomatous Hyperplasia of the Adrenal Cortex Associated with Essential Hypertension, *Arch. Path.* **32**:169 [Aug.] 1941. Selye, Hans; Rowley, E. M., and Hall, C. E.: *Canad. M. A. J.* **49**:88 [Aug.] 1943). These factors, in conjunction with augmented reactivity of the arterioles to pitressin as the result of the presence during pregnancy in the blood of placental sex hormones in concentrations far above anything occurring in the nonpregnant state, serve as a basis for the appreciation of a delicately adjusted equilibrium between the opposing effects on the blood pressure of the endocrine factors and placental acetylcholine. A disturbance of this balance in toxemia was demonstrated by the reports of my associates of remarkably low acetylcholine values in 28 placentas and by the evidence adduced by Mukherjee of increased concentration in the blood of postpituitary principles in toxemia. These investigations have brought into clear relief the etiologic relationship between undue pitressin effects and the causation of toxemia. To the summation of the experimental, morphologic and chemical facts pointing in this direction, as recorded in previous communications, may be added the recent demonstration of the blood concentrating effect and of the phosphorus raising action of the pressor hormone by Stehle and Bourne (*J. Physiol.* **64**:229).

The cardinal aspects which enter into the rational therapy of preeclampsia entail primarily the preservation as far as possible of the functional integrity of the liver as the organ most concerned with the excretion and detoxication of pitressin and thyroxine. In view of my observations of the effects of neostigmine, which closely parallel the report of Woodbury, I hesitate to recommend this drug. There is, however, another consideration concerning the potentiation of naturally occurring placental acetylcholine by inhibiting cholinesterase. The most valuable sedatives in the treatment of eclampsia (morphine, barbiturates) strongly inhibit cholinesterase, as recently shown by the studies of E. A. Zeller (*Helv. chim. acta* **26**:1619, 1943) and F. Schütz (*J. Physiol.* **102**:259 [Dec. 31] 1943). Their empirical clinical use in eclampsia may thus be rationalized.

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THE SUPPLY OF LABORATORY SERVICE

To the Editor:—In THE JOURNAL, June 16, page 539, Dr. Theodore Curphey criticized Montgomery County's method of supplying medical laboratory service to the public. His main objections were that: 1. If put into practice throughout the state and in other states, the system would "seriously jeopardize the healthy and natural development that laboratory medicine is now enjoying." 2. It would "limit the freedom of choice of the younger pathologist and would tend to force him into seeking state laboratory appointments." 3. It would "place at a serious economic disadvantage those private pathologists who work in proprietary hospitals or have laboratories of their own and who engage in private practice." 4. "These two things would be serious deterrents to the entry into the specialty of pathology by younger men." 5. The public's appreciation of pathologic services would be weakened because it is free. 6. "It might be harmful also to organized medicine in that . . . attempts might be made to offer the services of other medical specialists on the same basis to the community."

The first two of these objections are apparently based on a misapprehension of the facts. The Montgomery County Laboratory is not a state laboratory. It is entirely under county control. The expenses are paid jointly by the county and by the state. The intention of the state is, I believe, to encourage counties to supply laboratory service in those communities where it does not exist. Such communities are likely to be those whose population is too small to support the private practice of a pathologist and too distant from large centers to utilize existing facilities. By combining public health, hospital, medicolegal and outpatient work in one laboratory there may be enough to absorb the full time and interest of a pathologist, as in Montgomery County. It is desirable that most laboratory specimens be examined soon after collection, that the pathologist be familiar with local conditions and that he be available as a consultant. Furthermore, in many cases he needs information as to the clinical features. All this can be accomplished only if the laboratory is close to the community it serves.

While the Montgomery County type of laboratory is particularly suited to our community, this does not mean that it should be adopted in larger, more densely populated, areas or in places where satisfactory laboratory service is in existence. There is no danger that such a system will be "put into practice throughout the state and perhaps also in other states," nor does the New York State Department of Health propose to do so. It only provides aid to those communities which decide that they need it.

It will also be seen that objection 3 has no application to Montgomery County, for it was precisely the lack of private pathologists that incited the county to establish its laboratory. Indeed, the introduction of laboratory service where it is lacking creates additional positions for pathologists.

Objection 4 would be extremely serious if it should be corroborated. Before deciding what would deter younger men from entering the specialty of pathology, it would be desirable to ask the younger men that question. In my opinion there are at present two extremely serious and widespread deterrents to the specialty of pathology. The first is the low remuneration of pathologists in comparison to other physicians of equal training and degree of specialization. But this is at least as true of pathologists working in voluntary hospitals as of those employed in organizations such as the Montgomery County Laboratory. The second is the exclusion of pathologists from medical boards and generally from the direction of medical affairs in many hospitals. In Montgomery County the pathologist is a member of the staff of the two voluntary hospitals and has as much say in the government of the hospitals as the other physicians. The foregoing two factors being equal, I can see no reason for supposing that the type of administrative organization, whether hospital or county laboratory, would make the least difference to a young physician in deciding whether to enter pathology or another specialty.

Objection 5 deals with imponderables. As far as Montgomery County goes, my impression is that the public has shown at least as much appreciation of the free service as has been shown for paid services in other communities with which I am familiar.

Objection 6 can be judged only by the facts. In this county no such attempt has been made or, to my knowledge, even suggested. The county medical society was consulted and approved the laboratory plan before it was adopted.

Dr. Curphey concludes that a solution of the matter should be "motivated by a sincere desire to give an all inclusive modern laboratory service to communities, on a basis of individual community needs and not as is recommended in the Montgomery County Plan, as an overall free public service." All inclusive modern laboratory service on a basis of individual community needs is precisely what has been supplied in Montgomery County.

Finally, Montgomery County has made a contribution to pathologic service to the community which is worth pointing out. This is the recognition of autopsies as a vital public health service. In this county, autopsies are performed freely, not only, as in most places, on cases in which death has occurred in hospitals or medicolegal cases but on nonhospitalized cases as well. In addition to the public health value of this arrangement, it aids in research requiring prolonged follow-ups, as in cancer therapy. The possession of clinical and postmortem records of entire families in one laboratory also fosters the study of human genetics, a subject which should logically be within the province of pathology.

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Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Failure to Sterilize Instruments Before Removing Pterygium from Eye.—The plaintiff consulted the physician defendant, an eye specialist, with respect to a growth in the corner of his left eye, which the physician diagnosed as a pterygium and advised its removal. Subsequently the physician performed the operation in his office in the presence of the plaintiff's aunt. Both the patient and his aunt testified that the physician "whetted" the instrument with which he operated "on a stone" and then proceeded to operate without either sterilizing the instrument or washing his own hands. This was denied by the physician. Subsequently a "severe infection" developed in the eye, and the patient sustained some loss of vision. Attributing the infection to the alleged failure of the physician to sterilize the instrument or to wash his hands immediately prior to operating, the patient instituted an action for malpractice against the physician. At the trial it was established that the operation performed by the physician was a minor one and when properly performed was ordinarily not followed by the result which here occurred; that for a physician to operate on an eye without washing his hands and sterilizing his instruments would constitute negligence; and that an infection in the part of the body operated on might result from the use of an unsterilized instrument. As stated before, the physician denied whetting the operating instrument on a stone and claimed to have sterilized the instrument and to have washed his hands immediately prior to operating. The physician and the medical witness called on his behalf both testified that instruments such as the defendant

used in the operation in question were not sharpened by the operators but came from the manufacturer already sharpened and in sealed packages. On the other hand, Dr. Kirkpatrick, another eye specialist practicing in the same vicinity, testified that he sharpened his instruments prior to an operation. The evidence adduced was in conflict as to the manner in which the patient's eye might have become infected. The defendant testified that he saw no evidence of infection in the patient's eye when he operated and he believed that after the operation the patient had taken the bandage off, suffered a fall or "gotten a lick" which caused the infection. The patient and other witnesses on his behalf denied that any such incident had occurred. A Dr. Fuller believed that the infection which caused the loss of vision in the patient's eye was probably in existence at the time of the operation. At the close of the evidence the trial court refused to direct a verdict in favor of the physician and after the jury returned a verdict for the patient refused to set that verdict aside. The physician then appealed to the Supreme Court of Arkansas.

In considering the question, said the Supreme Court, of the correctness of the action of the trial court in refusing to direct a verdict in favor of the physician and in refusing to set aside the verdict that was rendered by the jury in favor of the patient, this court must bear in mind these fundamental rules: 1. A court on appeal from a judgment based on a jury's verdict does not pass on the credibility of witnesses. That function is solely to be exercised by the jury, whose decision as to the credence to be given to testimony (except as to testimony contrary to scientific knowledge and mathematical facts) is binding on the appellate court. 2. Where the verdict is supported by any substantial testimony it must, in the absence of prejudicial errors of the trial court, be upheld; and in determining whether there is substantial testimony to support the verdict the evidence must be given the strongest probative force in favor of the party obtaining the verdict that it will reasonably bear. We conclude that, when the testimony in this case is considered in the light of these rules, it must be held that a fact question for the jury was presented by the evidence and that the jury's verdict is supported by substantial testimony.

The physician contended that the evidence was insufficient to justify the verdict, arguing that the charge of negligence against him was not supported by the testimony of any medical expert witnesses. He contended that in a case of this kind negligence cannot be established except by witnesses who are skilled in the practice of medicine. If, answered the court, there could, under the testimony, be any dispute as to the method used in the operation or in the treatment of the patient it would be necessary to establish the correct method by the testimony of medical witnesses but we do not have that situation here. There was no dispute whatever as to what was the proper course to be pursued by the physician in preparing for and performing the operation. It was not denied that it was necessary and proper for the physician to cleanse his hands thoroughly and to sterilize his instruments. The dispute in this case was as to whether or not the physician followed the course which is conceded to be necessary and proper. The physician testified that he did and the patient and his aunt testified that he did not follow this course. No amount of expert testimony could have thrown any light whatever on the real question in this case.

The physician further contended that, even if it be conceded that he failed to sterilize his instruments and to wash his hands, those facts were not sufficient on which to base a finding that such negligence was the proximate cause of the infection. It is not required in a case of this kind, said the court, that the injured party show to a mathematical certainty or to the exclusion of every other hypothesis that his injury occurred as a result of the negligence of which he complains. Herzog, in his "Medical Jurisprudence," discussing the quantum of proof necessary to sustain a recovery for malpractice, lays down this rule:

"It is not necessary to prove beyond a shadow of a doubt that an injury was caused by negligence preceding it, but a showing of strong probability of the causal relation is sufficient. . . . Where negligence and injury are proved, a causal connection between them may be established by circumstantial evidence, by inferences from physical facts" (pp. 161, 162, sec. 186).

In this case it was shown by testimony accepted as true by the jury that the physician failed to wash his hands and to sterilize his instruments before operating on the patient's eye. It was undisputed that a serious and unusual infection followed the operation. Since it appeared that all the causes for this infection, which were suggested by the physician and the medical witnesses called by him, were excluded by testimony which the jury had a right to believe, we conclude that the jury was authorized to find that the infection in the patient's eye was caused by the negligence of the physician.

Accordingly, the judgment in favor of the patient was affirmed.—*Lanier v. Trammell, 180 S. W. (2d) 818 (Ark., 1944).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Aug. 4, page 1046.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: January. Sec., Dr. B. R. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS:* *Medical.* Little Rock, Sept. 20-21. Sec., Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, Nov. 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, Nov. 11. *Written.* Los Angeles, Aug. 13-16. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, Sept. 10. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

ILLINOIS: Chicago, Oct. 9-11. Supt. of Registration, Department of Registration & Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

LOUISIANA: New Orleans, Aug. 16-18. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MARYLAND: *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO:* Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 1-4. Sec., Dr. Jacob L. Lochner, Education Bldg., Albany.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

WISCONSIN:* Madison, Jan. 8-10. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Oct. 1-2. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, Sept. 5-6. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Oct. 13. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 22-23. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 3. Sec., Dr. J. F. Conn, Box 655, DeLand.

IOWA: Des Moines Oct. 9; Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Oct. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

RHODE ISLAND: Providence, Aug. 15. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: December. Sec., Dr. J. D. Alway, Aberdeen.

TENNESSEE: Memphis, Sept. 24-25. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Madison, Sept. 22. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee 3.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below

American Journal of Ophthalmology, Cincinnati

28:581-700 (June) 1945

Sympathetic Ophthalmia Following Subconjunctival Rupture of Eyeball C A Perera—p 581
Wernicke's Disease (Encephalitis Hemorrhagica Superioris) D Kravitz and R H Stockfisch—p 596
Angioid Streaks in Deep Layers of Retina A J Bedell—p 601
*Diabetic Iridopathy C V Clapp—p 617
Onchocerciasis A Study of Ocular Complications in 342 African Cases J G Scott—p 624
*Recurrence of Tobacco Alcohol Amblyopia T D Carroll—p 636
Visual Disturbance After Ingestion of Digitalis H M Langdon and R D Mulberger—p 639
Concerning Early Ocular Symptoms of Multiple Sclerosis C A Veasey—p 640
On Biastigmatism T I Pascal—p 644

Diabetic Iridopathy.—According to Clapp diabetic conditions are sometimes associated with changes in the iris Some of these changes are inflammatory, but the majority are not associated with inflammation and should be designated as iridopathy These noninflammatory changes may be confused with malignant melanoma Practically all of the pathologic material available to Clapp showed severe changes in the pigment epithelial layer He presents 2 case histories and reproduces a number of photomicrographs showing changes in the pigmented layer of the iris These changes deserve further study in order to ascertain whether they are limited chiefly to diabetic patients and also their cause

Tobacco-Alcohol Amblyopia.—Carroll reports the case of a woman with tobacco alcohol amblyopia who regained normal vision and normal fields, although she did not decrease her alcoholic intake or improve her diet Vitamin B appeared to be responsible for the satisfactory results When the thiamine was discontinued the amblyopia recurred, and when it was used again essentially normal vision was obtained The author thinks, however, that it is advisable to use a good diet supplemented by the whole vitamin B complex as well as just vitamin B_1 for the best results in the treatment of this condition

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

29:281-380 (May) 1945

Problem of Infection of Animal Mucosae with Neisseria Gonorrheae I Modification of Host Resistance J H Hill Virginia Huffer and Ellen Nell—p 281
*False Positive Serologic Reactions for Syphilis with Special Reference to Those Due to Smallpox Vaccinations (Vaccinia) C R Rein and Elizabeth S Elsberg—p 303
Penicillin in Late Syphilis Interim Report J H Stokes with collaboration of H Beerman V R Ingraham Jr and others—p 313
*Penicillin Therapy of Sulfonamide Resistant Gonococcic Infections and Associated Complications in the Male Schedule of Treatment for Ambulatory Patients V Cohn and B A Kornblith—p 334
Case of Yaws in White American Soldier L Katzenstein—p 340
Time Dose Relationships of Penicillin Therapy III Regimens Used in Early Syphilis W McDermott, Maria Benoit and Rebeckah DuBois—p 342
U S Army Experiences in Venereal Disease Control in European Theater of Operations P Padget—p 352
Keratoderma Blennorrhagicum Brief Review and Report of Case Treated with Penicillin E M Satulsky—p 361

False Positive Serologic Reactions for Syphilis Due to Smallpox Vaccinations.—Rein and Elsberg investigated the nature and incidence of false positive serologic reactions for syphilis following smallpox vaccinations All soldiers were examined one week after they received smallpox vaccination, and those who developed a vaccinoid or vaccinia reaction were referred for serologic investigation All specimens were subjected to the Kline diagnostic, Kline exclusion, Boerner-Jones-Lukens, Mazzini and Kahn standard flocculation tests and the Kolmer complement fixation test One hundred and twenty nine soldiers developed a vaccinoid or vaccinia reaction following the smallpox vaccination, of whom 58 (44.9 per cent) showed doubtful or positive tests with one or more of the serodiagnostic procedures employed The authors stress that since biologic false positive reactions occur with some frequency following smallpox vaccinations, it is important to rule out that possibility before antisyphilitic treatment is instituted Irreparable physical and psychologic damage has been produced by an ill considered or hasty diagnosis If treatment is started prematurely, the evidence which could have finally led to an accurate diagnosis is often obscured Serologic tests may become negative with a small amount of treatment, and one is at a loss to know whether the seronegativity represents a response to therapy or merely reflects the fact that the patient has never had syphilis Much time can be saved by thoroughly studying the soldier with an unexplainable positive serologic reaction before the diagnosis of syphilis is established and treatment is instituted

Penicillin Therapy of Sulfonamide Resistant Gonococcic Infections.—Cohn and Kornblith employed penicillin in the treatment of 113 men with sulfonamide resistant gonococcic infections Two schedules of penicillin therapy were tested In both schedules a total dosage of 100 000 Oxford units of penicillin, administered intramuscularly, was found both necessary and sufficient for bacteriologic cure In the first schedule treatment was divided over a period of six hours, an initial injection of 50,000 Oxford units of penicillin was followed by two intramuscular injections of 25,000 Oxford units each at three hour intervals Eleven patients who received this schedule of therapy became bacteriologically negative within four hours, and in the second schedule of treatment 102 patients received the total amount of 100,000 Oxford units of penicillin within a period of four hours A total of 100 cases in this group responded promptly to one course of therapy Eight of these patients were reinfected, and 5 of them again responded to a second course of penicillin therapy Of the 113 cases studied, 94 (83 per cent) presented complications There were 8 cases of epididymitis and 86 cases of prostatitis The acute symptoms of epididymitis, such as pain fever and malaise subsided within three days among 7 of the 8 cases observed Swelling and induration of the epididymis and inflammatory hydrocele persisted for variable periods of one to four weeks Acute symptoms and signs of prostatic involvement subsided promptly after penicillin therapy The more chronic infiltrations improved moderately during five weeks of observation There was no consistent correlation between the clinical findings in the prostate and the corresponding microscopic findings of wet smears from prostatic secretions Reactions to penicillin therapy were of a mild and transitory character The authors conclude that the therapy of complications of gonococcic infections does not necessarily end with the administration of the penicillin alone

American Review of Tuberculosis, New York

51:393-488 (May) 1945

*Minimal Tuberculous Lesions of Lung Their Clinical Significance D Reisner and J Downes—p 393
Tuberculosis Mortality in Communities of Different Size J Yerushalmy and Charlotte Silverman—p 413
Ventilatory Function Experiences with Simple Practical Procedure for Its Evaluation in Patients with Pulmonary Tuberculosis F C Warring Jr—p 432
Bronchography in Pulmonary Tuberculosis IV Geographic Adventure—Part I B A Dormer, J Friedlander and F J Wiles—p 455
*Diasone Therapy of Pulmonary Tuberculosis Its Clinical Efficacy and Toxicity L Benson and L Goodman—p 463
Fatal Pemphigoid Reaction to Diasone E H Robitzek—p 473
Tuberculin Testing of Medical Students Reaction to Tuberculin of Second Year Medical Students at College of Physicians and Surgeons Columbia University M M Steinbach and C J Duca—p 478

Minimal Tuberculous Lesions of Lung.—Reisner and Downes studied the behavior of the minimal lesion of tuberculosis during a period of about five years, which was the length of time for which about 50 per cent of the patients were followed up, the others being observed for longer or shorter periods The material was collected from the ambulatory chest

clinics of the New York City Department of Health and consists of 469 persons, of whom 200 were male and 269 female. Since analysis by sex showed no indication that females were more liable to progressive disease than males, the data for the two sexes have been combined. None of the patients were less than 10 years of age, 24 per cent were between 10 and 25, 58 per cent were in the age group between 25 and 44 and 18 per cent were 45 years or older. The majority of patients showing involvement of minimal extent are asymptomatic and aside from roentgenologic findings present few objective criteria for evaluation of their clinical significance. An appraisal of the clinical importance and presumable prognosis of the minimal tuberculous lesion requires a qualitative differentiation of the type of lesion. Lesions of the exudative or exudative-productive type are characterized by an unstable behavior and a tendency to progression. Progression was observed in about one half of the white patients and in 61 per cent of the nonwhite patients. Lesions of productive-fibrotic or fibrocalcific character have shown a stationary behavior in the majority of instances, progression or instability having occurred in only 5 per cent of the white and 14 per cent of the nonwhite patients. Lesions of the fibrocalcific type showed the highest rate of stability, progression being an exceptional occurrence. If the character of the lesion is considered, age per se is not important as far as the risk of developing progressive disease is concerned. The age factor merits consideration from the point of view of prognosis to the extent that lesions of exudative character, representing a presumably early and potentially progressive type of involvement, are more apt to be found in the young age groups. Supervision of patients with minimal tuberculosis should be on a selective basis and should take into account the risk of progressive disease as related to the character of the lesion.

Diasone Therapy of Pulmonary Tuberculosis.—Benson and Goodman administered diasone for from 120 to 160 days to 22 patients with pulmonary tuberculosis. Only 4 patients may possibly have benefited from the drug. Two patients in the series died while on the diasone therapy. Another patient developed an exfoliative dermatitis necessitating withdrawal of the drug. A variety of toxic and untoward responses to diasone were observed, including cyanosis, anemia, dermatitis, fever, jaundice, tremors, diplopia and enlargement of the thyroid. Diasone is an experimental drug which is currently being investigated. It should be employed only under the most rigid clinical and laboratory control.

Archives of Internal Medicine, Chicago

75:279-356 (May) 1945

Brain Abscess Associated with Congenital Heart Disease. S. L. Robbins. —p. 279.
*Influence of Anoxemia on Hemopoietic Activity. A. Hurtado, C. Merino and E. Delgado.—p. 284.
Effects of Some Liver Extracts on Carbohydrate Metabolism. H. B. Sokal.—p. 324.
Effects of Some Liver Extracts on Carbohydrate Metabolism. J. E. Sokal.—p. 327.
Gastroenterology: Review of Literature from July 1943 to June 1944. W. L. Palmer, D. S. Harman and W. E. Ricketts.—p. 341.

Anoxemia and Hemopoietic Activity.—Hurtado and his associates describe investigations of the influence of temporary, intermittent and chronic anoxic anoxia (anoxemia) on the morphologic and other characteristics of the circulating blood of several series of healthy and diseased male subjects at sea level and various altitudes. They found that exposure to a low pressure environment causes a polycythemic response. In general the level of polycythemia is directly proportional to the degree, duration and continuity of the anoxic stimulus. There seems to be a limit for the hematologic response to the anoxic stimulus. When this is extremely severe a decrease rather than a further increase is observed in polycythemia. The level of hemoglobin in the circulating blood may be one of the many factors which tend to preserve the internal stability against the disturbing influence of a constant lowering of the oxygen tension in the inspired air. The polycythemia associated with the anoxemia of high altitudes is absolute in type. The elevation in the total blood volume, which at times reaches high values, is due to an increased red cell volume. The polycythemia observed on arrival at high altitudes seems to be due to release of stored blood and hemoconcentration; that corresponding to a repeated or constant exposure to a low pressure environment is related to an erythropoietic hyperactivity. The polycythemia associated with a constant or intermittent anoxemia tends to show a proportional elevation in the circulating reticulocytes and in the serum bilirubin. The latter characteristic suggests that an increased rate of cellular destruction parallels the increased formation, but other factors, such as insufficiency of the liver in excretion of pigment, due to the anoxic condition, may also be a factor in the hyperbilirubinemia. The stimulating influence of anoxemia on the hemopoietic system is restricted to the formation of red blood cells and hemoglobin. Leukopoietic activity is not affected. Chronic anoxemia does not modify the erythropoietic activity permanently. When a person who has lived since birth at high altitudes is brought down to sea level he shows after some time blood characteristics similar to those found in persons who have always lived under the latter environmental conditions. Comparative study of the polycythemia of high altitudes and the polycythemic processes observed at sea level indicates that (*a*) in cases of anoxemia at sea level due to pulmonary changes the polycythemic response tends to be less than with corresponding degrees of arterial oxygen unsaturation at high altitudes, except in cases of Ayerza's disease; (*b*) it is not likely that the causative mechanism of polycythemia vera is related to the existence of an anoxic stimulus.

Archives of Ophthalmology, Chicago

33:341-428 (May) 1945

Inherited Cataract in the B. Genealogy: Occurrence of Diverse Types of Cataract in Descendants of One Person. F. C. Lutman and J. V. Neel.—p. 358.
Surgical Management of Glaucoma in Correlation with Gonioscopy and Biomicroscopy. S. J. Meyer and P. Sternberg.—p. 358.
Pathologic Physiology of Convergent Strabismus: Motor Aspects of Non-accommodational Type. F. H. Adler.—p. 362.
Use of Methyl Cellulose in Ophthalmology. K. C. Swan.—p. 378.
Ophthalmic Prisms: Corrective and Metric. L. G. H. Hardy, R. R. Chace and M. C. Wheeler.—p. 381.
*Ocular Sequelae of Administration of General Anesthesia: Paralysis of the Superior Rectus Muscle, Exophthalmos, Pseudoptosis and Fibrosis of the Inferior Rectus Muscle Following an Operation for Pilonidal Cyst with Patient Under General Anesthesia. C. Berens and G. Fonda. —p. 385.
Glaucoma Associated with Nevus Flammeus: Report of Case. E. E. Grossman.—p. 389.
Pathogenesis of Glaucoma. L. Hess.—p. 392.
Ophthalmologic Features of Intracranial Chordoma and Allied Tumors of the Clivus. I. Givner.—p. 397.
Use of Troncoso's Magnesium Implant in Cyclodialysis for Relief of Glaucoma: Observations in 2 Cases. P. H. Boshoff.—p. 404.

Ocular Sequelae of General Anesthesia.—Berens and Fonda report the case of a man aged 26 who was operated on for pilonidal cyst under ethylene-ether anesthesia. Prior to this operation the patient's eyes revealed no abnormality. Within twenty-four hours after the operation the patient experienced diplopia when looking upward. On the following day the diplopia was present while he was reading. Onset of ptosis was coincidental with the diplopia. Later examinations revealed paralysis of the superior rectus muscle, exophthalmos, pseudoptosis and fibrosis of the inferior rectus muscle. The most probable explanation of the ocular symptoms was that an embolism of the artery supplying the superior rectus muscle occurred. Fibrosis of the inferior rectus muscle may have been caused by the secondary contracture associated with embolic myositis. There may be no proved causal relationship between the ethylene-ether anesthesia and the sudden onset of diplopia and the proptosis, but the short interval of less than twenty-four hours between the occurrence of the ocular symptoms and the operation is highly suggestive of a close relationship.

Delaware State Medical Journal, Wilmington

17:81-110 (May) 1945

Psychiatry in Postwar Era. M. A. Tarumianz.—p. 81.
Atypical Case of Cerebellar Tumor. P. F. Elfeld.—p. 87.
Psychiatric Problems of Service Men's Wives. B. G. Lawrence.—p. 89.
The Psychic Epileptic Variant. G. J. Gordon.—p. 90.
Role of Insufficient Laboratory Study and Inadequate Treatment in Development of General Paresis. M. B. Zimbler.—p. 93.
Differential Diagnostic Considerations in Case of Postinfectious Psychosis. G. S. Bieringer.—p. 97.
Religious Sexual Excitement Syndrome in Schizophrenic Minister. F. A. Freyhan.—p. 99.
Treatment of Expressive Aphasia in War Veteran. J. Jastak.—p. 101.

Journal of Clinical Endocrinology, Springfield, Ill.

5:163-202 (April) 1945

Treatment of Adrenal Insufficiency. R. H. *Williams*, J. L. Whittenberger, G. W. Bissell and A. R. Weinglass, with the technical assistance of J. B. Peters.—p. 163.
Protein Bound Plasma Iodine in Patients with Thyroid Disease: Effect of Thiouracil. B. E. Lowenstein, M. Bruger, J. W. Hinton and W. G. Lough, with the technical assistance of S. Member.—p. 181.
Premature Sexual Precocity in a Young Girl. K. J. Karnaky.—p. 184.

Journal of Immunology, Baltimore

50:255-316 (May) 1945

Relative Susceptibility of Normal and X-Rayed Mice of *Different Stocks* to Pneumococcic Viruses. P. F. de Gara and J. Furth.—p. 255.
In Vitro and In Vivo Activity of Synthetic Detergents *Against Influenza* A Virus. M. Klein and D. A. Stevens.—p. 265.
Development of Acute Immunity in Swiss Mice with Infective and Noninfective Suspensions of *Poliomyelitis Virus*. S. D. Kramer and H. A. Geer.—p. 275.
Immunologic Studies on Fibrin. K. C. Robbins.—p. 283.
Concentration and Purification of Influenza Virus for Preparation of Vaccines. A. R. Taylor, D. G. Sharp, I. W. McLean Jr., *Dorothy* Beard and J. W. Beard.—p. 291.

Journal of Infectious Diseases, Chicago

76:83-162 (March-April) 1945

Infection of Ticks (Dermacentor Variabilis) with Pasteurella Tularensis. J. F. Bell.—p. 83.
Immunologic Studies on Psittacosis-Lymphogranuloma Group of Viral Agents. M. R. Hilleman.—p. 96.
Field Study of Latent Tularemia in Rodents with List of All Known Naturally Infected Vertebrates. A. L. Burroughs, R. Holdenried, D. S. Longanecker and K. F. Meyer.—p. 115.
Effect of Chlorination on Virus of Eastern Equine Encephalomyelitis in Presence of Organic Substances. J. E. Kempf, Marjorie E. Pierce, Martha G. Wilson and M. H. Soule.—p. 120.
Studies on Endameba Histolytica: V. On Decrease in Infectivity and Pathogenicity for Kittens of E. Histolytica During Prolonged In Vitro Cultivation and Restoration of These Characters Following Encystment and Direct Animal Passage. Shih Lu Chang.—p. 126.
Isolation of Agent Belonging to Psittacosis-Lymphogranuloma Group of Viruses. Alice H. Kempf, A. H. Wheeler and W. J. Nungester.—p. 135.
Trypanocidal Activity and Toxicity of Antimonials. G. Chen, E. M. K. Geiling and R. M. MacHatton.—p. 144.
Effect of Cysteine on Trypanocidal Activity and Toxicity of Antimonials. G. Chen, E. M. K. Geiling and R. M. MacHatton.—p. 152.
Susceptibility of Muskrats and Other Rodents to Poliomyelitis Virus (Lansing Strain). F. B. Gordon.—p. 155.

Laryngoscope, St. Louis

55:191-238 (May) 1945

Surgery of Facial Nerve in 300 Operated Cases. T. G. Tickle.—p. 191.
*Surgical Treatment of Cancer of Larynx. C. L. Jackson and C. M. Norris.—p. 196.
Use of Otosmosan in Otology: Clinical Report. S. J. Kopetzky.—p. 216.
Abscesses of Pyriform Sinus. A. Nigro.—p. 228.

Cancer of Larynx.—Cancer of the larynx is 100 per cent fatal without treatment, but according to Jackson and Norris the prognosis of treated cases is better than in cancer of most other parts of the body. The cases treated surgically should be divided into those treated by laryngofissure (or partial laryngectomy) and those treated by total laryngectomy. The mortality of the form of laryngofissure used by the authors should be practically zero. In their clinic not a single patient has died of this operation for fourteen years; and during this time 148 laryngofissures have been done. According to the literature, the mortality of total laryngectomy is certainly much higher than that of laryngofissure, but in the last 70 laryngectomies performed by the authors there has not been a single operative fatality. A recent analysis of the end results in a series of 150 patients with cancer of the larynx treated at the Temple University Hospital by surgery and irradiation during the period 1930 to 1937 inclusive showed a combined five year cure rate of 64 per cent. Of the 101 patients with intrinsic lesions who underwent either laryngofissure or laryngectomy, 80 patients obtained at least a five year cure. Nine patients with extrinsic lesions in whom laryngectomy was done died. During the same period 34 patients were treated by irradiation (protracted fractional technic), 22 of them intrinsic and 12 extrinsic. In the intrinsic group a 59 per cent five year cure rate was obtained, in the extrinsic group a 25 per cent five year cure rate.

Maine Medical Association Journal, Portland

36:75-90 (May) 1945

Pudendal Block Anesthesia in Home Obstetrics. M. Trowbridge Jr.—p. 75.
Problem of Acute Gastrointestinal Hemorrhage. E. H. Risley.—p. 80.

36:91-116 (June) 1945

Acute Abdominal Emergencies. A. H. McQuillan.—p. 91.
Use of Prostigmine in Arrested Poliomyelitis. G. Geyerhahn.—p. 95.

New England Journal of Medicine, Boston

232:613-640 (May 24) 1945

The Circus Disaster and the Hartford Hospital. D. B. Wells.—p. 613.
Salicylism Accompanied by Respiratory Alkalosis and Toxic Encephalopathy: Report of Fatal Case. H. W. Ryder, M. Shaver and E. B. Ferris.—p. 617.
Endoscopy. E. B. Benedict.—p. 621.
Chronic Ulcerative Colitis; Acute Ulcerative Ileitis with Perforation. H. S. Pittman.—p. 628.
Rheumatoid Arthritis. Amyloidosis of Kidneys, Spleen and Liver. W. W. Beckman.—p. 632.

232:641-664 (May 31) 1945

*Ligation of Inferior Vena Cava in Prevention and Treatment of Pulmonary Embolism. E. E. O'Neil.—p. 641.
Cruveilhier-Baumgarten Syndrome: Case. A. Blain III and M. Clapper.—p. 647.
Eczema. F. M. Rackemann.—p. 649.
Acute Hepatitis. J. C. Aub.—p. 654.
Adenoacanthoma of Pancreas. F. D. Moore.—p. 657.

Ligation of Inferior Vena Cava in Pulmonary Embolism.—*O'Neil* suggests that when concurrent phlebothrombosis exists in both lower extremities and has extended to or above the inguinal ligament and when pulmonary embolism has occurred and its course is not evident, interruption of the inferior vena cava is indicated. The fact that aseptic thrombosis may exist in the large pelvic vessels and initiate a serious embolism should not be overlooked. If an operation is to be performed only on suspicion of deep venous thrombosis, the best assurance that can be given for the patient's safety is the highest possible ligation compatible with adequate venous return.

Surgery, Gynecology and Obstetrics, Chicago

80:561-662 (June) 1945

*Mechanism of Shock from Burns and Trauma Traced with Radiosodium. C. L. Fox and A. S. Keston.—p. 561.
Analysis of Massachusetts General Hospital Cases of Lung Abscess from 1938 Through 1942. R. H. Sweet.—p. 568.
*Postoperative Prophylaxis of Recurrent Mammary Cancer with Testosterone Propionate. A. Prudente.—p. 575.
Role of the Decompensatory Reaction of Peripheral Blood Vessels in Tourniquet Shock. B. W. Zweifach, R. G. Abell, R. Chambers and G. H. A. Clowes.—p. 593.
Effects of the Parenteral Administration of Fluids on Metabolism of Electrolytes During Postoperative Convalescence. E. M. Limbert, M. H. Power, J. D. Pemberton and E. G. Wakefield.—p. 609.
Treatment of Thrombophlebitis. M. D. Yahr, C. Reich and C. Eggers.—p. 615.
Surgical Anatomy of Facial Nerve, with Special Reference to the Parotid Gland. L. J. McCormack, E. W. Cauldwell and B. J. Anson.—p. 620.
*Causalgia. F. H. Mayfield and J. W. Devine.—p. 631.
Safe, Simple and Efficient Method of Intestinal Anastomosis. J. Peyton Barnes.—p. 636.
Transverse Upper Abdominal Incisions. M. S. Rosenblatt and D. Colver.—p. 641.
Primary Tumors of Liver. W. N. Warvi.—p. 643.

Mechanism of Shock.—*Fox and Keston* used radioactive sodium to explore whatever changes might occur after shock from burns or trauma. Two types of experiments were conducted. In one type animals were prepared with radiosodium given in isotonic solution of sodium chloride so that the body sodium was in equilibrium and tagged with the isotope. Shock was produced twenty hours later, and the concentration of radiosodium in the tissues and organs was determined in the animals during shock but not when moribund. In a second type of experiment shock was produced first and the animals were then treated with isotonic saline solution containing some radiosodium. About twenty hours later, on recovery from potentially fatal shock (as judged by death of untreated controls), the concentration of radiosodium was determined in tissues and organs. The water content of all tissues sampled was also measured by drying the tissues at 110 C. for eighteen to twenty-four hours. Similar analyses were performed in parallel control animals which had not been injured but which had received equal doses

of radioactive sodium. The experiments were made on mice. They demonstrated the great accumulation and side tracking of sodium in injured tissues with subsequent reduction in plasma volume characteristic of traumatic shock. Conversely, treatment with an amount of isotonic sodium solution approximating one-half the extracellular volume restored this volume. This explains the successful treatment of shock in animals and in man with large volumes of isotonic solutions of sodium salts.

Testosterone Propionate in Mammary Cancer.—Prudente used testosterone as a postoperative measure in treating 63 patients with mammary cancer who had previously been operated on. As controls, 64 cases are reported in which the breast had been removed by the same technic of radical surgery and in which testosterone propionate was not used. All 127 cases were operable. The results obtained, as gaged by the survivals of three, four and five years, are about 100 per cent better than those observed after operation only. This fact indicates that testosterone propionate exercises a protective or prophylactic action against recurrences of surgically treated mammary cancer. Very high doses of testosterone propionate, up to 175 mg. a week, may and should be used after operations for mammary cancer, and this treatment should be continued through many years. The principal criterion for the selection of the dosage is the grade of histologic malignancy of the tumor. The side effects following this therapy are of secondary importance. They consist of virilization and of disturbances of menstruation. In patients between 40 and 50 years of age who are still menstruating, early cessation of menstruation is often observed.

Causalgia.—Mayfield and Devine report 15 cases of causalgia found among a group of 737 peripheral nerve injuries. The nerve lesion was incomplete in each case of causalgia. This syndrome has not been seen in any individual in whom the nerve was completely divided. Burning pain was a constant complaint and was usually immediate in onset. The median or sciatic nerve was involved in each instance. Certain patients showed vasoconstriction in the causalgic limb; others showed vasodilatation. The trophic changes and response to warm or cold moisture and to hyperthermia varied, depending on the blood flow. Twelve patients were relieved by sympathectomy of the involved limb; 1 was cured by artificial fever therapy and 2 recovered spontaneously. Direct surgical attack (neurolysis) on the injured nerve, which was performed in 5 cases, and periarterial sympathectomy at the level of the injury, performed in 3, have not been of benefit. Procaine block of the sympathetic chain affords complete relief temporarily and should be repeated two to three times, although no case in this series has shown any lasting benefit from this procedure. Sympathectomy (preganglionic) gave immediate and lasting relief to 12 patients. Sympathectomy should be done early to prevent stiffness of joints due to disuse. The personality changes present during the painful stages are secondary to the pain. There is no evidence in these cases that there is a predisposing constitutional psychic factor in causalgia.

Union Médicale du Canada, Montréal

74:721-876 (June) 1945

Penicillin from Biologic and Experimental Point of View. A. Frappier.—p. 726.
*Rare Cause of Acute Intestinal Occlusion: Incarcerated Transmesenteric Hernia. E. Desjardins.—p. 734
Total Gastrectomy. J. Bruneau.—p. 741.
Goiter and Psychosis. R. Dore.—p. 749.
Vesicovaginal Fistulas: 3 Cases. F. X. Demers and J. Fisher.—p. 753.
Spring and Summer Dermatoses. H. Smith.—p. 756.
Surgery of Pain: Painful Stumps and Their Treatment.—p. 764.

Transmesenteric Strangulated Hernia.—Desjardins presents the case of a man aged 47 who had always been in good health but who suddenly during the night had a violent attack of abdominal pain with vomiting. Examination revealed a severe state of shock, hypothermia, rapid pulse, muscular rigidity over the whole abdomen and the presence of a mass in the hypogastric region and the iliac fossae. On operation a strangulated transmesenteric hernia was found, 60 inches of the small intestine was resected and an ileocecal anastomosis was made. The postoperative course was stormy; there was a localized peritonitis, a pulmonary abscess and purulent pleurisy. A drainage pleurotomy was done, but the patient died thirty-nine hours after the onset of the disease. These hernias are not frequent, Hausmann and Morton having found only 52 cases among 467 cases of internal hernias. Diaphragmatic hernias are the most frequent among the internal types of hernia. The transmesenteric hernias may supervene at any age and in both sexes. They do not have a sac and consist only of the passage of a loop of intestine through a gap in the mesentery.

War Medicine, Chicago

7:275-340 (May) 1945

*Reaction of Degeneration in Electrodiagnosis of Experimental Peripheral Nerve Lesions. L. J. Pollock, J. G. Goldseth, A. J. Arieff, I. C. Sherman, M. A. Schiller and E. L. Tigay.—p. 275.
Subacute Emotional Disturbances Induced by Combat. R. A. Cohen and J. G. Delano.—p. 284.
*Functional Enuresis in the Army: Report of Clinical Study of 100 Cases. H. Shlionsky, L. R. Sarracino and L. J. Bischof.—p. 297.
Review of Gastroscopic Studies on 100 Consecutive Pre-Pearl Harbor Military Patients. C. A. Tavares.—p. 304.
Negro Army Psychiatric Casualties: Statistical Report on 100 Negro Soldiers Referred to an Army Mental Hygiene Unit. H. E. Harms, F. J. Kobler and F. J. Sweeney.—p. 309.
Classification for Medical Corps Officers of Army Air Forces. W. A. Glasier.—p. 313.

Reaction of Degeneration in Peripheral Nerve Lesions.—Pollock and his associates describe the data obtained from the examination of denervated and recovering muscles in cats as related to the characteristics of the reaction of degeneration; they compare such data with some obtained in human subjects and discuss the usefulness of the reaction of degeneration as a diagnostic and prognostic sign. For the most part Erb's description of the characteristics of complete reaction of degeneration have been confirmed by their studies. They emphasize that faradic stimulation is effective throughout degeneration, denervation and regeneration, provided sufficient amperage is employed. The changes of response to galvanic stimulation of "infinite time" which characterize complete reaction of degeneration are (1) hyperirritability of muscle to galvanic stimuli, (2) sluggishness of relaxation of the contraction wave, (3) lessening of the ratio between amperage necessary to produce tetanus and rheobase to almost unity and (4) increase of efficacy of the anodal closing stimulus to equality with the cathodal closing stimulus. Unequivocal signs of recovery are (1) a sudden increase in rheobase, (2) an increase of ratio between the amperage necessary to produce tetanus and rheobase and (3) an increase in efficacy of the cathodal closing stimulus as compared with the anodal closing stimulus. The electrical sign of recovery characterized by the sudden increase of rheobase antedates the recovery of motion and sensation for long periods, in man by many weeks. The other signs likewise antedate other clinical signs of recovery. Electrotherapy has no effect on the response of muscles to electrical stimuli.

Functional Enuresis in the Army.—Shlionsky and his co-workers report observations on 100 men with functional nocturnal enuresis whom they studied in an army training camp in the United States. They found that the educational and occupational background of these men was in general below average. Most of the men had lived in rural communities and had used outdoor toilets in childhood. There was a high incidence of enuresis in the immediate families of these soldiers. A considerable number gave a history of disruption of the home or of exposure to various other unfavorable types of environment in childhood. A relatively high percentage of the men were below average intelligence. The majority manifested in addition to the enuresis various neurotic tendencies and personality disorders. Most of the men showed evidence of emotional immaturity. Not infrequently there was persistence or recurrence of some of the various neurotic traits of childhood, such as nightmares, nail biting, stuttering, fear of the dark, sleepwalking and talking in the sleep. Functional backache was a common symptom. Virtually none of the patients had ever received adequate medical attention for the enuresis prior to army service. Functional enuresis is generally but one manifestation of a lifelong pattern of neurotic behavior or personality maladjustment and is not infrequently associated with adequate intelligence. Apart from the consideration that the symptom of enuresis itself creates a difficult situation in the service, it is apparent that the majority of enuretic adults do not possess the qualifications necessary for the successful performance of duty in the armed forces.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal of Endocrinology, London

4:103-218 (Jan.) 1945

Effects of Sex Hormones on Blood in Rats. V. Korenchevsky and K. Hall.—p. 103.
Influence of Thyroid on Pregnancy and Parturition in Rabbit. J. P. Chu.—p. 109.
Role of Thyroid Gland and Estrogen in Regulation of Gonadotropic Activity of Anterior Pituitary. J. P. Chu and S. S. You.—p. 115.
Ovarian Stimulation by Estrogens: 2. Stimulation in Absence of Hypophysis, Uterus and Adrenal Glands. P. C. Williams.—p. 125.
Studies of Biologic Action of Serum Gonadotropin. P. C. Williams. —p. 127.
Adrenalectomy and Gastric Secretion. E. Tuerkischer and E. Wertheimer. —p. 143.
"Growth" in Relation to Diabetogenic and Pancreotropic Actions of Anterior Pituitary Extract. R. F. Ogilvie.—p. 152.
Experimental Control by Hormone Action of Estrous Cycle in Ferret. F. H. A. Marshall and J. Hammond Jr.—p. 159.
Induced Ovulation and Heat in Anestrous Sheep. J. Hammond Jr. —p. 169.
Induction of Lactation in Goats and Cows with Synthetic Estrogens and Anterior Pituitary Extracts. S. J. Folley, F. H. Malpress and F. G. Young.—p. 181.
Galactopoietic Action of Pituitary Extracts in Lactating Cows. S. J. Folley and F. G. Young.—p. 194.

Transactions Roy. Soc. Tropical Med. & Hyg., London

38:237-310 (March) 1945

*Amebiasis, with Special Reference to Treatment. A. R. D. Adams. —p. 237.
Tropical Ulcer. F. Marsh and H. A. Wilson.—p. 259.
*Survival of Transfused Red Cells in Blackwater Fever Circulation and of Blackwater Red Cells in Normal Circulation: Preliminary Report. H. Foy, A. Kondi, A. Rebelo and A. Soeiro.—p. 271.
Clinical Filariasis Due to Acanthocheilonema (Filaria) Perstans. E. I. Garratt.—p. 287.
Dividing Forms of Plasmodium Falciparum in Peripheral Blood of Africans. A. B. Raper, Margaret E. Wilson and D. B. Wilson. —p. 291.
*Massive Dose Tryparsamide by Intravenous Drip Method in Treatment of Trypanosomiasis. A. F. Fowler.—p. 297.

Treatment of Amebiasis.—According to Adams, large numbers of men overseas are being exposed to infection with Endameba histolytica. Some suffer from gross clinical attacks of amebic dysentery, others give no such history but are found to be infected on routine examination of the stools. The author thinks that it is improper to neglect a detected infection with E. histolytica until clinical manifestations make their appearance. To do so is to condemn many patients to subsequent unnecessary ill health with the possible development of a major disaster such as an amebic liver abscess. Furthermore, such patients are liable to disseminate the infections to others. They should be regarded as latent cases requiring early treatment. To discover these infections necessitates routine repeated stool examination. Emetine has a more specific action on this infection than any other drug. Emetine alone by injection will not sterilize an infection in more than a minority of cases; if it is given unwisely the infection becomes resistant to the drug in all forms and less amenable to treatment. Therefore the use of emetine by injection should be restricted to the control of clinically acute manifestations, and the minimum amount necessary to achieve this end should be given. The eradication of an intestinal infection must be attempted by the use of a variety of drugs, including emetine preparations, all of which have some action on the infection. These drugs should be given together because their combined effect is greater than that of any single drug alone, and they must be given as early as possible over an adequate period. Three weeks of such treatment ensures a high proportion of cures in cases not previously repeatedly treated subcuratively.

Survival of Transfused Red Cells in Blackwater Fever.—Foy and his associates found that red cells transfused from compatible group O donors into hemolyzing cases of blackwater fever were destroyed in the blackwater fever circulation just as were the patient's own cells. Red cells taken from a hemolyzing group O case of blackwater fever and transfused into a normal group A person had a survival time of only six days, indicating that there is some defect in the blackwater fever red cells that renders them more susceptible to destruction even in normal circulations. Plasma taken from a hemolyzing case of blackwater fever and transfused into a patient with an acute attack of malaria failed to produce signs of hemolysis. Normal red cells transfused into patients with hemolytic jaundice have a normal survival time but hemolytic jaundice cells transfused into normal circulations have a shortened survival time, indicating that in this disease the primary defect is in the red cells. The hemolytic processes in blackwater fever and hemolytic jaundice may be of a fundamentally different nature. Lysolecithin fragility is increased in both blackwater fever and hemolytic jaundice, making it appear that this may be a better guide to hemolytic tendencies than is saline fragility or spherocytosis.

Tryparsamide by Intravenous Drip.—The results obtained in the treatment of early syphilis by massive dose intravenous drip arsenotherapy prompted Fowler to treat cases of trypanosomiasis similarly, using the pentavalent arsenical tryparsamide. He employed the intravenous drip method in 42 consecutive cases of trypanosomiasis. This method requires hospitalization but reduces the time of treatment from twelve weeks or more to about twelve days or less. The method produces rapid sterilization of the blood and lymph nodes and it is unlikely that treated cases will become arsenic resistant. Children and young adults tolerate the treatment well. The aged are unsuitable for such treatment. Brief case histories are given of 24 patients who were examined from four to seven months after treatment. Although it is impossible to estimate the curative effect of the treatment without further examination of the cases over a period of eighteen months, the results in the 24 cases appear to be encouraging.

Acta Radiologica Stockholm

25:251-378 (Sept. 20) 1944. Partial Index

Radiologic Study of Cecocolic Invagination of Adult. R. J. Gilbert and J. Garcia-Caldéron.—p. 251.
*Osteochondritis Dissecans of Head of Femur. I. Hermodsson.—p. 269.
*Treatment of Leukemia with Artificial Radioactive Sodium. J. E. Thygesen, A. Videbaek and I. Villaume.—p. 305.
Cystic Form of Cancerous Metastases of Bone. B. Engfeldt.—p. 317.
Internal Biliary Fistulas: 2 Cases. E. Brandel.—p. 333.

Osteochondritis Dissecans of Head of Femur.—Hermodsson presents histories of 5 cases in which he made careful x-ray studies and reviews cases from the literature. He differentiates between primary and secondary cases of osteochondritis dissecans of the head of the femur. To the latter he assigns cases caused by disorders such as cretinism and fracture of the neck of the femur. He stresses that in all cases of primary osteochondritis dissecans there exist x-ray signs indicating that a more or less extended osseous aseptic necrosis was present in the head of the femur. He offers the following explanation of the pathogenesis: There exists an aseptic necrosis. This is not completely reorganized and a reduced resistance remains. Under the influence of strain or trauma a pathologic fracture results at the most exposed site of the femoral head, the upper pole. This engenders a limited aseptic necrosis and this in turn results in osteochondritis dissecans, as was shown by Axhausen. This theory of pathogenesis explains the fact that most of the patients are laborers. The author describes some cases which represent an intermediate form between Perthes' disease and osteochondritis dissecans and suggests that if Perthes' disease is designated as osteochondritis deformans or osteochondrosis deformans these intermediate forms should be designated as osteochondritis deformans dissecans or osteochondrosis deformans dissecans.

Treatment of Leukemia with Artificial Radioactive Sodium.—Thygesen and his associates gave intravenous injections of a solution of radio sodium, Na^{24}, to 7 patients with chronic lymphatic leukemia. Except in 1 of the cases, which later proved refractory also to roentgen treatment, the fall in the white cell counts and the remissions obtained were similar to those after exposure to roentgen rays. The patients showed subjective as well as objective improvement. In 2 of the patients the improvement has been manifest for several months, but otherwise the time is too short to be able to judge the duration of the effect. In addition to the 7 cases of leukemia, 1 case of polycythemia vera was treated with radio sodium; here the effect was slight and only temporary.

Book Notices

Clinical Cystoscopy: A Treatise on Cystoscopic Technic, Diagnosis, Procedures, and Treatment. By Lowrain E. McCrea, M.D., F.A.C.S., Associate Professor of Urology, Temple University Medical School, Philadelphia. In two volumes. Drawings by B. Engle Shaffer. Cloth. Price, $25, per set. Pp. 534; 535-1056, with 667 illustrations. Philadelphia: F. A. Davis Company, 1945.

This treatise on clinical cystoscopy is a thorough presentation on the subject in two beautifully printed volumes. The classification of the text is good. The chapters are well arranged, carefully balanced and properly organized. The volumes read easily and are profusely illustrated. The drawings, paintings and photography, especially the colored photography of the cystoscopic appearance of the bladder diseases, are superb.

In the first volume are seventeen chapters, the first four of which take up the history of the cystoscope, the various types of cystoscopic instruments, indication and contraindication for cystoscopy, preparation of the patient for cystoscopy and the method of performing a cystoscopy. In chapter five the cystoscopic picture of the normal bladder is discussed. In the next seven chapters all the known diseases of the bladder are considered and these are discussed in a thorough, concise manner. Beautiful paintings or colored photographs illustrate the cystoscopic pictures of the disease. A chapter on the neurogenic bladder follows with a good classification of these disturbances, supplemented by various forms of treatment. In the chapter on prostatic hypertrophy the author's opinions concerning the indications and contraindications for transurethral resections may not be acceptable for many other urologists. The last three chapters discuss the ureter: its anomalies and diseases.

In the second volume are fourteen chapters in which surgical and medical diseases of the kidneys are discussed. One entire chapter is devoted to the subject of kidney function tests. Urology in children and the female requires two chapters for its comprehensive presentation. The last chapter concerns roentgenography in urology. More consideration might have been given to excretory urography. For instance, little effort has been made to discuss the physiologic principles of this diagnostic procedure. There are those who are not in complete agreement with the author in his discussion of the comparative value of retrograde and excretory pyelograms. At the end of each volume is an extensive and authentic bibliography arranged to coincide with the chapters.

These two volumes give the best presentation on clinical cystoscopy that the reviewer has seen and can be highly recommended to those interested in or desiring to learn more about cystoscopy. Even the trained cystoscopist can find much of value in them.

Penicillin hakkında in vitşo arastirmalar I-III (Almanca bölüm). Penicillin-Studien in Vitro I-III. Von Julius Hirsch, Hygiene-Institut der Universität Istanbul. Compte rendu annuel et archives de la Société turque des sciences physiques et naturelles, Fasc. 12 (Separatum). Paper. Pp. 88, with illustrations. Istanbul, 1945.

The monograph by Professor Hirsch deals with the author's theory of the mode of action of penicillin, the manometric test of penicillin activity developed by him and with a method of growing crude penicillin. Hirsch demonstrated in his experiments in vitro that penicillin has neither bactericidal nor bacteriostatic effect. Penicillin was shown to exert an effect only in bacterial cultures capable of multiplying. This effect becomes evident after multiplication of the bacteria has progressed for some time. In proportion to the added concentration of penicillin, the multiplication sooner or later suddenly changes into a logarithmically progressing process of destruction which may lead to lysis of the staphylococci. Generation of cells which develops in the presence of penicillin is incapable of further multiplication and their individual life span is abnormally short. These staphylococci show the morphologic changes described by Gardner. This effect of penicillin on the staphylococcus culture is a qualitative rather than a quantitative effect; it results in a generation of abnormal, sterile cells which rapidly die. The author considers this a specific action of penicillin and designates it as the "degenerative effect." This degenerative effect is characterized by a respiratory curve which, following the addition of penicillin, continues to increase for a while in normal logarithmic progression. The degenerative effect is the only effect of penicillin: a carefully purified barium salt produces exclusively this specific degenerative effect over a wide range of concentration (from 0.08 to 50.0 units per cubic centimeter). Hirsch also showed that in unpurified penicillin-barium salt a second antibiotic factor exists. This factor has a typical bacteriostatic action. It accompanies penicillin in the culture filtrates of penicillium notatum Fleming. The interference by this factor with the specific effect of penicillin is quite evident even in diluted crude penicillin.

The manometric penicillin test developed by the author depends on the respiration rate (oxygen consumption—by time unit) of staphylococcus cultures in the presence of penicillin. The addition of penicillin to staphylococcus cultures results in an increase which is limited in time and is followed by logarithmic decrease. The oxygen deficit can be utilized for the determination of the activity of crude penicillin and of penicillin preparations.

Hirsch found that the addition of concentrated watery extracts of wheat bran to the Czapek-Dox medium (5 to 7.5 per cent of wheat bran or BK dry substance in the culture medium) produces in from eleven to twelve days a crude penicillin with from 50 to 60 units per cubic centimeter. A good penicillin crop can be obtained only in small cultures with limited surface. He was able to overcome the inhibition of the surface growth of the fungus by the method of a closed screen of floating glass bulb rods. By this method it is possible to produce mass cultures of the Fleming strain on culture mediums that contain wheat bran extract and that are of any desired surface. They produce, after eight days, a crude penicillin of at least 50 to 60 units per cubic centimeter.

This monograph is an important contribution to the new science of antibiotics. Although published in Turkey, it is written in German and should therefore be accessible to workers in this field.

Anatomy and Physiology for Students of Physiotherapy, Occupational Therapy and Gymnastics. By C. F. V. Smout, M.D., M.R.C.S., L.R.C.P., Senior Lecturer and Acting Professor, Department of Anatomy, University of Birmingham, and R. J. S. McDowall, M.D., D.Sc., Professor of Physiology, University of London, King's College. Cloth. Price, $8. Pp. 418, with 288 illustrations. Baltimore: William Wood & Company, 1944.

The authors state that this book is not intended to be used as a substitute for the standard anatomy and physiology textbooks. The amount of significant information presented in the volume, however, would hardly warrant its general use as a supplementary textbook. The cost of the book may be prohibitive for students. The most instructive chapters are those entitled Living Anatomy and Muscles in Action. The physical therapist, occupational therapist and teacher of physical education need a concentrated and sufficiently detailed diagrammatic and photographic presentation of surface anatomy as it applies to these fields. This section is well done but not complete. The chapter Muscles in Action is interesting for the diagrammatic and outline presentation of muscle function in common activities. The book would be more valuable if this section had been considerably enlarged. The section on physiology is not sufficiently related to the three fields under consideration to be of value as supplementary material, nor does it cover the subject thoroughly enough for a basic textbook.

Health Research in Industry. (Proceedings of a Conference on Industrial Health Research held at the London School of Hygiene and Tropical Medicine, 28th September, 1944.) Medical Research Council, Industrial Health Research Board. Paper. Price, 6d. Pp. 27. London: His Majesty's Stationery Office, 1945.

This bulletin contains a series of papers presenting the views of the Medical Research Council and of management, medicine and trade unions on the present state of organization and desirable evolution of industrial health services. The opinions expressed indicate that at least in respect to health matters not much controversy remains. Neglect of manpower is poor business—and there no longer is room in competitive industry for the bad manager. Labor asks for liberalization of occupational disease benefits, better working environment and intensified research. The organization and early experiences of the Department of Research on Industrial Medicine of London Hospital are described, as is also the work of the applied psychology unit of Cambridge University.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DIAGNOSIS OF THYROTOXICOSIS

To the Editor:—I should appreciate comment on the following statement, the origin of which I cannot find but the value of which I believe to be significant: "Any patient with hyperthyroidism has a tachycardia while sleeping and has a widened pulse pressure. If the pulse at rest is normal and/or if the blood pressure is normal, the diagnosis of thyrotoxicosis is excluded." MC, U.S.N.

ANSWER.—The statement that a normal pulse rate and a normal blood pressure at rest exclude the diagnosis of thyrotoxicosis is true in most instances but not in all. In making the diagnosis of toxic goiter it is not sufficient to rely on the pulse rate and blood pressure, and there is too much tendency at the present time to do so; for example, one pharmaceutical house recently considered the desirability of distributing among physicians a chart for determining the basal metabolic rate from the product of the pulse pressure and the pulse rate. The diagnosis of thyrotoxicosis is usually not difficult, but in doubtful cases attention must be paid to many factors and it is sometimes necessary to observe the response of the basal metabolism to iodine or thiouracil before arriving at a definite conclusion.

SMOKING IN PULMONARY TUBERCULOSIS

To the Editor:—In the book of instructions to patients at a tuberculosis institution it is stated that tobacco is injurious to patients with tuberculosis of the lungs. Many practicing physicans apparently disagree with this opinion. Is there any authentic work on this subject? M.D., Virginia.

ANSWER.—Statistical studies have not shown tuberculous infection or disease to be more frequent in users of tobacco than in those who abstain. Well controlled quantitative studies of the effect of tobacco on the course of pulmonary tuberculosis are lacking. Among tuberculous patients it has been found that those who smoke are apt to have a higher incidence of laryngeal involvement and that such complications appear to be adversely affected by persistence in smoking. Acceleration of the pulse rate, frequent extrasystoles and accentuated sinus arrhythmia, hacking cough, hoarseness and diminished appetite, which so often result from tobacco smoking, may simulate or even accentuate the symptoms of tuberculosis, whether or not they exert much influence on the actual course of the disease in the average patient. The course of pulmonary tuberculosis is so variable and is influenced by so many factors that it is not easy to demonstrate an important or clearcut effect from any one item or detail in the regimen of treatment. Most phthisiologists, however, are convinced that smoking can do no good and may do harm sufficiently often to advise against it.

References:

Bogen, Emil: Tobacco and Tuberculosis, *Dis. of Chest* **3**:22 (March) 1937.

Schrumpf-Pierron, P.: Tobacco and Physical Efficiency, New York, Paul B. Hoeber, 1927.

EXSTROPHY OF BLADDER

To the Editor.—How early in life may a child be operated on safely for exstrophy of the bladder? L. Edward Giovine, M.D., Woodside, N. Y.

ANSWER.—The operation for exstrophy of the bladder which is generally accepted consists in reimplantation of the ureters into the sigmoid, with excision of the vesical tissue. There is some difference of opinion as to the most favorable age at which a child should be operated on. Many surgeons have waited until the child is 3 or 4 years of age before advising operation. Recently operation has been advised for infants less than 1 year of age; in fact, preferably under 6 months. The reasons given are (1) to avoid the possibility of ascending infection, (2) tolerance to operation by the infant and (3) to obviate the psychologic impression of physical defect on the older child. Some surgeons however believe that, because of diminutive size of the ureteral and other tissues, the technical difficulties are greatly increased in infancy. It is open to question whether serious pathologic complications in the urinary tract develop often prior to 3 years of age.

HOMOSEXUALITY

To the Editor:—Is homosexuality thought to be a congenital or an acquired condition? Paul Sizemore, M.D., Durant, Okla.

ANSWER.—Despite the fact that some homosexuals have rather obvious characteristics of the opposite sex both in physical appearance and in character traits, the majority of psychiatrists and sexologists believe that homosexuality is an acquired condition and that the main etiologic factors are psychogenic rather than genetic.

All human beings are to varying degrees bisexual, and under certain environmental circumstances homosexual behavior may break out in persons whose previous behavior has been consistently heterosexual. This phenomenon is not uncommon in men confined to a completely homosexual environment as, for example, a prison, or among adolescents living in institutions limited to one sex.

Many homosexuals have had or are capable of having heterosexual experiences. During psychiatric treatment it is learned that the homosexual has the usual heterosexual wishes and longings but these are repressed because of deep seated fears of heterosexuality. Childhood sexual experiences of a fearful nature, especially parental attitudes which are prohibitive, threatening and punitive toward the normally developing sexuality (the expression of sexual curiosity and sexual play such as masturbation) may in the child shift the scale toward homosexuality. As such a child grows up he retreats from heterosexuality to homosexuality because of previous fearful associations with heterosexuality.

A recent study of hermaphrodites by Ellis (The Sexual Psychology of Human Hermaphrodites, *Psychosomatic Med.* **7**:108 [March] 1943) has thrown more light on the importance of psychogenic and environmental factors in homosexuality. He found that the hermaphrodite assumes the sexual role that accords primarily not with his or her internal or external somatic characteristics but rather with his or her masculine or feminine upbringing. Therefore heterosexuality and homosexuality in hermaphrodites as in the nonhermaphrodite are primarily caused by environmental and not by endocrine or other physiologic factors.

Although the treatment of homosexuality is a difficult task, thoroughgoing psychiatric treatment which aims at uncovering and correcting psychogenic factors offers a much better hope for cure than treatment with injections of endocrine preparations.

TOXICITY OF CHLORINATED NITRILS

To the Editor:—Could you give me any information regarding the toxicity of chlorinated nitrils? F. F. Boys, M.D., East Chicago, Ind.

ANSWER.—It was shown by Liese (*Ztschr. f. hyg. Zool. Schädlingsbek.* **33**:1, 1941; *Chem. Zentralbl.* **1**:2713, 1941) that trichloracetonitrile (CCl_3CN) is somewhat less toxic than sulfur dioxide in that a concentration of 2.9 Gm. per cubic meter (490 parts per million) was comparatively well tolerated by mice, whereas sulfur dioxide in concentrations of 2.76 Gm. per cubic meter (1,031 parts per million) was absolutely fatal.

According to Meurice (*Arch. internat. pharmacod.* **7**:11, 1900) the fatal dose of chloral nitrile ($CCl_3CH(OH)CN$) with subcutaneous injection for pigeons is 0.012 mg. per gram of body weight and that of the corresponding nonhalogenated nitrile (lactonitrile, $CH_3CH(OH)CN$) is 0.010 mg. per gram of body weight, whereas that of potassium cyanide is 0.0015 mg. per gram of body weight. Hunt (*Arch. internat. pharmacod.* **12**:497, 1904) determined the fatal dose of chloral nitrile with subcutaneous injection for mice as 0.023 mg. per gram of body weight, whereas the fatal dose of hydrocyanic acid was 0.005 mg. per gram of body weight. It appears, therefore, that the chlorinated nitrile is of the same order of toxicity as the unsubstituted nitrile and that both are about five times less toxic than hydrocyanic acid, causing the same or at least a similar toxicologic picture.

CONVULSIONS IN CHILDREN

To the Editor:—Do children with chorea ever have convulsions? Are there any other conditions that are accompanied by the emotional and physical disturbances associated with chorea? M.D., Ohio.

ANSWER.—Convulsions are not usually a symptom or a part of chorea in children. Although a convulsive seizure may usher in the onset of an acute chorea, it is hardly ever seen as a part of it. There are other conditions that may have convulsive seizures in association with choreiform movements. These are encephalitis, meningoencephalitis, lesions of the corpus luysi (hemiballisms) and various degenerative diseases of the basal ganglions.

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HUMAN ENCEPHALITIS IN THE YAKIMA VALLEY, WASHINGTON, 1942

WITH FORTY-NINE VIRUS ISOLATIONS (WESTERN EQUINE AND ST. LOUIS TYPES) FROM MOSQUITOES

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In the Yakima Valley, Washington, a series of four annual epidemics of encephalitis have occurred. The present report is concerned with the last of these outbreaks (1942), which is the third studied and reported. The findings of this investigation warrant reporting, particularly since the cases were followed more carefully clinically, since a higher proportion of both early and late phase serums were obtained for neutralization tests, and especially since 49 virus isolations were made from mosquitoes caught in the epidemic area. Identification of these viruses and repeated titrations of antibody in the patients' serums have greatly delayed this report, but during the interval certain other significant data have been collected and experiments performed which contribute greatly to the analysis of the problem. Furthermore, it may now be recorded that two succeeding summers (1943-1944) have passed during which there has been no encephalitis epidemic in the valley. Only 1 human case was recognized in 1943. This terminated fatally and we succeeded in obtaining from the brain the first strain of western equine virus to be isolated directly from man from this area. Studies are in progress to attempt to discover what may have brought about this break in the series of epidemics.

During the late summer of 1942, 28 cases of encephalitis were sufficiently well diagnosed to be included in this series. These include cases of the western equine and St. Louis types and probably at least one other whose etiologic agent has not been identified. We [1] reported 31 cases in 1939, 58 in 1940 and 26 in 1941. Chart 1 shows the seasonal distribution of cases for the four years. From the standpoint of temperature, humidity and mosquito prevalence the summer of 1942 did not vary significantly from the two previous years; the temperature rose to 90 F. or above almost every day, there was no measurable precipitation, and mosquitoes bred abundantly in many places, principally as a result of careless irrigation practices.

CLINICAL OBSERVATIONS

Diagnosis in all but 1 case was confirmed by some laboratory procedure. In most instances the spinal fluid was examined in the clinical laboratory, and in the virus laboratory serum antibody titrations were made to both western equine and St. Louis viruses. In a number of instances tests were made for antibodies to Japanese B encephalitis virus, the latter all with negative results (table 1). In 5 instances in which cases were seen very soon after the onset, throat and nasal washings, after centrifugation at 18,000 revolutions per minute, were tested for the presence of a virus by intracerebral mouse inoculation. These tests were also negative. One of us (W. M. H.) saw practically every patient in consultation, and most of the patients were visited daily or at frequent intervals throughout the period of illness.

In table 1 are presented the results of the serum neutralization tests. It will be noted at a glance that, although this probably represents the most complete series of early and convalescent phase serums yet reported, in but a few instances have the tests made it possible to make an etiologic diagnosis. It certainly indicates that a test on a single convalescent specimen is without value, unless negative.

In each instance the convalescent serum was first tested to determine the presence or absence of antibodies. If positive it was then simultaneously titrated in serial threefold or fivefold dilutions against a dilution of virus representing approximately ten to fifteen LD_{50} intracerebral mouse doses. Most positive serums showed some protection to this amount of either virus in a dilution of 1:125 or 1:625 and occasionally higher. It was found that results obtained when employing the more common method of titrating undiluted serum against serial dilutions of virus were very unreliable in that if repeated at a later date great discrepancies were occasionally noted. Because the factors involved were not understood at the time and therefore could

We were assisted during part of the entomologic survey by Mr. Theodore Aarons and in the laboratory work by Mrs. Anne Thorpe, technician.

From the George Williams Hooper Foundation for Medical Research, University of California, San Francisco, and the Yakima City-County Health Department, Yakima, Wash.

This investigation was carried out under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the University of California and in cooperation with the Washington State Health Department and the U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Division of Insects Affecting Man and Animals. Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

1. Hammon, W. M.: Encephalitis in the Yakima Valley: Mixed St. Louis and Western Equine Types, J. A. M. A. **117**: 161-167 (July 19) 1941. Hammon, W. M., and Howitt, Beatrice F.: Epidemiological Aspects of Encephalitis in the Yakima Valley, Washington: Mixed St. Louis and Western Equine Types, Am. J. Hyg. **35**: 163-186 (March) 1942. Hammon, W. M.: *Encephalitis: Eastern and Western Equine and St. Louis Types, as Observed in 1941 in Washington, Arizona, New Mexico and Texas*, J. A. M. A. **121**: 560 564 (Feb. 20) 1943.

not be controlled, the more satisfactory method of serum dilution was substituted. Many minor modifications of the method were tried, and most serums were tested repeatedly.

In 6 instances the titer of antibodies to the western equine virus showed a definite increase. In 2 other cases serologic evidence of an almost incontrovertible nature led to a similar diagnosis of this type infection. These were 2 infants aged 5 and 8 weeks who had antibodies to western equine virus in the one serum specimen obtained, and in neither instance was any antibody present at the same time in the mother's serum.

St. Louis virus antibodies were present in the serums of these same 2 infants and their mothers, but when comparative titrations were made the titer of each infant's serum was much below that of the respective mother. This represents in all probability placentally transmitted St. Louis virus antibody in the infants' serums with titers well below those of the mothers at a period of five to eight weeks after birth.

Five patients developed an increase in antibody titer to the St. Louis virus, but 2 of these also showed an increase in titer for the western equine strain. This

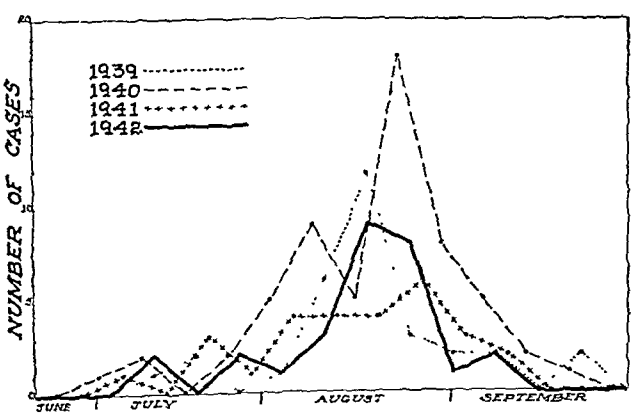


Chart 1.—Cases of encephalitis by weeks, 1939-1942.

increase to both viruses has been reported by us previously and suggestions were made regarding interpretation.[2]

The serums of 10 patients from whom early and late specimens were obtained failed to show an increase of titer to either virus, yet the clinical manifestations, including the spinal fluid findings, were of a nature similar to the others in which the serologic findings were positive (case 13). One of the 10 had antibody to the western equine virus alone, with no change in titer. Six had both western equine and St. Louis antibodies, but the titer of both remained constant. Two had antibodies to St. Louis virus alone, both without change. One had no antibodies to either virus. The last group to be considered includes those from whom only one or no specimen of blood was obtained, or whose serum titration for one virus showed no change and for some reason titration against the other virus was not satisfactorily completed. Results of tests on those from whom at least a single specimen was tested were 2 positive to western equine alone, 2 positive to western equine and not tested for St. Louis, 1 positive to St. Louis alone and 1 to neither. From 1 infant no serum was obtained; thus there were 6 definitely diagnosed western equine infections. 3 to St. Louis virus, 2 possibly infected by both viruses, 10 who probably were not infected by either of these viruses during the illness in question, and 9 who were not adequately studied serologically.

Not 1 case of paralytic poliomyelitis was encountered, and since only 1 central nervous system infection of unknown etiology occurred in a child, we can quite safely eliminate poliomyelitis from further consideration.

The clinical picture varied widely but did not differ essentially from those cases which have been described previously from this area[1] and elsewhere.[3] One very severe case, in an adult, with recovery, has been previously reported in some detail.[4] Four infant cases were diagnosed, aged 11 days, 17 days, 5 weeks and 8 weeks. Despite the fact that infant rates have been high in Manitoba,[5] North Dakota and neighboring states[6] and in California,[7] these are the first seen in the Yakima Valley among 130 cases. Case histories are given for 1 of the youngest infants, for a 9 year old boy with a very severe St. Louis infection and for 2 adults with typical, moderately severe disease manifestations. 1 due to the western equine virus and 1 with unknown etiology:

Case 11.—L. H., a girl, was born July 27 in a Yakima hospital and went home with her mother on July 30 to a poorly screened, mosquito infected home at the edge of the city. There were 8 siblings, all apparently well. The home was adjacent to irrigated pasture and orchard land and was within half a mile of a mill pond. There was a horse with encephalitis in a nearby pasture at about this time. Within 150 yards there were horses, mules, cows, pigs, goats, dogs, cats, rats, mice, chickens, turkeys and ducks. The father recalled killing an engorged mosquito on the infant on August 11. On August 13, fourteen days after coming from the hospital, the infant vomited several times and continued to do so the next two days. Fever was noted on the second day, and the child was taken to a doctor. Convulsions began to occur that day. She was hospitalized on the 16th. The highest recorded temperature, 104.6 F., was on admission at 4 p. m. Convulsions occurred frequently, beginning usually with left sided twitching, progressing slowly to convulsions involving both sides, with extreme deviation of eyes to the right. During and after the convulsions there was cyanosis, and the infant was decidedly spastic at all times. Any attempt to flex the neck or a limb would stimulate another convulsion. The temperature fell slowly to 100 F. on the morning of the 17th but rose to 104.2 F. again that evening, fell to 100.4 F. the following morning and then rose to 102 F. that evening. It was essentially normal that night and remained at a normal level.

On the 17th a lumbar puncture revealed an increased pressure, 478 cells, of which 82 per cent were polymorphonuclears, and an increase in globulin. No organisms were seen in the smear of the centrifuged sediment. Enough fluid was removed to bring the pressure to a normal level. The following day another puncture was made, but blood prevented a suitable count. The pressure was still elevated. At this time the red cell count was 3,860,000 and the leukocyte count 25,800. Convulsions continued without much change until the sixth day of hospitalization. Definite general improvement was then noted, and the formula was voluntarily taken. Treatment in addition to lumbar punc-

2. Meiklejohn, Gordon, and Hammon, W. McD.: Epidemic of Encephalitis, Predominantly St. Louis Type, in Pinal County, Arizona, J. A. M. A. 118: 961-964 (March 21) 1942. Hammon.[3]

3. Hammon, W. McD.: The Epidemic Encephalitides of North America, M. Clin. North America 27: 632-650 (May) 1943. Meiklejohn and Hammon.[2]

4. Hammon.[3]

5. Jackson, F. W.: Encephalitis (Western Equine) in Manitoba, 1941, Am. J. Pub. Health 33: 833-838 (July) 1943.

6. Leake, J. P.: Epidemic of Infectious Encephalitis, Pub. Health Rep. 56: 1902-1905 (Sept. 26) 1941.

7. Howitt, Beatrice F.: Virus of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California, 1937-1938, Am. J. Pub. Health 29: 1083-1097 (Oct.) 1939. Buss, W. C., and Howitt, Beatrice F.: Human [illegible] Encephalomyelitis in Kern County, Calif., 1938 1939 and [illegible] 1941. Howitt, Beatrice F.: Human Equine [illegible] Encephalitis in California 1939 1940, ibid. 32: [illegible] (Nov.) [illegible]

ture consisted in repeated parenteral administration of glucose and saline solution, sulfapyridine and gavage feedings. Discharge was on the eleventh hospital day, at which time the infant seemed entirely normal. Blood serum taken August 20 (the seventh day after onset) protected against the western equine virus only when undiluted. Serum on the 27th (the fourteenth day after onset) protected in a dilution of 1:125 at least (highest dilution tested). This serum failed to protect against the St. Louis virus.

CASE 3.—R. S., aged 9, was a normally developed boy from a rural home. There were no other recognized cases in the vicinity and relatively small numbers of mosquitoes were found breeding nearby, but these were principally Culex tarsalis, collected from the chicken houses. His mother knew of only occasional mosquito bites. In the immediate vicinity there were horses, mules, cows, pigs, dogs, cats, rats, mice and large numbers of chickens. On July 26 he first complained of headache and abdominal pain and was found to have a temperature of 100 F. A physician examined him, found a red throat and bilaterally. The bladder was greatly distended, though he had been catheterized a few hours before. His breath was fetid and he was perspiring profusely. Lumbar puncture revealed a pressure of 28 mm. of mercury, and the clear fluid obtained had 164 cells per cubic millimeter, 40 per cent of which were polymorphonuclears. The globulin test was reported normal, and culture was negative. The red cell count was 4,760,000, with 90 per cent hemoglobin, and the white cell count was 11,000, 84 per cent of the leukocytes being polymorphonuclear and 15 per cent lymphocytes. The course of the illness was prolonged and very severe. The temperature ranged for the first two hospital days between 103.9 and 105.2 F. (all rectal). By the sixth hospital day it fell to 101.2 F. and remained between that and 102 F. till about the thirteenth day, then occasionally reached normal but was slightly elevated almost every day for well over a month. He remained comatose and with frequent convulsions until August 3 (the sixth hospital day), when he regained consciousness for a few moments. He remained spastic and required occasional catheterization. Lum-

TABLE 1.—*Patients by Age, Sex, Date of Onset, Spinal Fluid Cell Count and Results of Neutralization and Virus Tests*

Case	Age, Years	Sex	Date of Onset	Total Cells Cerebrospinal Fluid	Neutralization Test: Convalescent Serum: Western Equine	Neutralization Test: Convalescent Serum: St. Louis	Neutralization Test: Titer Increase: Western Equine	Neutralization Test: Titer Increase: St. Louis	Neutralization Test: Japanese B	Virus Test Pharyngeal Washings
11	17 days	♀	8/15	479	+	0	+	0	..	..
13	49	♂	8/17	177	+	0	+	0	..	0
6	67	♂	8/ 8	84	+	+	+	0	..	..
8	68	♂	8/ 8	58	+	+	+	0	..	..
18	5 wks.	♂	8/15	8	+	±	+*	0†	..	..
22	8 wks.	♂	8/24	200	+	+	+*	0†	..	..
10	13	♂	8/17	304	+	+	±	+	..	0
23	58	♂	8/25	115	+	+	+	+	..	0
3	9	♀	7/26	300	0	+	0	+	0	..
2	14	♀	7/10	82	+	+	0	+	..	..
24	40	♂	8/27	159	+	+	0	+	..	..
19	60	♂	8/22	107	+	0	0	0	..	..
15	35	♂	8/14	...	+	+	0	0	..	..
16	48	♂	8/21	69	+	+	0	0	..	0
17	55	♀	8/20	245	+	+	0	0	..	0
20	62	♂	8/19	...	+	+	0	0	..	..
21	21	♂	8/26	...	+	+	0	0	..	..
27	42	♂	9/ 4	46	+	+	0	0	..	..
1	23	♂	7/12	50	0	+	0	0	0	..
9	49	♀	8/10	536	0	+	0	0	0	0
4	3	♂	7/28	12	0	0	0	0	0	..
5	..	♀	8/ 6	133	+	0	..‡	..‡	..	..
14	70	♂	8/20	113	+	0	..‡	..‡	..	..
26	31	♂	8/28	38	+	..	..‡	..‡	..	..
30	71	♂	8/25	..	+	..	..‡	..‡	..	..
28	11	♀	9/ 6	75	0	+	..‡	..‡	0	..
25	63	♂	8/25	920	0	0	..‡	..‡	0	..
12	11 days	♀	8/16	183	..	..	..	..	..	..

* Single serum specimen from an infant, mother's serum negative.
† Single serum specimen from an infant, mother's serum also positive but titer much higher.
‡ Only one serum specimen tested.

treated him for a sore throat. The following day he was worse, with temperature of 102.4 F. He vomited once and complained of sore throat, dizziness and abdominal pain. The following day the temperature rose to 103.6 F. and he manifested rather pronounced drowsiness. There was, however, no more nausea or vomiting, but abdominal pain continued. The next day, July 29, he was hospitalized because he became uncooperative, irrational and staring and the temperature rose to 104.2 F. Urinary retention and dysarthria also developed. The next day tremors of the hands and jaws developed, the mental confusion first became worse, and by evening he became comatose and generalized convulsions developed. Shortly before coma and convulsions developed he was examined by one of us for the first time. His limbs showed moderate spastic resistance; his speech was garbled and incoherent. His mouth could not be opened. The pupils were regular in shape and size and reacted normally to light. He stared into space, and there was no indication that he saw anything. There was no nystagmus or strabismus. Tremor of the hands was noticeable. The neck was quite rigid, and the back moderately so. There was considerable tension in the hamstrings on both sides. No tendon reflexes could be elicited except the right knee jerk. Abdominal and cremasteric reflexes were absent. There was no Hoffman sign, but there was a positive Babinski reflex bar punctures were made almost daily, showing no change except for an increase in the proportion of lymphocytes. On August 5 and 6 he again regained consciousness temporarily and recognized and spoke to his mother once. However, on the 8th, when the temperature again reached 103.4 F., he began another two days of complete coma. By the 13th he still required tube feeding and spoke only to his parents, and his mental state was obviously still very confused. On the 15th he began to take food voluntarily and showed increased cooperation otherwise. By the end of the month he was able to sit up and was talking glibly, but he lived in a world of imagination. He was last seen that year on September 9. He was still hospitalized, still voiding involuntarily, and was incapable of remembering anything about the present. He recognized persons he knew before his illness and talked intelligently of past events but never learned a new name or face and had no concept of the time of day or memory of any event of the same day or the previous one. He was still running a low grade, daily fever. When seen just recently, two years after the acute phase, a great deal of improvement had occurred but he was far from normal. He can carry on conversation and discuss present or past events quite normally for a short period, but suddenly he will again lapse into fantastic imagination. This change is not apparent except for the incongruity of the facts

he states. He is extremely hyperactive and nervous and occasionally has epileptiform convulsions. He returned to school for a short time and in some subjects did fairly well but at recess time wandered away several times and forgot to return. During the early, acute phase of his illness, sulfonamide drugs were given and they were given repeatedly at later intervals to control exacerbations of urinary tract infection. Blood serum was taken the third, fifteenth and thirty-third days after onset. All serums failed to protect against the western equine virus and the Japanese B virus, but an increase of titer was detected to the St. Louis virus, the final titer reaching 1 : 243.

CASE 13.—C. S., a man aged 49, a farmer who had lived twenty years in the Yakima Valley, his home and farm being near the southern end of the valley, on August 18, in connection with what he thought was a cold, developed a severe headache with nausea after a few hours of general malaise and coryza. He continued to work for two more days with the headache becoming progressively worse; then he vomited several times, went to bed and called a physician. After two days in bed at home he became so much worse that the physician insisted on hospitalization. On August 21, at the time of hospital admission, he was found to have a temperature of 104 F., he was flushed, the face was edematous and he was bewildered, speaking thickly and slowly with great difficulty, sometimes irrationally. He had a mild tremor of the mandible when attempting to speak. He was severely dehydrated, his breath was foul and he was sweating profusely. His pupils were regular in shape and equal in size but quite contracted even in a darkened room. Vision appeared to be normal and there was no nystagmus or strabismus. The throat was moderately injected. The tongue had a definite but fine tremor. The neck was moderately stiff and the hamstrings were tense, but the back showed almost normal flexion. All extremities were very slightly spastic. The biceps and knee jerks were present and equal, but other tendon reflexes could not be elicited. Hoffman and Babinski reactions were not elicited. Abdominal reflexes were absent and the left cremasteric could not be demonstrated. Neither scrotum contracted after pinching. The spinal fluid was clear but contained 177 cells, of which 16 per cent were polymorphonuclears. The globulin was increased. The following day, after adequate fluids had been given, the red blood cell count was 3,990,000, the hemoglobin 79 per cent and the leukocyte count 17,600, 78 per cent of the leukocytes being polymorphonuclears. During the next three days, though the temperature gradually fell to a maximum of 101.4 F., he progressively developed more severe tremors of the tongue, chin, arms and legs. However, he felt better, the headache and general malaise having decreased. His mentality also cleared during these three days. By August 28, the seventh hospital day, his reflexes were all present and normal, the edema had left the face, he was eating well and the temperature was normal. However, the tremors were still very noticeable. His only drug treatment was sulfathiazole during the acute phase as a prophylaxis against secondary bacterial invaders. He was discharged on September 13, still slightly tremorous and very easily fatigued. Serum taken on the fifth day of illness protected against the western equine virus only when undiluted, but on the twenty-fifth day it protected in a dilution of 1 : 125. Neither serum protected against the St. Louis virus.

CASE 16.—A. B., a man aged 48, an orchard laborer, a resident of the valley for twelve years, living just outside a small midvalley town in a typical rural setting, with mosquitoes, chickens and other animals. On August 21 he developed a severe headache, then nausea, vomiting, dizziness, abdominal pain and feverishness later in the day. He also complained of severe pain in the legs and back. The following day he became very drowsy and noted photophobia together with intensification of other symptoms. Ou August 23 (the second day of illness) he was hospitalized. The maximum recorded temperature that day was 101.4 F. He appeared very drowsy and toxic, and his face was bloated. His pupils were regular in size and reacted to light but were abnormally small. Otherwise his eyes were normal. There was no tremor of the tongue or hands and the speech was normal, though slow. The neck was moderately rigid and the hamstrings were tight. The abdomen was slightly distended. All the limbs seemed slightly spastic. Biceps tendon and knee jerks were normal, but other tendon reflexes could not be elicited. There was a positive Babinski reaction on the left. Both abdominal reflexes were absent and the scrotum failed to contract on pinching, though both cremasteric reflexes were normal. The spinal fluid was clear, with 48 cells per cubic millimeter. There were 38 per cent polymorphonuclears, 50 per cent. lymphocytes and 12 per cent large mononuclears. On the following day the patient was slightly worse, with the temperature up to 103.6 F. The next day he had a chill, became quite restless, tremors of the mandible and the tongue appeared and his headache was much more severe. There was a partially sustained clonus of both legs. The next day (August 26) he groaned constantly with headache and cared about nothing else. A lumbar puncture showed a slight increase in pressure and 60 cells, 96 per cent lymphocytes and 4 per cent large mononuclear. The headache was partially relieved following the tap. The maximum temperature was 101 F. He was much improved the next day, the temperature was down and all reflexes were normal. Improvement was constant and he was discharged from the hospital on September 9, seventeen days after admission. Serum taken on the second and twelfth days after onset contained a high titer of antibodies to both western equine and St. Louis virus, but no change of titer could be demonstrated It must be supposed that the patient had serologic immunity to both of these viruses at the onset and was probably infected by another one which produced a similar clinical disease.

There were but 2 fatal cases in this outbreak, making a case fatality rate of 7.2 per cent. In 1940 and 1941 the rates were 22.4 per cent and 11.5 per cent respectively. Experience in treating the severe cases probably contributed to this reduced fatality. In 1 of the 2 fatal cases of 1942 death occurred in a nursing home on the fourth day of illness, a few hours after "half a cup" of spinal fluid was drained out. There was not enough information obtained to draw any definite conclusions as to the severity of the illness or the immediate cause of death. The other fatality was of a woman aged 70 who developed pulmonary complications on the fourth day while on inadequate sulfonamide dosage. She obviously needed continual special nursing care and it was requested, but owing to inability to obtain special nurses at the county hospital because of inadequate local supply she did not receive anywhere near adequate care and died of bronchopneumonia about forty-eight hours later. There were 6 other patients over 60 years of age who had severe disease but did recover, owing in a large part to excellent medical and nursing care. All but 1 had sulfonamides during the acute phase, probably preventing in some instances pulmonary and urinary complications.[4] Tube feeding, parenteral fluids, frequent turning and other symptomatic treatment contributed greatly. This consultant (W. M. H.) noted a pronounced improvement in the care of these cases during the three annual epidemics. The case fatality rate changes, though possibly not significant statistically, are at least highly suggestive.

Two other cases merit mention because of special interest. This consultant was called to see 1 patient suspected of having a virus encephalitis because of temporary coma, restlessness and delirium with high fever. Spinal fluid findings were negative and the temperature curve suggested malaria. The first blood smear made contained large numbers of Plasmodium falciparum parasites. This was an autochthonous case of cerebral malaria, a rather infrequent infection in the Yakima Valley. In 1 proved case of western equine infection the first symptoms appeared just after he had given blood for a transfusion. The recipient did not develop any symptoms of encephalitis.

EPIDEMIOLOGY

The age distribution of cases is presented in tables 1 and 2. It will be noted that the distribution indicates either an increased exposure or increased susceptibility at the extremes of life. The mean age is 36 years, as compared with 46 for 1940 and 25 for 1941.

The sex distribution, table 2, assists little in the interpretation of the age incidence. In most large outbreaks of the western equine infection the sex distribution of very old and very young has been equal and males predominated heavily only in the adult and "teen" age working group. Here there are 21 males and 7 females, with little difference in proportion of any age group except infancy. This discrepancy may be due entirely to chance distribution in these small numbers.

TABLE 2.—*Cases of Encephalitis by Age and Sex*

Age in Years	Number of Cases		
	Male	Female	Total
Under 1	2	2	4
1 - 4	1	0	1
5 - 9	1	0	1
10 - 14	1	2	3
15 - 19	0	0	0
20 - 29	2	0	2
30 - 39	2	0	2
40 - 49	4	1	5
50 - 59	1	1	2
60 plus	6	1	7
Unknown	1	0	1
Total	21	7	28

The geographic distribution varies but little from that observed previously. Eight patients lived in an urban area, 10 suburban and 10 rural. Only in 2 instances did the place of work differ from that of residence; 1 rural resident worked in a suburban area, and 1 suburban resident worked in the city of Yakima. Since the urban population represents about one third that of the whole county, there is little difference in the rates between urban and the combined suburban and rural rates. This is comparable to the findings in 1940, when rates were 57.5 and 62.7 per hundred thousand respectively. Nevertheless, when cases are plotted on a map the urban distribution is shown to be largely at the periphery of the city, where conditions in regard to domestic fowl are suburban or rural in nature.

TABLE 3.—*Cases of Encephalitis by Time of Onset*

Time in Weeks	Cases
July 10 to 16	2
17 to 23	0
24 to 30	2
31 to August 6	1
August 7 to 13	3
14 to 20	9
21 to 27	8
28 to September 3	1
September 4 to 10	2
Total	28

Seasonal distribution, as previously mentioned, and shown in chart 1 and table 3, is almost identical to that of previous years. The peak occurred during the middle and latter part of August. Quantitative mosquito studies made by Mr. W. W. Yates of the Portland office of the Bureau of Entomology and Plant Quarantine, Division of Insects Affecting Man and Animals, U. S. Department of Agriculture (under the direction of Mr. C. M. Gjullin), by using five New Jersey type light traps, showed that the activity of Culex tarsalis again correlated well with the epidemic curve[8] (chart 2). The period of greatest activity of several species, including Culex tarsalis, just preceded the peak in onset dates of human cases, a period representing probably the incubation period in man and mosquito.

MOSQUITO AND "RESERVOIR"[9] FOWL STUDIES

During the preceding year five strains of western equine virus and three of St. Louis virus were isolated from 4,655 Culex tarsalis mosquitoes tested from this area.[10] Since no virus was isolated from any other arthropod tested the previous year, the survey was limited to mosquitoes in 1942. During July and August a total of 24,751 mosquitoes, including nine species, were collected and tested for virus content, yielding forty-nine strains of virus. Of these mosquitoes 9,466 were Culex tarsalis. Results of the tests are presented in table 4. A total of forty-five viruses was isolated from this species, forty-one western equine and four St. Louis strains. Thus, in Culex tarsalis an infection rate was demonstrated of at least 1 in each 210 collected, as compared to 1 in each 386 found the preceding year. The role of Culex tarsalis as a natural vector of these viruses in the Yakima Valley is thus amply confirmed. In addition to the isolations of virus from Culex tarsalis, one strain each of western equine and St. Louis virus was isolated from Culex pipiens. Strains of western equine virus were isolated from Culiseta inornata and Anopheles maculipennis freeborni. No virus was isolated from 7,503 Aedes mosquitoes tested.

TABLE 4.—*Viruses Isolated from Mosquitoes Caught in Summer*

Mosquito Species	Number Tested	Viruses Isolated		
		Western Equine	St. Louis	Total
Culex tarsalis	9,466	41	4	45
Culex pipiens	967	1	1	2
	1,950	1	0	1
	4,496	1	0	1
	4,866	0	0	0
Aedes vexans	2,513	0	0	0
	124	0	0	0
	397	0	0	0
	62	0	0	0
Totals	24,751	44	5	49

An interpretation of the significance of these virus isolations by consideration of the vector abilities of the different species concerned leads to interesting conclusions. Culex tarsalis has been demonstrated to be an efficient vector of both western equine[11] and St. Louis viruses.[12] It feeds predominantly on fowl

8. Hammon, W. M.; Reeves, W. C.; Brookman, B., and Gjullin, C. M.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: V. Summary of Case Against Culex Tarsalis Coquillett as a Vector of the St. Louis and Western Equine Viruses, J. Infect. Dis. **70**: 278-283 (May-June) 1942.

9. Reservoir animal is used here and elsewhere in this paper when in quotations in a restricted sense. All known vertebrate sources of these viruses are infectious for only a short time and thus are not *reservoirs* in the usual sense of an animal having a latent or chronic infection which may serve as a source of infection over a long period. No such a true reservoir for these viruses is known as yet. Such a reservoir, if it exists, might be vertebrate or invertebrate.

10. Hammon, W. M.; Reeves, W. C.; Brookman, B., and Izumi, E. M.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: I. Arthropods Tested and Recovery of Western Equine and St. Louis Viruses from Culex Tarsalis Coquillett, J. Infect. Dis. **70**: 263-266 (May-June) 1942.

11. Hammon, W. M., and Reeves, W. C.: Laboratory Transmission of Western Equine Encephalomyelitis Virus by Mosquitoes of the Genera Culex and Culiseta, J. Exper. Med. **78**: 425-434 (Dec.) 1943.

12. Hammon, W. M., and Reeves, W. C.: Culex Tarsalis Coquillett a Proved Vector of St. Louis Encephalitis, Proc. Soc. Exper. Biol. & Med. **54**: 142-143 (Oct.) 1942; Laboratory Transmission of St. Louis Encephalitis Virus by Three Genera of Mosquitoes, J. Exper. Med. **78**: 241-253 (Oct.) 1943.

and occasionally on mammals. It becomes readily infected by feeding on fowls at a time when virus is present in the blood, and specimens thus infected become, in turn, infective by their bite after a suitable extrinsic incubation time at high temperatures.[13] Thus, it would appear that this species is an important vector of both western equine and St. Louis viruses.

Culex pipiens was found infected this year with St. Louis and western equine viruses. This species also acts as a laboratory vector of St. Louis virus [14] and thus can now be considered an established natural vector. However, in all laboratory tests this species has lost every detectable trace of western equine virus in twenty-four hours.[15] It would appear that the recovery of western equine virus from a mosquito of this species, in nature, was an instance of finding a specimen recently engorged on an infected "reservoir" animal, and the virus would probably have disappeared within a few more hours.

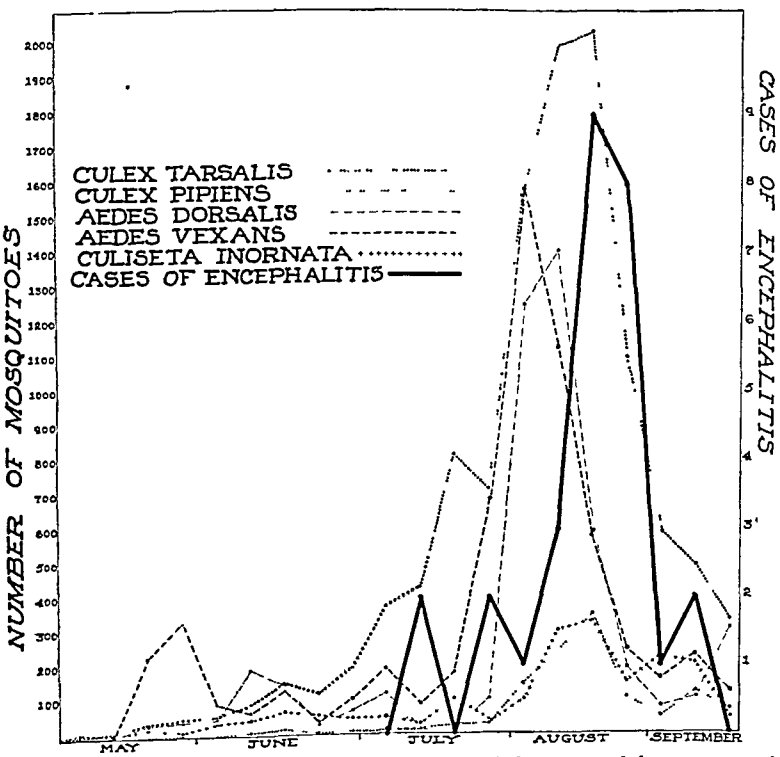


Chart 2.—Principal species of mosquitoes caught in light traps and human cases of encephalitis, by weeks.

Culiseta inornata, found infected with western equine virus, is capable of acting as a vector in the laboratory [11] and if present in large numbers might serve as a vector of importance.

Anopheles maculipennis freeborni, found infected with western equine virus, has been demonstrated to lose all detectable virus within twenty-four hours.[11] Thus, this species, like Culex pipiens, was infected in nature but apparently would not have become infectious by its bite.

Culex pipiens (St. Louis) and Culiseta inornata (western equine), the potential vectors other than Culex tarsalis which were found infected, were present in comparatively small numbers (chart 2) and could be of but small importance.

No virus other than western equine and St. Louis types was isolated from any source during the investigations.

During the survey of the previous year (1941) a small scale study was made of the feeding habits of Culex tarsalis.[16] This study was made by application of the precipitin test technic and by direct observation. This phase of the problem was greatly enlarged in the 1942 study, to throw more light on probable vertebrate reservoirs and in an attempt to discover why excellent laboratory vectors like Aedes were not found infected A large series of blood engorged specimens, collected in domestic habitats, were tested by means of the precipitin method to determine the relative proportions which fed on domestic animal "reservoirs" of these infections and on man.[17] At the same time, hand collections were made on the horse, cow and man to determine which of the various mosquito species fed on these hosts. It was found that Culex tarsalis, the species best fitting the epidemiologic picture as a mosquito vector of encephalitis in this area, fed frequently on birds (45.7 per cent of all tested) and included most of the common domestic animals in its feeding range. The feeding habits of this species alone could result in the incidence of encephalitis antibodies demonstrated in domestic animals and man by means of the neutralization test.

Other species which were rarely or never found infected in nature appeared to be those which fed almost exclusively on large mammals (Aedes dorsalis, 96.6 per cent) which, if all like the horse, have low titers of virus in the blood, probably too low to permit infection of the mosquito.

Culex pipiens was the exception, as it fed almost exclusively on fowl. This species can now be considered a natural vector of St. Louis virus, probably important in the St. Louis area but, because of small numbers, not important in the Yakima Valley.

The results of the precipitin tests, and the repeated isolations of virus from Culex tarsalis, together with previous evidence from a serologic survey [18] give strong support to the probability that domestic fowl are an important "reservoir" of infection in the Yakima Valley. In the laboratory, the blood of domestic fowl (chickens) has been shown to serve as an excellent source of virus to infect mosquitoes

In order to determine, if possible, whether encephalitis viruses are carried through the winter by hiber-

13. Hammon, W. M.; Reeves, W. C., and Gray, M.: Mosquito Vectors and Inapparent Animal Reservoirs of St. Louis and Western Equine Encephalitis Virus, Am. J. Pub. Health **33**: 201-207 (March) 1943.
14. Mitamura, T.; Ajamada, S.; Hazato, H.; Mori, K.; Hosoi, T.; Kitaoka, M.; Watanabe, S.; Okobu, K., and Tenyin, S.: Ueber den Infektionsmodus der epidemischen Enzephalitis, Tr. Jap. Path. Soc. **27**: 573-580, 1937. Reeves, W. C.: Hammon, W. M., and Izumi, E. C.: Experimental Transmission of St. Louis Encephalitis Virus by Culex Pipiens Linnaeus, Proc. Soc. Exper. Biol. & Med. **50**: 125-128 (May) 1942.
15. Merrill, M. H.; Lacaillade, C. W., and TenBroeck, C.: Mosquito Transmission of Equine Encephalomyelitis, Science **80**: 251-252 (Sept. 14) 1934. Hammon and Reeves.[10] Hammon, W. M., and Reeves, W. C.: Unpublished results.
16. Bang, F. B., and Reeves, W. C.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: III. Feeding Habits of Culex Tarsalis Coq., a Mosquito Host of the Viruses of Western Equine and St. Louis Encephalitis, J. Infect. Dis. **70**: 273-274 (May-June) 1942.
17. Reeves, W. C., and Hammon, W. M.: Feeding Habits of the Proved and Possible Mosquito Vectors of Western Equine and St. Louis Encephalitis in the Yakima Valley, Washington, Am. J. Trop. Med. **24**: 131-134 (March) 1944.
18. Hammon, W. M.; Lundy, H. W.; Gray, J. A.; Evans, F. C.; Bang, F., and Izumi, E. M.: A Large Scale Serum Neutralization Survey of Certain Vertebrates as Part of an Epidemiological Study of Encephalitis of the Western Equine and St. Louis Types, J. Immunol. **44**: 75-86 (May) 1942.

nating mosquitoes, 5,973 such mosquitoes were collected in the Yakima Valley during January 1943 while snow was on the ground and the temperatures ranged down to minus 15 F. All tests for virus were negative. Only 18 Culex tarsalis could be found, but of Culex pipiens there were 4,789, of Anopheles 1,161. Culex pipiens and Anopheles undoubtedly winter predominantly as adults, but although Culex tarsalis has been reported to do so, it seems quite possible from our observations that some other mechanism of overwintering may be more important in this area. This may have an important bearing on the epidemiology of the disease. All our attempts so far, however, to obtain evidence of transovarian infection in Culex tarsalis of both viruses have been entirely negative.

At the end of the season to determine roughly infection rates of the two viruses in chickens, which we consider very important sources of mosquito infection, serum was drawn from 20 chickens from the spring hatch of 1942. Six definitely had antibodies to the western equine virus, and 5 had low titers in a questionable range. To the St. Louis virus only 2 had any protective power, and these fell in the questionable range. This proportion is comparable to the infection rates found in mosquitoes, 44 western equine, 5 St. Louis, indicating considerable preponderance of the western equine virus during the season in question.

SUMMARY

1. In the fourth and last of a series of annual epidemics of encephalitis in the Yakima Valley, diagnosis was accepted in 28 cases. Titration of antibodies in acute and convalescent phase serums established the diagnosis of western equine or St. Louis encephalitis in 11, 10 clinically similar cases failed to develop an increase in titer to either and so are attributed to a hypothetical third virus, and the others were not so completely studied serologically. Six serums were tested for antibodies to Japanese B virus, with negative results.

2. Maternal transmission of St. Louis virus antibody to 2 infants occurred.

3. The case fatality rate was only 7.2 per cent. The decrease from previous years (22.4 and 11.5 per cent) is attributed in part to therapy and care.

4. The occurrence of a case of autochthonous cerebral falciparum malaria introduced an additional problem in differential diagnosis.

5. Transfusion on the day of onset from 1 patient failed to produce encephalitis in the recipient.

6. Activity of Culex tarsalis mosquitoes, as indicated by light trap collections, correlated with the epidemic wave.

7. Forty-nine strains of virus were isolated from four species of mosquitoes. From Culex tarsalis were isolated forty-one strains of western equine virus, and four strains of St. Louis virus. Infection rates in Culex tarsalis were at least as high as 1 in 210.

8. Culex pipiens was found infected with both viruses but will transmit only the St. Louis strain. It is now a proved natural vector of St. Louis virus.

9. Culiseta inornata found infected with western equine virus was demonstrated to be capable of transmitting it and so becomes a proved natural vector of the western equine virus.

10. In mosquito collections made during the winter, no virus was found. It was observed that few Culex tarsalis adults, if any, survive the severe winter in the Yakima Valley.

11. Antibody studies in the 1942 season's chickens indicated that 30 to 50 per cent had been infected with western equine virus but very few with St. Louis virus. This correlates well with the proportion of the two viruses isolated from mosquitoes.

PSYCHOSOMATIC ASPECTS OF FILARIASIS

PRESENT DAY EVALUATION

LIEUTENANT COMMANDER MEYER A. ZELIGS (MC), U.S.N.R.

Knowledge of the clinical characteristics of filariasis among Marines who have returned from the South Pacific has taken a broad step forward during the past year. A sounder appreciation of the later symptomatology and clinical course of this exotic disease, together with a continued opportunity to study its psychologic aspects, has made it possible to envisage more definitely the ultimate prognosis of such cases and has clarified many of the misconceptions which unfortunately have arisen in regard to this heretofore almost unheard of condition. This advance in medical understanding has been brought about by careful study and observation of a large group of Marines who were returned from the South Pacific because of filariasis. This report represents but a small part of the clinical and rehabilitative work which is now going on at the Marine Barracks at Klamath Falls, Ore.

The need for such a center as the Marine Barracks at Klamath Falls developed after the return to the United States of large numbers of Marines with filariasis for whom no definitive plan of treatment or observation had been worked out and in regard to whom only meager scientific data were available. Knowledge of this rather obscure tropical disease in the white man had thus far been limited to short term studies by a few observers working under a diversity of environmental conditions in the field and in the United States. The problem of the ultimate disposition of these men by the military, based on statistically sound group observations, had yet to be worked out. There was thus an important need for the development of a site and program for the study of these individuals under properly controlled conditions. And so, early in 1943, in a joint undertaking by the United States Marine Corps and the Bureau of Medicine and Surgery of the U. S. Navy, the Marine Barracks at Klamath Falls was conceived and established. Its purpose was to be twofold:

(*a*) The general rehabilitation of Marines returned from overseas with filariasis or malaria (or both).

(*b*) The careful study and investigation of the clinical, therapeutic, laboratory, animal experimental and psychologic aspects of these two diseases.

The successful accomplishment of such a project necessitated the highest degree of integration between the administrative and medical departments. A well controlled program which included a graded type of physical activity, vocational and educational courses, military training and recreational activities was inaugurated, all of which was fitted into an organized schedule

From the U. S. Marine Barracks, Klamath Falls, Ore.
This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

in a background of continuous medical observation. The untoward and actually deteriorating effects of improper rest and inactivity on individuals with chronic, nonincapacitating disease such as filariasis are now well understood by all who have dealt with such problems, and circumvention of this long existent therapeutic pitfall was one of the primary considerations in shaping the new rehabilitative ideology of this station. An aura of activity and vigor was to innovate the atmosphere before any clinical observations of real worth could be recorded. It will be noted that I have referred to the Klamath Falls Station as a "Marine Barracks" and not as a recuperative or convalescent center. This I have done advisedly and deliberately, for it was our purpose from the outset to establish a post which would function in a combined military, vocational and educational capacity and would in no sense resemble or be regarded as a hospital. The men at the station were not referred to as "patients"; they were officially carried on the Marine Corps roster on a full duty status, unless specifically excepted because of some concurrent disabling condition. Each man enjoyed the various benefits and privileges which are generally forthcoming to every one while on active duty (such as eligibility for promotions, awards, furloughs and living off the post if married).

All Marines sent to duty at the barracks at Klamath Falls had signs of active filariasis or a history of having had filariasis during the past two years (or malaria). Those just returned from overseas, following an initial physical examination which was performed immediately after their arrival, were allowed a thirty day (overseas) furlough and on their return from leave were again examined and classified as to the type of duty which they were to perform. Thus all men sent to Klamath Falls were immediately placed on a prepared program for the duration of their stay unless they had to be hospitalized. This was to be an active duty station in its fullest sense, despite the fact that almost 80 per cent of our complement had come as former patients from the various naval hospitals and convalescent centers. The medical department functioned in the background of this setting and as an integral part of the station. It comprised a staff of medical specialists, picked laboratory research workers and technicians, nurses and corpsmen. The hospital wards and laboratories were amply equipped with all the medical and technical facilities necessary for comprehensive treatment and research.

During the formative months of the station's development, the transition for many of the men from their former convalescent or hospital routine to one of activity was accompanied by considerable difficulty. Such individuals had become physiologically and psychologically weakened as the result of months of sedentary or convalescent existence and for a considerable time were unable to meet the physical demands which this active routine required. The psychosomatic reactions to this change lasted for a few months, during which time the daily sick call was full to overflowing (at one time reaching as high as 12 per cent of the total personnel) with complaints of fatigue, fear of collapse and sundry inabilities to perform the seemingly arduous duty now required of them. Symptoms referable to sites of old injuries or disease which had been quiescent or healed for many months were psychologically brought to light and reactivated. Among these were headaches, backache, diverse gastrointestinal complaints (especially vomiting) and a host of other psychosomatic disturbances. As the training program developed, however, and the intractably psychoneurotic and other inadequate individuals were separated out, the general attitude and group morale improved dramatically and the men became desirous of completing the prescribed three months training period. In the event of reactivations, they were observed for a longer period.

For purpose of this particular study, the total complement of the station was divided into two main groups:

(*a*) Individuals with signs or history of filariasis recently returned from overseas.

(*b*) Those similarly affected but who had been evacuated to the United States six to twelve months previously and who had been "convalescing" at various naval hospitals throughout the country.

A comparative study of these two groups was undertaken, and the attitude of each individual in the group toward his symptoms was determined by careful psychiatric appraisal. Over 500 such interviews were conducted, the examiner attempting primarily to discover the extent to which the subject's mental attitude colored or affected his ability to perform active duty. A special attempt was thus made to elicit whether individuals with filariasis, after six to twelve months in the United States as convalescents or on some type of limited duty, had developed any particular or fixed attitudes in relation to their symptoms and, if so, to what degree this acquired neurotic behavior was manifest. The element of secondary gain, which invariably arises after such a neurotic pattern has been achieved, was measured by the degree of insistence for light or limited duty. In addition to the foregoing, and of essential interest in this study, was an evaluation of the degree of anxiety in these men as evidenced by expressed fear of sterility, sexual impotence and loss of libido. Following is a summary of the impressions which were formed as a result of these interviews:

1. Individuals who had been hospitalized for at least a month (or longer) were, as a group, less capable of performing active duty as compared with those who had had similar symptoms but who had not been hospitalized for more than a few days after their return to the United States. Following treatment of presenting complaints, reassurance and the inauguration of an appropriate training and vocational program which allowed expression of natural aptitudes and interests, individuals in this group soon adapted themselves to the required active routine. In general, it was found that the longer the preceding period of inactivity, the more difficult and protracted was the return to active duty.

2. Individuals recently out of combat and exhibiting classic symptoms of war neurosis or combat fatigue (battle nightmares, startle reactions, increased tension, personality change) were but little concerned about their filarial symptoms and were especially desirous of overcoming their acute nervous disturbances.

3. Individuals whose past history showed evidence of psychoneurotic behavior before they developed filariasis almost invariably utilized their filarial symptoms to help solve preexisting neurotic needs or conflicts. Exaggeration of complaints and pronounced somatic-mindedness, in the face of negative physical findings, was especially prominent in this group. Generalized aching of muscles and joints and easy fatigability were the most common features in this group.

Demonstrable signs of filarial activity was found in less than 4 per cent of all individuals and in all cases after one or more reactivations no further incapacitating

sequelae occurred. In an earlier analysis of this same group Haviland [1] reported the degree of involvement found at the time of the initial "screening" examination as presented in table 1. It will be seen that 91 per cent of men were sufficiently free from symptoms so as not to require medical attention. Of this group 40 per cent showed "mild" involvement, which usually amounted to transient aching or swelling of an extremity or of the spermatic cord following moderate or heavy physical exertion. In many cases the complaint was entirely subjective (aching, but no evidence of swelling or redness) and as the patient became physically and psychologically adapted to his activity these symptoms disappeared. With these facts in mind, let us now compare the rate of attendance at the "filariasis clinic" during its first two months with the next four months (chart 1). One sees a progressive decline in the percentage of the station complement attending the "filariasis clinic" as the period of training ensued. It is to be emphasized, furthermore, that this decline in clinic attendance occurred during the very same months in which the total filarial complement of the station

TABLE 1.—*Examining Physician's Evaluation at Time of "Screening Examination"*

(Taken from Haviland)

Physician's Evaluation	Men Involved (%)
[illegible]	51.0
[illegible]	40.0
[illegible]	9.0
Severe involvement	0.2

TABLE 2.—*Pregnancies and Births Among Wives of Marines with a History or Signs of Filariasis*

Marital Status	Cases	Pregnancies or Births	Disturbed Sexuality (Psychic Impotence, Fear of Sterility, and So On)
Married	249	45	10
Single	657	0	17
Total cases	906	45	27

was steadily increasing as the result of the continued arrival of new cases. Despite the constant increase in the filarial complement, one sees a progressive decline in the total percentage of men attending the "filariasis clinic" as the training program continued.

Chart 2 shows the total filarial complement of the station by months. At the present time the approximate attendance at this clinic is about 1 per cent of the station's total filarial complement (chart 1, January 1945). This trend is of real significance and is emphasized as one of the essential points of this report, for it categorically summarizes the beneficial effects which took place in these men following proper physical conditioning and the removal of unfounded psychogenic fears and apprehensions concerning the outcome of this disease. Especially prevalent among the latter was the fear of sterility and other evidences of disturbed psychosexuality.

The data given in table 2 show the incidence of pregnancies and births among wives of Marines returned to the United States with a history or signs of filariasis and were obtained during the last weeks of the three to four month training period ("final screening examination") which was done preparatory to each man's transfer to another station. This table also shows the incidence of disturbed sexuality, from any cause, among the single and married Marines under observation for filariasis. It is evident that there has been no interference with procreation (18 per cent of wives were pregnant or gave birth) and the incidence

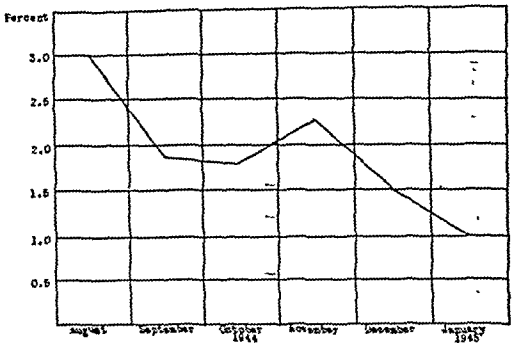


Chart 1.—Percentage of total complement of station (with filariasis) attending "filariasis clinic."

of disturbed sexuality of psychogenic origin was well within the range of normality (2.8 per cent) for any group of individuals.

COMMENT

It appears thus, from the data presented, that the disease filariasis in a nonendemic area has a definite tendency to burn itself out after one or more reactivations. The precise mechanism for this is still under dispute by pathologists, though it is felt by most investigators [2] that the symptoms of reactivation (characterized clinically by mild fever, localized redness and swelling, retrograde lymphangitis and regional lymphadenitis) are caused by the ultimate development of an adult worm, which, having grown to its full size, creates an obstructive, inflammatory reaction in the lymphatic channels in which it is lodged and then dies and disintegrates, the latter process accounting for the acute clinical signs. Whatever the exact pathologic process may be, whether it is an obstructive one or a local allergic phenomenon or both, has yet to be determined

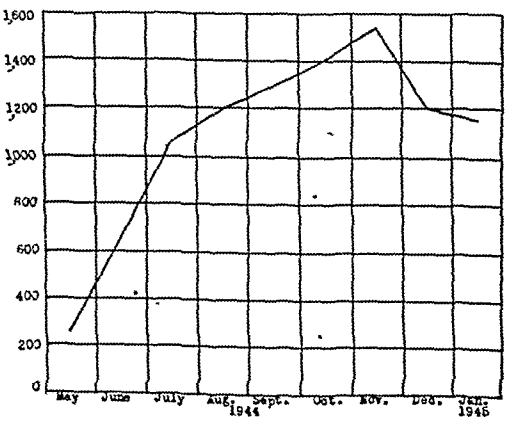


Chart 2.—Total filarial complement of station by months.

accurately. The essential point in regard to the problem under discussion is that in individuals so affected, when removed from endemic areas, the disease runs a self-limited course and soon dies out. This categorical statement is one which until now could not be unequivocally made, because of the lack of adequate clinical data which are now at hand.

1. Haviland, J. W.: Recent Experiences with Filariasis, Northwest Med 43:371-376 (Dec.) 1944.

2. Zuckerman, S. S., and Hibbard, J. S.: Clinicopathologic Study of Early Filariasis, U. S. Nav. M. Bull. 44:27-36 (Jan.) 1945.

Factual knowledge, such as this, has proved of immense importance in the therapeutic handling of these and more recently arrived cases. Just a year ago Rome and Fogel,[3] in a then timely article, discussed the keen and almost universal anxiety which was seen to be associated with this disease soon after its inception. This state of apprehension was brought about by a combination of several reasons: First, the admitted lack of knowledge by medical officers at that time concerning the cause and possible sequelae of this disease when they were first faced with it in such large numbers in the Samoan area and, secondly, the fact that in about 50 per cent of cases the genitals were initially involved, this anatomic site being especially prone to produce anxiety due to fear of subsequent impairment of sexual function. This understandable emotional overlay was present at the onset in almost all men afflicted, genitally or otherwise, and continued observance and psychologic identification with native Samoans (in whom the incidence of obvious "mumu" or gross elephantiasis in some villages ran as high as 85 per cent) served to enhance and maintain the unwholesome state of mind. In many of the more suggestible, imaginative and psychologically susceptible ones, as Rome and Fogel go on to point out, actual mental depression occurred. In others, psychic impotence and profound fear of sterility developed after their return to the United States. Such psychosomatic manifestations no longer obtain, however, and this brings us to the present day evaluation of this aspect of the problem. From a clinical and statistical review of the group of patients in this study it can now safely be said that the initial anxiety concerning the outcome of this disease, such as impairment of sexual function and the development of elephantiasis of limbs or scrotum, is no longer present. Only in previously psychoneurotic or constitutionally inadequate individuals is there still evidence of such worries and fears. It is to be further emphasized that the regimen which was used to overcome this state of apprehension included a program of prophylactic psychiatry which was soon replaced by the subject's own appreciation, in terms of actual performance, that his physical and sexual prowess were not impaired. Rome and Fogel emphasized the importance of disseminating encouraging propaganda regarding the future course of this disease. They pointed out that this was an essential factor in helping to prevent the spread of false and exaggerated notions of the sequelae of this condition. This is indeed important, but one must remember also that such "psychologic inoculation" is but temporary and "passive" and will soon become attenuated unless it is fortified and substantiated by the patient's own proof that his sexual performance and virility have remained intact. Normal sexuality, as demonstrated by months of maintained potency and virility and evidenced among the married men by a normal rate of pregnancies and births, has served as the final and indisputable proof. This was the final blow which served to dispel any remaining apprehension in this regard.

CONCLUSIONS

The following conclusions concerning the course, prognosis and psychosomatic features of patients with filariasis derive from this study:

1. Following removal of individuals afflicted with early signs of filariasis from the endemic area, the disease has been shown to run a self-limited course and, after one or more clinical reactivations, burns out.

2. The rehabilitation and restoration to full duty of individuals with signs or a history of filariasis is in a large measure dependent on a combined program of military, vocational, educational and medical training and supervision, this being of especial significance in the handling of men previously weakened by prescribed inactivity.

3. No demonstrable impairment of sexual function, either libidinous or procreative, has resulted from this disease.

4. Severe or incapacitating sequelae have thus far occurred in only 0.2 per cent of persons with filariasis.

5. The clinical, military and psychologic import of this wouldbe problem should, within another year or so, have entirely disappeared.

3. Rome, H. P., and Fogel, R. H.: The Psychosomatic Manifestations of Filariasis, J. A. M. A. **123**: 944-946 (Dec. 11) 1943.

FILARIASIS

EARLY CLINICAL MANIFESTATIONS

AN ANALYSIS OF THIRTY-FIVE CASES

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Filariasis is a tropical disease endemic in many parts of the world that are now inhabited by American troops. In its importance among mosquito borne diseases it looms second only to malaria. However, unlike malaria, the importance of filariasis as a military medical problem has not been fully evaluated as yet because of its long incubation period, estimated to last as long as two years. It is only recently that American military personnel stationed in endemic areas have reached the end of this incubation period. A proper evaluation of the problem should therefore soon become apparent.

Filariasis, moreover, may well constitute an important future civilian medical problem. Theoretically, any soldier returning from an endemic area may develop filariasis two years hence when he may well have returned to civilian life. It becomes obvious, therefore, that physicians throughout the United States may be called on to recognize early manifestations of filariasis.

This report is based on the observation of 35 cases admitted to a station hospital of the South Pacific Forward Area and presenting a symptom complex suggestive of early filariasis.

It is readily conceded that the final proof for the diagnosis, the demonstration of Filaria bancrofti or its larvae, was missing in all cases. Repeated thick blood smears taken at different hours of the day and night failed constantly to reveal microfilariae. This observation is in accord with many attempts in large numbers of similar cases.[1]

A great deal of work is being done at present to devise laboratory methods helpful in the diagnosis of early filariasis. Such tests as skin tests and immunity reactions either are in the experimental stage or have failed to prove their usefulness.[2] It appears, therefore,

1. Burhans, R. A.; Camp, J. D.; Butt, H. R., and Cragg, R. W.: Lymphangitis of Suspected Filarial Origin: A Preliminary Report Concerning Its Treatment, U. S. Nav. M. Bull. **42**: 336 (Feb.) 1944. Rome, H. P., and Fogel, R. H.: The Psychosomatic Manifestations of Filariasis Among J. A. M. A. **123**: 944 (Dec. 11) 1943. Michael, P.: Filariasis Among U. S. Navy and Marine Personnel: Report on Laboratory Investigations, U. S. Nav. M. Bull. **42**: 1059 (May) 1944. Fogel, R. H., and Huntington, R. W., Jr.: Genital Manifestations of Early Filariasis, ibid. **43**: 263 (Aug.) 1944.

2. Dickson, J. G.; Huntington, R. W., and Eichold, S.: Filariasis in Defense Force, Samoan Group, U. S. Nav. M. Bull. **41**: 1240 (Sept.) 1943. Strong, R. P.: Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases, ed. 6, Philadelphia, Blakiston Company, 1942.

important to depend on a clinical picture which should be sufficiently characteristic to permit a diagnosis of early filariasis.

Current textbooks [3] offer a great deal of information on the later stages of the disease, such as the febrile filarial attacks and the final chronic stage, the elephantoid type of the disease. However, information as to the early stage of the disease, immediately following the incubation period, is scanty. It is this stage which at this time presents a pressing problem for medical officers serving in tropical and endemic areas. Such a stage of early filarial disease has been described as a latent symptomless period which follows the incubation period and which may last for several years or even throughout life. There are said to be typically no manifest symptoms, although local tissue alterations around the adult worms may be in progress.[4]

My observations would bear out the fact that early filarial disease is not as symptomless as formerly believed and that a rather well defined clinical picture presents itself, sufficiently typical to suggest the presence of the disease. The characteristic salient features of 35 cases are herewith described.

CLINICAL HISTORY

The clinical history was significant in many respects. All soldiers came from an area known to be heavily infested with Filaria. They were exposed to day and night biting mosquitoes. At times they were assigned to night duty, such as night guard duty, night repair crews and unloading ships.

Under the assumption that the time of their arrival at the endemic area was identical with the time of exposure, the incubation time in this series of cases lasted from three to six months. After this period symptoms became noticeable. All patients were hospitalized from one to three months after onset of symptoms. The clinical syndrome described herein would represent, therefore, a stage of filariasis which appears four to nine months following exposure.

The disease started slowly and progressed gradually with intermissions. The most frequently described early symptom was a feeling of numbness or weakness in a leg or an arm. Frequently the affected extremity would "fall asleep," particularly at night, disturbing the patient's sleep. This was shortly followed by an aching sensation in one or more extremities, particularly after heavy work. Gradually the ache developed into a frank pain which was keenly felt during the rest period immediately following heavy exertion. The pain usually originated in the axilla or groin and it was then that the men discovered the presence of axillary or inguinal lymphadenopathy.

As time progressed any mild exertion such as a brisk walk would elicit pain in the affected parts. Eventually a certain periodicity became unmistakable. With or without preceding exertion, periodically recurring pains around the axilla, arms, groins, thighs and scrotal regions were described, occasionally accompanied by visible swellings, particularly around the groin and scrotal regions. The duration of these periodic attacks was described as lasting from a few hours to several days, followed by periods of days or weeks of well being. Nocturnal occurrence of the attacks was frequently observed, and even in the quiet periods of intermission nocturnal pains of various degree were noted. This was especially true of nightly recurring testicular pains. Such nocturnal orchiodynia was experienced so commonly that it constituted an important part of the patient's history. Finally the patients became aware of the constant presence of palpable nodes, notably around the groins and scrotal regions, although periodic changes in the degree of such enlargements were common.

Such a history usually covered a period of from four weeks to three months prior to hospital admission. None of the patients gave a history as to involvement of constitutional signs or symptoms such as general malaise, headaches or loss of weight, strength or appetite. In fact, general well being was usually emphasized. Only 1 patient gave a history of fever during attacks of pain, and this was verified by hospital observation.

PHYSICAL FINDINGS

Physical examination disclosed all patients in good general condition. There was no evidence of weight loss, debility or anemia. Cardiovascular, respiratory and gastrointestinal systems were found normal findings were strictly confined to the lymphatic and genital system.

Involvement of the lymphatic apparatus was characterized by a more or less generalized lymphadenopathy, which was present in all of the 35 cases. The lymphadenopathy consisted of multiple slightly tender, firm well separated nodes of from pea to walnut size. There was no tendency toward confluence, attachment to skin or breakdown.

TABLE 1.—*Distribution of Lymphadenopathy in 35 Cases*

	Supraclavicular	Axillary	Pectoral	Epitrochlear	Inguinal	Femoral	Popliteal
Number of cases.....	1	35	3	11	35	35	3
Per cent.....	3	100	9	31	100	100	9

Bilateral axillary, inguinal and femoral adenopathy was present in all cases. In addition, epitrochlear adenopathy was found in 11 cases, pectoral adenopathy in 3 cases and popliteal adenopathy in 3 cases. Only 1 case presented a supraclavicular adenopathy (table 1).

The pectoral adenopathy was pronounced in all 3 cases seen, a string of lymph glands extending from the axilla along the margin of the pectoral muscle downward toward the nipple. In 1 case the pectoral and subpectoral adenopathy was pronounced and tender enough to be erroneously diagnosed as acute mastitis by the referring medical officer.

As a rule, however, acute inflammatory changes such as redness, edema and heat were absent. Episodes of retrograde (centrifugal) lymphangitis were not observed in this series. It must be emphasized that there was no noticeable correlation between periodically recurring pains and the objective appearance of glands.

The genital system was involved in all 35 cases, although degree and intensity of involvement varied greatly not only from case to case but also frequently within the individual during the period of observation.

The most frequently encountered genital involvement was a left funiculitis found in 21 cases. In 6 of these cases there was in addition a left varicocele. A right funiculitis was found in 5 cases, and in 1 additional case it was associated with a bilateral varicocele. The total number of cases presenting a varicocele was 10, a hydrocele 3 and an epididymitis 1 (table 2).

3. Manson-Bahr, P. H.: Manson's Tropical Diseases, ed. 11, Baltimore, Williams & Wilkins Company, 1943. Strong.[3]
4. Craig, C. F., and Faust, E. C.: Clinical Parasitology, ed 3, Philadelphia, Lea & Febiger, 1943.

The diagnosis of funiculitis was based on enlargement, often of a peculiar nodular character; thickening, edema and tenderness of funicular structures. It was found best to conduct this examination with the patient in the standing position. The two funiculi were examined simultaneously by rolling them between the thumb and the index finger of both hands, thus gaining impression as to their respective enlargement, nodulation, tenderness and edema.

As a further diagnostic aid it was found useful to introduce the finger into the external inguinal ring as is done in the routine examination of hernia. This procedure always elicited pronounced tenderness or frank pain presumably due to pressure of the sensitive edematous funiculus and spermatic cord against the pubic bone.

A less reliable but frequently helpful diagnostic aid was the absence of the cremasteric reflex on the affected side. It would seem reasonable to assume that edema and infiltration of the cremasteric muscle may interfere with the muscular reflex response on stimulation.

TABLE 2.—*Distribution of Genital Lesions in 35 Cases*

	Number of Cases				Per Cent
	Right	Left	Bilateral	Total	
Funiculitis	6	21	0	27	77
Varicocele	0	9	1	10	29
Hydrocele	2	0	1	3	9
Epididymitis	1	0	0	1	3

TABLE 3.—*Laboratory Data in 35 Cases*

	Leukocytosis Over 10,000	Sedimentation Rate		Eosinophilia	
		15 to 20 Mm.	Above 20 Mm.	5% to 10%	Above 10%
Number of cases	2	6	1	9	5
Per cent	6	17	3	26	14

Little difficulty was encountered in the diagnosis of hydrocele, varicocele and epididymitis, as these conditions corresponded exactly to the well known picture due to various other causes.

LABORATORY DATA

The following laboratory tests were performed in all 35 cases: repeated thick blood smears for microfilaria and malaria plasmodia, Kahn tests, sedimentation rates, blood counts and urine examinations. In addition, biopsy of inguinal lymph glands was done in 4 cases and hydrocele fluid examinations in 2 cases.

As stated before, blood smears taken at various intervals, day and night, were consistently negative for both filarial and malarial parasites. Careful examination of aspirated hydrocele fluid revealed no microfilariae in 2 cases.

Excised lymph glands were examined histologically by Lieut. A. P. Gewanter, M.C.R., U.S.N., and Capt. A. J. Segal, M. C., A. U. S. The diagnosis made was chronic hyperplastic lymphadenitis and follicular hyperplasia respectively. No evidence of filariae was found in sections. Excised lymph glands, furthermore, were incubated in saline solution for twenty-four hours and the tissue juice examined for filariae. The results were negative.

Urine examinations as well as Kahn tests were negative throughout. Red blood cell counts and hemoglobin determinations revealed no evidence of anemia. The leukocyte count was between 5,000 and 10,000 in all but 2 cases, in which the counts were 14,050 and 13,750 respectively. The sedimentation rate was normal in 28 cases, elevated to between 15 and 20 mm. per hour in 6 cases and above 20 (29 per hour) in 1 case.

The eosinophil count was found elevated to between 5 and 10 per cent in 9 cases and elevated to above 10 per cent in 5 cases, the highest being 19 per cent in 1 case (table 3).

Because of the fact that eosinophilia in the tropics is most frequently due to worm infections, stools of patients showing eosinophilia were repeatedly examined for evidence of helminthiasis. Stool specimens were examined fresh by the concentration and zinc sulfate flotation method. The results were negative.

COMMENT

The value of the old dictum that a diagnosis of infectious disease should not be made without demonstration of the causative organism is undisputed. Yet if one was to adhere to this dictum the early diagnosis of filariasis could not be made in most cases, for microfilariae were not found in this series as well as in large numbers of similar cases.[1] If the diagnosis should be delayed until such time as microfilariae become demonstrable it might prevent the only effective measure, namely early removal of the patient from the endemic area. It would furthermore create a large reservoir of carriers on whom the mosquitoes could feed and thus cause widespread propagation of the disease.

It is for this reason that a syndrome such as outlined must be depended on in order to reach at least a tentative diagnosis.

There seems little doubt that the clinical picture described was actually due to filarial infection. It is true that the findings were not as evident as described in the textbook picture nor were there typical filarial attacks accompanied by constitutional symptoms such as fever, general malaise and prostration. On the other hand there was a history of exposure to day and night biting mosquitoes in an area where the native population was known to be heavily infected with filariasis. There was a more or less generalized lymphadenopathy and there were present various types of genital lesions. Periodic aggravations of pains and swellings, so characteristic of the later stages of the disease, were commonly observed. However, the asymptomatic stage, also peculiar to late cases, was not noted in this series. Nocturnal pains and particularly nocturnal orchiodynia were frequent complaints.

Laboratory tests as performed were of little diagnostic help with the possible exception of an eosinophilia which was present in 40 per cent of these cases. Present efforts to devise a reliable laboratory test for the diagnosis of early filariasis would constitute a real advancement if successful. Meanwhile, however, the diagnosis must be based on clinical evidence and it is hoped that the symptom complex as outlined herein may serve toward this goal.

SUMMARY AND CONCLUSIONS

1. A clinical syndrome believed to be sufficiently characteristic to permit the presumptive diagnosis of filariasis in its early stages has been observed.

2. Laboratory data were of no value in the early diagnosis, with the possible exception of an eosinophilia which was present in 40 per cent of this series of 35 cases. Microfilariae were not found.

THE RELATIONSHIP OF POSTSCARLATINAL ARTHRITIS AND CARDITIS TO RHEUMATIC FEVER

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Our purpose in this communication is to present the evidence of cardiac involvement occurring among 110 patients with scarlet fever and to correlate this involvement with rheumatic fever.

Cardiac injury, often associated with arthritis, has long been known to follow scarlet fever, but there still exists some question of its relationship to rheumatic fever. The cardiac and joint sequelae are still commonly designated as postscarlatinal carditis and arthritis without reference to this possible relationship. Many workers, on the other hand, have stressed the apparent close connection between postscarlatinal and rheumatic heart disease.[1]

It is well known that electrocardiographic abnormalities comparable to those seen in active rheumatic fever also occur during both the acute and the convalescent stage of scarlet fever. The reported incidence of such abnormalities has varied much, reaching as high as 86 per cent in the cases examined by Wickström.[2] This variation is in part due to differences in criteria for abnormal electrocardiograms employed by the different workers and in part to probable variation in host reactions.

The interpretation of the electrocardiographic changes has also varied among the different workers. Shookhoff and Taran[3] found only minor changes in the position of the RT or ST interval in 14 per cent and abnormalities in the shape and direction of the T waves in leads 1 and 2 in 10 per cent of 50 children with scarlet fever. They concluded that their findings in scarlet fever differed from those described in rheumatic fever in the comparative infrequency of abnormalities in the ventricular portion of the electrocardiogram, in the complete clearing up of all the abnormalities early in convalescence and in the absence of conduction disturbances. Wickström,[2] on the other hand, emphasized the striking similarity between the changes he observed in the electrocardiograms of patients with scarlet fever and in those with rheumatic fever but failed to comment on the possible etiologic relationship between the two diseases. Faulkner, Place and Ohler[4] observed prolongation of the PR interval beyond 0.20 second and T wave changes in lead 1 or 2 or both in 6 per cent of 171 patients. They also noted the striking similarity of the postscarlatinal electrocardiographic changes to those seen in active rheumatic fever and were doubtful whether the differences between the two conditions are fundamental. Roelsen[5] found electrocardiographic changes in 36 per cent of scarlatinal patients with arthralgia and in 26 per cent of those without arthralgia. In commenting on the possible etiologic relationship between the cardiac complications following scarlet fever and those of rheumatic fever he apparently believes that the scarlet fever patients who develop heart disease probably have both diseases, with a probable overlapping of the two conditions.

METHODS OF STUDY

In the present investigation only cases of unquestionable scarlet fever were included. All patients had typical scarlatinal rashes with postscarlatinal desquamation. Each patient was watched closely for any signs or symptoms of complications or sequelae. Routine symptomatic treatment was employed, and codeine rather than salicylates or aminopyrine was given to relieve discomfort. Sulfonamides were generally used only to combat developing purulent complications; many of the patients, however, received full therapeutic doses of sulfadiazine, together with a nose and throat spray containing 2.5 per cent sodium sulfadiazine, during postscarlatinal convalescence in an effort to clear up their streptococcic carrier states. Routine x-rays of the heart, lungs and paranasal sinuses were taken shortly after admission and when indicated thereafter.

Nose and throat cultures were made in duplicate on fresh 5 per cent sheep and rabbit blood agar plates on all patients on admission and routinely at weekly intervals during the remainder of their hospital stay or until two successive cultures were negative. The hemolytic streptococci were grouped and typed by the precipitin technic.[6] To avoid cross infections, only patients found to have the same type of group A streptococci were put together in rooms; otherwise they were strictly isolated.

Blood to determine the erythrocyte sedimentation rates and antistreptolysin and antifibrinolysin titers was obtained on admission and at weekly intervals. The erythrocyte sedimentation technic was that of Westergren;[7] the antifibrinolysin tests followed the method of Tillett, Edwards and Garner[8] as modified by Boisvert,[9] and the antistreptolysin determinations were made according to the method of Todd,[10] modified as previously described.[11]

With the subjects in the supine position, standard three lead electrocardiograms were obtained on all patients at the time of admission and at least once a week thereafter. Daily records were taken on 15 of the patients.

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OBSERVATIONS

In this study there were 101 males and 9 females ranging in age from 17 to 45 years, with an average of 23 years. The majority had mild attacks of scarlet fever and only a few were severely ill. None were considered critically ill during their scarlatinal infection.

TABLE 1.—*Distribution of Groups and Types of Streptococci Recovered from 110 Cases of Scarlet Fever*

Number of Cases	Group	Type	Number of Cases	Group	Type
8	A	3	3	A	19 6*
1	A	3 14*	2	A	26
6	A	6	8	A	30
1	A	6-14*	1	A	33
6	A	17	2	A	38
1	A	18	5	A	No type †
65	A	19	1	C	—

* Two types recovered from these cases. The type listed first was considered probably responsible for the scarlatinal infection.
† These strains did not type by the precipitin technic. Three proved to contain the T antigen of type 14 by the agglutination method.

Hemolytic streptococci, generally as the predominating micro-organism, were isolated in large numbers on culture from the nasopharynx in every case, and all belonged to group A except one, which belonged to group C. The distribution of the various types is shown in table 1. The group A strains recovered from 5 of the patients could not be typed by the anti-M precipitin technic; 3 of these strains, however, proved to have the T antigen of type 14 by the agglutination method. Two different types were isolated from 5 patients; in these instances, as shown in table 1, the type strain considered to have caused the patient's scarlatinal infection is listed first, and it is believed that the patient was probably carrying the second strain at the onset of his illness.

Sixty-three patients suffered neither purulent complications nor nonpurulent sequelae. During the acute phase of their scarlatinal infection 3 members of this group had mild, transitory joint pains (arthralgia) which subsided with the disappearance of fever; and at no time were there any objective signs of arthritis or other associated rheumatic manifestations in these 3 patients.

Twenty-nine patients suffered purulent complications: 12 had sinusitis, 7 peritonsillar abscess, 5 otitis media, 2 pneumonia, 2 cervical lymphadenitis and 1 both sinusitis and otitis media. Four of these also had electrocardiographic abnormalities and are therefore included in the next group. In addition, 3 others of the 29 had arthralgia during the acute febrile stage of their disease similar to that described in the 3 patients in the first group.

Twenty-two patients showed definite electrocardiographic abnormalities either during the acute stage or late in convalescence from their scarlatinal infection; and it is this group of patients who are of particular interest. The electrocardiographic changes together with other signs and symptoms of possible rheumatic activity which occurred concurrently are shown in table 2.

TABLE 2.—*The Correlation of the Electrocardiographic Abnormalities with Other Signs and*

Patient	Age	Sex	Type of Group A Streptococci Cultured from Nasopharynx	Day of Scarlet Fever on Which Complication or Sequela Appeared	Electrocardiographic Findings: Admission — T Waves Lead 1	Lead 2	Lead 3	PR, Sec	Maximum Change — T Waves Lead 1	Lead 2	Lead 3	PR, Sec	Discharge — T Waves Lead 1	Lead 2	Lead 3	PR, Sec
1	18	♂	6	4 (or less)	—	—	—	0.13	—	—	—	0.13	+	+	Isoelectric	0.16
2	20	♂	19	5	+	+	+	0.15	—	—	—	0.16	+	+	+	0.16
3	25	♂	19	4	+	+	+	0.16	+	+	+	0.22	+	+	+	0.16
4	32	♂	19	10	+	+	—	0.14	+	—	—	0.16	+	±	—	0.16
5	25	♀	19	12	+	+	+	0.16	+	—	—	0.16	+	+	Isoelectric	0.16
6	23	♂	19	27	+	+	—	0.12	±	—	—	0.12	+	+	Isoelectric	0.1,
7	18	♂	3	15	+	+	—	0.12	±	—	—	0.13	+	+	—	0.12
8	21	♂	19	56	+	+	+	0.16	+	+	+ (Rate 130)	>0.20	+	+	+	0.18
9	20	♂	19	10	+	+	+	0.14	+	+	—	0.24	+	+	+	0.16
10	24	♂	19	30	+	+	+	0.16	+	+	+	0.26	+	+	+	0.16
11	18	♂	19	10	+	+	—	0.16	+	—	—	0.16	+	+	—	0.16
12	24	♂	19	30	+	+	∓	0.16	+	+	∓	0.24	+	+	∓	0.16
13	31	♂	19	24	+	+	+	0.16	+	+	+	0.26	+	+	+	0.14
14	32	♂	19	35	+	+	+	0.16	+	+	+	0.28	+	+	+	0.17
15	19	♂	19	19	+	+	—	0.12	+	∓	—	0.19	+	+	—	0.12
16	24	♂	19	23	+	+ V P. C	+	0.15	+	+ RT23 depressed	—	0.22	+	+	—	0.16
17	25	♂	19	23	+	+	+	0.14	+	+	+	0.25	+	+	±	0.14
18	21	♂	19	40	+	+	—	0.20	+	+	—	0.28	+	+	∓	0.20
19	21	♂	19	28	+	+	+	0.14	+	+	—	0.22	+	+	∓	0.16
20	22	♂	19	19	+	+ (T waves low)	∓	0.14	—	— (Dropped beats)	—	0.29	+	+	∓	0.16
21‡	23	♀	17	29	+	+	—	0.16	+	+ (Dropped beats)	+	0.72	+	+	—	0.20
22	20	♂	6	19	+	+	+	0.12	+	+ (Dropped beats)	—	0.60	+	+	+	0.16

* Indicates that these signs or symptoms may be attributed to the scarlatinal infection; → indicates trend of erythrocyte sedimentation rate or white blood cell count, the first figure is the lowest level attained prior to the onset of the sequela and the second figure is the highest level attained after the onset; those without arrows showed no significant change after the subsidence of the scarlatinal infection and during the sequela.
‡ This patient developed subcutaneous nodules.

The first signs or symptoms of cardiac involvement appeared relatively early in patients 1, 2 and 3; that is, within the first five days of their primary streptococcic infections. Two of these patients developed inverted T waves in all three limb leads, and the other developed transient, partial heart block. In addition to showing electrocardiographic abnormalities, all 3 patients complained of mild joint pains; 2 had precordial distress, and 1 of these had also a gallop rhythm. The fever, leukocytosis and elevated erythrocyte sedimentation rates in these patients may all be attributed to their scarlatinal infections. The clinical course of patient 2 is shown in chart 1.

Nineteen patients (4 through 22) developed their signs or symptoms of cardiac involvement during what may be designated as phase 3 of their illness; that

is, between the 10th and 56th days after the onset of their scarlet fever. In this group the temperature had returned to a normal level (phase 2) following the scarlatinal infection in all except patient 11; and in most instances the erythrocyte sedimentation rate and white blood count had returned to normal levels before the onset of the sequelae; that is, of phase 3. In most of these cases, therefore, it is possible to attribute the secondary rise in the temperature, leukocyte count and erythrocyte sedimentation rate to a complicating factor.

Seven of these 19 patients (4 through 10) had no definite clinical signs or symptoms of rheumatic activity contemporaneous with their electrocardiographic abnormalities. Four of these showed inversion of the T wave in lead 2 or in leads 1 and 2; the remaining 3 developed partial heart block. Patient 10 had a slight transient, secondary rise in temperature, leukocyte count and erythrocyte sedimentation rate associated with the electrocardiographic change, patient 9 had a brief secondary rise in temperature and patient 7 had only a transient leukocytosis. The associated increase in temperature, leukocyte count and erythrocyte sedimentation rate in patient 8 cannot be evaluated because of the appearance concurrently of coryza and cough. All of these patients appeared quite well at the time of the electrocardiographic abnormalities and, although repeatedly questioned, were without complaints. The clinical course of patient 10 is shown in chart 2.

Four patients (11 through 14) in addition to showing electrocardiographic abnormalities between the 10th and 35th days after the onset of their scarlatinal infection also complained of transient stiffness or mild pains in their joints, and 3 had accompanying malaise and anorexia. Three of them developed partial heart block and the remaining one showed an inverted T wave in lead 2. Three showed secondary increases in their erythrocyte sedimentation rates coincident with the electrocardiographic changes; 2 of whom also had transitory secondary rises in temperature and leukocyte count. The associated signs and symptoms of possible rheumatic activity in all 4 of these patients were mild and transient, and without the abnormal electrocardiograms they would have been difficult to interpret if not entirely neglected. The clinical course of patient 14 is illustrated in chart 3.

The remaining 8 patients (15 through 22) all had other signs and symptoms obvious enough to indicate the probable character of the sequela without the aid of the electrocardiogram. The associated signs and symptoms of rheumatic fever in patients 15 and 16 were, however, rather mild and transient. In the remaining patients (17 through 22) there could be little question regarding the diagnosis of rheumatic fever. All of them after making an apparently uneventful recovery from their scarlatinal infections developed secondary rises in temperature, leukocyte count and erythrocyte sedimentation rate with polyarthritis and definite electrocardiographic abnormalities varying from transient, partial heart block to heart block with dropped beats together with inversion of the T waves in all three leads. Patient 19 had signs of mitral stenosis when admitted with his scarlatinal infection; hence his attack undoubtedly represents a rheumatic recurrence. Patients 21 and 22 developed definite valvular disease while under observation and while receiving full doses of salicylates or aminopyrine respectively; 2 others, patients 15 and 17, developed soft apical systolic murmurs which were not transmitted; and in 1 of them the murmur disappeared with the subsidence in rheumatic activity. Patient 21 had typical subcutaneous rheumatic nodules. The clinical course of patient 17 is illustrated in chart 4.

Only 2 of the 22 patients showing definite electrocardiographic abnormalities had signs of or gave a history of having previously suffered from rheumatic fever or chorea. As already noted, patient 19 had definite signs of mitral stenosis on admission, although he denied having had rheumatic fever or chorea. Patient 3 gave a definite history of having had rheumatic fever in childhood, although on admission there were no abnormal cardiac findings.

Symptoms of Possible Active Rheumatic Fever Occurring in Twenty-Two Patients with Scarlet Fever

Erythrocyte Sedimentation Rate, Mm. per Hr.	White Blood Cells per Cu. Mm.	Fever, Degrees F.	Other Signs and Symptoms of Possible Rheumatic Fever: Arthritis	Gallop	Murmurs	Malaise	Precordial Pain
60 *	22,500 *	104 *	±	0	No	+ *	+
38 *	13,800 *	103.6 *	±	+	No	+ *	+
60 *	13,100 *	102.6 *	±	0	No	+ *	0
27 *	11,850 *	No	0	0	No	0	0
72 *	13,200 *	No	0	0	No	0	0
44* → 7	6,300	No	0	0	No	0	0
18 → 6	7,300 → 12,800	No	0	0	No	0	0
5 → 14	9,100 → 10,000 (Coryza and cough)	101	0	0	No	+ (Coryza and cough)	0
74 *	36,800 *	101	0	0	No	+ *	0
9 → 35	8,300 → 10,400	100.2	0	0	No	0	0
21 *	9,000	100.5 *	±	0	No	0	0
3 → 13	5,000	No	±	+	No	+	+
37 → 78	11,200 → 13,700	100.8	±	0	No	+	0
2 → 14	8,400 → 12,800	100.2	±	0	Apical systolic	+	0
2 → 37	8,500 → 16,300	102	+	0	Apical systolic	+	0
11 → 43	9,700 → 15,400	100.6	+	0	No	+	+
20 → 88	6,300 → 11,400	103.6	+++	0	Apical systolic	+	0
1 → 24	8,300 → 13,500	101.6	++	0	No	+	0
9 → 91	7,400 → 13,500	102	++	0	Mitral diastolic	+	0
8 → 116	14,200	101.8	++	0	No	+	0
54 → 116	7,700 → 10,000	100.6	++	0	Mitral systolic, aortic diastolic	+	0
33 → 116	13,700	104.8	++	0	Mitral systolic	+	0

SERUM ANTISTREPTOLYSIN O AND ANTI-FIBRINOLYSIN STUDIES

A summary of the serum antistreptolysin O and antifibrinolysin determinations made in the 110 cases of scarlet fever is presented in table 3. A rise in the serum antistreptolysin O content was considered significant only if the titer increased by two or more dilutions. An increase of one dilution over that shown on admission was regarded as a doubtful increase in titer. Patients were considered to have had a definite increase in the antifibrinolysin titration only if between admission and discharge there was a difference of at least 2 degrees of resistance to lysin of their plasma clots. Increases of 1 degree in resistance were considered as doubtful rises.

The results of the antistreptolysin O and antifibrinolysin tests have been divided into three groups according to whether the patients had uncomplicated scarlet fever, whether they suffered purulent complications or had electrocardiographic changes (table 3). The number of cases is too small to draw any conclusions by comparing the results obtained in one group with those in another. The total number of patients, however, is probably large enough to allow a comparison of the results of the two tests in the entire group. Ninety-four (85.5 per cent) of the patients showed a definite increase in their serum antistreptolysin O titers, while only 68 (61.8 per cent) showed a definite increase in the resistance of their plasma clots in the antifibrinolysin test. Thirteen (11.8 per cent) and 14 (12.7 per cent) had doubtful increases in their antistreptolysin O and antifibrinolysin titrations respectively, while only 3 (2.7 per cent) had no increase in antistreptolysin O titer against 21 (19.1 per cent) for the antifibrinolysin titer. Seven (6.4 per cent) of the patients had 4 plus resistance to lysis of their plasma clots on admission, so that further degrees of resistance could not be measured. These results are essentially the same as those previously reported by Mote and Jones [12] in 124 cases of scarlet fever.

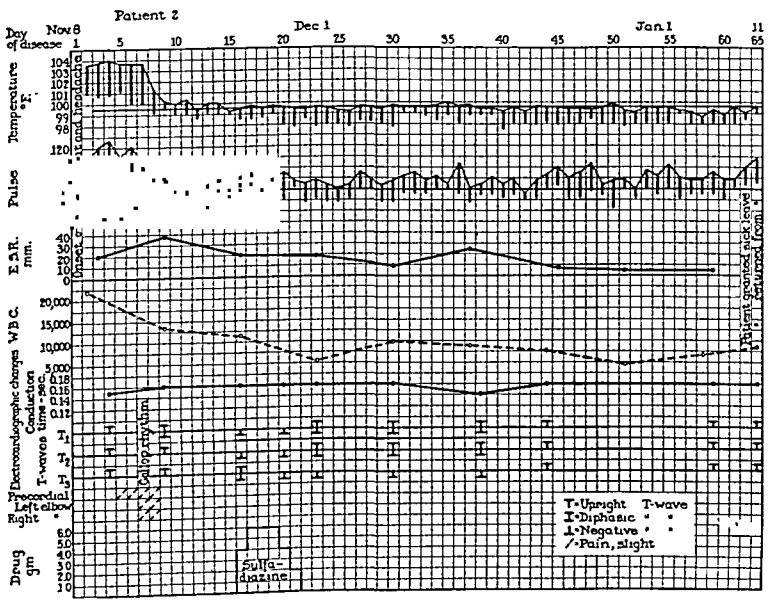


Chart 1.—Clinical course in case 2.

12. Mote, J. R., and Jones, T. D.: Studies on Hemolytic Streptococcal Antibodies in Control Groups, Rheumatic Fever and Rheumatoid Arthritis: II. The Frequency of Antistreptolysin O, Antifibrinolysin and Precipitating Antibody Responses in Scarlet Fever, Hemolytic Streptococcal Infections and Rheumatic Fever, J. Immunol. **41**: 61-85 (May) 1941.

COMMENT

An analysis of the complications and sequelae which occurred among 110 young adults with scarlet fever, who were intensively studied, has been presented. Group A streptococci were recovered on culture from the nasopharynges of 109 patients and a group C strain from the remaining one. Sixty-three patients had uncomplicated infections, 29 suffered purulent complications and 22, including 4 who also suffered purulent complications, developed definite and unequivocal electrocardiographic abnormalities, 3 during their acute infection and 19 later in postscarlatinal convalescence. It is this last group of patients with which this study is particularly concerned.

Electrocardiographic changes have been described in many acute infections,[13] including scarlet fever. The changes previously described in acute infections other than scarlet fever and diphtheria were generally observed during the acute phase of the disease, although slight increases in the auriculoventricular conduction time without other associated signs and symptoms have been noted during convalescence from pneumonia. In contrast to this, the changes noted in scarlet fever often occur late in convalescence and are frequently associated with transient joint pains, rises in temperature and leukocyte count.

It is now generally recognized that rheumatic fever is usually, if not invariably, preceded by a group A streptococcic infection (phase 1). It is also well known that there is ordinarily an asymptomatic period (phase 2) varying in length from a few days to several weeks between the acute streptococcic infection and the onset of rheumatic manifestations (phase 3). Today scarlet fever is considered a streptococcic infection. Whether the person with a streptococcic upper respiratory infection develops scarlet fever or only tonsillitis or pharyngitis seems to be determined largely by two factors; namely, the host's relative susceptibility to the erythrogenic toxin and the ability of the infecting streptococcus to produce this toxin in effective amounts. With these facts well established, it appears unreasonable to designate the symptom complex arthritis and carditis which follows scarlet fever by a different name from that applied to a similar complex which may follow tonsillitis or pharyngitis.

In view of these facts it is pertinent to consider the relationship to rheumatic fever of the condition causing the electrocardiographic abnormalities in the 22 patients considered in this study. Since the diagnosis of rheumatic fever rests on certain clinical signs and symptoms together with nonspecific laboratory evidence of infection and specific evidence of a previous hemolytic

13. Brow, G. R.: The Heart in Typhoid Fever, Canad. M. A. J. **20**: 606-608 (June) 1929. Master, A. M.; Romanoff, A., and Jaffe, H.: Electrocardiographic Changes in Pneumonia, Am. Heart J. **6**: 696-709 (June) 1931. Master, A. M., and Jaffe, H.: Electrocardiographic Evidence of Cardiac Involvement in Acute Disease, Proc. Soc. Exper. Biol. & Med. **31**: 931-933 (May) 1934. Marvin, H. M.: The Effect of Diphtheria on the Cardiovascular System: I. The Heart in Faucial Diphtheria, Am. J. Dis. Child. **29**: 433-476 (April) 1925. Porter, W. B., and Bloom, N.: The Heart in Typhoid Fever: A Clinical Study of 30 Patients, Am. Heart J. **10**: 793-797 (Aug.) 1935. Cushing, E. H.: Electrocardiographic Changes in Trichinosis, ibid. **11**: 494-496 (April) 1936. Burkhardt, E. A.; Eggleston, C., and Smith, L. W.: Electrocardiographic Changes and Peripheral Nerve Palsies in Toxic Diphtheria, Am. J. M. Sc. **195**: 301-313 (March) 1938. Fuller, C. C., and Quinlan, J. W.: Acute Pneumonitis and Pericarditis, Report of a Case, New England J. Med. **229**: 399-401 (Sept. 2) 1943. Woodward, T. E., in collaboration with Bland, E. F.: Clinical Observations in Typhus Fever, with Special Reference to the Cardiovascular System, J. A. M. A. **126**: 287-293 (Sept. 30) 1944.

streptococcic infection, we realize that the answer is not subject to experimental proof It is generally conceded, however, that carditis is one of the major manifestations of rheumatic fever, and also that one of the most characteristic signs of active rheumatic carditis is the occurrence of electrocardiographic abnormalities. Therefore, on the basis of these two factors, all of the 22 patients have suffered an infection with an agent recognized as playing an important role in inducing rheumatic fever and also had at least one of the characteristic signs of carditis

Without doubt 8 of these patients (15 through 22) had definite clinical evidence of rheumatic fever of varying severity. All 8 developed polyarthritis and electrocardiographic abnormalities accompanied by secondary rises in temperature, leukocyte count and erythrocyte sedimentation rate between the 19th and the 40th day after the onset of their streptococcic infection. Two, in addition, developed definite evidence of valvular disease, 1 of whom also had subcutaneous rheumatic nodules; and a third had mitral stenosis on admission as evidence of a previous rheumatic infection. Four other patients (11 through 14) differed from these 8 largely in that their rheumatic-like manifestations were milder and more transitory. All 4 had transient stiffness of the joints or mild joint pains concurrent with their electrocardiographic changes ten to thirty-five days after the onset of their scarlatinal infection; 2 in addition had slight secondary rises in temperature, leukocyte count and erythrocyte sedimentation rate; and a third had a slight increase in the erythrocyte sedimentation rate with precordial pain and gallop rhythm. Seven other patients (4 through 10) developed similar electrocardiographic abnormalities without other associated symptoms of rheumatic activity ten to fifty-six days after the onset of their scarlatinal infections. Patient 10 had a secondary rise in temperature, leukocyte count and erythrocyte sedimentation rate, while patient 9 had a brief secondary rise in temperature and patient 7 had only slight, transient leukocytosis associated with the electrocardiographic abnormalities.

From the foregoing description it is apparent that the difference between these three groups of patients is largely one of degree: it is quantitative rather than qualitative. All had a group A streptococcic infection—many with the same serologic type from the same scarlet fever epidemic—followed ten to fifty-six days later by definite electrocardiographic abnormalities of the type commonly observed in patients with active rheumatic carditis. It therefore appears most likely that the mechanism [14] by which the abnormal electrocardiograms were produced was the same in all of these patients irrespective of the occurrence of other rheumatic manifestations, and that all suffered from the same fundamental tissue injury following their streptococcic infection; namely, that characteristic of rheumatic fever.

It is somewhat more difficult to relate the changes found in the first 3 patients to those induced by rheumatic fever, largely because of the time element involved; for electrocardiographic abnormalities occur not infrequently during the acute phases of many different infections entirely unrelated to rheumatic fever. It is therefore quite possible that the early electrocardiographic abnormalities in these 3 were due to the same mechanism which cause similar abnormalities to occur in other acute infectious diseases. It is noteworthy, however, that all 3 of these patients had mild associated joint pains, 2 complained of precordial distress, and 1 of these had also a gallop rhythm. It may also be significant that 1 of the patients had previously suffered from rheumatic fever.

Mallory and Keefer [15] have recently described the histopathologic lesions in the hearts and other organs in 90 fatal cases of hemolytic streptococcic infections, including 47 cases of scarlet fever. The lesions found in the hearts of the scarlet fever patients consisted for the most part of focal accumulations of lymphocytes, plasma cells and histiocytes, at times with a few polymorphonuclear leukocytes, and a rare eosinophil. These lesions were most numerous in the subendothelial and perivascular connective tissues, which in general were the sites of the Aschoff bodies found in the control

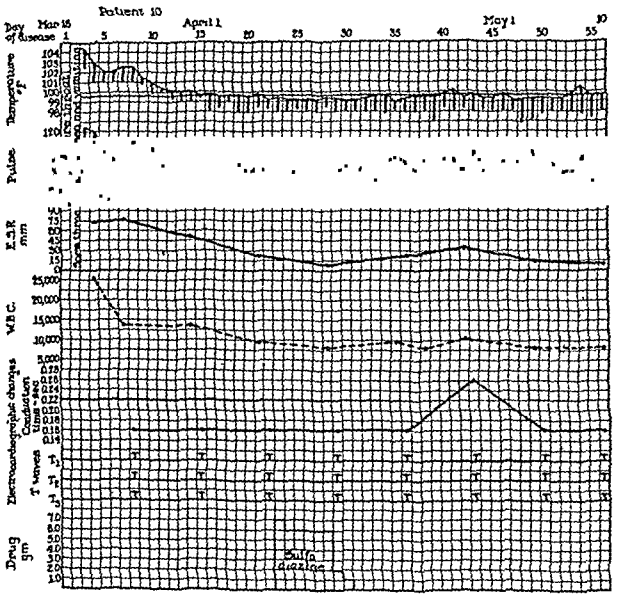


Chart 2.—Clinical course in case 10.

rheumatic hearts. Tying in with our clinical observations, it is of interest to note that these authors found these focal lesions to occur most commonly in the hearts of patients under 30 years of age who had survived their streptococcic infections for at least six to ten days. Mallory and Keefer propose the interesting hypothesis that these focal lesions may be an early stage of Aschoff body formation and present some evidence to support this concept. Similar lesions have been described by previous workers; [16] however, the interpretations of their findings have not been the same.

The cardiac abnormalities in the cases described in this study might well be explained on such a pathologic basis and may be interpreted as giving some clinical support to Mallory and Keefer's hypothesis. That is, those patients showing only transient changes late in convalescence may have had only focal collections of cells in their hearts, and these lesions then rapidly

14. We are aware that there is some evidence (Bruenn, H. G.: The ... ventricular Conduction in Acute Rheu... 1: 413 425 [April] 1937 and Keith, J. D.: ... rve in Rheumatic Fever, Quart. J. Med. ... *that the prolongation of the PR interval* associated with active rheumatic fever may be supraventricular in origin However, the great majority of cases described in this study presented other signs of infection, or symptoms of carditis or rheumatic fever, concurrent with the prolonged PR interval We therefore believe that in these cases the prolonged PR interval was indicative of carditis, regardless of the mechanism by which it is produced

15. Mallory, G. K., and Keefer, C. S.: Tissue Reactions in Fatal Cases of Streptococcus Hemolyticus Infections, Arch. Path. 32: 334-355 (Sept.) 1941.

16. Fahr, T.: Vergleichende Herzuntersuchungen bei Scharlach, Streptokokkeninfektion und rheumatischer Granulomatose, Beitr. z. path. Anat. u. z. allg. Path. 83: 445-468 (Nov.) 1930. Fahr,[17] Siegmund,[18] Eckert-Möbius [19]

regressed. Those patients who in addition to the electrocardiographic changes had transient joint pains with secondary rises in temperature, leukocyte count and erythrocyte sedimentation rate may have had more numerous and more widespread lesions, possibly persisting longer and progressing to a stage more comparable with that shown by rheumatic granulomas as described by Fahr,[17] Siegmund [18] and Eckert-Möbius.[19]

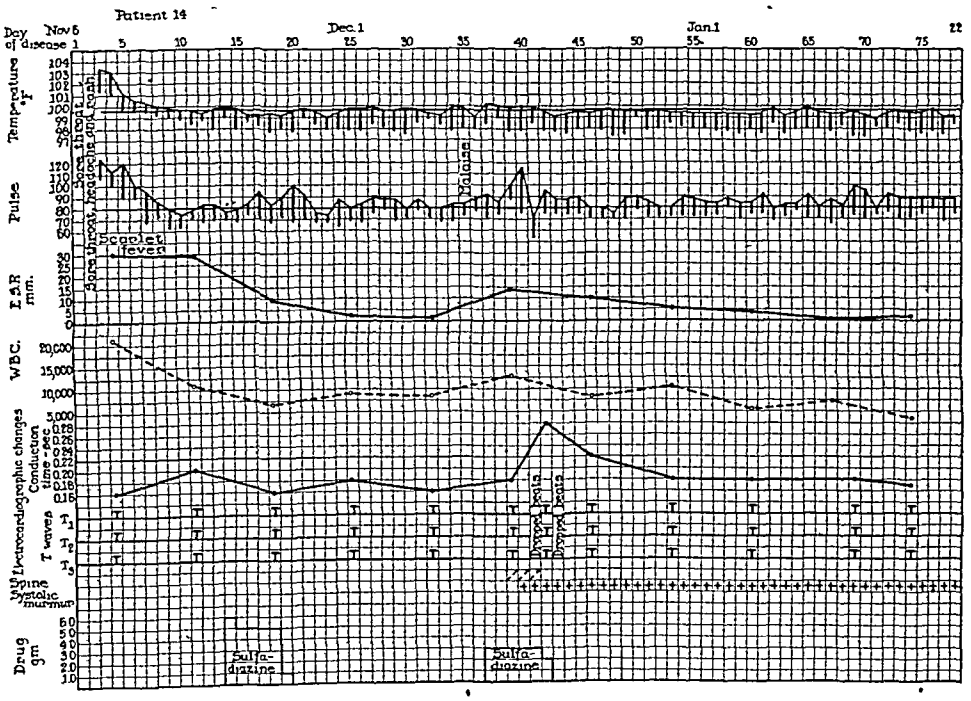


Chart 3.—Clinical course in case 14.

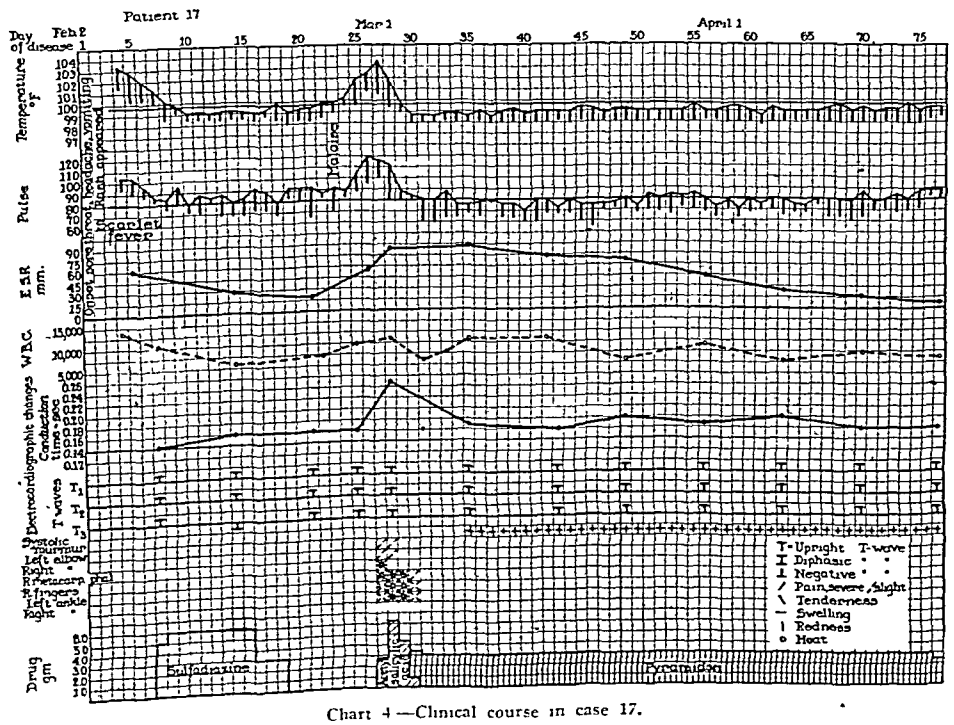


Chart 4.—Clinical course in case 17.

Those patients who had definite clinical attacks of rheumatic fever probably had comparable early lesions which, because of continued activity due to some unknown reason, in many instances progressed to form typical Aschoff bodies. Such an explanation would fit in well with our opinion that the fundamental tissue injury in all of these patients is essentially the same but that the response varies in intensity.

Whether the focal lesions described by Mallory and Keefer result from antigen-antibody reaction (allergic) in the tissues as these authors have suggested is impossible to say. Schick [20] and later Escherich and Schick [21] advanced the theory that the sequelae occurring from the end of the second week and lasting as long as seven weeks after the onset of the scarlet fever, with the greatest frequency in the third and fourth weeks, are allergic in nature. One of us [22] has previously emphasized this point of view. There is much evidence now to support such a hypothesis; namely, (1) the location and microscopic appearance of the lesions are consistent with an allergic reaction, (2) the lesions are more frequent late in the course of the disease than early and (3) similar types of lesions have been induced in rabbits by injection of foreign serums by Klinge,[23] Vaubel,[24] Junghans [25] and, more recently, Rich and Gregory.[26]

Nonpurulent arthritis or arthralgia is a well known concomitant or sequel of scarlet fever. Weaver [27] observed this complication in about 10 per cent of 5,595 cases and showed that the incidence increased with age. It was observed in 3.6 per cent of 10,000 cases at the Edinburgh City Hospital [28] and in 3.58 per cent of 153,607 cases in the Metropolitan Asylum Board Hospitals.[29] The arthritis or arthralgia may occur at any time during the course of the disease or in late convalescence. Secondary fever and leukocytosis often accompany the arthritis occurring in postscarlatinal

17. Fahr, T.: Beiträge zur Frage der Herz- und Gelenkveränderungen bei Gelenkrheumatismus und Scharlach, Virchows Arch. f. path. Anat. 232: 134-159 (July) 1921.
18. Siegmund, H.: Veränderungen der Gefasswände und des Endokards bei Scharlach, Centralbl. f. allg. Path. u. path. Anat. 44: 314 (Feb.) 1929.
19. Eckert Möbius, J.: Beitrag zur Frage der Scharlachmyokarditis, Arch. f. Kreislaufforsch. 9: 91-122 (July) 1941.
20. Schick, B.: Die Nachkrankheiten des Scharlach, Jahrb. f. Kinderh., Ergänzungsh. 65: 132-173, 1907.
21. Escherich, T., and Schick, B.: Scharlach, Vienna, Alfred Hölder, 1912.
22. Swift, H. F.: The Heart in Infection, Tr. Cong. Am. Physicians and Surgeons 14: 39-61 (May) 1928.

convalescence. Most observers agree that the arthritis which occurs in postscarlatinal convalescence cannot be distinguished from the arthritis associated with rheumatic fever. Actually, we believe that there is no reason to differentiate the two, because they are probably due to the same fundamental tissue injury. If frequent electrocardiograms were taken in these so-called postscarlatinal arthritis cases, a high percentage would probably show abnormal changes, as was previously observed by Roelsen.[29]

All of the patients considered in this report who developed arthritis or arthralgia late in postscarlatinal convalescence also showed abnormal electrocardiograms. Six patients in our series, however, had mild transient joint pains without electrocardiographic or other rheumatic manifestations during the early acute phase of their streptococcic infection. Whether the joint manifestations in these early cases is due to the same mechanism that produces those late in convalescence is difficult to answer at present. It is noteworthy, however, that the arthralgia seen during the acute stage of scarlet fever is rarely accompanied by evidence of exudation, such as is frequently seen with the arthritis later in convalescence. Healey[30] and Rhoads and Afremow[31] have found that a high percentage of patients developing joint pains following the injection of streptococcic erythrogenic toxin give a past history or have evidence suggestive of previous rheumatic infection. They therefore interpret their results as evidence that these individuals are sensitive to the erythrogenic toxin or other streptococcic products in the sterile filtrate injected. The mechanism of the arthralgia seen early in scarlet fever might be explained on a similar basis, but, on the other hand, it might be due to a direct toxic damage to the tissues.

Many patients with rheumatic valvular disease fail to give a history of previous attacks of rheumatic fever or chorea. White[32] estimates that a definite history of rheumatic fever can be elicited in only about 70 per cent and a history of chorea in another 5 to 10 per cent. Recently Levy, Stroud and White[33] found that 68.8 per cent of 2,250 rejected draftees with definite rheumatic valvular cardiac disease failed to recall any symptoms or signs of rheumatic fever or chorea earlier in life. Whether patients such as we have observed, with only electrocardiographic abnormalities or with associated mild arthralgia, contribute to such a "history negative" group cannot be answered at present. One might argue that they do not, because the brevity of the signs and symptoms of rheumatic carditis would hardly be expected to lead to severe and permanent valvular damage. Since we consider that these patients suffered true first attacks of rheumatic fever, we therefore believe that they should be regarded as more liable to rheumatic recurrences than normal subjects and as more likely to develop permanent cardiac damage following subsequent hemolytic streptococcic infections. Because the extent of permanent cardiac damage in rheumatic subjects is roughly proportional to the number of attacks of rheumatic fever they have suffered, it seems only logical to place this class of patients in a category to which special measures should be applied for the prevention of hemolytic streptococcic infection.

TABLE 3.—*Summary of the Antistreptolysin O and Antifibrinolysin Determinations in 110 Cases of Scarlet Fever*

Type of Case	Number of Cases	Antistreptolysin O Titer: Increased Number	Increased Per Cent	Doubtful Increase Number	Doubtful Increase Per Cent	No Increase Number	No Increase Per Cent	Antifibrinolysin Titer: Increased Number	Increased Per Cent	Doubtful Increase Number	Doubtful Increase Per Cent	No Increase Number	No Increase Per Cent	Not Measured Number	Not Measured Per Cent
	66	56	88.9	4	6.3	3	4.8	38	60.2	8	12.7	15	23.8	2	3.2
	25*	20	80.0	5	20.0	0	0.0	15	60.0	2	8.0	5	20.0	3	12.0
	22	18	81.8	4	18.2	0	0.0	15	68.2	4	18.2	1	4.5	2	9.1
Total	110	94	85.5	13	11.8	3	2.7	68	61.8	14	12.7	21	19.1	7	6.4

* Four other patients also had purulent complications in addition to electrocardiographic abnormalities and are therefore included in the latter group

SUMMARY AND CONCLUSIONS

The purulent complications and nonpurulent sequelae which occurred among 110 cases of scarlet fever in young adults who were intensively studied were analyzed. Group A streptococci, representing at least thirteen different types, were recovered on culture of the nasopharynges of 109 patients and a group C strain from the remaining one. Antistreptolysin O and antifibrinolysin titrations were made with the serums and plasmas respectively of all patients at weekly intervals.

Sixty-three patients had uncomplicated infections and made uneventful recoveries; 29 suffered purulent complications; and 22, including 4 who also had purulent complications, developed pronounced and unequivocal electrocardiographic abnormalities comparable with those seen in patients with active rheumatic carditis. Three of these 22 patients developed abnormal electrocardiograms during their acute streptococcic infection and the other 19 during postscarlatinal convalescence. It is this latter group of 19 patients who are of particular interest in this study.

Eight of the 19 patients who developed electrocardiographic abnormalities during postscarlatinal convales-

23 Klinge, F. Die Eiweissüberempfindlichkeit (Gewebsanaphylaxie) der Gelenke, Beitr. z. path. Anat. u. z. allg. Path. **83**: 185-216 (Nov.) 1929.

24 Vaubel, E. Die Eiweissüberempfindlichkeit (Gewebshyperergie) des Bindegewebes (II. Teil), Beitr. z. path. Anat. u. z. allg. Path. **89**: 374-418 (May) 1932.

25 Junghans, E. Weitere Untersuchungen über die hyperergische Carditis und Arteritis insbesondere die Aortitis, Beitr. z. path. Anat. u. z. allg. Path. **92**: 467-475 (Feb.) 1934.

26 Rich, A. R., and Gregory, J. E. Experimental Evidence that Lesions with Basic Characteristics of Rheumatic Carditis Can Result from Anaphylactic Hypersensitivity, Bull. Johns Hopkins Hosp. **73**: 239-264 (Oct.) 1943.

27. Weaver, G. H.: Scarlet Fever, Pediatrics, edited by I. A. Abt, Philadelphia, W. B. Saunders Company, 1925, vol. 6, pp. 298-362.

28. Ker, C. B.: Ker's Infectious Diseases: A Practical Text Book, ed. 3, revised by C. Rundle, London, Humphrey Milford, Oxford University Press, 1929, pp. 116-119.

29. Rolleston, J. D.: Acute Infectious Diseases: A Handbook for Practitioners and Students, ed. 2, London, William Heinemann, Ltd., 1929, pp. 270-272.

30. Healey, C. E.: The Cause of Joint Pain Occurring During Active Immunization with Scarlet Fever Streptococcus Toxin, J. A. M. A. **108**: 628-630 (Feb. 20) 1937.

31. Rhoads, P. S., and Afremow, M. L.: The Significance of Joint Pains Caused by Sterile Streptococcus Toxin, Ann. Int. Med. **19**: 60-63 (July) 1943.

32. White, P. D.: Heart Disease, ed. 3, New York, Macmillan Company, 1944, p. 326.

33. Levy, R. L.; Stroud, W. D., and White, P. D.: Report of Reexamination of 4,994 Men Disqualified for General Military Service Because of the Diagnosis of Cardiovascular Defects, J. A. M. A. **123**: 937-944 (Dec. 11), 1029-1035 (Dec. 18) 1943.

cence had definite clinical attacks of rheumatic fever of varying severity. Four others differed from these 8 in that their rheumatic-like manifestations were milder and more transitory. The remaining 7 during a comparable period in their convalescence developed similar electrocardiographic abnormalities without other symptoms of rheumatic fever, although several had brief secondary rises in temperature, leukocyte count or erythrocyte sedimentation rate. The difference between these three groups of patients is quantitative rather than qualitative, and we believe that all suffered from the same fundamental tissue injury following their streptococcic infection; namely, that characteristic of rheumatic fever.

AN OUTBREAK OF SONNE DYSENTERY

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History indicates that bacillary dysentery is almost as old as war itself. It is said that dysentery decimated the army of Napoleon in its retreat from Moscow. Though no accurate figures are available from the Revolutionary War, there were 285,000 cases of dysentery in the federal army alone during the Civil War.

In World War I bacillary dysentery was the most important disease in the British armies in the Eastern Mediterranean area and at Gallipoli was responsible for almost 100,000 casualties. Many writers have claimed that dysentery was more important than the Turks in driving the British troops out of this area.

According to the Surgeon General's report of 1917-1918, 87,700 cases of dysentery and common diarrhea occurred among the American troops in World War I.[1] The average time lost from duty was eleven days in each case. The admission rate in 1917-1918 was 18.45 per thousand, while for the ten year period from 1930 to 1940 it dropped to 1.8 per thousand. Again in 1940-1942, with the mobilization of troops, the rate rose to 10.17 per thousand. It is apparent from these statistics that in times of war, when close congregation of large forces of soldiers is necessary, bacillary dysentery becomes one of the most important diseases encountered by the military surgeon.

World War II has been no exception. A recent report by the Preventive Medicine Division of the office of the Surgeon General,[1] which includes statistics only up to April 1942, already shows data collected on 328 outbreaks of diarrhea. Two hundred and fifty-five occurred in the continental United States and 73 abroad, affecting nearly 25,000 soldiers. Laboratory studies, made on approximately 100 of these outbreaks, indicated that roughly 50 per cent were due to one of the members of the bacillary dysentery group.

This presentation is concerned with an outbreak which occurred in a basic training center of the Army Air Forces during the summer of 1943, persisting in epidemic form for about eight weeks and then gradually tapering off.

Epidemiology revealed that the source of this outbreak began at a new target range located at some distance from the main camp but connected with it. Investigation clearly indicated that the epidemic was fly borne. Bacteriologic studies by Cohn[2] of the hospital laboratory and further corroborated by Kuhns[3] revealed the causative organism to be Bacterium sonnei. During this period of approximately four months following the onset of the outbreak, positive cultures of this organism were obtained in 181 cases.

The clinical picture of this group of cases was typical of the description found in most textbooks for the Sonne type of bacillary dysentery. By and large the cases were mild in severity. The duration of active symptoms was only three to four days. The onset in the majority of cases was sudden and the chief symptoms were chills, fever, malaise, backache and cramping abdominal pains associated with diarrhea and usually tenesmus. In most patients the diarrhea was only moderately severe, with the number of stools ranging from 2 to 20, for an average of 8 daily. The stools were watery and greenish mucoid in character in the vast majority of cases. In 10 cases (5 per cent) the stools were tinged with blood. There were no gross hemorrhages. Tenesmus was present in most of the cases but was not severe in any. Fever was present in 75 per cent of the cases admitted in the acute stage, ranging from 99 to 104 F., with an average of 101 F. Chills or chilly sensations were present in nearly 50 per cent of the cases. Although most of the patients showed some evidence of malaise or weakness, none were sufficiently prostrated from toxicity or dehydration to warrant the parenteral administration of fluids. The fever persisted as a rule for two to four days, and the diarrhea subsided after four to seven days with or without specific treatment. There were no complications and no fatalities.

On admission all patients were given bed rest, either a bland or a high protein low residue diet, and camphorated tincture of opium or morphine, depending on the severity of the diarrhea.

During the acute stage the leukocyte count varied from 6,400 to 10,000 per cubic millimeter of blood, averaging 8,200, with 62 per cent polymorphonuclear neutrophils and 37 per cent lymphocytes. It is obvious that most of these cases had perfectly normal total and differential leukocyte counts.

Sigmoidoscopy was performed in 50 cases (27 per cent) during the acute phase of the disease. The findings varied from mild to severe hyperemia and edema to granular mucosal changes and superficial ulceration. The latter occurred in only 5 cases (2.7 per cent).

The diagnosis was confirmed by culture of either fresh stool specimens, rectal swab utilizing the Hardy[4] rubber tube technic or by direct sigmoidoscopic swab. These specimens were inoculated on SS (shigella, salmonella) agar and the organism further identified by fermentative and specific serologic reactions. Emphasis should be placed on the fact that in most cases the culture reports were not available until the acute manifestations of the disease had subsided. It is clear then that any evaluation of treatment would be essentially a determination of the efficacy of various types of therapy in eradicating the carrier state.

1. Simmons, James S.: The Present State of the Army's Health, J. A. M. A. 122: 916-923 (July 31) 1943.

2. Capt. Clarence W. Cohn, M. C., chief of the laboratory service, performed the bacteriologic studies in the cases reported.

3. Col. Dwight Kuhns, M. C., and the staff of the Fourth Service Command Laboratory, corroborated the bacteriologic findings.

4. Hardy, A. V.; Watt, J.; DeCapito, Thelma; Peterson, J., and Schlosser, E.: New Procedures in Bacteriologic Diagnosis: Carriers in Shigella Paradysenteriae; Sulfaguanidine in Control of Shigella Dysenteriae Infections, Pub. Health Rep. 57: 521 (April 10) 1942.

As it appeared that a large number of soldiers were developing the disease, an excellent opportunity was at our disposal for the study and appraisal of existing methods of specific treatment.

The use of sulfonamides in the treatment of bacillary dysentery is not particularly new. Many reports have appeared during the past four years attesting the value of sulfonamides on the course of acute, chronic or the carrier state of bacillary dysentery. The pioneer work of Marshall and his associates [5] reported in January 1941 marked the advent of chemotherapy in bacillary dysentery when they demonstrated the value of the drug sulfaguanidine in rendering negative the stools of 15 out of 17 children affected with the disease. Since then other workers [6] have shown the value of this drug in controlling relatively large epidemics of the various forms of this disease both in the Middle East and in Puerto Rico.

In 1942 Poth, Knotts and their co-workers [7] reported on the efficacy of a newer sulfonamide, the succinyl salt of sulfathiazole, which, they reported, had a striking bacteriostatic effect not only against the usual intestinal flora but also against the strains of Shiga, Flexner and Sonne dysentery bacilli.

Hoagland, Harris and Raile,[8] in a series of 45 carriers of Bacterium paradysenteriae, divided into two groups, observed equally good results with either of the aforementioned drugs. They employed a dosage of 20 Gm. daily for six days and; regardless of the drug used, obtained 100 per cent cure of the carrier state. This work was supported by lengthy observations of cultures over a period of seventeen to sixty days.

Smyth and his associates,[9] using a similar dosage of sulfaguanidine and approximately the same dosage of succinylsulfathiazole, also observed fairly satisfactory results. However, in view of failures with each type of therapy and the potentially greater toxic effects of sulfaguanidine, they concluded that succinylsulfathiazole was the drug of choice.

Paulley,[10] in reviewing his experiences in the treatment of dysentery in the Middle East, found that sulfapyridine was more effective than sulfaguanidine in the management of acute bacillary dysentery. Unfortunately, stress of circumstances prevented complete follow-up cultures in this series.

Yannet, Leibovitz and Deutsch,[11] using plain sulfathiazole in the treatment of 27 patients suffering from Sonne dysentery, found that this sulfonamide, though producing a more rapid clinical recovery, allowed more cases to persist as carriers than those not treated in this manner.

Page,[12] in his recent report of 500 cases, 208 of which proved to be due to members of the genus Shigella, found after careful follow-up cultures 97.3 per cent cured with 130 Gm. of sulfaguanidine given in a ten day period. Page used as a secondary treatment sulfadiazine in a dosage of 22 Gm. given in a five day period and was able to render the remainder (2.7 per cent) dysentery free.

Eisenoff and Goldstein,[13] using all of the aforementioned sulfonamides except sulfapyridine in an outbreak of Sonne dysentery, found all of these agents effective in 90 per cent of the cases and eliminated the carrier state in the remaining 10 per cent by a second administration of the drug.

From this review it is evident that all of the sulfonamides have a beneficial action in acute bacillary dysentery but possess a somewhat varying effect on the eradication of the carrier state.

Since the outbreak of World War II, sulfaguanidine has attained considerable prominence in the treatment of this disease. However, it is apparent that a wide divergence of opinion exists as to the optimum dosage, with amounts varying from 4 Gm. daily for seven days [14] to as high as 20 Gm. daily for six days.[8]

Prior to 1942 little had appeared in the literature regarding the toxic effects of sulfaguanidine. Cole [15] reported a severe sulfaguanidine intoxication in a case of ulcerative colitis. He utilized a dosage of 0.1 Gm. per kilogram (roughly 6-7 Gm.) initially followed by 0.05 Gm. per kilogram (3.5 Gm.) at four hour intervals. After 110 Gm. had been given a severe intoxication developed, which was manifested by vomiting, fever, oliguria and a morbilliform rash. At the height of this reaction the blood level was only 2 mg. per hundred cubic centimeters. Recently Whyte [16] reported evidence of renal irritation in 14 out of 25 cases treated. He utilized only 9 Gm. a day for three days followed by 6 Gm. a day for four days (total dosage 51 Gm.).

Bunting and Levan,[17] reporting on the treatment of 191 soldiers with bacillary dysentery, noted objective evidence of toxicity in 11.5 per cent and subjective manifestations in 20 per cent. Crystalluria was found in 26.5 per cent, drug fever in 9.4 per cent, skin reactions in 5 cases and transient hematuria in 4. They gave 3.5 Gm. three times daily for a ten day period, a total dose of 105 Gm. They concluded that sulfaguanidine is not without its dangers and that caution in its administration should be exercised. Schnitker,[18] in reviewing the literature on the toxic manifestations of sulfaguanidine, stated that the overall toxicity was 1 to 2 per cent and concluded that the untoward effects seem slightly more frequent with this drug than with succinylsulfathiazole.

In view of the foregoing reports it was decided to assess the value of sulfaguanidine in the treatment of bacillary dysentery, with utilization of the smaller dosage as recommended by Opper and Hale.[14]

The other sulfonamide chosen was succinylsulfathiazole. This was selected in view of the reported infrequency of toxic effects.[19]

5. Marshall, E. K., Jr.; Bratton, A. C.; Edwards, Lydia B., and Walker, Ethel [illegible] n Treatment of Acute Bacillary Dysentery in [illegible] opkins Hosp. **68**: 94 (Jan.) 1941.

6. Fairley, [illegible] K.: Sulfaguanidine in Bacillary Dysentery, Lan[illegible] 1942. Cornell, V. H.; Watt, J., and Dammin, [illegible] in the Control of Shigella Para-dysenteriae In[illegible] Surgeon **92**: 253 (March) 1943.

7. Poth, E. [illegible] Clinical Use of Succinylsulfathiazole, Arch. Surgery **44**: 208-222 (Feb.) 1942.

8. Hoagland, Robert J.; Harris, F. H., and Raile, R. B.: Treatment of Bacillary Dysentery Carriers, War Med. **4**: 400-403 (Oct.) 1943.

9. Smyth, C. J.; Finkelstein, M. B.; Gould, S. E.; Koppa, T. M., and Leeder, F. S.: Acute Bacillary Dysentery: Treatment with Sulfaguanidine and Succinylsulfathiazole, J. A. M. A. **121**: 1325-1330 (April 24) 1943.

10. Paulley, J. W.: Treatment of Bacillary Dysentery in the Middle East, Lancet **2**: 592 (Nov. 21) 1942.

11. Yannet, H.; Leibovitz, A., and Deutsch, J. V.: Sulfathiazole in Epidemic Sonne Dysentery, J. A. M. A. **120**: 184-188 (Sept. 19) 1942.

12. Page, S. G.: Sulfaguanidine in the Treatment of Bacillary Dysentery, Bull. U. S. Army M. Dept., January 1944, pp. 50-62.

13. Eisenoff, H. M., and Goldstein, Hyman: The Control of an Outbreak of Bacillary Dysentery with Sulfonamides, J. A. M. A. **123**: 624-626 (Nov. 6) 1943.

14. Opper, L., and Hale, V.: Sulfaguanidine in the Treatment of Dysentery (Bacterium Flexneri) Carriers, J. A. M. A. **119**: 1489-1491 (Aug. 29) 1942.

15. Cole, S. L.: Sulfaguanidine Toxicity in a Case of Ulcerative Colitis, J. A. M. A. **120**: 196-197 (Sept. 19) 1942.

16. Whyte, J. H. S.: Sulfaguanidine and Renal Damage, Brit. M. J. **1**: 373 (March 11) 1944.

17. Bunting, J. J., and Levan, N. E.: Toxic Reactions of Sulfaguanidine Therapy, J. A. M. A. **125**: 773-774 (July 15) 1944.

18. Schnitker, M. A.: Oxford Medicine, edited by Henry Christian, New York, Oxford University Press, vol. 4, part 3, p. 938.

19. Crohn, B. B.: The Clinical Use of Succinylsulfathiazole (Sulfasuxidine), Gastroenterology **1**: 140-146 (Feb.) 1943. Streicher, M. H.: Sulfonamides: A Clinical Evaluation in Infectious Diseases of the Colon, M. Clin. North America **27**: 189 (Jan.) 1943. Poth and Knotts,[7] Schnitker.[18]

Criticism might be directed to the fact that the sulfonamides producing a high blood concentration were not considered. We are fully aware that acute bacillary dysentery is not a condition confined to the intestinal mucosa but a tissue and systemic disease. Thus during the acute diarrhea phase it is probable that sulfonamides producing immediate high blood levels are desirable. However, as previously mentioned, most of the patients in this study were over the acute stage in such a short time that the problem resolved itself chiefly into eradication of the carrier state. In this situation sulfonamides producing a low blood level and a high bowel concentration might be the drugs of choice.

TABLE 1.—*Results in 181 Cases*

	Types of Therapy	No. of Cases	Results: Cures: No. of Cases	Results: Cures: Per Cent	Results: Failures: No. of Cases	Results: Failures: Per Cent
1	Controls	33	26	79	7	21
2	Sulfaguanidine (1 Gm. q. i. d. 7 days)	21	16	76	5	24
3	Sulfaguanidine (2 Gm. q. i. d. 7 days)	7	6	85.9	1	14.19
4	Succinylsulfathiazole 0.25 Gm./Kg. body weight per day for 7 days	71	70	98.5	1	1.5
5	Polyvalent bacteriophage 2 capsules (50 mg. each) q. i. d. for 2 days	49	40	81.7	9	18.3
	Total number of cases	181	158	87.3	23	12.7

As failures have been reported with all the aforementioned chemotherapeutic agents, it was only appropriate to investigate the status of the bacteriophage as a means of overcoming the carrier state. The theory of its use in the treatment of bacillary dysentery is not new. As long ago as World War I d'Herelle[20] attempted the treatment of bacillary dysentery with this specific agent, with questionable results. More recently Gantenberg,[21] in an epidemic of bacillary dysentery following the German invasion of Poland, reported inconclusive and unsatisfactory results with a polyvalent bacteriophage made by Behring. On the other hand, Compton[22] has recommended it in Cairo, where it is said to have become quite popular.

PLAN TO STUDY

In the beginning the original intention was to divide all of the cases into four equal groups, but as the epidemic assumed greater proportions it became imperative that more cases be given the type of therapy which had shown the greatest degree of success. These four groups were treated in the following manner:

1. Controls, treated symptomatically.
2. Sulfaguanidine 1 Gm. four times daily for seven days, total dose 29 Gm.
3. Succinylsulfathiazole 0.25 Gm. per kilogram of body weight daily for seven days; average total dosage 130 Gm.
4. Polyvalent dysentery bacteriophage two capsules four times daily for two days, each capsule containing 50 mg.

The last named material was supplied through the courtesy of Larkum[23] of the Army Medical School. This bacteriophage was active against the entire Shigella genus and was lyophilized so that each 50 mg. was equivalent to 25 cc. of the original phage.

Although many other patients with diarrhea were admitted to the hospital during this outbreak, only those were treated who were proved by culture to have Bacterium sonnei infection. Table 1 reveals the results obtained in 181 proved cases with the different types of therapy. It will be noted that the table includes an additional group. The creation of this group was due to a relatively high percentage of failures when the smaller dosage schedule of sulfaguanidine was used. The dosage of sulfaguanidine was doubled in this new group, 2 Gm. being given four times daily for a seven day period.

TABLE 2.—*Treatment of Failures*

	Unsuccessful Primary Therapy	Number of Failures	Successful Secondary Therapy: Control Management Alone	Sulfaguanidine, 1 Gm. q. i. d.	Sulfaguanidine, 2 Gm. q. i. d.	Succinylsulfathiazole, 0.25 Gm./Kg. B. W./Day	Polyvalent Bacteriophage, 2 Capsules q. i. d.	Succinylsulfathiazole and Bacteriophage
1	Controls, symptomatic treatment	7	0	0	0	2	5	0
2	Sulfaguanidine, 1 Gm. q. i. d. 7 days	5	0	0	0	0	3	2
3	Sulfaguanidine, 2 Gm. q. i. d. 7 days	1	0	0	0	1	0	0
4	Succinylsulfathiazole, 0.25 Gm./Kg. daily 7 days	1	0	0	0	0	1	0
5	Polyvalent bacteriophage, 2 capsules q. i. d. 2 days	9	1	0	0	1	3	4
	Total	23	1	0	0	4	12	6

In order to make this tabulation completely understandable, the criteria of cure and the determination of failure must be stated. Cultures were taken three days after the cessation of treatment in all groups except the controls. In the latter the stools were cultured for the first time after the diagnostic culture, nine days after admission. Following this initial culture, successive cultures were taken on the fifth day, twelfth day and nineteenth day following cessation of therapy. If the first or any of the succeeding cultures remained positive for the organism, the case was considered a treatment failure and secondary treatment immediately instituted.

From table 1 it is clear that the greatest percentage of cures was obtained with succinylsulfathiazole, while with the smaller dosage schedule of sulfaguanidine and the prescribed dose of bacteriophage the percentage of cures was actually no better than in those cases in which only a symptomatic regimen was given. It should be noted, however, that when the dosage of sulfaguanidine was doubled the percentage of cures showed a small but definite increase.

It is also apparent from table 1 that some failures occurred with all types of therapy, so that secondary treatment was necessary.

20. d'Herelle, F.: Bacteriophage and Its Behavior, Baltimore, Williams and Wilkins Company, 1926.
21. Gantenberg, cited by Stitt, E. R., and Strong, R. P.: Diagnosis, Prevention and Treatment of Tropical Diseases, ed. 6, Philadelphia, Blakiston Company, vol. 1, pp. 554-556, 578.
22. Compton, Arthur: Treatment of Bacillary Dysentery, Brit. M. J. 2:280 (Aug. 23) 1941.
23. Larkum, N. W.: Personal communication to the authors.

Table 2 demonstrates the type of therapy that was successful after the primary treatment had failed.

There were no failures after a second course of therapy with the twenty-one day period of follow-up cultures. We are fully cognizant of the fact that some of these cases might have reverted to a positive carrier state some weeks or months later. However, in a basic training center where the men are assigned for only a limited period of time, further observation of cultures beyond the twenty-one day period was not feasible. From table 2 it seems likely that a combination of a sulfonamide with a potent bacteriophage may offer some promise of success in overcoming the obstinate carrier problem.

Blood levels were obtained at the beginning and end of the treatment in the majority of patients receiving either one of the sulfonamides. With sulfaguanidine in the low dosage group, the blood levels ranged from 0.9 to 2.0 mg. per hundred cubic centimeters, with an average of 1.2 mg. per hundred cubic centimeters. It is clear that even with very small doses this drug attained a comparatively high blood concentration. On the other hand, with succinylsulfathiazole, when used in doses roughly four times the amount of sulfaguanidine, the blood showed only concentrations varying from 0.12 to 0.31 mg. per hundred cubic centimeters for an average of 0.22 mg. per hundred cubic centimeters. However, despite the wide variance in the range of blood levels, when the two sulfonamides were used there were no toxic reactions in either group. The only untoward reaction noticed was in a few patients on succinylsulfathiazole therapy, who complained of slight frequency and burning on urination.

CONCLUSION

1. One hundred and eighty-one cases of dysentery due to Bacterium sonnei were studied.

2. Low dosage treatment (4 to 8 Gm. per day for seven days) with sulfaguanidine was ineffective in eliminating carriers. No comparison relative to the effectiveness of the two sulfonamides can be made, owing to the gross disparity in dosage used.

3. Succinylsulfathiazole 0.25 Gm. per kilogram daily for seven days was efficacious in the eradication of the carrier state.

4. Polyvalent dysentery bacteriophage was no more effective than symptomatic management in rendering the patient dysentery free.

Beginning of Modern Dentistry.—The professional life of the "father of modern dentistry," Pierre Fauchard, began in the reign of the Sun King of France, Louis XIV, at whose gilt edge, resplendent court good looks—which might be marred by bad teeth—often carried off the fairest favors. Fauchard himself, graceful, elegant, courteous, might have passed for an idle nobleman. Actually he worked hard, first at Angers and later (after 1719) in Paris, at pulling, filling and reconstructing teeth and studying dental disease. Almost single handed he established dentistry as a respectable profession; before him it had been left to itinerant tinkers, vagabonds and boorish charlatans who made "tooth drawing" a laughable public spectacle. Fauchard had been trained as a naval surgeon; hence he chose the title "The Surgeon-Dentist" ("Le Chirurgien-Dentiste") for his great two volume textbook, published at Paris in 1728. Among the "aphorisms of dentistry" here selected and arranged from this first dental textbook none bears repetition today more forcibly than that one relating to the cleansing of the teeth.—The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co., Inc., 1945.

DYE POISONING IN THE NURSERY

A REVIEW OF SEVENTEEN CASES

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Instances of acute poisoning by aniline and its derivatives occur not infrequently. Many of the cases reported among industrial workers and particularly in children could have been prevented had the possibility of this condition been kept in mind. It is also true that the recognition of this dye intoxication would not be so indefinite and always forthcoming if workers would be constantly on the alert in places where it is apt to occur. Therefore it is our purpose in this paper to reemphasize and warn all those concerned that this condition should never be underestimated and that today negligence of some sort is usually its chief source.

HISTORY

There have been many interesting reports on the toxic effects of aniline, its derivatives and coal tar, their mother substance. The first series of cases due to aniline-stamped diapers was in 1886. Rayner [1] reported 17 cases which appeared in London at this time. The cause of the cyanosis which appeared in these babies was an unsolved riddle among London doctors for many months. In 1929 Zeligs [2] reported 4 cases of aniline and nitrobenzine poisoning in infants. All recovered. It was found that 3 of these cases were due to skin absorption of dye from freshly stamped pads and 1 was caused by inhalation of vapors used in bedbug exterminating. He stated that articles were rendered harmless by boiling after dyeing or freshly stamping them.

Two years later Weinberg [3] described 13 cases, the poisoning resulting from the baby's body having been wrapped in clothing freshly marked with hospital identification lettering. In practically all of the cases the printing was found to be in contact with some part of the infant's body. Definite staining was found in 8 of 13 cases. The subsequent course of these children showed that all were fully recovered in from twenty-four to seventy-two hours without any observable harmful effects.

Neuland [4] reported 3 similar cases in which poisoning occurred in the same manner and Ewer [5] saw 5 infants with aniline intoxication. Two of the latter group had extensive furunculosis and therefore absorbed more of the dye. All of this last group recovered.

From the Department of Pediatrics, Touro Infirmary.

The members of the staff of Touro Infirmary gave permission to use their cases in the compilation of this report.

1. Rayner, W.: Cyanosis in Newly Born Children Caused by Aniline Marking Ink, Brit. M. J. **1**: 204 (Feb. 13) 1886.
2. Zeligs, M.: Aniline and Nitrobenzene Poisoning in Infants, Arch. Pediat. **46**: 502 (Aug.) 1929.
3. Weinberg, A. A.: Aniline Poisoning in Newborn: Thirteen Cases, Am. J. Obst. & Gynec. **21**: 104 (Jan.) 1931.
4. Neuland, W.: Poisoning of Infants and Children by Methemoglobin Producing Substances, Med. Klin. **17**: 906 (July 25) 1921.
5. Ewer, H.: Outbreak of Nitrobenzol Poisoning in Infants, Deutsche med. Wchnschr. **46**: 1078 (Sept. 25) 1920.

CHEMISTRY

Aniline has the chemical formula $C_6H_5NH_2$ and is aminobenzine. It is a colorless, oily liquid with no medicinal use. When aniline intoxication occurs in the body methemoglobinemia develops. This condition, of the blood is probably the chief cause of the presenting symptoms and is due to paraminophenol and hydroxyphenylhydroxylamine,[6] which are intermediate oxidation products of aniline in the body. When the methemoglobin forms there is a short reversible reaction, with some of it being changed back into hemoglobin. Methemoglobin is a true oxide of heme and native globulin. Oxygen cannot be removed from this combination except by chemicals: methemoglobin is not capable of acting as a respiratory pigment, and a functional anemia results because of the diminution of hemoglobin available for oxygen transport.

SYMPTOMS

When there is 5 Gm. of reduced hemoglobin, cyanosis in the skin and mucous membranes appears. Some authors[7] believe that the grayish blue cyanosis which occurs with aniline intoxication is a specific symptom. They maintain that it is due to the deposition of a specially formed pigment in the subcutaneous tissues. This is borne out for them by the fact that in spite of the cyanosis the respiration remains rhythmic. This is not true when cyanosis is caused by cardiac decompensation or pulmonary involvement. Nevertheless, cyanosis depends to a large extent on the amount of methemoglobin in the body. This condition, which turns the skin slate colored, is one of the most striking of all symptoms encountered with the intoxications.

Aside from the alarming and acute symptoms concerned primarily with the companionable linkage of the blood hemoglobin and respiratory physiology, other symptoms often draw one's attention. These are evident in the nervous symptoms such as convulsions, tremor, vertigo, tinnitus and later paralysis. Dulstin[7] explains these and other nervous symptoms by saying that aniline has a direct and toxic effect on the central nervous system. He maintains that the great abundance of lipoids in the nervous tissues probably aids in the solubility of unchanged aniline found in the blood stream. Of course, many of these symptoms and signs are not detectable in the newborn for obvious reasons.

Often one sees prominent cardiac disorders having to do with disturbances in the conducting mechanism of the heart. In a group of animal experiments, Young and his associates[8] found that aniline had a direct toxic effect on the heart muscle. Proper amounts of the dye produced heart blocks and all varieties of arrhythmias. Young maintains that in acute aniline poisoning death is usually cardiac. In this series, as will be shown later, death was not due to cardiac disorder.

REVIEW OF CASES

On Jan. 5, 1944 at the Touro Infirmary a near tragedy was seen in the nursery, which was occupied by 32 babies. Seventeen of the babies unexpectedly and gradually became cyanotic and began to breathe with extreme difficulty. The diagnosis of this extensive and bizarre finding was finally made by Dr. Julian Graubarth, who remembered such a condition to have occurred in Cincinnati in 1929. The cause of these sudden symptoms was finally traced to a particular set of diapers which were stamped with ink containing aniline dye. These were accidentally sent to the nursery without first having been laundered or sterilized. The infants then absorbed the aniline through the skin of their buttocks.

At this time it would probably be wise to point out a few of the trying situations that hospitals and particularly nurseries have found themselves confronted with during the present war. There has been a shortage of diapers both in hospitals and in civilian life; therefore it can easily be seen how a nursery can exhaust its ready supply and then hastily seek what diapers it has left if the necessity becomes acute. Too, hospitals have experienced a frequent turnover in employees. This has resulted in the constant necessity of training new workers as well as combating serious problems that arise owing to lack of experience and breaks in hospital technics. Innumerable obstacles, as those that have been mentioned, have arisen in hospitals as they have in industry. It is not unlikely that situations which present themselves in the future will act as precipitating or predisposing factors to similar outbreaks.

At the time of the mishap at Touro there were 32 babies in the nursery, although only 17 developed evident aniline intoxication. All of those affected wore the unwashed diapers stamped with the dye, while the remaining 15 were wearing old diapers. A review of case histories of those children developing aniline dye poisoning revealed the following findings: One of the first things to be noted was varying degrees of anorexia in some, while others showed no disinclination to feed. All the babies showed signs of cyanosis, but this was most evident in 9 cases and lasted, on an average, ten to fourteen hours. Respiration was accelerated in every instance, but it was difficult in only 5 babies. Irritability, vomiting and loose stools were each noted in 3 cases. Other findings were hematuria (2), distention (2), jaundice (1) and an enlarged spleen (1). It was noted among most of the infants that the cry was reduced in intensity, and only 1 case showed what was thought to be a mild convulsive seizure. After ten months there have been no reports of cerebral damage. There are no reports on a refractory anemia which often follows this type of intoxication.

One infant, L. W., had serial blood pictures which revealed the following: On January 9, four days after the onset of the poisoning, the blood determinations revealed a red blood cell count of 2,500,000 and a hemoglobin of 4.9 Gm. One month later the red blood cells had risen to 3,000,000 per cubic millimeter and the hemoglobin to 9.7 Gm. The last determination was on June 9, 1944, at which time the red blood cell count was 4,300,000 and the hemoglobin was 11.6 Gm. These figures show that at the end of six months there was a complete return to normal of the red blood cell count and the hemoglobin. This picture was typical of many of the other infants.

Unfortunately, the final analysis showed that of the 17 babies involved 4 failed to survive. It is interesting,

6. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, New York, Macmillan Company, 1941, p. 247.
7. Dulstin, M. S., and others: The Clinical Symptoms of Acute and Paranitroaniline Intoxications, Klin. Med. 11: 397, 1933.
8. Young, A. G.; Muehlberger, C. W., and Meek, W. J.: Toxicological Studies of Acute Aniline Poisoning; Experimental Studies of Acute Aniline Poisoning, J. Pharmacol. & Exper. Therap. 27: 101 (March) 1926.

to note that of the 4 deaths 3 were of premature infants, 2 of these being twins. The premature twins died of bronchopneumonia approximately three weeks later. The pathologists reported that the cause of death in the third premature child was from an intracranial hemorrhage complicated by bronchopneumonia. The fourth fatality was due to a generalized peritonitis caused by the Friedländer bacillus. In this infant no other pathologic change could be found, except for a diffuse reddening on both thighs which appeared to be a diaper rash, although an extensive search was made.

For the sake of brevity, 1 typical case will be described in detail, since many of the cases were similar in signs and symptoms:

Baby M., born several days previously, of an uncomplicated delivery, weighed 7 pounds 4 ounces (3,290 Gm.). This infant became dusky during the morning of Jan. 5, 1944. Its condition gradually became worse and respiration more difficult; therefore oxygen and 5 per cent carbon dioxide was started early in the afternoon. At this time the temperature was 99.0 F. By 5 p. m. of the same day no improvement was noticed and it was decided to administer 2 mm. of mkethamide. There was no reaction to this drug and the color became progressively worse, now being a grayish blue. At 9 30 p. m. methylene blue ½ grain, 0.032 Gm. (5 cc.), was given intravenously as well as a transfusion of 60 cc. of whole blood. Oxygen was administered until 8 o'clock the following morning. During the first day the baby was fed at 2 and 10 p. m. 1½ ounces of the nursery's routine formula.

On January 6 methylene blue was again given in the same dosage at 12, 3, 6, 9, 12, 3. Later the patient's color improved and became slightly pink. It nursed well but two clyses, each 50 cc. of 5 per cent glucose in isotonic solution of sodium chloride, were given at 10 a. m. and 4 p. m. The infant continued to improve and was discharged from the hospital five days later weighing 7 pounds 7½ ounces (3,390 Gm.). On leaving the hospital the baby still showed a faint grayish tinting of the skin.

By stating that this case was a typical one, we do not intend to imply that the therapy was the same for each of the remaining 16 babies. It must be borne in mind that the infants were treated by their individual doctors as they saw fit, but a more or less general plan was followed.

DIFFERENTIAL DIAGNOSIS

Because of the rarity of aniline dye intoxication in nurseries the diagnosis is seldom thought of when extremely pronounced and unexpected cyanosis appears. Cyanosis in the newborn or young baby may often bring to mind various congenital heart malformations. Many men have associated enlargement of the thymus gland with cyanosis. Two of the commonest causes of cyanosis to be encountered in the infant are pneumonia and aspiration. Aspiration of a foreign body could be milk curds, mucus, mechanical objects and the like. Intracranial hemorrhage, common poisons such as sulfonamides, nitrites or ferrous cyanide, allergies from insect sprays or disinfectants and the escaping of illuminating gas often are first noticed because of the peculiar grayish blue tint that occurs as one of their early symptoms.

In this series of cases food was considered as the causative agent for only a short time in the beginning. It was found that all of the babies, whether breast fed or artificially fed, were affected similarly by the then unknown cause. Even babies who were brought directly from the delivery room and who received nothing by mouth developed the condition within a short time.

TREATMENT

In the Touro incident treatment centered around the use of methylene blue, oxygen and 5 per cent carbon dioxide and whole blood transfusions. Of the total number, 17, 12 infants were given methylene blue in the dosage of ½ grain (5 cc.) in each of their feedings for two days. All were fed by a three hour schedule. This left 3 babies that did not receive the methylene blue. The oxygen and 5 per cent carbon dioxide was given to 6 and blood transfusions to 9. Each of the 4 babies that died, except the premature twins, was given the same treatment. Transfusion was found to be too difficult a procedure on them.

Methylene blue and oxygen had no apparent effect on the time or type of recovery of any of the infants. Just as complete and just as speedy a recovery was seen in the 3 infants who had no treatment other than change of diapers, isolation and transfusion. Even in 2 of the infants who received no therapy whatever recovery was similar and uneventful. Had the diagnosis been apparent at the time, no treatment other than transfusion would have been tried. It has never been proved whether methylene blue has any effect on accelerating the rate of reduction of methemoglobin to hemoglobin, and in high concentration it converts the ferrous iron of reduced hemoglobin to reduced iron, thus producing methemoglobin. The use of oxygen in treating cyanosis of this type is not rational, since the methemoglobin reduces the amount of hemoglobin that can act as a respiratory pigment.

It is needless to say that the treatment lies first in the prevention, then in removing the source, transfusions with whole blood or red cells suspended in saline solution, giving plenty of fresh air and, finally, isolation. In a very profound case of cyanosis due to aniline, transfusions of whole blood or red cells suspended in saline solution would be the most logical therapeutic agent to use.

CONCLUSION

1. In 17 cases of aniline dye poisoning in a nursery the intoxication was caused by diapers stamped with ink containing aniline dye. Thirteen babies recovered; 4 died from unrelated causes.

2. The prevention of this type of poisoning rests in the adherence of a strict aseptic technic in handling all supplies entering the nursery. If this is done an ink-containing aniline dye could be used, as it becomes innocuous after the first laundering.

3. It must be remembered that only small proportions of aniline dye are necessary to produce intoxication in infants. This is true also for adults.

4. Treatment consisted primarily in removing the source of intoxication, oxygen and 5 per cent carbon dioxide, transfusion, methylene blue and isolation. Methylene blue and oxygen therapy were found to be unnecessary, and transfusions are not imperative unless the condition is acute and severe.

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THE USE OF HUMAN IMMUNE SERUM GLOBULIN (GAMMA GLOBULIN)

IN INFECTIOUS (EPIDEMIC) HEPATITIS IN THE MEDITERRANEAN THEATER OF OPERATIONS

II. STUDIES ON TREATMENT IN AN EPIDEMIC OF INFECTIOUS HEPATITIS

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Because of the long period of convalescence following infectious hepatitis with resulting loss of manpower to the United States Army, the present study was conducted in suitable groups in the Mediterranean Theater of Operations in order to determine whether or not gamma globulin is an effective therapeutic agent in lessening the severity of the disease and in shortening the period of convalescence. Stokes and Neefe,[1] pointing out that globulin is often of value if injected soon after the onset of the initial symptoms of measles,[2] suggested its trial as a therapeutic measure in early infectious hepatitis.

Through the cooperation of an air force in this theater, patients developing infectious hepatitis were made available for the study. The majority of the patients came from one bombardment group and were diagnosed by the squadron physicians, who had extensive experience with the disease. Patients were chosen for the study as soon as possible after the onset of symptoms and signs suggestive of early, preicteric infectious hepatitis. Typical symptoms consisted of an acute onset of fever, chilliness or chills, headache, nausea, vomiting, anorexia and abdominal pain. Suggestive signs consisted of right upper quadrant tenderness and spasm, often with a palpable and tender liver. If there was any suggestion of scleral icterus, the patient was not included in the series. Alternate patients arriving at each squadron or headquarters dispensary were given 0.3 cc. of gamma globulin per pound of body weight. The average total dose of globulin was 45 cc., half of which was injected into each buttock. The only reaction consisted of pain and tenderness at the site of injection owing to the distention caused by the large dose administered. The pain was much less pronounced if the globulin was injected after the patient had been hospitalized and muscular movement thus limited. However, the globulin was administered as soon as a tentative diagnosis of early, preicteric hepatitis was made. The injected and control patients were evacuated from the dispensaries as soon as possible by plane to the 26th General Hospital in order to maintain a uniform program of clinical and laboratory follow-up of the group. It was understood that, in the attempt to diagnose hepatitis so early in the course of the disease, errors would be inevitable and patients with diseases other than infectious hepatitis would be included. However, it was felt that such cases would fall equally into the injected and control groups and could subsequently be discarded.

A total of 278 patients were admitted to the study; 70 of these developed jaundice subsequent to the time of injection of globulin. The great majority of the remaining patients proved to have hepatitis without jaundice, as indicated by the liver function tests and the subsequent course of the disease.

Before reviewing the hospital course of the injected and control patients, it appeared that the following criteria might be of value in determining whether or not globulin had an attenuating effect on infectious hepatitis once the disease had started: (*a*) the incidence of jaundice occurring in the injected and control groups, (*b*) severity and duration of jaundice, (*c*) length of hospitalization, (*d*) the duration of the period in which various laboratory tests showed activity of the disease and (*e*) the frequency of relapse in the two groups.

On the basis of the foregoing criteria the following results were obtained:

(*a*) *Incidence of Jaundice in Injected and Control Patients.*—Of the 70 patients who developed jaundice subsequent to admission to the study, 31 had received globulin and 39 were control patients. The difference between the two groups is not sufficiently great to be significant.

(*b*) *Severity and Duration of Jaundice.*—The severity and duration of jaundice proved to be unsatisfactory criteria for judging the attenuating value of globulin, as their variation within each group was so great. Cases with mild and transient jaundice fell equally into the injected and control groups.

(*c*) *Length of Hospitalization.*—Subjective symptoms determined to a great degree the length of hospitalization necessary in this disease, and since these were appreciably affected by the patient's desire or unwillingness to return to his unit it was impossible to use the period of hospitalization for comparison.

(*d*) *Length of Time in Which Laboratory Tests Indicated Activity of Disease.*—The only test which was conducted daily for each of the patients and could therefore be accurately compared in the two groups was the methylene blue test.[3] The average duration of a positive methylene blue test, counting from the first day of scleral icterus, was ten days for the injected patients and 9.9 days for the controls. Since the cephalin cholesterol flocculation test and the sulfobromophthalein test were not performed at identical intervals for all patients, the time required for these to return to normal could not be accurately determined for the two groups. Therefore the methylene blue test, the only test permitting comparison of the injected and control patients, revealed no evidence in favor of an attenuating effect of globulin.

(*e*) *Frequency of Relapses.*—Four patients in the control group and 1 in the injected group developed relapse of the disease. Since the total number of

This work was carried out under the direction of the Commission on Measles and Mumps of the Army Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, U S. Army.
The gamma globulin used in these studies was obtained from pools of plasma, each pool representing 3,000 to 5,000 individuals, collected by the American Red Cross and fractionated, according to the method of Cohn and his co-workers, by various biologic manufacturers These pools were obtained originally from groups of individuals in the Eastern and Southern regions of the United States.

1. Stokes, J., Jr., and Neefe, J. R.: The Prevention and Attenuation of Infectious Hepatitis by Gamma Globulin, J. A M. A **127**: 144 (Jan. 20) 1945.

2 Stokes, J., Jr.; Maris, E. P., and Gellis, S S Use of Concentrated Normal Human Serum for Prevention and Attenuation of Measles, J. Clin Investigation **23**: 531, 1944.

3 Franke, K . Methylenblau, ein einfaches sehr empfindliches Reagens Zum Nachweis von Bilirubin, Med. Klin. **27**: 94, 1931. Gellis, S S., and Stokes, J, Jr The Methylene Blue Test in Infectious Hepatitis, J. A M A **128**: 782 (July 14) 1945.

patients with relapse is so small, this difference does not appear to be significant.

It was difficult to compare the cases of hepatitis without jaundice in the treated and control groups. Variation in the severity and duration of this form of the disease was even more evident than in hepatitis with jaundice. No clearcut evidence was obtained indicating an attenuation in the treated group.

COMMENT

In accordance with observations recorded in the majority of virus diseases that homologous immune bodies rarely are effective therapeutically when the symptoms have fully developed, immune bodies also in this epidemic disease appear to have little, if any, therapeutic value. As the present data do not include a large number of cases at their earliest onset, it is still possible that larger amounts of immune bodies in the form of gamma globulin or, more properly, gamma globulin from pools of convalescent plasma may prove effective in therapy. The obvious difficulty in obtaining cases of this disease at their earliest onset is very great and renders the possibility of such a therapeutic approach highly problematic.

The additional possibility that gamma globulin may be of value in the prevention of relapses or recurrences of the disease deserves further investigation.

SUMMARY

A program designed to test the effectiveness of human immune serum globulin (gamma globulin) in the attenuation of infectious hepatitis was conducted in an air force in the Mediterranean Theater of Operations.

Gamma globulin, 0.3 cc. per pound of body weight, was administered intramuscularly to alternate patients presenting the earliest symptoms suggestive of infectious (epidemic) hepatitis.

No evidence was obtained in the patients studied in favor of an attenuating effect of gamma globulin when administered early in the course of the disease.

Clinical Notes, Suggestions and New Instruments

PENICILLIN THERAPY IN PYLEPHLEBITIS

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Pylephlebitis is an inflammation of the portal vein caused by an acute suppurative process in that part of the abdomen drained by the portal vein. The disease carries a high mortality because of the multiple embolic liver abscesses arising from the infected thrombi in the portal system.

The most common condition causing this disease is acute appendicitis; however, gangrenous cholecystitis, infected thrombotic hemorrhoids, diverticulitis or pelvic suppuration may precipitate a portal thrombosis.

The case reported here followed an acute attack of appendicitis, so I shall confine the discussion to this disease.

In 1897 Armstrong[1] reporting in England, stated that this complication caused 5 per cent of the deaths due to appendicitis. Hawkes[2] in 1938 analyzed a series of 1,463 cases of acute appendicitis in which portal thrombosis occurred but 12 times. This lowered incidence can be attributed to earlier operative intervention in acute appendicitis.

From the Surgical Service, U. S. Marine Hospital, Chicago.

1. Armstrong, G. E.: Introduction to a Discussion on Appendicitis, Brit. M. J. **2**: 945, 1897.
2. Hawkes, S. L.: Thrombophlebitis of Appendical Vein, Surg., Gynec. & Obst. **66**: 62, 1938

PATHOLOGY

According to Crossland[3] pylephlebitis usually follows pronounced appendical disease. Busch and Spivack[4] reported 4 fatal cases in a series of 635 cases of acute appendicitis. Two of these were gangrenous appendicitis with perforation, and 2 were appendical abscesses. This fulminating type of appendicitis is usually attributed to the streptococcus. Early in the disease a septic thrombus is found in the terminal branches of the ileocolic vein, and if the thrombus is not removed at time of operation with the appendix the thrombus extends upward or breaks off and lodges in the liver. Early in the disease positive blood culture is rare. Later, when the liver is riddled with abscesses and its venous system is thrombosed, they may be obtained. Empyema of the right chest by direct extension from the liver may occur. Jaundice due to liver destruction is a late finding. Ascites is common and is associated with the massive portal obstruction.

SYMPTOMATOLOGY

In addition to the clinical history suggesting appendicitis, the patient may have a chill. Colp[5] found a chill in 6.8 per cent of his cases and Kelly and Hurdon in 15 per cent of theirs. Temperature elevations are out of proportion to the amount of appendical disease. Severe prostration accompanies even the milder cases of thrombophlebitis of the appendical vein.

TREATMENT

Prophylaxis by early removal of the appendix when inflamed is mandatory. Probably few cases would develop if all cases should come to operation during the first twenty-four hours.

Treatment by ligation of the veins in the ileocolic angle has been most disappointing. Wilms[6] first suggested this, and his operation was modified by Braun.[7] Routine ligation of the ileocolic vein is to be condemned, but all should be inspected and ligated if thrombosed.

Sulfanilamide has been used with success in 2 cases as reported by Ottenberg and Berck.[8]

REPORT OF CASE

History.—H. H., a man aged 22, a seaman, admitted June 2 1944, complained of dull pain in the right groin and a swollen abdomen. The patient had an operation for appendicitis, gangrenous type, done Feb. 10, 1944, This operation was done as an emergency measure at a hospital along the Florida coast He was transferred to the Marine Hospital in Chicago on June 2, 1944. The history forwarded with the patient stated that on Feb. 10, 1944 the patient presented himself with the typical signs and symptoms of acute appendicitis and was given an immediate operation. The appendix was suppurative with exudate on its outer surface; there were local peritonitis and a turbid peritoneal fluid. Cultures were not made. During the patient's convalescence he developed drainage from the wound but it healed after about three weeks. On the second postoperative day the patient developed chills and a septic temperature began; that is, he had an afternoon elevation with temperatures running to 101 and 102 F. and chills nearly every day. The white blood cell count was elevated to about 18,000 but the blood cultures were repeatedly negative. The patient had no particular complaints except anorexia and extreme weakness He perspired freely and subsequently developed an anemia which was treated with iron and blood transfusions. On April 24 he complained of shortness of breath and fulness of the abdomen; fluid was demonstrated in the right chest. This was subsequently aspirated. The first specimen was slightly turbid and in appearance was serosanguineous. Repeated aspiration a few days later revealed that the specimen was more purulent, was bile stained and had a peculiar odor which is usually associated

3. Crossland, P. M.: Pylephlebitis Complicating Appendicitis, U. S. Nav. M. Bull. **39**: 398, 1941.
4. Busch, I., and Spivack, A. H.: Observations on Acute Appendicitis, Surg., Gynec. & Obst. **70**: 241, 1940.
5. Colp, R.: Treatment of Pylephlebitis of Appendicular Origin Surg., Gynec. & Obst. **43**: 627, 1926; Chills in Acute Appendicitis Ann. Surg. **85**: 257, 1927.
6. Wilms: Venenunterbindung bei eitriger Pfortaderthrombose nach Appendicitis, Zentralbl. f. Chir. **36**: 1041, 1909.
7. Braun, H.: Die Unterbindung der Vena ileocolica bei meseterialer Pyämie nach Appendizitis, Beitr. z. klin. Chir. **86**: 314, 1913.
8. Ottenberg, R., and Berck, M.: Sulfanilamide Therapy for Pylephlebitis and Liver Abscesses, J. A. M. A. **111**: 1374 (Oct. 8) 1938

with a colon bacillus infection. At this time a diagnosis of pylephlebitis or thrombophlebitis of the portal veins, with liver abscess, was made. The patient developed a transitory jaundice, the liver became definitely enlarged and the patient became weaker. He was put on sulfanilamide therapy, 1 Gm. being given every four hours, and penicillin. A total of 10,000 units of penicillin was given before the patient was transferred to our hospital.

On admission, June 2, the patient had some pain in the abdomen and pain in his right groin. He had little appetite and felt weak. He was not taking sulfonamide drugs at this time but was on a high vitamin diet. The pain in the abdomen seemed to remain stationary in the right side but at times appeared to radiate toward the midline and down the right leg. The site of the operation did not pain him at that time. However, he felt "full in the abdomen" and was sure that he contained a lot of fluid. He had no pain in the right chest and had no dyspnea on exertion. He was slightly constipated and had to take liquid petrolatum to keep his bowels open. He had no dependent edema nor any pain or swelling in the legs which would indicate phlebitis of the femoral or iliac veins. A systemic review of his symptoms was noncontributory except for his present complaints.

His past history was noncontributory.

Physical Examination.—The patient was poorly nourished but fairly well developed and appeared acutely ill. There was evidence of great weight loss. He was too sick to weigh at this time but he stated that he had lost about 60 pounds. The eyes, ears, nose and throat were essentially normal. The ribs were prominent; the supraclavicular and infraclavicular fossae were depressed. There was limitation of excursion right and left, especially anteriorly. There was dulness to percussion in the left base, but in the right base the dulness was more evident and extended to the level of the nipple line anteriorly and to the level of the sixth rib posteriorly. There was no excursion of the diaphragm on the right. There were bronchial and vesicular breath sounds, right and left, with the breath sounds diminished in the bases. There were no rales audible. Tactile and vocal fremitus were diminished. There was tenderness over the posterior right lumbar area on Murphy's percussion. The heart was normal except for a roughened first sound. The pulse rate was 120, the blood pressure 125/80. The pulse, while rapid, was regular and of good quality. The abdomen was greatly distended and a fluid wave elicited. There was some shifting dulness but with so much fluid it was hard to demonstrate. The liver was enlarged 3 fingerbreadths below the costal margin, but it was smooth and some tenderness was present. The genitourinary examination gave essentially normal results. There were some muscle aches and pains in the extremities and in the joints on extreme ranges of motion. There was 1 plus edema over the dorsum of the feet. The temperature on admission was 38.2 C. (100.7 F.), the pulse rate 118.

Laboratory Work on Admission.—Red blood cells numbered 3,350,000, white blood cells 10,500; hemoglobin was 61.4 per cent, 9.5 Gm.; small mononuclears 22, stabs 34, neutrophils 41, 1 Türk cell, an occasional target cell. The urine was amber color and showed a trace of albumin; the specific gravity was 1.014. The Wassermann and Kahn reactions were negative; blood culture showed no growth after ten days; the icterus index was 10 units; the blood was of type O. Serum protein was 6.8 Gm. per hundred cubic centimeters of serum. Repeated blood cultures were negative. Repeated examinations of stools for parasites were negative for Endameba histolytica. X-ray examination at time of admission revealed a large liver with elevation of the right diaphragm.

Course.—The patient was observed for four days after admission and given a high protein, high vitamin diet with iron therapy. During that time he had temperature elevations that ran from 39 C. (102.2 F.) in the afternoon to 37.6 C. (99.7 F.) in the morning. On June 6 a soft area was noticed on the posterior chest wall at the level of the tenth rib, in the posterior axillary line. Under nitrous oxide anesthesia this soft mass was incised and drained. The pus was thick and green and had the appearance of concentrated streptococcus pus. The abscess cavity extended about 12 cm. in all directions and went beneath the latissimus dorsi deep to the tenth rib. We were unable to demonstrate any connection with the liver or with the subdiaphragmatic space. The pus was cultured both aerobically and anaerobically. Guinea pig inoculation for tubercle bacilli was negative; aerobic cultures were negative, but we were able to demonstrate anaerobic staphylococci on culture. Consequently the patient was placed on penicillin therapy, receiving 20,000 units intramuscularly every three hours until 2,000,000 units had been given. The patient had repeated aspirations of the abdomen while in the hospital so that we could control the amount of abdominal fluid. These aspirations were done about every five days, and approximately 1,500 cc. of ascitic fluid would be removed at each time. The patient continued to have low grade spiking temperatures, after the incisions and drainage of the abscess of the right chest wall, until June 27. At that time an aspiration of the liver was done in the posterior axillary line below the level of the twelfth rib so that we would remain retroperitoneal and outside of the pleural space. On June 27 an abscess of the liver was demonstrated; it contained about 100 cc. of thick greenish yellow purulent material and also contained much cellular débris. There was a slight putrefactive odor not characteristic of any organism. It was sent to the laboratory, and again an anaerobic staphylococcus was demonstrated. The abscess was then irrigated with saline solution and the washings were sent to the laboratory and a search made for amebas. None were demonstrable here, just as none had been demonstrable in the repeated stool examinations. Into the abscess cavity was injected 25,000 units of penicillin dissolved in distilled water. Repeated explorations were then made, but we were unable to demonstrate any more abscesses in the liver. Roentgenograms were made on several occasions after 100 cc. of air had been placed within the liver abscess; thus we were able to demonstrate that the abscess was in the liver and not in the subdiaphragmatic space.

The patient continued to improve; his anemia became less pronounced and the abscess of the liver was repeatedly aspirated. On June 30 we again opened the posterior wound in the right chest wall and demonstrated a connection between the abscess of the right posterior chest wall and the liver. Several Penrose drains were inserted deep into the chest wall and into the fistulous tract leading to the liver. This wound was also irrigated with a penicillin solution. On June 30, after we had drained the liver abscess, the patient became afebrile and continued so throughout the rest of his stay in the hospital. On July 8 lipiodol was injected into the fistulous cavity leading to the liver, and x-ray consultant Dr. J. T. Case interpreted the films as showing a large liver abscess which permitted the lipiodol to be demonstrated over a wide area, or perhaps as a liver abscess with numerous pockets in the abscess.

Recovery was very slow, owing to the fact that the patient had anemia and a severe debilitating disease. He was discharged from our hospital on September 19 as improved. He has returned as an outpatient several times since then and at present is able to return to work. He was last seen at this hospital in February 1945, at which time his weight was almost up to his normal of 190 pounds (86 Kg.). He was moving about as well as ever, felt energetic and was given a fit for duty certificate so that he could return to sea. His posterior right thoracic wound, through which the liver abscess was drained, was healed with a nontender adherent scar and he said that he had no abdominal pain, and his abdomen was not distended. At the time of discharge the red blood cell count was 4,850,000, with hemoglobin 90.4 per cent, 14.0 Gm. The white corpuscle count was 10,750, with 51 per cent neutrophils; 35 per cent stabs giving a total of 86 per cent polymorphonuclears, 12 per cent mononuclears and 2 transitional cells. There was a moderate toxic granulation of the polymorphonuclears. There was a tendency for the red cells to be of a hypochromic type. At the time of discharge the urine had a specific gravity of 1.022

and was negative for albumin, sugar, pus, casts or epithelial cells. He was advised to report for follow-up examination in six months.

SUMMARY

Pylephlebitis follows pronounced appendical disease and, while infrequent, should be considered when systemic symptoms are severe.

Thrombosis of the appendical vein may be a progressive disease, with extension into the portal vein, and result in multiple liver abscesses.

After appendicitis is diagnosed, chills, fever and prostration are the cardinal signs of this disease

Treatment is early operation, early ligation of the thrombosed ileocolic vein. If the disease progresses in spite of this treatment, chemotherapy with sulfadiazine and penicillin should be instituted.

A case of pylephlebitis ended in complete recovery.

A MEANS OF INDUCING OLIGURESIS DURING PENICILLIN ADMINISTRATION

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In reference to the published material suggesting the advisability of urine concentration in the penicillin therapy of gonorrhea, the following suggestion is made Pitressin to accomplish this end was suggested to me during observations on pitressin and its influence on human urine secretion. Because of the paucity of clinical material and facilities at sea the suggestion is passed on for evaluation by those more favorably situated for such study.

The antidiuretic principle of posterior pituitary was first noted by von den Velden[1] in 1913.

Gargle, Gilligan and Blumgart[2] in 1928 showed that it was the pressor function of the posterior pituitary that was responsible for the hormone's antidiuretic principle.

Leberman[3] in 1930 made use of this fact by employing the hormone to produce urinary concentration in the execution of renal concentration tests

McQuarrie and his associates[4] in 1936 used the period of diuresis which follows prolonged antidiuresis with pituitary to relieve edema in certain instances of nephrosis.

Lich and Lewis[5] have utilized pitressin induced antidiuresis to eliminate the period of water deprivation preceding intravenous pyelography.

In studying the effect of pitressin in normal man both during increased water intake and in normal conditions it was found that antidiuresis is maintained from three to five hours following the subcutaneous administration of 0.5 cc. of pitressin. This effect may be prolonged with the repeated administration of pitressin at intervals of three hours and may be continued for a twenty-four hour period. Hence this would seem a simple positive method to affect urinary concentration if this is essential in penicillin medication for the treatment of gonococcic urethritis.

SUMMARY

The use of pitressin subcutaneously is suggested to produce oliguresis during periods of penicillin therapy. It has been suggested in the literature that urinary concentration is beneficial in penicillin therapy of gonococcic urethritis.

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2. Gargle, S. L., Gilligan, D. R., and Blumgart, H. L.: The Antidiuretic Effect of the Oxytocic and Pressor Principles of the Extract of the Pituitary, New England J. Med. **198**: 169, 1928
3. Leberman, F.: Funktionelle Nierendiagnostik durch Hypophysenpräparate, Med. Welt **4**: 1144, 1930.
4. McQuarrie, I.; Thompson, W. H. and Ziegler, M. R.: Effects of Posterior Pituitary Extract on Water and Mineral Exchanges in Edema, J. Pediat. **8**: 277, 1936
5. Lich, R., Jr., and Lewis, P. J. The Use of the Antidiuretic Property of Pitressin in Excretory Pyelography, J. Urol., to be published.

Special Article

NEW DOSAGE FORMS OF PENICILLIN

STATEMENT CONCERNING CERTIFIABLE PENICILLIN PRODUCTS, INCLUDING RECOMMENDED INDICATIONS, DOSAGES AND PRECAUTIONS

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Chairman of the Committee on Chemotherapeutics and Other Agents of the National Research Council and Medical Administrative Officer to the Committee on Medical Research of the Office of Scientific Research and Development
BOSTON

ROBERT P. HERWICK, PH.D., M.D.
WALTON VAN WINKLE JR., M.D.
AND
LAWRENCE E. PUTNAM, M.D.
U. S. Food and Drug Administration
WASHINGTON, D. C.

On July 6, 1945 the Federal Food, Drug and Cosmetic Act was amended to provide for the certification of batches of drugs composed wholly or partly of any kind of penicillin. The Federal Security Administrator, in accordance with the provisions of this amendment, has promulgated regulations providing such standards of identity, strength, quality and purity as will insure the safety and efficacy for use of a number of penicillin products. Before distribution in interstate commerce, each manufacturer must submit samples of each batch of any penicillin product to the Food and Drug Administration for examination and must obtain a certificate showing that the batch complies with the applicable regulations.

Inclusion of the penicillin products listed in the regulations providing for certification was based on a review of the available scientific evidence and on information developed in consultations with experts in the field of chemotherapy and the medical and scientific staffs of interested manufacturers. The suggestions regarding indications, dosages and precautions reflect as closely as possible the experience of experts in penicillin therapy. These suggestions are necessarily conservative, since experience with many of these products has been limited and there are many questions yet unanswered. As additional evidence accumulates it may be possible to extend the indications and alter the dosage schedules set forth in the following paragraphs.

PARENTERAL PRODUCTS

SODIUM PENICILLIN AND CALCIUM PENICILLIN

Sodium penicillin and calcium penicillin are so purified and dried that the final products have a potency of not less than 500 units per milligram. They are sterile, nontoxic and nonpyrogenic and have a moisture content of not more than 2.5 per cent. They are packaged in 100,000 unit, 200,000 unit, 500,000 unit, 1,000,000 unit and 5,000,000 unit sizes.

Indications and Dosage.—

GROUP I INDICATIONS

1. All staphylococcic infections with and without bacteremia:
   - Acute and chronic osteomyelitis
   - Carbuncles—soft tissue abscesses
   - Meningitis.
   - Cavernous or lateral sinus thrombosis.
   - Pneumonia—empyema.
   - Carbuncle of kidney.
   - Wound infections—burns.
   - Endocarditis.

2. All cases of clostridia infections:
   Gas gangrene.
   Malignant edema.
3. All hemolytic streptococcic infections with bacteremia and all serious local infections:
   Cellulitis.
   Mastoiditis with intracranial complications, i. e. meningitis, sinus thrombosis and so on.
   Pneumonia and empyema.
   Puerperal sepsis.
   Peritonitis.
   Endocarditis.
4. All anaerobic streptococcic infections:
   Puerperal sepsis.
   Localized infections elsewhere.
5. All pneumococcic infections of:
   Meninges.
   Pleura.
   Endocardium.
   All cases of sulfonamide-resistant pneumococcic pneumonia.
6. All gonococcic infections.
7. All cases of anthrax.
8. All cases of chronic pulmonary suppuration in which surgical treatment is contemplated.
9. All meningococcic infections failing to respond to sulfonamides.
10. All cases of bacterial endocarditis due to susceptible organisms.
11. Erysipeloid (swine erysipelas).
12. Vincent's infection.
13. Prophylactic use in prevention of possible secondary infection following tonsillectomy and tooth extraction in cases with a history of rheumatic fever or in rheumatic heart disease, in congenital heart disease and in other conditions in which secondary infection may occur (infected teeth; tonsils).

GROUP II INDICATIONS

Penicillin has also been found to be an effective agent in the following diseases, but its position has not been definitely defined and will require additional experimental work:

1. Syphilis.
2. Actinomycosis.
3. Diphtheria, in conjunction with antitoxin.

GROUP III CONDITIONS OF QUESTIONABLE VALUE

Penicillin is of questionable value in mixed infections in which the predominating organism is of the gram negative flora—i. e.:

1. Ruptured appendix with peritonitis.
2. Liver abscesses.
3. Urinary tract infections due to Escherichia coli.
4. It is also of questionable value in rat bite fever due to Streptobacillus moniliformis.

GROUP IV CONDITIONS IN WHICH PENICILLIN IS INEFFECTIVE

1. All gram negative bacillary infections:
   Typhoid—paratyphoid.
   Dysentery.
   Escherichia coli.
   Hemophilus influenzae.
   Bacillus proteus.
   Bacillus pyocyaneus.
   Brucella melitensis (undulant fever).
   Pasteurella tularensis (tularemia).
   Friedländer's bacillus.
2. Tuberculosis.
3. Toxoplasmosis.
4. Histoplasmosis.
5. Acute rheumatic fever.
6. Lupus erythematosis, diffuse.
7. Infectious mononucleosis.
8. Pemphigus.
9. Hodgkin's disease.
10. Acute and chronic leukemia.
11. Ulcerative colitis.
12. Coccidioidomycosis.
13. Malaria.
14. Poliomyelitis.
15. Blastomycosis.
16. Nonspecific iritis and uveitis.
17. Moniliasis.
18. Virus infections.
19. Cancer.

Method of Preparing Penicillin for Treatment.—As penicillin is extremely soluble, it may be dissolved in small amounts of sterile distilled, pyrogen-free water, in sterile isotonic solution of sodium chloride or in sterile 5 per cent dextrose solution. When large unit sizes are being used in hospitals, the contents of the ampule should be dissolved in water or saline solution so that the final concentration is 5,000 to 50,000 units per cubic centimeter, depending on the circumstances of the case. This solution should be stored under aseptic precautions in the ice box and made up freshly every day. Solutions for local or parenteral use may be diluted further, depending on the concentration desired.

A. For intravenous injection:

1. The dry powder may be dissolved in sterile isotonic solution of sodium chloride in concentrations of 10,000 to 50,000 units per cubic centimeter for direct injection through a syringe.
2. The dry powder may be dissolved in sterile saline solution or 5 per cent glucose solution in lower dilution (25 to 50 units per cubic centimeter) for constant intravenous therapy.

B. For intramuscular injection:

1. The total volume of individual injections should be small, i. e. 10,000 to 50,000 units per cubic centimeter of isotonic solution of sodium chloride. It may also be given by constant intramuscular drip, 120,000 units in 250 cc.

Methods of Administration of Penicillin.—There are three common methods of administering penicillin—intravenous, intramuscular and topical. Subcutaneous injections are likely to be painful and should be avoided. The route of choice is intramuscular.

Dosage.—The dosage of penicillin will vary from one patient to another depending on the type and severity of infection. The objective in every case is to bring the infection under control as quickly as possible. In most cases a minimum of 100,000 units daily will be required.

It is well to remember that penicillin is excreted rapidly in the urine so that following a single injection it is often impossible to detect it in the blood for a period longer than two to four hours. It is well, therefore, to use repeated intramuscular or intravenous injections every three or four hours or to administer it as a continuous infusion.

A. In serious infections with or without bacteremia an initial dose of 15,000 or 20,000 Oxford units with continuing dosage as:

1. Constant intravenous injection of isotonic solution of sodium chloride containing penicillin so that 5,000 to 10,000 Oxford units is delivered every hour, making a total of 120,000 to 240,000 units in a twenty-four hour period. One half the total daily dose may be dissolved in a liter of isotonic solution of sodium chloride and allowed to drip at the rate of 30 to 40 drops per minute.
2. If a continuous intravenous drip is undesirable, 20,000 to 40,000 units may be injected intramuscularly every three or four hours.
3. After the temperature has returned to normal, the penicillin may be continued as long as there are any signs of active infection.

B. In chronically infected compound injuries, osteomyelitis and the like the dosage schedule should be 20,000 units every two hours or 40,000 units every four hours parenterally with local treatment as indicated. This dosage schedule may have to be increased, depending on the seriousness of the infection and the response to treatment. The best results are obtained in these cases when penicillin is combined with adequate surgical treatment.

C. Gonorrhea:

1. Twenty-five thousand units every three hours intramuscularly for five doses. The results of treatment should be controlled by culture of exudate. All patients failing to respond to the first course should be retreated.

D. Empyema:

1. Penicillin in isotonic solution of sodium chloride should be injected directly into the empyema cavity after aspiration of pus or fluid. This should be done once or twice daily, using 50,000 or 100,000 units, depending on the size of the cavity, type of infection and number of organisms. Penicillin solution should not be used for irrigation.

E. Meningitis:

1. Penicillin does not penetrate the subarachnoid space in appreciable amounts, so that it is necessary to inject penicillin into the subarachnoid space or intracisternally in order to produce the desired effect. Ten thousand units diluted in isotonic solution of sodium chloride in a concentration of 1,000 units per cubic centimeter should be injected once or twice daily, depending on the clinical course and the presence of organisms.

F. Bacterial Endocarditis:

1. Penicillin is the best agent available for the treatment of bacterial endocarditis. Penicillin alone is as effective as penicillin combined with heparin. The treatment should be continued for three weeks or longer, depending on the individual case. The intramuscular route is the one of choice, although in a few instances it may be desirable to use the continuous intravenous route in order to obtain the maximum effect. The dosage should range from 200,000 to 300,000 units a day if the best results are to be obtained.

PENICILLIN WITH DILUENT

Penicillin with diluent is a combination package of penicillin and a suitable solvent such as water for injection, 5 per cent dextrose injection or isotonic solution of sodium chloride.

Indications and Dosage.—Same as for sodium penicillin and calcium penicillin.

PENICILLIN IN OIL AND WAX

Penicillin in oil and wax is a suspension of calcium penicillin in a menstruum of refined peanut oil in which white wax is dispersed. It is packaged in 100,000 units per cubic centimeter, 200,000 units per cubic centimeter and 300,000 units per cubic centimeter concentration. The white wax content of the 100,000 units per cubic centimeter and 200,000 units per cubic centimeter concentrations is not less than 3 per cent and of the 300,000 units per cubic centimeter concentration not less than 4.7 nor more than 4.9 per cent. The calcium penicillin used in the 300,000 unit per cubic centimeter concentration has a potency of not less than 900 units per milligram, and that in the other concentrations has a potency of not less than 750 units per milligram.

Indications and Dosage.—Gonorrhea, acute staphylococcic and streptococcic infections and pneumonia.

All conditions require a minimum of 300,000 units per day. Preparations containing 200,000 units per cubic centimeter may be administered at twelve hour intervals. If the quantity is 100,000 units per cubic centimeter, administration at eight hour intervals is necessary. Rotation of the site of injection is desirable; the upper outer quadrants of the buttocks, the anterior thighs and triceps are suggested sites.

Gonorrhea.—Three hundred thousand units as a single injection or 200,000 units as an initial injection followed by 100,000 units in twelve hours, or three injections at eight hour intervals of 100,000 units each. In the presence of complications such as arthritis, endocarditis and epididymitis the dosage should be intensified and prolonged.

Pneumonia and Acute Staphylococcic and Streptococcic Infections.—A minimum of 300,000 units daily, preferably in divided doses and continued until the temperature returns to normal and other evidence of infection disappears.

Precautions.—DO NOT USE INTRAVENOUSLY. Do not use in those conditions listed in groups III and IV under "Sodium Penicillin" and "Calcium Penicillin."

ORAL PRODUCTS

TABLETS BUFFERED PENICILLIN, CAPSULES BUFFERED PENICILLIN

Tablets buffered penicillin and capsules buffered penicillin contain one or more of the buffer substances sodium citrate, citric acid, aluminum hydroxide, calcium carbonate, magnesium oxide and aluminum-dihydroxy-amino acetate. The potency of each tablet or capsule is not less than 20,000 units, and the number of tablets or capsules in each single package is such that the total number of units therein is not less than 300,000.

CAPSULES PENICILLIN IN OIL

Capsules penicillin in oil is a suspension of sodium penicillin or calcium penicillin in refined vegetable food oil. The potency of each capsule is not less than 20,000 units, and the number of capsules in each single package is such that the total number of units therein is not less than 300,000.

PENICILLIN WITH ALUMINUM HYDROXIDE GEL

Penicillin with aluminum hydroxide gel is a combination package of sodium penicillin or calcium penicillin and aluminum hydroxide gel. The quantity of aluminum hydroxide gel packaged with the penicillin shall be 30 cc. for each 100,000 units.

Indications and Dosage.—Oral penicillin preparations should be administered on a fasting stomach, not less than thirty minutes before or not less than one and one-half to two hours after eating.

Gonorrhea.—Combined Therapy: A single injection of 100,000 units followed not later than two or three hours by oral doses of 40,000 to 50,000 units each every two or three hours for six doses per day for one or two days.

Oral Therapy: Forty thousand to 50,000 units every two or three hours for six doses per day for one or two days.

In complications such as arthritis, endocarditis and epididymitis, administer penicillin parenterally. Concurrent infections of gonorrhea and syphilis should always be considered. Treatment of gonorrhea under the foregoing dosage schedule may prevent the appearance of the chancre and thus mask the first evidence of syphilis. The masking of the chancre should not be construed as a beneficial effect. Blood serologic tests should be made once a month for a minimum of three months.

Pneumococcic, Streptococcic and Staphylococcic Infections.—A minimum of 20,000 to 40,000 units of penicillin parenterally every three hours. After the acute phase and when the temperature has been reduced, treatment may be continued with oral administration. Treat with a dosage of 40,000 to 50,000 units each two or three hours (day and night) for at least forty-eight hours after the temperature has returned to normal. If the condition is not controlled by oral penicillin, return to parenteral administration.

Prophylaxis.—Against secondary infections after tonsillectomy or tooth extraction in cases with a history of rheumatic fever or rheumatic heart disease, congenital heart disease and other conditions in which secondary infections may occur (infected teeth or tonsils), administer 100,000 to 200,000 units daily in divided doses from one day before to three or four days after surgery.

Precautions.—In meningitis, endocarditis and peritonitis, administer penicillin *only* parenterally. In acute infection with bacteremia or septicemia, parenteral administration of penicillin should be continued until the blood cultures become negative and the acute condition is controlled. Do not use in those conditions listed in group III and IV under "Sodium Penicillin" and "Calcium Penicillin."

TOPICAL PRODUCTS

PENICILLIN OINTMENT; PENICILLIN OINTMENT OPHTHALMIC

Penicillin ointment is calcium penicillin in an ointment base composed of wool fat, petrolatum or white petrolatum, or any mixture of two or all of these with or without liquid petrolatum, white wax, yellow wax, cottonseed oil or peanut oil, or any mixture of two or all of these. Its potency is not less than 250 units per gram, and it contains not more than 50 viable micro-organisms per gram.

Penicillin ointment is packaged in collapsible tubes, not larger than 1 ounce size, except that ophthalmic ointments shall be in tubes not larger than the one-eighth ounce size.

PENICILLIN OINTMENT OPHTHALMIC

Indications and Dosage.—Superficial infections of the eye involving the cornea, conjunctiva, meibomian glands and lacrimal sac caused by organisms susceptible to penicillin. Apply one or more times a day as the condition indicates. Supplement local treatment of gonorrheal conjunctivitis with parenteral administration of penicillin.

Precaution.—If sensitization occurs, discontinue use.

PENICILLIN OINTMENT

Indications and Dosage.—Superficial infections of the skin caused by organisms susceptible to penicillin. Apply locally, with or without a bandage, one or more times a day as the condition indicates. If indicated, supplement local treatment with parenteral or oral administration of penicillin.

Precaution.—If sensitization occurs, discontinue use.

TOPICAL PENICILLIN

Topical penicillin is calcium penicillin which conforms to the standards prescribed therefor under "Calcium Penicillin" but is a fine powder. It may be packaged in vials or in foil enclosures containing not less than 10,000 units or not more than 50,000 units of penicillin.

Indications and Dosage.—For postoperative mastoid infections, inject through a small inlying catheter, directly into the cavity, 1 cc. of a sterile solution containing 50,000 units, once a day for a minimum of four days. In osteomyelitis, parenteral therapy may be supplemented by local instillation with 25,000 to 50,000 units in sterile solution two to three times a day. In empyema after aspiration, instil from 50,000 to 100,000 units into the cavity in a volume of solution less than the quantity of fluid aspirated. In superficial infections of the skin caused by organisms susceptible to penicillin, apply sterile dressings wet with a solution containing 1,000 units per cubic centimeter one or more times per day as the condition indicates. If indicated, supplement local therapy with systemic medication.

Precaution.—If sensitization occurs, discontinue use.

PENICILLIN TROCHES

Penicillin troches are composed of sodium penicillin or calcium penicillin and may contain masticatory substances. The potency of each troche is not less than 500 units. If the product contains masticatory substances, the word "chewing" or "masticatory" shall appear in juxtaposition with the name penicillin troches wherever such name appears on the label and labeling.

Indications and Dosage.—In Vincent's infection, allow one troche to dissolve in the mouth. Repeat two or three times a day between meals. Smears should be taken before and after therapy. If indicated, supplement local treatment with parenteral or oral administration of penicillin.

Precaution.—If sensitization occurs, discontinue use.

PENICILLIN TROCHES (MASTICATORY)

Indications and Dosage.—In Vincent's infection, chew two or three troches a day. When high continuous concentrations are desired, chew one troche each hour or two.

Precaution.—If sensitization occurs, discontinue use.

PENICILLIN DENTAL CONES

Penicillin dental cones are composed of calcium penicillin and may also contain sulfanilamide or sulfathiazole or both. The potency of each cone is not less than 500 units, and the content of viable micro-organisms is not more than 50 per gram. If a sulfonamide is used, its quantity is not less than 0.032 Gm. per cone.

Indications and Dosage.—Insert a cone after tooth extraction or as treatment for dry socket. Use in conjunction with parenteral therapy in operative procedures.

Precaution.—If sensitization occurs, discontinue use.

Awareness of Aging.—The subjective appraisal of failing physiologic and psychologic functions is largely an individual matter and is relative to cultural pressures and level of aspiration. Malamud points out that there is no one-to-one relationship between these different aspects of senile decline. Many of the psychologic traits of the aged are due to the cumulative effects of experience, to frustrations and the awareness of limitations, rather than to any primary or essential consequences of physiologic deficit.—Jones, Harold E., and Kaplan, Oscar J.: Psychologic Aspects of Mental Disorders in Later Life, from Mental Disorders in Later Life, edited by Oscar J. Kaplan, Stanford University Press, 1945.

Council on Physical Medicine

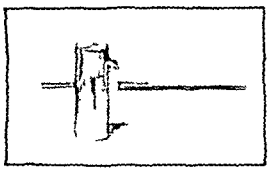
The Council on Physical Medicine has authorized publication of the following reports. HOWARD A CARTER, *Secretary.*

TORPIN INSUFFLATOR ACCEPTABLE

Distributors: University of Georgia School of Medicine.

This device is designed to aid in the resuscitation of the cyanotic newborn. It is essentially a combination of a liquid trap and safety valve. The pressure of oxygen or air administered to the infant's lungs is controlled at all times by the weighted valve, which blows off at 20 cm. of water pressure. The trap acts as a reservoir for aspiration of mucus and other secretions from the trachea and also as a trap for the expiratory secretions of the operator. A reprint of an article entitled "Apnea Neonatorum" by Perry P. Volpitto and Richard Torpin, submitted as part of the evidence, describes the instrument and explains how it is used.

The device was investigated in a laboratory acceptable to the Council. It was reported as a metal trap designed to be inserted between the lips of the physician and a tube in the infant's trachea. If one sucks on the device, the trap serves to keep one from sucking material into one's mouth, and the heavy lid on the trap will be raised if one blows with too high a pressure. This will prevent blowing up the infant's lungs unduly. If the physician attaches the appliance directly to a tank of oxygen under high pressure instead of to his mouth, it will allow oxygen to escape rather than let it go into the trachea under high pressure. This is a desirable safeguard. The apparatus is harmless in its potentialities. The insufflator has been manufactured for the University of Georgia, which so far has aided in its distribution.



Torpin Insufflator.

The Council on Physical Medicine voted to accept this product for inclusion in its list of accepted devices.

KREISELMAN RESUSCITATORS, ADULT CART MODELS, ACCEPTABLE

Manufacturer: The Ohio Chemical & Manufacturing Company, 1177 Marquette Street, Cleveland.

Kreiselman resuscitators are designed for the administration of artificial respiration with oxygen to patients whose spontaneous respirations have not been resumed. These models are primarily for use in medical institutions. Essential parts of the apparatus are a two stage automatic reducing valve and an adjustable automat for regulating the amount of positive pressure exerted at the face piece, a flowmeter calibrated for oxygen, a flowmeter control valve, a resuscitation inhaler and tubing. These units are mounted on an upright stand equipped with three wheels. The shipping weight is approximately 175 pounds. Only positive pressure is provided by the apparatus. There is no negative pressure developed at the face piece. The units come equipped with tools and instructions.



Kreiselman Resuscitator, Model 61-A.

Model 61-A, which is essentially similar to the others, was furnished for investigation. The Council investigator reported that the pressure regulator is standard for the company and is reliable. The fitting of the oxygen cylinder is made for a "commercial" cylinder, and an adapter is furnished to fit "medical" cylinders. The apparatus provides a pressure at the face mask varying up to 25 mm. of mercury. The gas is delivered by pressing on a convenient lever with the thumb of the hand which holds the face mask. The mask can be removed and a fitting for an endotracheal tube substituted. When attached to either mask or tube, double valves permit normal inspiration and expiration to take place through it when the inflation lever is not pressed.

A second mask receives oxygen through another tube by way of a standard Heidbrink flowmeter graduated up to 14 liters of helium-oxygen mixture or 11 liters of pure oxygen. This second mask is open around the oxygen inlet so that free respiration of air can take place with the mask held in place in case the flow of oxygen is inadequate.

Both the inflator and the inhalator are commendably safe since, if no oxygen is available, the patient can continue to breathe normally.

A motor with the air pump is mounted on the cart which provides adequate negative pressure to suck mucus from the throat of a patient. This part of the apparatus seems safe. Doubtless the motor and the pump are the best available at present. This apparatus complete will, it is believed, serve the purpose for which it is intended both safely and efficiently.

Other Kreiselman resuscitators are acceptable since they are variations in assembly of otherwise accepted parts. The parts are in different combinations. They are Models Nos. 52, 52-A, 52-B, 61, 61-A, 61-B, 80, 80J, 81 and 81J.

The Council on Physical Medicine voted to adopt the Kreiselman resuscitators, models aforementioned, for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

ALUMINUM HYDROXIDE GEL (See New and Nonofficial Remedies, 1944, p. 382).

The following dosage forms have been accepted:

BARLOW-MANEY LABORATORIES, CEDAR RAPIDS, IOWA

Aluminum Hydroxide Gel: 480 cc. bottles. Contains the equivalent of 3.6 to 4.4 per cent of aluminum oxide (U. S. P. XII).

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Aluminum Hydroxide Gel: 240 cc. and 3,840 cc. bottles. Contains the equivalent of 3.6 to 4.4 per cent of aluminum oxide (U. S. P. XII).

E. R. SQUIBB & SONS, NEW YORK

Aluminum Hydroxide Gel: 360 cc. and 3,840 cc. bottles. Contains the equivalent of 3.6 to 4.4 per cent of aluminum oxide (U. S. P. XII).

SYRINGE APPLICATORS FOR CONTRACEPTIVE JELLIES AND CREAMS (See New and Nonofficial Remedies, 1944, p. 341).

The following product has been accepted:

CONTRA CREME AND DIAPHRAGM CO., SEVERNA PARK, MD.

Contra Applicator: A transparent plastic syringe threaded at the blunt, intravaginal end, to screw onto the tubes of Contra Creme, to permit filling by compression of the tube. The full capacity is 5 cc., the recommended dose.

EPHEDRINE SULFATE (See New and Nonofficial Remedies, 1945, p. 270).

The following dosage form has been accepted:

THE WM. S. MERRELL CO., LOESER LABORATORY DIVISION, CINCINNATI

Solution Ephedrine Sulfate: 0.048 Gm. in 1 cc. ampuls.

DIETHYLSTILBESTROL (See New and Nonofficial Remedies, 1944, p. 417).

The following dosage form has been accepted:

WALLACE & TIERNAN PRODUCTS, INC., BELLEVILLE, N. J.

Tablets Diethylstilbestrol: 0.1 mg., 0.5 mg. and 1.0 mg.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, AUGUST 18, 1945

PENICILLIN IN SUBACUTE BACTERIAL ENDOCARDITIS

The therapy of subacute bacterial endocarditis, prior to the advent of the new chemotherapeutic agents, was all but futile. According to Libman, spontaneous recoveries probably occurred in from 3 to 5 per cent of the cases. Kelson and White [1] collected data on 66 cases treated intensively with sulfapyridine, and in 65 the course of the disease was not influenced by this therapy. Friedman, Hamburger and Katz [2] suggested that continued deposition of new fibrin and platelets on the vegetations created an impenetrable barrier to the action of otherwise effective agents; they proposed that a patient with bacterial endocarditis be first subjected to treatment with an anticoagulant such as heparin. Kelson and White [1] treated 7 patients with sulfapyridine and heparin. Only 3 patients were able to take heparin for more than a week, and in these there was a striking improvement. The first reports on the effect of penicillin in bacterial endocarditis were not encouraging. In the 17 cases reported by Keefer [3] there were four deaths during the course of treatment; in 3 cases temporary improvement was followed by a relapse in 2 soon after treatment was discontinued; no appreciable effect was noted in 10.

In contrast to these discouraging results, Loewe [4] reports a clinical cure in 75 per cent of a consecutive series of 54 unselected cases from a combined penicillin and heparin therapy. Loewe and his collaborators were able to limit the deposition of fibrin and platelets on the heart valves in animals with artificially induced bacterial endocarditis by administration of heparin. Friedman, McLean and others called attention to the difficulties and hazards of heparin therapy in man. Loewe and Rosenblatt [5] deposited the drug subcutaneously, utilizing the Pitkin menstruum, which is composed of gelatin, dextrose, glacial acetic acid and water in definite proportions. By this technic a slower and more equable absorption of heparin was accomplished. Loewe and his co-workers administered heparin and sulfonamide compounds combined to 17 patients with subacute bacterial endocarditis but could not determine an appreciable effect on the course of the disease in 15. Of the 54 patients treated with penicillin and heparin combined, 14 were failures and 40 appeared to be cured. In the latter group 37 are alive and many have resumed useful occupations; 3 have died of other causes. In the group of failures of treatment, thirteen deaths followed circulatory failure, coronary occlusion, embolization and pneumonia. These authors feel that a five week course of treatment with penicillin should be the standard minimum. Additional courses are well tolerated and are to be given when indicated. Based on penicillin sensitivity tests, an average daily dose of 200,000 Oxford units is suggested. Inadequate dosage invites failure, and the organisms may acquire resistance that is so high as to render future therapeutic levels unattainable. The total unitage in their series varied between the low 86,700 and a high of 48,930,000 Oxford units. To heparinize the blood effectually required subcutaneous deposition of 300 mg. of heparin every second or third day.

Dawson and Hunter [6] administered combined heparin-penicillin therapy to 16 patients with bacterial endocarditis. The infection of 11 patients has apparently been terminated. All 11 have remained bacteria free and in excellent health for three months or longer since treatment was discontinued. The infection of 2 patients was controlled but recurred when treatment was stopped. Two patients died as the result of a cerebral embolism. These authors feel that patients with subacute bacterial endocarditis should be treated with penicillin if the infecting organism is a streptococcus sensitive to the action of the drug. They were impressed with the advantages of administering penicillin by continuous intramuscular drip, as advocated by Harris.[7]

Bloomfield [8] and his associates obtained excellent results from intensive penicillin therapy alone carried on for six to eight weeks. All 11 patients were promptly made bacteria free except 1, who died early in the course of treatment. Eight were clinically cured of the infection after follow-up periods up to six months. One patient, apparently cured of the infection, died of cardiac failure. There were no clinical relapses or rein-

1. Kelson, S. R., and White, P. D.: New Method of Treatment of Subacute Bacterial Endocarditis, J. A. M. A. **113**: 1700 (Nov. 4) 1939.
2. Friedman, Meyer; Hamburger, W. W., and Katz, L. N.: Use of Heparin in Subacute Bacterial Endocarditis, J. A. M. A. **113**: 1702 (Nov. 4) 1939.
3. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. Barry, Jr.: Penicillin in the Treatment of Infections, J. A. M. A. **122**: 1217 (Aug. 28) 1943.
4. Loewe, Leo: Combined Use of Anti-Infectives and Anticoagulants in Treatment of Subacute Bacterial Endocarditis, Bull. New York Acad. Med. **21**: 59 (Feb.) 1945.
5. Loewe, Leo, and Rosenblatt, Philip: A New Practical Method of Subcutaneous Administration of Heparin, Am. J. M. Sc. **208**: 54 (July) 1944.
6. Dawson, M. H., and Hunter, T. H.: Treatment of Subacute Bacterial Endocarditis with Penicillin, J. A. M. A. **127**: 129 (Jan. 20) 1945.
7. Harris, F. I.: Continuous Intramuscular Infusion of Penicillin, J. A. M. A. **126**: 232 (Sept. 23) 1944.
8. Bloomfield, A. L.: Treatment of Subacute Bacterial Endocarditis with Penicillin, J. Clin. Investigation **24**: 251 (May) 1945.

fections. These authors believe that the time factor is even more important than the daily dose. The failures of the early attempts were due to short periods of treatment. Continuous treatment over long periods is more likely to eradicate the infection than brief courses of penicillin.

CULTIVATION OF MALARIAL PARASITES

In 1912 Bass and Johns [1] reported a method for the cultivation of two species of malarial parasites of man. Blood drawn from a malarial patient was expelled directly into a defibrinating tube containing 0.1 cc. of a 50 per cent dextrose solution for each 10 cc. of blood taken. Defibrination was effected by gentle stirring with a glass rod. The defibrinated blood was allowed to sediment at incubator temperature (40 C.) until a column of serum ½ to 1 inch deep was above the sedimented cells. The parasites live and develop in the half millimeter top layer of the sedimented cells. All parasites beneath this top layer die and disintegrate. In such a culture the young parasites increase in size during the first twenty-four hours. Segmentation begins in about thirty-six hours. Extracellular parasites are rapidly ingested and destroyed by leukocytes. A free asexual malarial parasite cannot live longer than a few minutes in normal human serum. Probably, therefore, malarial plasmodia can pass from cell to cell only when the cells are in direct contact.

Most of the earlier investigators [2] who attempted to confirm this work reported that development of human malaria parasites in the so-called culture is at best only minimal. Counts show that increases do not occur in the number of parasites. Other investigators afterward applied a modification of this technic to the attempted cultivation of malaria parasites from canaries, domestic fowls and monkeys. Among the most favorable results were those reported by Gavrilov,[3] who showed that tissue cultures from the bone marrow of chickens infected with Plasmodium gallinacium remained infective for ten days. Trager [4] of the Rockefeller Institute effected in vitro survival of the bird malarial parasite (Plasmodium lophurae) up to sixteen days. The parasite population in his "cultures" usually remained constant for the first few days and then declined. He concluded that the death rate, particularly after the first few days, far exceeded the birth rate, though development must have been continuing in his preparations.

A much more successful in vitro cultivation of malarial parasites is now reported by Ball and his co-workers [5] of Harvard Medical School. They selected the erythrocytic form of Plasmodium knowlesi, a malaria parasite of monkeys (Macaca mulatta), which also produces infection in man. This parasite has a twenty-four hour asexual life cycle. They first developed a buffered nutrient fluid consisting of glucose (2.5 Gm. per liter), proteose peptone (1.5 Gm.), a purified mixture of amino acids (0.5 Gm.) and the usual salts necessary for tissue cultures, supplemented by presumably optimal amounts of all known essential vitamins.

Two culture technics were developed. By the first, or "rocker dilution," technic 1 part of whole malarial blood was added to 3 parts of nutrient fluid, and the mixture was placed in a flask equipped with a gas inlet and outlet. The container was placed in a rocker machine, which just kept the red cells in suspension. A slow flow of 5 per cent carbon dioxide in 95 per cent air was passed through the container. The whole procedure was carried out with aseptic precautions at a temperature of 38.5 C. The best results were obtained when the number of parasitized cells in the mixture was not more than 25,000 per cubic millimeter. More highly parasitized blood was diluted with several times its volume of normal monkey blood.

The second, or "rocker perfusion," technic employed a cellophane membrane to separate the infected blood from the nutrient medium. Several types of apparatus were developed. For small volumes of blood the cellophane membrane was stretched over one end of a glass tube about 1 inch in diameter. The blood was placed within the tube directly on the membrane. The tube was mounted in a vessel containing the nutrient fluid so that the membrane was just wet by the fluid. For larger cultures a coil of cellophane tubing was used. This was supported by a glass form and immersed in the blood. Nutrient fluid was allowed to flow through the tubing at a rate of approximately 1 cc. per minute. In both types of cultivation a slow stream of 5 per cent carbon dioxide in 95 per cent air was passed through the container, which was gently rocked to keep the corpuscles in suspension. All operations were performed at 38.5 C.

Cultivation was usually carried on for twenty-four hours. If subcultures were desired, a fresh setup was made at the end of each twenty-four hours, the parasitized blood being diluted with normal blood and the nutrient fluid replaced. The addition of one fourth volume of normal blood serum to the nutrient fluid was an advantage. In eighty-nine experiments the average increase in parasite count within twenty-four hours was approximately fourfold. In 60 monkeys the average in vivo increase in parasite count for the same period was also fourfold. Differential counts during the twenty-four hour period showed that segmentation usually takes place between the fifth and the tenth hour.

Under the rocker perfusion technic six successive generations have thus far been cultivated by the Harvard pathologists. The infectivity of the sixth genera-

1. Bass, C. C., and Johns, F. M.: J Exper. Med. **16**: 567, 1912.
2. Horovitz, A., and Sautet, J.: Ann Parasitol. **7**: 151, 1929.
3. Gavrilov, W.; Bobkoff, G., and Laurencin, S.: Ann Soc. belge méd. trop. **18**: 429, 1938.
4. Trager, William: J Exper. Med. **74**: 441, 1941; **77**: 411, 1943.
5. Ball, E. G.; Anfinsen, C. B.; German, Q. M.; McKee, R. W., and Osmose, R. A.: Science **101**: 542 (May 25) 1945.

tion was demonstrated by inoculation into a monkey. The technic is now being applied with encouraging results to the in vitro cultivation of human malaria parasites. Typical of results thus far obtained is their finding that para-aminobenzoic acid is probably the chief essential growth component furnished by the nutrient fluid. This in their opinion may help to explain the observation of Coggeshall [6] that sulfanilamide will eradicate P. knowlesi infections in monkeys.

UNAVAILABLE NUTRIENTS

After the discovery of the vitamins it became obvious that a conventional chemical analysis of a food might give little indication of its real nutritive value, as the relative quantities of these accessory food factors usually are too small to be thus measured. As time passed it became increasingly plain that a similar philosophy applies to dietary constituents which can be measured; in addition to a chemical analysis, the utilization of these constituents can be examined by the methods of biologic assay. Through this device it has been shown that a wide variation exists in the availability to the organism of dietary essentials in various forms in our foods. A relatively simple method of determining the availability of iron, for instance, is to measure hemoglobin regeneration in an animal on an iron free diet to which the source of iron to be tested is added. Sherman, Elvehjem and Hart [1] found that about 70 per cent of the iron of liver is available for hemoglobin formation but only 50 per cent of that in wheat can be used and only 20 per cent of the total iron of spinach is utilized. Nakamura and Mitchell [2] examined some pure iron compounds and found that the iron of ferric phytate was only about one half as available to the rat as ferric chloride. The presence of phytate is believed to explain the low utilization of the iron of whole wheat.

In studying the calcium utilization of high extraction flour, that is, the dark flour which contains most of the wheat kernel, McCance and Widdowson [3] observed that the calcium of 92 per cent extraction flour was less completely used by human subjects than was the calcium in 69 per cent extraction flour (white flour). Addition of sodium phytate to the white flour depressed the availability of calcium in the product. In a white flour to which dephytinized bran was added to simulate a synthetic high extraction flour, the calcium was as available as in the original white flour. Hence the factor in whole wheat which renders its calcium unavailable is believed to be phytic acid.

Earlier investigations have shown that both human beings and experimental animals are unable to utilize the thiamine from fresh yeast as completely as that present in dried or dead yeast samples. Recently Parsons, Williamson and Johnson [4] have presented data on human subjects which show that the thiamine present in two types of commercial bakers' yeast was not utilized when the yeast was fed in the fresh state. This was indicated by a high fecal and low urinary excretion of thiamine. In addition, ingestion of these yeasts reduced the availability of thiamine which was supplied by the basal diet. By boiling the yeast for a short time before ingestion, the availability of the thiamine present in the yeast cells was strikingly increased. Although a different species of yeast with a higher thiamine content did not show the inhibition of utilization of dietary thiamine, boiling this yeast also made its thiamine more available. Thus it appears that fresh yeast is not as reliable a source of thiamine as is heat-treated yeast.

Evidently the total content of a nutrient in a food is not the only index to its nutritional value; of equal or more importance is the ability of the animal to utilize the nutrient. Tables of nutritive factors in foods will no doubt soon give the available or utilizable nutrients rather than the total nutrients as shown by chemical analysis. Such tables would be especially valuable to the physician who is planning adequate therapeutic diets.

Current Comment

DIAGNOSIS OF PULMONARY TUBERCULOSIS IN THE ADULT

In a recent essay on primary principles for guidance in the diagnosis of tuberculosis of the lungs Pinner [1] emphasizes the need of a better understanding by the public of the possible significance of minimal symptoms and the importance of proper examination of the patient. In pulmonary tuberculosis, as also in cancer, the advanced stage of the disease when the patient comes under treatment is the greatest hindrance to its success. In both instances the fault may lie with the patient who fails to seek treatment early or with the physician who fails in his diagnosis. Pinner points out that periodic x-ray examination, which is the only means of discovering pulmonary tuberculosis in a prognostically hopeful stage, is not yet practiced as promptly and widely as its value demands. He urges more and wider x-ray surveys, especially in groups in which tuberculosis is prevalent. The preemployment examinations, including x-ray films, which have proved of great value in defense industries should be continued and followed by earnest efforts at physical and economic rehabilitation. The lack of such efforts is "probably the weakest link

6. Coggeshall, L. T.: J. Exper. Med. **71**: 13, 1940.

1. Sherman, W. C.; Elvehjem, C. A., and Hart, E. B.: J. Biol. Chem. **107**: 383 (Nov.) 1934.

2. Nakamura, F. I., and Mitchell, H. H.: J. Nutrition **25**: 39 (Jan.) 1943.

3. McCance, R. A., and Widdowson, E. M.: J. Physiol. **101**: 44 (June 2); 304 (Nov. 30) 1942.

4. Parsons, H. T.; Williamson, A., and Johnson, M.: J. Nutrition **29**: 373 (June) 1945.

1. Pinner, Max: Pulmonary Tuberculosis in the Adult, Springfield, Ill., Charles C Thomas, 1945, p. 347.

in our present antituberculosis work." In his discussion of the actual diagnosis of pulmonary tuberculosis in a case Pinner makes it clear that the question is to determine whether or not an active tuberculous focus is present in the lungs. Here the value of the tuberculin test will depend on the reactor rate of the group to which the patient belongs. The test would hardly be worth while in cities where that rate is close to 100 per cent in adults. While the presence of a focus of disease in the lungs may be demonstrable by physical examination, physicians should remember that absence of a focus cannot be determined without proper x-ray examination. The patient cannot be assured that he does not have pulmonary tuberculosis except on the basis of such examination. Establishment that a focus in the lungs is actively tuberculous requires the demonstration of tubercle bacilli in the sputum or in the gastric contents. If bacilli cannot be found in the presence of a suspected focus, all the differential diagnostic possibilities must be considered. The demonstration of tubercle bacilli, changes on serial roentgenograms and pulmonary symptoms establish active tuberculosis, but the absence of any one of these criteria does not exclude activity. The decision may require prolonged observation. In recent years the examinations on military induction, before employment and in diagnostic surveys are bringing to light so-called asymptomatic patients in whom pulmonary lesions are discovered accidentally. Here the problem of differential diagnosis and tuberculous activity requires special study. In Pinner's hands serial roentgenograms, bacterial tests and close study of symptoms have given good results, while hematologic data have been of relatively low value In view of the fundamental importance of the x-ray examination in the recognition of pulmonary tuberculosis, provision should be made everywhere for competent free examination of patients who are unable to pay. Fortunately this is now done in many cities. The importance of early correct diagnosis cannot be overstated, because "symptomatic treatment without adequate diagnosis is a prominent cause of far advanced tuberculosis."

STAIRWAYS AND THE PHYSICALLY HANDICAPPED

The National Society for Crippled Children and Adults has recently inaugurated a campaign to construct new public buildings with ground level entries, elevators between floors and the elimination of all unnecessary steps. This society also urges the remodeling of existing buildings with long flights of stairs, to provide ground level entries, elevators, ramps and other practicable measures aimed at the elimination or amelioration of impediments to ready access. Patients with heart disease, crippling illnesses, missing limbs or other disorders of locomotion form an increasing proportion of the population, both because of the war and because of the lengthened average age. Progress along the lines suggested should decrease the number of accidents among the handicapped as well as greatly increase their ability to perform business activities and seek pleasure with greater frequency and ease.

THE SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH

In connection with the expansion of the Memorial Hospital in New York City the Alfred P. Sloan Foundation has announced the appropriation of $4,000,000 for the erection and initial maintenance of the Sloan-Kettering Institute for Cancer Research. The building will stand in the middle of the "Memorial Cancer Center." The cost of construction is estimated at $2,000,000, and $200,000 a year will be provided for running expenses for ten years. The clinical facilities and materials of the center will be available to the institute, which will have its own board of trustees and be "self contained in all its various research functions." The present research organization of the hospital will become part of the institute. To complete the plans for the expansion of the Memorial Hospital an additional $3,000,000 to $4,000,000 will be needed for increase of its bed capacity, for training fellowships and for the equipment of the James Ewing Hospital of 300 beds to be built by the city of New York on the same grounds. The completion of this program will result in the creation of a great center for cancer service and cancer research, a model for the establishment of similar centers in other cities. Commenting on the projected institute Mr. Alfred P. Sloan Jr., the sponsor of the foundation, said that his industrial experience has led him to appreciate the amazing possibilities of research when organized on a broad and comprehensive scale and that he and his associate, Dr. Charles F. Kettering, are convinced of the applicability of the broad principles of organized industrial research to the problems of cancer. "The current acceleration of scientific knowledge provides an unusual opportunity for a determined all-out effort." Mr. Sloan also said "In addition to this specific project we hope it may be possible to organize on a high scientific level the more complete coordination of other worthy efforts now being directed to the same end objective. It is of great importance that this be done. It should result in a more effective use of aggregate resources now available for the purpose." This is indeed tidings of momentous significance. Solution of the problems of cancer can be attained only by research. The new institute will carry on its work in the spirit and the conviction that long-range programs of research with adequate support and direction can solve such problems. At the same time the control of cancer by the means at hand will be steadily promoted by improving and enlarging the facilities for skilled clinical service coupled with continuous education of the public in the vital importance of early and effective treatment.

MEDICINE AND THE WAR

TRANSPORTABLE SICK AND WOUNDED SOLDIERS HOME FROM EUROPE

The War Department recently announced that the Army's plan for bringing all transportable sick and wounded soldiers home from Europe within ninety days after V-E day will be completed according to schedule. To achieve this ninety-day goal army authorities put on such pressure, beginning with V-E day, that the major portion of the task was done within sixty days. This is in sharp contrast to the procedure in the first world war, when American sick and wounded soldiers remained overseas about a year.

In May there were more than 43,000 soldiers brought home from the European theaters, practically all after May 8, or V-E day. With approximately 14,000 who came into West Coast hospitals, this brought the May total to an all time high of approximately 57,000 who were evacuated. The figure for evacuees from Europe dropped the next month to slightly less than 32,000, which, with the Pacific casualties, made the evacuation total over 42,000 for June. In July approximately 27,000 arrived at East Coast ports, which included practically all of those who were wounded prior to V-E day. The number of nontransportable cases is comparatively small, Brig. Gen. Raymond W. Bliss, assistant Surgeon General of the Army, said.

The nation's wounded and sick servicemen arrive under the care of army doctors, nurses and Medical Department personnel at New York, Charleston, S. C., Boston and Hampton Roads, Va. The majority are disembarked at the first two ports. It is only a matter of hours from the time these soldiers reach port until they are assigned a bed at a nearby hospital, such as Halloran General at New York or Stark General at Charleston.

At the time of Pearl Harbor there were approximately 15,000 beds in all army general hospitals in this country. The army general and convalescent bed capacity is now 215,000. This does not include the vast network of army station and regional hospitals which care for the routine needs of sick and wounded soldiers who have been incapacitated in this country.

CIVILIAN PSYCHIATRISTS COMPLETE ETO SURVEY

At the request of the Surgeon General, the Office of Scientific Research and Development appointed a group of noted civilian psychiatrists to undertake a study of combat exhaustion problems in the European Theater of Operations. These psychiatrists have now returned with a report of their findings. Included in the group which made the survey with the cooperation of the Army Medical Department are Dr. Leo H. Bartemeier, professor of psychiatry, Wayne University, Detroit; Dr. Lawrence S. Kubie, associate in neurology, Columbia University College of Physicians and Surgeons, New York; Dr. Karl Menninger, director of the Menninger Clinic, Topeka, Kan.; Dr. John Romano, professor of psychiatry, Cincinnati General Hospital, Cincinnati, and Dr. John C. Whitehorn, chief psychiatrist of Johns Hopkins Hospital and professor of psychiatry, Johns Hopkins University School of Medicine, Baltimore.

AWARDS MADE FOR YUGOSLAV TYPHUS WORK

Brig. Gen. Leon Fox, Birmingham, Ala., chief of the United States Typhus Commission, and three members of his staff were recently awarded the Yugoslav medal for services to the people of Yugoslavia. Two of the awards were given to Lieut. Col. Edward Murray, Cedar Rapids, Iowa, and Lieut. Col. Charles Wheeler, Doon, Iowa.

95TH STATION HOSPITAL AWARDED PLAQUE

The Meritorious Service Unit Plaque was recently awarded to the 95th Station Hospital "for superior performance of duty in the completion of exceptionally difficult tasks under adverse conditions and the maintenance of a high standard of military discipline and efficiency during the period Oct. 15, 1944 to Feb. 15, 1945." Col. A. A. Leonidoff is commanding officer of the hospital, and Major James W. Tobin and Lieut. Col. Charles D. Driscoll are chief of surgical service and chief of medical service, respectively.

DR. A. L. BENISON REPORTED MISSING

Dr. A. L. Benison, formerly of Edmore, Mich., serving in the U. S. Army and captured by the Japanese at Pearl Harbor, is reported lost on a Japanese prison ship 200 miles off the coast of China. The ship was reported to have been torpedoed by submarines as it was taking American war prisoners to Japan last October 24. Dr. Benison graduated from the University of Michigan Medical School, Ann Arbor, in 1937 and entered the service May 15, 1941.

ARMY AWARDS AND COMMENDATIONS

Colonel Clifford V. Morgan

A Bronze Oak Leaf Cluster to the Legion of Merit was recently awarded to Col. Clifford V. Morgan, formerly of Washington, D. C. The citation accompanying the award read "for exceptionally meritorious conduct in the performance of outstanding services, as deputy general purchasing agent, Forward Echelon, Headquarters Communications Zone, European Theater of Operations, from Feb. 25, 1944 to Aug. 7, 1944. Colonel Morgan supervised and coordinated general purchasing planning as far as coordination was necessary with 21st Army Group (British), First United States Army Group, First United States Army, Third United States Army, Western Task Force, 9th Air Force, and agencies of Communications Zone staff. He ably guided and facilitated purchasing planning for overseas operations and formulated a clear and concise general purchasing agent plan consistent with directives of higher authority. Colonel Morgan rendered outstanding services on the continent not only by advising and personally assisting the advance section, but also by attaching key personnel to that section for training purposes." Dr. Morgan graduated from the University of Nebraska College of Medicine, Omaha, in 1927 and has been in the service since August 1928.

Colonel Edward D. Churchill

The Legion of Merit was recently awarded to Col. Edward D. Churchill, formerly of Boston, "for exceptionally meritorious conduct in the performance of outstanding services. By instituting advanced principles of war surgery throughout American hospitals in the theater during the Tunisian campaign, and by initiating a standardized surgical technic, he was responsible to a considerable extent for the extremely low mortality rate among wounded soldiers. By his keen foresight, his efficient planning and careful supervision of surgical procedures, much suffering was alleviated and many lives were saved." Dr. Churchill graduated from Harvard Medical School, Boston, in 1920 and entered the service Jan. 10, 1943.

Major Donald Grillo

For his work in the activation and evacuation of his station hospital at Kweilin, China, Major Donald Grillo, formerly of Gary, Ind., was recently awarded the Bronze Star. Dr. Grillo graduated from Indiana University School of Medicine, Indianapolis, in 1929 and entered the service in July 1942.

Major Edward C. Dyer

The Bronze Star was recently presented to Major Edward C. Dyer, formerly of Boston, "for meritorious achievement in action during the period Feb. 19, 1945 to Feb. 25, 1945, near Monte Belvedere, Italy." Dr. Dyer graduated from Harvard Medical School, Boston, in 1939 and entered the service Feb. 17, 1942.

Major Harry DeWitt Nesmith

Major Harry DeWitt Nesmith, formerly of Salem, Ill., was recently awarded the Bronze Star for meritorious achievement in connection with military operations against the enemy from June 1, 1944 to March 31, 1945. At the present time he is stationed in Germany. Dr. Nesmith graduated from the University of Illinois College of Medicine, Chicago, in 1939 and entered the service in March 1941.

Major Hugh M. Crumay

The Air Medal was recently awarded to Major Hugh M. Crumay, formerly of Mercer, Pa. The citation accompanying the award read "For meritorious achievement while participating in the Southwest Pacific Area, during which hostile contact was probable and expected. The courage and devotion to duty shown during these fights are worthy of commendation." Dr. Crumay graduated from Harvard Medical School, Boston, in 1933 and entered the service July 17, 1942.

Captain David Paris

The Bronze Star was recently awarded to Capt. David Paris, formerly of Cushing, Okla., "for meritorious achievement in connection with military operations against the enemy at Aitape, British New Guinea, from July 1, 1944 to Sept. 9, 1944; at Morotai, Netherlands East Indies, from Sept. 15, 1944 to Nov. 9, 1944; at Leyte, Philippine Islands, from Nov. 14, 1944 to Jan. 22, 1945, and at Luzon, Philippine Islands, from Jan. 29, 1945 to June 1, 1945." Dr. Paris graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1941 and entered the service July 1, 1942.

Captain Robert L. Kendall

Capt. Robert L. Kendall, formerly of Ardmore, Okla., was recently awarded the Bronze Star "for meritorious service in direct support of combat operations from Aug. 15, 1944 to Jan. 15, 1945 in France. During this period Captain Kendall's station has operated under a variety of conditions ranging from rapid advances requiring a high degree of mobility to static conditions with a large number of casualties. Despite adverse circumstances, Captain Kendall obtained a high state of efficiency and standard of medical care. The problem of serving two additional regiments was handled promptly and efficiently under his direction." Dr. Kendall graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1940 and entered the service Jan. 6, 1942.

NAVY

THE NAVY MEDICAL OFFICERS INQUIRE ABOUT DISCHARGE

[NOTE.—*Recently a letter from five Army medical officers was published. Here follows a similar communication from five Navy medical officers.*—ED.]

To the Editor:—We are Navy medical officers on active duty for varying lengths of time ranging from forty-two to thirty months. Most of us have seen duty throughout the mid and southwest Pacific. Like our Army colleagues, we have given much thought to the problems of rotation and the staffing of veterans' hospitals after the war. We have two suggestions to make which we sincerely believe are practical and meritorious. Like our colleagues, we hope to be heard and we trust that you will publish this letter under conditions similar to those pertaining to the Army one.

There are hundreds of Navy reserve medical officers on active duty who are over 40 years of age and have served for over three years. Many of these are married and have families. Like firemen, they have been standing by their posts, often inactive for long periods of time. They are anxious to work and to use their medical skill where it is most needed.

There are hundreds of civilian physicians who are overworked, some of them for as much as fourteen hours a day, and have been overworked for several years. Without waiting for the cessation of hostilities, would it not be possible to have the Procurement and Assignment representative in each state relieve some of these overworked civilian physicians with relatively idle Navy medical officers? To effect the transfer in as close a location as was proper, Navy headquarters in each district could submit to P. & A. headquarters the names of reserve physicians over 40 years of age or who have had over three years' active service and who express a desire to be relieved. The civilian physician could be shown the ropes by one of the other Navy medical officers and, like many other civilian employees of the Navy, would not have to wear a uniform.

The staffing of larger temporary Naval hospitals and of veterans' hospitals after the war deserves grave consideration. A system similar to the foregoing could be adopted for a period of thirty-six months following the end of hostilities. Overworked civilian physicians could be assigned to such hospitals under a special classification by the state P. & A. director. (If civilians are strong enough to work extremely hard for twelve hours a day in private practice they will certainly be able to stand the less arduous duties of an eight hour day in a Naval or veterans' hospital; indeed, the change will benefit them.) It will be noted that this suggestion in no way interferes with the training of medical students, since it is not proposed that men essential for full time teaching be displaced. The basic proposal is for a fair rotation of civilian and military doctors for a three year period following the termination of hostilities; at the end of that time the matter can be reviewed and further equitable adjustments made.

MARINE CORPS' AMPHTRACKS EQUIPPED AS FIELD HOSPITAL

The Marine Corps' amphtracks are now fitted with the equipment of a field hospital and are serving as front line mobile operating rooms. Utilization of the hitherto strictly combat vehicle in its new role is the idea of Navy Capt. Joseph W. Kimbrough, formerly of San Francisco and now chief surgeon of the First Marine Division, who started work on the idea months before the invasion of Okinawa. Once the amphtrack moves into the desired site, the hospital gear is unpacked and set quickly into position. The metal interior is covered with white fabric, trays of surgical instruments are placed in a sterilizer and the portable operating table and lamp are set up. Then by means of the canvas covers carried as part of the regular equipment of the vehicle, blackout curtains are rigged so that the doctors can work throughout the night without fear of drawing enemy rifle or artillery fire.

HEAD OF POSTWAR PLANNING BOARD

Capt. William E. Eaton (MC), U.S.N. (Ret.), was recently relieved as head of the Washington Office, Materiel Division, Bureau of Medicine and Surgery, to devote full time to his duties as head of the Postwar Planning Board. Succeeding him in the materiel post is Lieut. Comdr. Paul T. Rees (HC), U.S.N., whom the Surgeon General also has nominated as representative of the Bureau of Medicine and Surgery to work with the logistics organization planning unit on the call of its senior member in the development of a Navy supply program.

COMMANDER EUGENE PERRY HARRIS

The Croix de Guerre with red star was recently awarded to Comdr. Eugene Perry Harris, formerly of Washington, D. C., by the government of France for exceptional war service rendered in the course of operations in the liberation of France for the period June to December 1944. Dr. Harris was previ-

ously awarded the Legion of Merit by our own government for his work during the same time interval. He is at present assigned to the U. S. Naval Hospital, Corvallis, Ore., as chief of the eye, ear, nose and throat service. Dr. Harris graduated from the University of Texas Medical Branch, Galveston, in 1930 and was commissioned in the Navy in January 1937.

NAVY AWARDS AND COMMENDATIONS

Lieutenant (jg) Leonard Hunter Roach

The Bronze Star was recently awarded to Lieut. (jg) Leonard Hunter Roach, formerly of St. Louis. The citation accompanying the award read "for heroic achievement as assistant battalion surgeon during action against enemy Japanese forces in the Marianas Islands, on Saipan from June 15 to July 10, 1944 and on Tinian from July 24 to Aug. 1, 1944. Courageous in the face of a heavy artillery and mortar barrage, Lieutenant, Junior Grade, Roach displayed outstanding professional skill and executive ability in evacuating casualties on the beach during initial landings on Saipan and, by his valiant devotion to duty during the invasion and occupation of these islands, continued to administer medical aid to wounded men, thereby materially reducing casualties under the extremely difficult combat conditions. His self-sacrificing spirit and gallant conduct were in keeping with the highest traditions of the United States Naval Service." Dr. Roach graduated from the University of Cincinnati College of Medicine in 1942 and entered the service May 3, 1943.

Lieutenant Frank Ashbrook Stewart

The Silver Star was recently awarded to Lieut. Frank Ashbrook Stewart, formerly of Stamford, Conn. The citation read "for conspicuous gallantry and intrepidity while serving with the 3d Battalion, 1st Marine Division during action against enemy Japanese forces at Cape Gloucester, New Britain, on Jan. 14, 1944. With his battalion engaged in routing a fanatic, deeply entrenched enemy from heavily fortified Hill 660, Lieutenant Stewart fearlessly risked his life in a valiant effort to aid marines who had fallen under the fierce opposition. Gallantly proceeding up the steep incline through enemy infested, unfamiliar jungle terrain, he skilfully and calmly cared for the wounded despite the enemy's shattering machine gun and rifle fire, carrying out his perilous task with undaunted initiative until evacuation could be effected. By his outstanding professional ability, determined perseverance and grave concern for the safety of others at great personal risk, Lieutenant Stewart contributed to the saving of many lives and upheld the highest traditions of the United States Naval Service." Dr. Stewart graduated from the University of Nebraska College of Medicine, Omaha, in 1940 and entered the service Feb. 8, 1943.

Lieutenant Commander Francis A. Agrest

Lieut. Comdr. Francis A. Agrest, formerly of Brooklyn, was recently awarded the Presidential Unit citation. Commander Agrest took part in three campaigns with the First Marine Division in the Southwest Pacific. He graduated from the Long Island College of Medicine, Brooklyn, in 1934 and entered the service March 29, 1941.

MISCELLANEOUS

EPIDEMICS OF RELAPSING FEVER

The extensive epidemics of typhus which swept North Africa during the war have been followed by an epidemic of louse borne relapsing fever. Dr. G. Stuart, chief of the Epidemic Control Section of the UNRRA European Regional Office, stated that more than 40,000 cases were reported up to March 1945, mainly in Tunisia, but in recent months the outbreak has spread also to Algeria and Morocco. After the first world war eastern Europe suffered from extensive epidemics of relapsing fever, and some twenty years ago this disease decimated the population of the semiarid country south of the North African desert belt. Lately there have been small outbreaks in southern France and in Rumania, but so far there has been no major epidemic in Europe.

UNRRA CONTRIBUTES FULLY EQUIPPED AMBULANCE

A fully equipped ambulance was recently turned over to the republic of San Marino by Lieut. Col. Vincent B. Lamoreux of the UNRRA Italian Mission Medical Division. This is the first contribution under the agreement signed recently with UNRRA whereby the small republic is to receive assistance up to $30,000. Medical supplies transported in the ambulance included penicillin, insulin, DDT insecticide powder, vitamin C tablets, ether, calcium gluconate ampules, phenobarbital tablets, sulfadiazine ointment, bandages, cotton gauze, suture catgut, syringes, thermometers, forceps, blankets, sheets, powdered and condensed milk, and sugar.

DDT ADDED TO INSECTICIDE MIXTURE

Addition of DDT to the Army's insecticide dispenser, known among troops in the Pacific as the aerosol bomb, has greatly increased the effectiveness of the insecticide mixture in that now it kills not only mosquitoes but also disease-bearing flies. The new mixture is composed of 85 per cent freon, 2 per cent of a 20 per cent pyrethrum solution, 5 per cent cyclehexanone, 5 per cent lubricating (hydrocarbon) oil and 3 per cent DDT. With DDT added, the aerosol bomb becomes an excellent weapon in the fight against malaria and fly-borne diseases.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Birmingham General Hospital, Van Nuys: Effects of High Altitude and Gravity, Prof. D. R. Drury, September 12; Cardiovascular Problems, Dr. W. Gordon Garnett, September 26.

Camp Cooke Station Hospital, Lompoc: Respiratory Disease Problems, Major F. E. Willett, September 5; War Wounds of the Chest, Lieut. Comdr. J. P. O'Connor and Lieut. Henry Jaffee, September 19.

A. S. F. Regional Hospital, Camp Haan: The Pneumonias, Dr. W. E. MacPherson, September 4.

Hoff General Hospital, Santa Barbara: Respiratory Disease Problems, Major F. E. Willett, September 5; War Wounds of the Chest, Lieut. Comdr. J. O. O'Connor and Lieut. Henry Jaffee, September 19.

A. A. F. Regional Station Hospital, March Field, Riverside: The Use of Fibrin and *Fibrolysin* in Wound Healing, Capt. Harry P. Schenck, September 18.

Santa Ana Army Air Base Regional and Convalescent Hospital, Santa Ana: Acoustic Trauma, Comdr. D. G. Mitchell, September 4; Rheumatic Heart Disease, Dr. Louis E. Martin, September 18.

Torney General Hospital, Palm Springs: Surgery of the Biliary Tract, Capt. Howard K. Gray, September 4; The Management of the Simple Skin Diseases, Lieut. Col. Everett R. Seale, September 18.

U. S. Naval Hospital, Santa Margarita Ranch, Oceanside: Cardiac Pain, Lieut. Comdr. Robert L. Langley, September 13; Differentiation Between the Protozoal and the Bacillary Dysenteries, Dr. John F. Kessel, September 27.

U. S. Naval Air Training Station, San Diego: Clinical Aspects of Rheumatic Fever, Lieut. Comdr. George C. Griffith, September 6; Problems in Tuberculosis, Comdr. W. L. Rogers, September 7; The Malingering Tests, Dr. John Mackenzie Brown and Mr. Raymond Brown, September 21.

U. S. Naval Hospital, Long Beach: Problems in Tuberculosis, Comdr. W. L. Rogers, September 19.

U. S. Naval Hospital, Corona: Allergy, Dr. John Lamson, September 13; The Rh Factor, Capt. George Macer, September 27.

ORGANIZATION SECTION

Bureau of Information

SUMMARY SHEETS FROM MONTANA AND NEBRASKA

Completed county summary sheets have been received from most of the counties in Montana and Nebraska through Dr. R. F. Peterson, secretary, Medical Association of Montana, and Dr. R. B. Adams, secretary, Nebraska State Medical Association.

The accompanying table gives data from selected counties in each of these states. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. *They are not included in computing physician* population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

Montana

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Big Horn		8,494	2	4,247	42
Blaine		7,739	4	1,935	33
Cascade		42,016	31	1,355	8
	Great Falls	29,928			
Deer Lodge		14,061	6	2,344	13
	Anaconda	11,004			
Garfield		1,999	1	1,999	0
Jefferson		3,444	1	3,444	19
Richland		8,737	3	2,912	18
	Sidney	2,978			
Rosebud		5,644	3	1,881	21
		5,158	1	5,158	18
		37,907	26	1,458	8
	Billings	23,261			
	Laurels	2,754			

Nebraska

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Antelope		10,586	4	2,647	9
Brown		4,898	2	2,449	8
Buffalo		23,074	7	3,296	8
	Kearney	9,643			
Cass		15,034	6	2,506	7
	Plattsmouth	4,263			
Cedar		13,326	6	2,221	7
Dixon		9,023	3	3,008	5
Howard		7,016	2	3,508	12
Sarpy		11,417	3	3,806	17
Scotts Bluff		32,050	20	1,603	13
	Scotts Bluff	12,057			
	Gering	3,104			
York		12,756	4	3,189	5
	York	5,383			

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Council on Medical Service and Public Relations

PREPAID MEDICAL CARE

Medical Service and Indemnity Plans Sponsored by County and State Medical Societies

Consistent increase in membership marks the medical insurance plans sponsored by county and state medical organizations. This is the outstanding conclusion of the preliminary survey of many of these plans which has just been completed by the Council on Medical Service and Public Relations of the American Medical Association. Without exception the number of persons covered by these plans has shown a substantial increase within the last year; for example, Colorado 300 per cent, Wilmington, Del., 250 per cent, Massachusetts 400 per cent, Milwaukee 1,200 per cent, Kansas City 300 per cent, two New York plans 100 per cent. The Toledo, Ohio, plan has jumped from nothing a year ago to 43,273 subscribers now.

A study made by the Bureau of Economics of the American Medical Association in 1937, showing the growth in membership for thirty-five Blue Cross hospitalization plans between January 1936 and 1937, represents an increase in membership of 138 per cent during the twelve months. The number of members increased more than 200 per cent for the ten largest plans. For one plan the increase was 700 per cent. Although these voluntary medical plans have come into nationwide prominence only recently, the study shows that the movement has gained tremendous momentum during the last year and the figures compare favorably with those of the longer established Blue Cross plans of hospital insurance, when compared with the corresponding years of early operation. When the study of group hospitalization plans was made in 1937 the total membership was 700,000, the three largest plans having 49 per cent of all members. At the present time Blue Cross plans cover some twenty million people.

This present preliminary study on medical insurance programs indicates that a growth can be expected for these medical plans within the next eight years similar to that which marked Blue Cross from 1937 to 1945.

The first medical plan is believed to have been started in 1917 in Pierce County in the state of Washington. Little progress was made during the next decade. A rapid increase in number and size of these organizations was made during 1933-1940, when most of the county bureaus in the state of Washington were established. The most rapid growth has come since 1939, when statewide plans were started in Michigan and California.

In addition to plans now in operation, enabling legislation has been passed in several states in anticipation of the establishment of medical service plans. Active studies are now under way in Connecticut, Indiana, Illinois and several other states which should result in the early establishment of additional voluntary prepayment plans under the direction of or with the approval of state medical organizations. According to the information collected, the largest plan now in operation in point of membership is the Michigan Medical Service, which on May 31, 1945 had 777,104 subscribers.

The table on the following pages shows the wide variety of coverage. Also evident is the fact that the legal authority for the creation of the different plans varies greatly from state to state. Additional studies of these plans and other voluntary insurance plans will be made from time to time by the Council and the results published in THE JOURNAL.

Medical Service Plans

Name and Address	Year Organized	Number of Members Now	Number of Members Year Ago	Principal Benefits Provided	Charge	Annual Income
California Physicians' Service, 153 Kearny Street, San Francisco 8, or 743 South Grand View Street, Los Angeles 5	1939	162,000	102,000	(1) Surgery and hospitalization, employees and dependents alike (2) Medical, surgical and hospitalization for employees only	Employee, male, $1.45 female, 2.00 Employee and 1 dep., $3.80 Employee and 2 or more dep., $5.40 Medical rider (emp. only), $0.90	$2,300,000
Colorado Medical Service, Inc., 810 Fourteenth Street, Denver	1942	81,234	25,417	(1) Surgical care in doctor's office or hospital (2) Treatment of fractures and dislocations (3) Obstetric care (4) Lab. and x-ray up to $15 each per subscriber	Ind..... $0.75 mo. Family..... 2.00 mo. 2 persons..... 1.50 mo.	$460,835.28
Community Surgical Plan, July 1944 228 Superior Street, Toledo, Ohio		43,276	None	(1) Surgical, obstetric (hospital, office, home) (2) X-ray (3) Anesthesia (4) Medical, in hospital for 70 days	(1) Ind..... $0.60 (2) Man and wife..... 1.50 (3) Family..... 2.00 (4) Additional rates quoted for each	$180,628
Dallas County Medical Plan, 433 Medical Arts Building, Dallas, Tex.	1940	1,444	366	(1) Medical care (2) Surgical care (3) Consultation services (4) X-ray, lab. and anesthesia (5) Obstetric services	Ind..... $1.75 mo.	$9,109.75
Group Hospital Service, Inc., 902 Orange Street, Wilmington, Del.	1943	56,341	19,021	(1) Surgical care (2) Anesthesia (3) X-ray (4) Obstetrics (5) Fractures	Ind..... $0.60 mo. Family..... 1.65 mo.	$153,753.45
Hawaii Medical Service Association, Hawaiian Trust Building, Hawaiian Trust Building, Room 417, Honolulu 48, T. H.	1938	9,272	7,507	(1) Medical care for 30 days (hospital) (2) Surgical care (3) X-ray and physical therapy (4) 6 office or home visits	Individual and dependents varies with monthly salary	$166,152.95
Hospital Care Association, Inc., 107 Market Street, Durham, N. C.	1933	Hosp. 69,780 H.&S. 41,784 111,561	72,792 23,627 96,419	(1) Hospital care (2) Surgical care	Ind..... $0.60 Family..... 1.60	$749,839.99
Hospital Saving Association of N. C., Inc., 165 E. Franklin St. Chapel Hill, N. C.	1935	Hosp. 161,695 H&S. 84,705 246,400	177,318 47,171 224,489	(1) Medical care (2) Surgical care	Ind. Family Hosp..... $0.60 $1.60 H. and S.... 1.20 2.50	$1,114,106.48
Iowa Medical Service, 222 Insurance Exchange Bldg., Des Moines Iowa	July 1945	Enrollment began July 1945	No experience	(1) Medical (2) Surgical (3) Obstetric (4) X-ray (5) Anesthesia	Med. & Surg. Surgical Ind..... $1.25 $1.00 Family..... 3.25 2.50	No experience
Massachusetts Medical Service, 230 Congress St., Boston	1942	124,676	29,295	(1) Surgical services (2) Anesthesia (3) X-ray (4) Endoscopy (5) Fractures (6) Obstetrics	Ind..... $0.85 mo. Husband and wife..... 1.65 Family..... 2.00	$238,227.99
Medical Service Association, Inc., 107 Market St., Durham, N. C.	1940	Regular 10,973 F. S. A. 30,284	Regular 12,388 F. S. A. 0	(1) Medical care } with F. S. A. members being covered only for surgical care (2) Surgical care }	Ind. male.....33 c. wk. Ind. female.....37. c. wk. Two persons....55 c. wk. Family.....65 c. wk. F.S.A. family $8.00	Total, $75,000 Reg., 53,000 F.S.A., 21,516 (11 mo.)
Medical Service Association of Pa., 222 Locust Street, Harrisburg, Pa.	1939	14,788	11,351	(1) Surgical care (2) Obstetric care (3) Treatment of fractures and dislocations in hospital	Ind..... $0.50 to $0.80 Dep..... 1.25 Family..... 2.00	$80,522.16
Medical and Surgical Care, Inc., 5 Hopper Street, Utica, N. Y.	1939	36,321	24,941	(1) Surgery and maternity (2) Anesthesia (3) X-rays (4) Metabolism (5) Cardiogram (6) Spec. lab. in hospital (7) Medical calls in hosp. plus 3 after	Plan 2 Plan 3 Ind..... $0.75 $0.48 Dep..... 0.75 0.51 Family..... 1.90 1.38	$245,365
Medical-Surgical Plan of New Jersey, 31 Clinton Street, Newark 2, New Jersey	1942	6/30/45 41,782	6/30/44 23,846	(1) Medical (2) Surgical (3) Obstetric (4) Anesthesia (5) Consulting } rendered in hospital (6) First aid surgery, rendered anywhere	Individual..... $0.75 Family..... 2.00	Year ending 6/.0/45 $276,265.07
Michigan Medical Service, 1300 Washington Blvd. Bldg., Detroit 26	1939	777,104	622,997	(1) Surgical (2) Obstetric (3) Diagnostic x-ray not in excess of $15 each year (4) Anesthesia (5) Emergency surgical service	Ind., 60 c. to 90 c. per month subscription fees Two persons..... $1.60 Family..... 2.25	$1,916,921.56 Misc. income $17,693.99

Medical Service Plans

Annual Expenditure	Surplus and Reserve	Income Ceiling	Annual Benefit Limit	Legal Authority	Date Figures Based	Comment
$2,100,000 00	.. ..	$3,000 00	One year's care	Attorney General of state of California	6/14/45	Increased rates to beneficiary members, 30% No surplus or reserve at present, but new rate increase will give surplus of about $200,000 by Dec 31, 1945 90% of membership notified of rate increase—acceptance by them with cancellation rate of less than one half of 1 per cent of membership
$231,211.00	$14,699 27	Ind., $1,500 per yr. 2 persons, $1,920 Families, $2,400	None	Incorporated under Colorado law governing non profit corporations in state. No enabling act	1945	
$102,628	Reserves Maternity $27,094 Unfiled claims, $10,837	None	None	State insurance laws	1944	June 23, 1945. Only one waiting period on maternity. No exclusion
$8,162 51	$10,661 22	Single, $2,500 Married, $3,000	$325 00	Charter granted by state of Texas	1944	
$93,557.23	$45,863 76	None	$150 00	None	1944	
$86,122 93	$106,192 45	$6,000		Charter given by the Territory of Hawaii for non-profit organizations	5/31/45	The Kauai Medical Service Association has just been inaugurated on the island of Kauai—enrolment now under way. The plan is supported by the business firms and other local groups
$697,159 95	$190,000 00	None	None	Sp enabling act, 1941 amended 1943	1944, financial 5/30/45, membership	
$1,003,447 21	$442,914 18	None	.....	Special enabling act, 1941 Amended in 1943 to include professional fee	1944	
No experience	No experience	$1,500 per year for individual, $2,500 family full service	21 days hospital and medical care per year	Code of Iowa, senate file 128	7/1/45	Plan is just now ready to enroll subscribers. Participating physicians are being enrolled at the present time
$197,665 01	$127,908 34	Participating physicians may charge extra only when patient's income exceeds $2,500 per year if married, $2,000 if single	No limit to number of admissions	Special act state legislature	1944	Includes $25 000 of surplus donated by Massachusetts Medical Society, refundable only when total surplus exceeds $225,000
90% actual amount available expenditure	10% maintained for operating expense	None	No limit	....	12/3/44, financial 6/30/45, membership	
$70,242 20	$35,802.75	$3,120 (annually)	None	Enabling legislation, act of general assembly, 167, 168, 398, 399	4/30/45, enrollment 12/31/44, financial	
$174,772	$89,804 08	None	Plan 2 $225 Plan 3 $200	New York state	4/30/45	32% of Blue Cross Hospital Plan, Inc, members are all enrolled
7/1/44 6/30/45 $.22,469 91*	6/30/45 $64,081 81	None for enrolment. Full service benefits to single contract $2,000; family $2,000 plus $500 for wife and $200 each child	21 days medical care; no limit for surgical	Special enabling act 1940 amended 1944, Rev. Stat N. J.	6/30/45	Organized by Medical Society of N. J. Cooperates with Hospital Service Plan of N. J. In addition a separate organization (Medical Service Adm. of N J) operated statewide I S A Plan and City of Newark Plan for indigent
Services rendered $3,875,593.21 administration expense $374,003 39	$.99 941 37	None (participating doctors may make additional charge) according to income	None, except for $15 for diagnostic x-rays	Michigan public act No 109, 1939	5/31/45	

Medical Service Plans—Continued

Name and Address	Year Organized	Number of Members Now	Number of Members Year Ago	Principal Benefits Provided	Charge	Annual Income
Nebraska Surgical Plan, 330 City National Bank Bldg., Omaha, Neb.	1944	2,300	None	(1) Surgical operations (hospital or office) (2) Obstetric care (3) Limited x-ray examinations	Ind..... $0.75 Dep..... 1.50 Family..... 2.00	
New Hampshire Physician Service, 89 N. Main Street, Concord, N. H.	1944	(12/31/44) 4,881	(not organized) None	(1) Surgical service, limit $150 (2) Anesthesia, lab. and x-ray exam. (3) Maternity (4) Medical service, 25 doctor's visits	Ind. (co. service)..... $0.75 Two persons..... 1.50 Family..... 1.75	$5,117.63
Oregon Physicians' Service, 471 Pittock Block, Portland 5, Ore.	1941	90,000	82,000	(1) Complete medical } for services .....} employee (2) Complete hospital } group services	Ind.. $2.50 per mo. or $0.60 per wk. Dependents, no coverage Family, no coverage	$2,400,000.00
Surgical Care, 208 E. Wisconsin Avenue, Milwaukee	1943	(1/1/45) 3,519	(1/1/44) 266	(1) Surgical services (2) Obstetric services on family contract (3) Medical services	Ind., 90 c. per mo. One dependent, $1.75 (without obstetrics) Family, $2.50 (ob. included	$16,003.85
Surgical Care, Inc., 531 Argyle Building, Kansas City 6, Mo.	1943	40,000	13,000	(1) Surgery (2) Obstetrics (3) Orthopedics (4) Anesthesia (5) X-ray (6) Radiation therapy	Ind., $0.75 per mo. mbr. and 1 dep., $1.50 Family, $2 (mbr. and 1 dep., maternity benefits included, $2)	$200,000.00
United Medical Service, Inc., 370 Lexington Ave., New York 17	1944	79,494	37,561	(1) Medical (2) Surgical (3) Obstetric	Contract: Indemnity; Surgical service; Surgical and medical Ind.: $0.40; 0.32; 0.64 Hus. & Wife: $1.00; 1.12; 1.36 Family: $1.80; 2.00; 2.56	$324,167.43
Washington State Medical Bureau, 218 Cobb Building, Seattle, Wash.	....	250,000	.....	(1) Medical (2) Hospital, ambulance (3) Dental and nursing care	Premiums run from $1.75 to $2.75 and up to $7.75 for full family coverage	$500,000 per mo. or about $6,000,000 per yr.
Western New York Medical Plan, Inc., 888 Delaware Avenue, Buffalo	1940	3/30/45 45,000	3/30/44 24,171	(1) Surgical (2) 25 house, office or hosp. calls (3) Anesthesia (4) $5 specialist x-ray consultation (5) $5 specialist endoscopic exam. (6) Maternity care	Surg. Med. Surg. Ind..... $0.60 $1.50 Dep..... .... Family..... 1.70 3.00 (per month)	$280,314.17

LOUIS H. PINK TO REORGANIZE INSURANCE INDUSTRY IN PHILIPPINES

Louis H. Pink, president of Associated Hospital Service of New York and former superintendent of insurance of the state of New York, is en route for Manila, where he will serve temporarily as special adviser to the Philippine government in the reorganization of the insurance industry of the islands, it was announced on June 18 by Jamie Hernandez, secretary of finance of the Philippines. Mr. Pink accepted the Philippine post in response to a personal appeal from President Sergio Osmena.

Leonard M. Gardner of Portland, Ore., who is accompanying Mr. Pink as associate adviser, will remain in the islands for an indefinite period to assist the Philippine government in carrying out the program of reorganization.

The resolution of the board of directors of Associated Hospital Service of New York granting Mr. Pink leave of absence until September to serve the Philippine government is in keeping with the organization's policy of cooperation in public service activities.

INCORPORATORS OF CONNECTICUT MEDICAL SERVICE

Six members of the Connecuticut State Medical Society have been named incorporators of the Connecticut Medical Service, the prepayment plan which is soon to be launched in the state. The society's representatives are Edmund L. Douglass, Groton; Ira V. Hiscock, professor of public health, Yale University School of Medicine; H. Goldersleeve Jarvis, Hartford; James Raglan Miller, Hartford; J. Harold Root, Waterbury, and Charles H. Sprague, Bridgeport. Five laymen active in civic affairs, particularly in the health and welfare field, are the remaining members of the board: Dr. D. Spencer Berger, treasurer, Berger Brothers, New Haven; Wallace E. Campbell, secretary, Fuller Brush Company, Hartford; J. William Hope, president, J. William Hope Company, accountants, Bridgeport; Robert S. Judd, vice president, Southern New England Telephone Company, New Haven; Edward J. Quinlan, judge of the superior court, Norwalk.

WARNER EXPANDS GROUP INSURANCE PROGRAM

A liberal expansion in the group insurance program of William R. Warner & Co., Inc., and its subsidiary companies, Richard Hudnut and Standard Laboratories, Inc., was made effective May 1 according to an announcement by John H. Holzbog, vice president in charge of industrial relations. In addition to the life insurance program which the company had previously carried for its employees, the new plan includes accidental death and dismemberment coverage, weekly sickness and accident benefits, surgical benefits, daily hospital benefits of $5 a day for employees and dependents, and an additional allowance for special hospital charges of five times the daily hospital benefit, which also extends to employees and their dependents. Employees who have been with the company for three months or more are eligible for the full coverage. The plan will include employees of the company's plants in New York, St. Louis and Mamaroneck as well as all salesmen and field representatives in the United States. Approval has also been sought from the Canadian War Labor Board for including employees of the company in Canada. The entire cost of the program is being carried by the company.

The plan is being underwritten by the Travelers Insurance Company of America.

Medical Service Plans—Continued

Annual Expenditure	Surplus and Reserve	Income Ceiling	Annual Benefit Limit	Legal Authority	Date Figures Based	Comment
Less than 1 yr. in operation	$10,000	None	Limited to $250 maximum for each person on agreement	State of Nebraska under assessment insurance law	6/30/45	Organization only in operation 8 months
$9,449.07	$4,331.44	None	None	State law	8/1/44 to 12/31/44	
$2,400,000.00	$75,000.00	None	One year's total service and 6 months hospital service for any single ailment	License from Oregon State Insurance Dept.	5/1/45	No definite income ceiling set but coverage of high income people avoided wherever possible
$13,057.80	$3,546.05	Single person, $1,800 married person, combined income of $2,400 plus additional allowance of $200 per dependent	None	Corporate charter of the Medical Society of Milwaukee County	1/1/43 to 1/1/45	
$170,000.00	$44,500.00	None	None	No enabling act; Pro forma corporation under religious, benevolent and educational statutes	5/31/45	
$ 225,016 67	$187,857.58	None for purchase of coverage	None	Article ix-c of New York state insurance law	12/31/44	Service benefits under "service" contracts available for single persons with annual incomes of $1,800 or less and married persons with annual incomes of $2,500 or less; subscribers with incomes above these amounts receive indemnity benefits only
.....	None	Income ceiling discarded except in couple of bureaus where it is $3,600	Benefits limited to from six months to one year's time	Washington State Medical Association and Washington Physicians Service, Inc. (The latter on insurance company to comply with state insurance code)	7/17/45	Pierce county, first bureau organized in 1917. Bulk of other 16 bureaus established in 1933-1935. Organization still going on, with three or four now in process of being established. Medical and hospital plans are being developed for families of workers covered; already in force in some bureaus
$242,795.56	$11,458.63	None	None	Article iv c N. Y. State Ins. law	12/31/44	

Medical Economic Abstracts

MEDICAL SERVICE PLANS IN CONTINENTAL COUNTRIES

This is the first of a series of abstracts on medical service plans in foreign countries which will appear in THE JOURNAL from time to time, prepared by the Council on Medical Service and Public Relations. The following was taken from the *British Medical Journal:*

Denmark

Denmark's peculiar contribution to social legislation lies in the field of social insurance. The state organizes and regulates insurance and in part runs the insurance administration itself. National insurance covers the entire population. Previous to what is known as the Social Reform—a mass of social legislation which was passed in 1933—there was a voluntary system of sick clubs or sickness benefit societies which covered about two thirds of the population, and this has been preserved within the national compulsory system. Every person on reaching 21 is required to become a member either of a sick club or of a state-controlled sickness insurance institution. In the sick club there are two classes of members. The "active members" consist of those who are "unpropertied"; that is, with an annual income of less than about 3,500 kroner (just under £200). The second class, the "passive members," consist of those who are above the income level and are not eligible for the benefits of the club, but should their income fall below the stated level they may, irrespective of their state of health, on complying with the conditions become "active members."

In illness the sick club provides its "active members" with entirely or partly free domiciliary medical attendance, free treatment at a hospital (where the municipality meets half the expense), two thirds of the expenditure on medicines and cash benefit up to twenty-six weeks. Special maternity benefits have been introduced.

There are 1,650 sick clubs, all separate units but all subject to state supervision. Of their total income about 68 per cent comes from members' contributions and 28 per cent from state and communal grants. The real significance of the general obligation brought about by the National Insurance Act to be a member either of a sick club or of a national insurance institution lies in the fact that the act also introduced a general and compulsory invalidity insurance the premium for which is collected with the sick club contribution, and also that no one can obtain the old age pension without being a member. Thus the provision of help in sickness, in invalidity and in old age is joined together in a common insurance system.

Under social insurance medical service is provided by practitioners working under agreements. The agreements are divided into two different categories. Outside Copenhagen the insurance institutions have no authority to select practitioners; all physicians who report to the regional section of the Danish Medical Association that they are willing to serve may be placed on the list. In Copenhagen, on the other hand, the doctors are engaged by the insurance institutions. Nearly all medical practitioners in Denmark, except the specialists, engage in insurance practice. Doctors may be remunerated either by a capitation fee or according to a schedule of fees for the services they render. The amount paid for medical services is divided about equally between these two forms of arrangement.

Considerable choice of doctor is allowed to the patient in Copenhagen, though not complete free choice. The city is divided into three main districts, and insured persons may make their choice among the local contracting physicians in their district. However, no physician may accept more than 1,500 persons as potential patients, and consequently this limits free choice.

Washington Letter

(From a Special Correspondent)

Aug. 13, 1945.

Hawley Reported to Be New Medical Chief of Veterans Administration

The new medical director of the Veterans Administration is expected to be Major Gen. Paul Hawley of the Army Medical Corps, who since January 1943 has been chief surgeon of the Army in the European theater. General Bradley, new Veterans Administrator, who worked with General Hawley, is expected to announce the appointment when he takes over as Veterans chief this week. The job was reported to have been lined up previously for Col. Howard A. Rusk of the Army Air Forces, who conferred with President Truman and General Bradley on a rehabilitation program for war veterans General Hawley is a native of Indiana and a graduate of the University of Cincinnati Medical School.

Request for Four State Pollution Survey of the Potomac River

The U. S. Public Health Service has been asked by the newly organized Interstate Commission for the Potomac River Basin to make a pollution survey of the 14,500 square mile drainage area in four states, according to an announcement from Hershey, Pa. The commission, pending receipt of the requested data, has tentatively divided the basin into three water use classification. It recommends treatment of all water taken from the Potomac and its tributaries. The commission includes representatives of Pennsylvania, Maryland, Virginia, West Virginia, the District of Columbia and the federal government. It has classified as unfit for either drinking or swimming the waters of the Potomac in Metropolitan Washington, the Luke-Cumberland area and the north branch to Patterson creek, described as the worst polluted sections of the basin.

UNNRA to Combat Yellow Fever Throughout the World

Dr. Fabio Carmeiro de Mendonca, Brazilian physician and director of quarantine for Brazil, who arrived here from Rio de Janeiro recently, states that "UNNRA will shortly inaugurate a world campaign for the eradication of yellow fever. It will be one of its major projects in disease prevention. The yearly death toll from this disease is considerable. It is quite prevalent in the islands of the Pacific. Brazil is no longer menaced with yellow fever as it is known in the United States. We do have some infectious diseases similar to yellow fever." Dr. Mendonca conferred here with prominent U. S. medical authorities on preventive measures for yellow fever.

Improvement of German Health and Sanitation in United States Zone

Steady improvement in restoration of German health and sanitation, economy and local civil government is reported in the U. S. zone of occupation by the War Department. The report said that health conditions are gradually being bettered. Typhus has decreased. Tuberculosis and venereal disease have been serious among displaced persons. Typhoid, dysentery, diphtheria and scarlet fever cases are being reduced. Food continues to be a primary concern, with Allied displaced persons receiving, through priorities, daily diets of 2,000 calories. Water services have been restored for drinking water at least. Selected industries are making critical items such as soap, fertilizer, insecticide and processed food.

Development of Improved Artificial Hand by Navy Technicians

An improved artificial hand made of plastic materials, which is said to be natural looking and far superior in use and appearance to anything previously devised, is revealed as the work of dentists and enlisted men working under Capt. Rae D. Pitton and Lieut. Comdr. LeMar W. Harris, former Chicago dentist, at the Naval Dental School, Bethesda, Md. Dr. Harris got his start in plastics making artificial teeth. Following research extending over more than a year, they are said to have produced a hand that looks real, doesn't require wearing a glove, is almost as efficient as a hook, picks up and holds articles in a rubber-like grip and weighs less than a pound. While some amputees will get the new hand soon, mass production is not expected for some time. The prosthetic appliance is made of a special plastic and is tinted to match the patient's skin. A 1 pound cam mechanism hidden inside the hand is said to permit natural finger movement. The mechanism is operated by a cord running up the arm and around the shoulders. Control is by the shoulder muscles. The new hand is the first improvement in artificial limbs to be announced since the government's appeal for new ideas.

Standardized Form of Treatment for Poliomyelitis Predicted

Standardization of treatment for infantile paralysis is predicted by District of Columbia medical men. They expect that medical research now under way will combine the best features of the Kenny and other treatments to develop the most effective system. Dr. P. A. McLendon, chairman of the Children's Hospital poliomyelitis committee, reports that types of treatment differ with individual physicians. Some methods are successful in some cases and failures in others. As an illustration, ultraviolet irradiation, drawing out blood and bathing it with violet rays helps to combat infection in bulbar poliomyelitis, but it does not help spinal paralysis cases. The Kenny hot pack and manipulation method was said to have both advantages and disadvantages. While this treatment helps some patients, the extreme heat is believed to be detrimental to the patient's health.

Capital Notes

In a rabies control program, District of Columbia medical authorities have announced that 35,000 dogs will be vaccinated by September 7 at ten strategically located clinics.

District school teachers are studying improved health education methods at daily conferences in Wilson Teachers College. Speakers include Dr. Irma Nevins, national director of accident prevention, Red Cross; Frank S. Stafford, chief of health education, U. S. Office of Education, and Miss Bosse Randle, special consultant, school health services, Children's Bureau.

Russell Green, a University of Maryland sophomore whose left side was paralyzed when he was 10, is demonstrating to disabled veterans in Walter Reed Hospital how he learned to walk, dance, swim, type with one hand and tie his shoes.

Dr. Paul F. Douglask, president of American University, has announced plans for a $2,000,000 six story center of social science and public affairs.

Woman's Auxiliary

West Virginia

Dr. W. W. Bauer, director of Health Education of the American Medical Association, and Dr. Harry V. Thomas, president of the Harrison County Medical Society, were the guest speakers of the Harrison County Auxiliary Doctor's Day Program.

The Raleigh County Woman's Auxiliary recently announced the establishment of a "Book Shelf" at the Pinehill Sanitarium

Mrs. U. G. McClure, president of the Woman's Auxiliary to the West Virginia State Medical Association, recently announced the appointment of a Physicians Advisory Board for 1945-46, as follows: Drs. Hu C. Myers, Philippi; H. V. Thomas, Clarksburg; John P. Helmick, Fairmont; Scott A. Ford, Beckley, and U. G. McClure, Charleston. The following chairmen of standing committees have been appointed by Mrs. McClure to serve with other chairmen named late in May: convention, Mrs. Edwin J. Humphrey, Huntington; press and publicity, Mrs. W. Paul Elkin, Charleston, and speakers' bureau, Mrs. John W. Hash, Charleston.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTERFST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Faculty Changes.—Frederick E. Emery, Ph.D., associate professor of physiology, University of Buffalo School of Medicine, Buffalo, N. Y., has been appointed professor of physiology and head of the department of physiology and pharmacology of the University of Arkansas School of Medicine, Little Rock. John E. Davis, Ph.D., is professor of pharmacology in the department.

State Cancer Commission Created.—Under recent action of the legislature, a state cancer commission has been created to coordinate and direct a cancer control program in Arkansas to be financed by an initial appropriation of $25,000. The law providing for the commission stipulates that the funds may be used to furnish medical, hospital and home care for indigent cancer patients and may be matched with county and city funds in making available care for persons not wholly indigent. According to the *Field Army News* of the American Cancer Society, the commission may accept voluntary contributions and disburse any federal funds available for cancer control, conduct clinics wherever necessary in the state and institute educational programs in cooperation with established organizations as well as utilize facilities of private physicians and hospitals and the University of Arkansas School of Medicine. Gov. Ben Laney has been named chairman of the Arkansas State Cancer Commission and Dr. Carl A. Rosenbaum, associate professor of surgery at the medical school, secretary.

COLORADO

Anniversary Year of State Medical Society.—The Colorado State Medical Society this year will observe its seventy-fifth anniversary. Plans are under way to mark the occasion in some special manner.

New Professor of Pathology.—Dr. James Bernard McNaught, associate professor of pathology, Stanford University School of Medicine, San Francisco, has been appointed professor of pathology at the University of Colorado School of Medicine, Denver. Dr. McNaught graduated at Stanford in 1931.

Building Fund Revived.—On June 26 twenty past presidents of the Medical Society of the City and County of Denver gave a dinner to the members of the society to mark the revival of the dormant building fund campaign. Talks at the dinner revealed the status of homes owned by other societies and the facilities of other libraries as compared with the library facilities of the Denver society. A site has not been selected for the proposed permanent home of the society, the choice to be deferred until a majority of all members has voted its choice of location.

CONNECTICUT

Clinical Congress Canceled.—For the first time in twenty-six years the clinical congress of the Connecticut State Medical Society will not be held this fall.

Personal.—On June 1 Mr. Berger E. Foss, superintendent of the Knickerbocker Hospital, New York, became director of Newington Home for Crippled Children, a 200 bed orthopedic children's hospital, Newington, succeeding Miss Constance Leigh, R.N., who retired after twenty-seven years' service in that capacity.

ILLINOIS

Governor Vetoes Medical Bill.—The Allison bill, which was passed by the legislature and which would have made it unlawful for any physician or surgeon to refuse emergency or first aid treatment to an accident victim, was vetoed July 24 by Governor Green, according to the Chicago *Sun*.

Maude Etheredge Resigns at Illinois.—Dr. Maude Lee Etheredge, director of the women's health service and professor of hygiene, University of Illinois, Urbana, has resigned after twenty-two years' service to the university, according to the Urbana *Courier*, July 2. The resignation will be effective September 1. Dr. Etheredge graduated at Bennett College of Eclectic Medicine and Surgery, Chicago, in 1911. Prior to joining Illinois in 1923 she acted as medical adviser and was director of the women's health service at Cornell University, Ithaca, N. Y.

Chicago

Course in Bronchoesophagology.—The department of otolaryngology, University of Illinois College of Medicine, will offer a special course in bronchoesophagology, October 15-27, under the personal direction of Dr. Paul Holinger, assistant professor of laryngology, rhinology and otology. The course will consist of didactic lectures, animal and cadaver demonstrations, practice in bronchoscopy and esophagoscopy, diagnostic and surgical clinics and other work. Registration will be closed when the limited number of twelve applications of physicians have been received. Additional information may be obtained from the Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.

Emotional Adjustments of Civilians and Veterans.—The Illinois Society for Mental Hygiene is offering its services in the planning of educational programs to promote better understanding of the emotional adjustments of civilians and veterans. The service is available, without charge, to organizations wishing a list of speakers, a series of appropriate movies and a selection of literature for distribution or sale. Arrangements for hall, speakers, movies and audience will be left to the organization wishing the planning service. If the group wishes the Illinois Society for Mental Hygiene to conduct programs, a charge will be made for the cost price of the speakers' fees, movies and any other expense incurred. Additional information may be obtained from the Illinois Society for Mental Hygiene, 343 South Dearborn Street, Chicago 4.

KANSAS

Postgraduate Fund.—The Kansas Medical Society has voted to raise a fund of $100,000 to assist returning medical officers in obtaining postgraduate medical education before reentering private practice. A questionnaire has been sent to each member of the society now serving with the armed forces asking his plans for postgraduate education. Dr. William P. Callahan, president of the Kansas Medical Society, has appointed as a committee to study the distribution to be made of the fund of $100,000, more than $36,000 of which is now available, Drs. Harold H. Jones, Winfield, chairman; Floyd C. Beelman, Topeka; Clarence H. Benage, Pittsburg; Louis B. Gloyne, Kansas City; John L. Lattimore, Topeka; Benjamin H. Mayer, Ellsworth, and James H. A. Peck, St. Francis. It has already been decided that each medical officer desiring postgraduate medical education shall have the opportunity of receiving assistance from the fund and that each shall select the school and the course of study he prefers. The *Journal of the Kansas Medical Society* states that contributions to the fund are voluntary but that it is hoped each member will send in a donation.

KENTUCKY

Hugh Leavell Joins Rockefeller Foundation.—Dr. Hugh R. Leavell, Louisville, director of the Jefferson County Board of Health, who has been on leave with the UNRRA in Europe, has been appointed an assistant director for the medical sciences for the Rockefeller Foundation. The appointment will be effective in the fall, when his association with the UNRRA ends. Dr. Leavell has been connected with the Jefferson board of health since 1934.

MISSOURI

Personal.—Dr. Curtis H. Lohr, St. Louis, was to resume his activities June 15 as superintendent of the St. Louis County Hospital, Clayton, after a two year absence on overseas duty with the army.——Dr. William E. Angell, Rocheport, recently observed the fiftieth year in the practice of medicine.

The Doctor Prefix Bill.—House Bill 206, known as the "Doctor Prefix Bill," has been approved by the governor and will become law ninety days after the adjournment of the present session of the legislature, which is not expected until after January 1. To comply with the law, physicians should change their office name plates, cards, stationery, signs and so on by adding M.D. after the name whenever the word "Doctor" or "Dr." is used before the name. The law applies as well to dentists, osteopaths, veterinarians, chiropractors, chiropodists or any other persons who profess to be practicing the healing art and who use the prefix "Doctor" or "Dr."

Study of Tuberculous Pulmonary Calcification in Children.—The U. S. Public Health Service has established a laboratory at the University of Kansas School of Medicine, Kansas City, with a mycologist in charge to carry on a study of tuberculous pulmonary calcification. In cooperation of the local health department and the Kansas City Tuberculosis Society, the public health service is conducting a field study among the children, consisting of a tuberculosis and histoplasma skin test with an x-ray plate of the chest. The U. S. Public Health Service in 1944 investigated the question of pulmonary calcification in the absence of the tuberculin positive skin test, carrying on investigations in Detroit, Minneapolis, Philadelphia and Kansas City. Histoplasmin skin tests were made concurrently with tuberculin tests, and results suggest that much of the pulmonary calcification hitherto suspected of being tuberculosis is in reality due to a subclinical infection with Histoplasma capsulatum or an immunologically related organism.

NEBRASKA

Personal.—Dr. Charles W. Rudolph, Houston, Texas, has been appointed in charge of the Hospital for the Tuberculous, Kearney, succeeding Dr. Leland C. Albertson, resigned (THE JOURNAL, May 19, p. 216).

Hospital News.—Ground for the proposed 50 bed $270,000 Provident Hospital, Omaha, to be built by the Nebraska Negro Medical Society and other sponsoring groups, was bought July 9. The site is at Thirtieth and Wirt streets.

First Fellowship Under Poynter Foundation.—Philip D. McIntosh, B.S., who has completed his first two years of medicine in the University of Nebraska College of Medicine, Omaha, has been selected as the first C. W. M. Poynter Foundation Fellow in medical science for a period of a year beginning July 1 (THE JOURNAL, March 3, p. 534).

NEW JERSEY

"Polio" Quarantine in Trenton.—On August 5 a poliomyelitis quarantine became effective in Trenton, barring children under 16 years of age from churches, Sunday schools, theaters, stores, playgrounds, parks and gatherings of any kind. A resolution imposing the quarantine and fixing penalties for parents or others permitting violations by children was adopted by the city commission on August 4. Two days previously Dr. William E. Mountford, city health officer, asked the commission to act, and when it failed to do so he asked the public to comply voluntarily with his proposal. According to the New York *Times*, the number of poliomyelitis cases on August 4 totaled 45, with eight deaths.

NEW YORK

Memorial Library to Honor Physician.—Members of the medical staff of the Mount Vernon Hospital, Mount Vernon, and of the Mount Vernon Medical Society, as well as personal friends, are cooperating in the establishment of a library at the Mount Vernon Hospital to be named the Dr. Ludwig B. Goldhorn Memorial Library. The library will honor Dr. Goldhorn, who died Nov. 16, 1944 after serving the hospital for thirty-six years as roentgenologist, during which he established the first x-ray laboratories there.

Cancer Teaching Day.—On October 17 a cancer teaching day will be held at the Governor Clinton Hotel, Kingston, under the auspices of the Medical Society of the County of Ulster, the Third District Branch of the state medical society, the Tumor Clinic Association of the State of New York, the medical society and the state department of health's division of cancer control. Speakers will include:

Dr. Earl D. Osborne, Buffalo, Cancer of the Skin and Allied Tumors.
Dr. Frederick S. Wetherell, Syracuse, Role of the Practicing Physician in the Care of Cancer.
Dr. Charles B. Huggins, Chicago, Cancer of the Prostate.
Dr. Fred W. Stewart, New York, Biopsy in Tumors.

Agencies Named for Hospital Survey.—To make the proposed new hospitals in the state eligible for federal funds under the pending Hill-Burton hospital construction bill, Governor Dewey on August 2 designated the Postwar Planning Commission as the single state agency for surveys as required in section 612 (a) (1) of the bill and set up a Joint Hospital Board composed of the commissioners of health, mental hygiene and social welfare to coordinate activities in these fields which are required in the survey. The Joint Hospital Board will act for and with the planning commission in making the necessary inventory and survey of hospitals in the state. Needed experts are to be employed with funds furnished by the Postwar Planning Commission. The state advisory council required in section 612 (a) (2) of the Hill-Burton bill will be designated by the Joint Hospital Board.

New York City

Course in Hospital Administration.—Columbia University announces that, aided by a grant from the W. K. Kellogg Foundation, it will offer a course in hospital administration beginning September 27. The course will be of approximately twenty-one months' duration, consisting of an academic year in residence and a calendar year of supervised assistantship in an affiliated hospital. A baccalaureate degree will be a minimum requirement. Women will be admitted on the same terms as men. The course will be offered through the School of Public Health of the faculty of medicine of the university, according to an announcement.

Changes at Columbia.—Drs. James Wesley Jobling and Alwin Max Pappenheimer, professors of pathology at Columbia University College of Physicians and Surgeons, have been designated professors emeritus, the New York *Times* of July 26 reports. Dr. Jobling, who graduated at Lincoln Memorial University Medical Department, Knoxville, Tenn., in 1896, has been associated with Columbia since 1918. Dr. Pappenheimer, who graduated at Columbia in 1902, has been associated there since 1909. Aura E. Severinghaus, Ph.D., and Dr. Vernon W. Lippard are associate deans for medicine at Columbia. Dr. Harry S. Mustard, director of the DeLamar Institute of Public Health, is associate dean for public health.

Progress of Plans for Tropical Disease Hospital.—On July 16 federal approval was given to an advance of $76,000 to the city of New York to help finance the preparation of plans of a $2,200,000 hospital for tropical and communicable diseases to be constructed after the war. The federal advance, made through the bureau of community facilities, FWA, will be supplemented by $19,000 authorized by the board of estimate. The hospital will have a capacity of 300 patients. It is to be built on a tract facing the Hudson River, between 165th and 168th streets, and transferred to the city by agreement with Columbia University and the Presbyterian Hospital of the City of New York. On the same tract, a short distance north of the hospital, the city proposes to build a $2,690,000 public health laboratory, research and training center (THE JOURNAL, June 9, p. 453).

WASHINGTON

New Rule Relating to Medical Treatment.—The state department of labor and industries has reported to the Washington State Medical Association the adoption of a new rule relating to medical treatment, effective June 7. The rule stipulates that in any case in which the original report and diagnosis of the attending physician is used as a basis for the rejection of the claim, the physician shall be entitled to payment for his services on the first call, including x-rays and laboratory work necessitated for diagnostic purposes, in accordance with the fees prescribed in the fee schedule. In the past, when the department found it necessary to reject a claim on the basis that the condition present was not the result of an injury, and that action was based on the report of the attending physician, the physician's bill was also rejected. In other words, he was penalized for reporting the exact facts. The new rule will overcome that situation.

WEST VIRGINIA

Physicians Urge Extension of Current Medical Care.—The expansion of existing nonprofit medical and hospital service plans and the development of new plans to make medical and hospital care available to people residing in every part of West Virginia was recommended to the legislative interim committee by eight medical members of the recently appointed advisory committee (THE JOURNAL, June 23, p. 606). The plan was recommended in preference to a statewide plan. At the present time there are ten hospital service plans and nine medical service plans in operation in this state. The committee recommended that service corporations be developed and operated separately and that hospital care be made the responsibility of participating hospitals and medical service the responsibility of participating physicians. In the interest of economy of operation, the committee feels that hospital service groups should be permitted to serve as public agents for medical service corporations in the same area. The committee also recommended that reciprocal relations be arranged by which a member of a service group in one area may receive hospital or medical service in any other area of the state where service plans are in operation. It is felt that service outside the state should be on an indemnity basis only, unless reciprocal arrangements can be made by the plans operating in West Virginia and those in operation in other states. Under the plan recom-

mended by the doctor group, all state employees would be eligible to participate on a voluntary basis in nonprofit medical and hospital service plans, with provisions for salary deductions at the source covering this service. The group unanimously recommended that a division of medical and hospital service be created in the state health department under the supervision of a director, who would have such regulatory powers over nonprofit service plans as may hereafter be defined. The director would have the assistance of an advisory committee appointed by the governor, composed of two representatives each from the West Virginia State Medical Association, the Hospital Association of West Virginia, nonprofit hospital service plans operating in West Virginia and the public. The committee urged that at least one third of the members of the directing board of the various nonprofit hospital and medical service plans should be representatives of the public at large; that is, persons who are not doctors and who have no hospital affiliations. The group declared that the funds provided at the present time for medical and hospital care for the indigent have proved to be wholly inadequate for the purpose and recommended that a substantial increase be made in the appropriation. The revised plan would provide for emergency hospital and medical service for the indigent on a twenty-four hour basis. Dr. Robert J. Wilkinson, Huntington, chairman of the medical members of the advisory committee, submitted the report for the group. He stated that the program as outlined is acceptable to all of the service plans now in operation in the state with the exception of the recommendation for supervisory and regulatory control by the director of a new division to be created in the state health department. Six of the service plans favor regulation by the insurance commissioner, while representatives of two of the plans favor the creation of a new division.

GENERAL

Ophthalmology Examination Postponed.—The American Board of Ophthalmology announces that because of transportation difficulties the examination of the board, originally scheduled for Chicago in October, has been postponed to Jan. 18-22, 1946. Examinations of the board will be Chicago January 18-22, Los Angeles January 28-February 1, New York in May or June and Chicago in October.

Antinoise Awards.—Memphis, Tenn., was named first prize winner of the Grand National award, a gold plaque, presented for the first time this year by the National Noise Abatement Council, New York. Winners of the 1945 four city population group awards, silver plaques, include group I (cities over 500,000), Chicago; group II (250,000 to 500,000), Rochester, N. Y.; group III (100,000 to 250,000), Salt Lake City, Utah; group IV (less than 100,000), Little Rock, Ark.

Publicity Program for Radiology.—The commission on public relations of the American College of Radiology has received a grant of $15,000 from the National Electrical Manufacturers' Association to conduct a publicity campaign in connection with the commemoration of the fiftieth anniversary of Roentgen's discovery of the x-rays. The campaign will be directed by a joint committee representing the college and the manufacturers' association. Through newspapers, periodicals and the radio, the role of the specialist in radiology as a doctor and consultant will be described. The campaign will end November 8, the fiftieth anniversary of Roentgen's discovery.

Ammonia.—The rapid growth of new chemicals and the widening industrial use of well known ones, especially during the war, has led the Division of Labor Standards in the U. S. Department of Labor to inaugurate a series of bulletins on controlling chemical hazards in cooperation with the Manufacturing Chemists Association of the United States, according to V. A. Zimmer, director. The first bulletin, "Ammonia," is just off the press and others shortly to be issued cover chlorine, sulfuric and nitric acids, formaldehyde and the anilines. There will be over a hundred such bulletins in the series. These bulletins are designed for safety men in industry, insurance companies and state labor departments, for union safety committees and for materials warehousemen, handlers on railroads and trucking concerns, industrial doctors and nurses and firemen and fire prevention authorities. Each bulletin describes the hazards of the chemical, its characteristics, safety precautions for installation, handling and storage, protective clothing, permissible and hazardous concentrations, and first aid treatment. A bibliography is included. Each bulletin is checked for technical accuracy and practical safeguards with firms manufacturing the chemical through the Manufacturing Chemists Association. "Ammonia" will be of special interest to refrigeration and air conditioning manufacturers, oil refineries, steel treatment and water purification plants, manufacturers of sulfuric and nitric acids, fertilizer, drugs and chemicals, and bottling works. A supply of up to twenty-five copies will be distributed without charge on request by the Division of Labor Standards as long as the free supply lasts. Larger orders may be obtained for 5 cents a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. A 25 per cent discount is allowed on orders of 100 or more.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended August 4 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Division and State	Poliomyelitis Week Ended 8/4, 1945	Poliomyelitis Week Ended 8/5, 1944
New England States:		
Maine	2	1
New Hampshire	2	1
Vermont	5	1
Massachusetts	15	23
Rhode Island	0	0
Connecticut	9	10
Middle Atlantic States:		
New York	83	311
New Jersey	82	16
Pennsylvania	31	86
East North Central States:		
Ohio	12	48
Indiana	5	36
Illinois	26	14
Michigan	5	40
Wisconsin	3	5
West North Central States:		
Minnesota	1	14
Iowa	5	1
Missouri	4	4
North Dakota	0	0
South Dakota	0	0
Nebraska	0	4
Kansas	5	5
South Atlantic States:		
Delaware	2	3
Maryland	6	27
District of Columbia	3	9
Virginia	15	63
West Virginia	0	7
North Carolina	6	40
South Carolina	8	4
Georgia	5	7
Florida	1	7
East South Central States:		
Kentucky	0	65
Tennessee	23	4
Alabama	4	5
Mississippi	1	10
West South Central States:		
Arkansas	2	0
Louisiana	4	21
Oklahoma	14	1
Texas	38	5
Mountain States:		
Montana	0	0
Idaho	0	0
Wyoming	0	0
Colorado	5	0
New Mexico	1	2
Arizona	0	1
Utah	12	1
Nevada	0	0
Pacific States:		
Washington	12	5
Oregon	1	16
California	18	9
Total	476	932
First 31 weeks:		
1945 and 1944	2,915	3,992
Median, 1940-1944	1,852	

Four Million Dollars for Cancer Research.—The Alfred P. Sloan Foundation has given $4,000,000 to provide and in part to maintain a proposed Sloan-Kettering Institute for Cancer Research, to be organized in conjunction with Memorial Hospital for Cancer and Allied Diseases, New York. The gift will provide for a building especially designed for the purpose and self contained in all its various research functions. It will be erected at an estimated cost of $2,000,000 on property now owned by Memorial Hospital adjacent to its present location. The facilities to be provided will be adequate to permit the exploration of all avenues that may be expected to contribute to the objective. The entire project will be in keeping with a program of expansion at Memorial Hospital. In addition, the Alfred P. Sloan Foundation will undertake to provide $200,000 a year toward the operating cost for a definite period of ten years. In a statement to the press, Reginald G. Coombe, president of the hospital, said that, while the Alfred P. Sloan Foundation gift provides for most of the financial requirements of the research phase of the proposed Memorial Cancer Center, the center will not be fully effective from the point of view of its ability to render service until it is completed. It is planned to launch a public campaign to obtain the necessary $3,000,000 to $4,000,000 to provide for an increased bed capacity at Memorial Hospital proper, for fellowships for the training of specialized medical personnel and for equipment necessary to the servicing of the new Dr. James Ewing Hospital for Cancer to be erected at the center by the city of New York. The new institute will bear the name of the two men who have cooperated in many scientific endeavors, Alfred P. Sloan Jr. and Charles F. Kettering, chairman and vice president and director of research, respectively, of General Motors. Mr. Sloan created the Alfred P. Sloan Foundation to advance in any proper way the interest of the community at large, with emphasis on economic education, giving to it in 1937 an endowment of $10,000,000 to provide for expanded activities.

Deaths in Other Countries

Dr. Henry R. Kenwood, emeritus professor of hygiene and public health, University of London, died June 7, aged 82. —**Dr. Edward Barclay-Smith**, emeritus professor of anatomy, University of London, died in London, aged 84.— **Dr. Philippe Dally**, noted physician and Paris correspondent of THE JOURNAL, died in Paris July 5, aged 75.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 28, 1945.

The New Chair of Human and Comparative Anatomy at the Royal College of Surgeons

Thanks to the munificence of Sir William H. Collins, a new chair of human and comparative anatomy has been founded at the Royal College of Surgeons. The first to hold it is the distinguished anatomist F. Wood Jones, who occupies the chair of anatomy at the University of Manchester. After graduating in the University of London in 1904 he became demonstrator of anatomy at the London Hospital and St. Thomas's Hospital. After some years as medical officer in the Far East he was appointed anthropologist to the Egyptian government and took part in the archeological survey of Nubia. In 1919 he was appointed professor of anatomy at Adelaide University, which position he resigned in 1927 on taking the Rockefeller chair of physical anthropology in the University of Hawaii. In 1930 he left Hawaii to become professor of anatomy in Melbourne University. In 1932-1933 he acted as director of anatomy in Peiping Union Medical College. He is the author of several books marked by original thinking on corals, arboreal man, the mammals of South Australia, and sea birds as well as "The Principles of Anatomy as Seen in the Hand," "Unscientific Excursions," "Life and Living" and "Design and Purpose."

Inter-Allied Cooperation at the Royal Society of Medicine

This war has to its credit one important benefit—increased contacts between the leaders of the allied countries. In Britain we have been privileged to welcome them in large numbers—from the United States as members of the huge American army quartered here and from the European continent as refugees from German oppression. For the time being they have been honorary members of our medical societies, and the pleasant and profitable contacts with them will be long cherished in our memories. The Royal Society of Medicine, with its membership of over 7,000, has played the leading part in these contacts, of which farewell celebrations have just taken place. At an annual meeting of the fellows the president, Surg. Rear Admiral Gordon-Taylor, presented scrolls of honorary fellowship to certain distinguished persons in medical services of the British and Allied forces. In doing so he addressed the Czech, Norwegian and Belgian recipients in their native languages. The first award was made to Gen. Frantisek Langer, director general of the medical service of the Czech army. The next was made to Dr. Karl Evang, director general of the Norwegian public health services. In returning thanks Dr. Evang said that before the war Norwegian medical science looked to the south, to Germany and Austria, though it had partly turned to Britain and the United States. There would now be a radical change, and more Norwegian doctors would knock at the British door. The last of the allied recipients was Colonel Gallemaerts, director general of medical services of the Belgian army. General Smirnov, head of the medical service of the Russian army, was not able to attend for his presentation. The guests included Brig. Gen. Elliott Cutler of the United States Army in Europe and Col. A. T. Jurasz, dean of the Polish Medical School in Edinburgh. A farewell dinner was also given to the representatives of the Allied forces in this country. The chairman, Sir Henry Tidy, recalled that among the useful subjects discussed by them at the meeting of the society were lifeboats at sea, the psychology of the Germans, army rations, field surgical units, operational strain, psychosis and combat exhaustion, malaria, head injuries, plastic surgery, the prisoner of war, famine in Bengal, typhus, blood transfusion, infective hepatitis, concentration camps and starvation.

BRAZIL

(From Our Regular Correspondent)

São Paulo, May 26, 1945.

Penicillin in Syphilitic and Parasyphilitic Diseases

Six patients with tertiary yaws were treated with penicillin in small doses at the Evandro Chagas Hospital of the Oswaldo Cruz Instituto in Rio de Janeiro by Dr. F. Nery Guimarães. The lesions presented by the patients were gummatous ulcerations, periostitis, osteitis, osteoporosis and gangoza (rhinopharyngitis mutilans). In all cases clinical recovery was obtained, the time of treatment varying from two to seven months. The number of Oxford units per patient varied from 48,000 to 558,800. Patients with bone lesions, even after treatment, did not show complete repair of the bone structure, but the lesions appeared to be healed and negative serologic tests were obtained.

Dr. Nery Guimarães and his co-workers Drs. Area Leão and Genard Nobrega published their therapeutic researches on syphilitic infection.

Six syphilitic patients were treated with penicillin in small doses at the Evandro Chagas Hospital of the Oswaldo Cruz Institute. Primary lesions were found to be bacterioscopically negative in three to six days, and cicatrized completely in ten to thirteen days with applications of 1,200 to 2,400 Oxford units each in twenty-four hours. Syphilitic condylomas and hypertrophic mucous patches showed negative bacterioscopic results in ten to twenty days with applications of 1,200 Oxford units in twenty-four hours. Doses of 4,800 units during the same time, however, were insufficient to control other secondary syphilitic manifestations (roseolar rash). In 3 cases under serologic control it was found that after a clinical cure had been effected the Wassermann reaction showed considerable oscillation, becoming first negative and then positive.

Brief Items

A postgraduate course in psychiatry and mental hygiene has been inaugurated this month at the Institute of Psychiatry of the University of Rio de Janeiro, under the direction of Prof. Henrique Roxo. Besides Dr. Roxo, Drs. Flavio de Souza, Morais Coutinho, Rodrigo Ulysses and Paulo Lacaz are in charge of the course.

The faculty of the Medical School of the University of Rio de Janeiro conferred the degree of doctor honoris causa on Dr. Pasteur Valéry-Radot, head of the French Cultural Mission to South America, now at Rio de Janeiro.

Marriages

Garrett Michael Swain, Chevy Chase, Md., to Dr. Shirley Catherine Towey of Roselle Park, N. J., in Washington, D. C., May 31.

Thomas A. Keenan, Rutland, Vt, to Miss Christine Elizabeth Kelley of Dorset in New York, April 14.

Norman Blaine Hasler, Worthington, Ind., to Miss Catherine M. McDonald of Orange, Mass., June 14.

William Hugh Hamilton Jr., Hemingway, S. C, to Miss Nanette Sherard of Abbeville, June 23.

Henry Patrick Drake Jr., Marion, Ohio, to Miss Anna Mae Blake of Toledo, June 30.

Arthur Clayton Curtis, Little Rock, Ark., to Miss Grace Roberts of Pine Bluff, June 17.

Robert R. Hays, Akron, Ohio, to Miss Thelma Louise Eppley of Zanesville, May 12.

Jerry Byron Hogsette, Vienna, Ga., to Miss Linda Davis of Sylvania, June 20.

H. W. Davis to Miss Ruth Keene, both of Alton, Ill., June 16.

David Kleiner to Miss Rita Steig, both of Brooklyn, June 30.

Deaths

Egil Thorbjorn Olsen, Detroit; George Washington University School of Medicine, Washington, D. C., 1904; for three years with the U. S. Public Health Service; served as chairman of the program committee of the Wayne County Medical Society, as chairman of the legislative committee of the American Hospital Association and as president of the Michigan Hospital Association; superintendent of the Receiving Hospital from 1929 to 1934; later appointed medical director and assistant superintendent of the Oklahoma University Hospital, Oklahoma City; for many years superintendent of the Englewood Hospital, Chicago; at one time chief medical examiner of the Chicago Civil Service Commission and chief of the bureau of hospitals of the Chicago Health Department; awarded the citation of the Order of Honor and Merit of the Red Cross of Cuba in recognition of services performed in behalf of Cuban residents of Detroit; associated with the medical department of the Ford Motor Company; died in the Henry Ford Hospital June 3, aged 70, of arteriosclerotic heart disease.

James Paul Johnston ⊕ East Moline, Ill.; University of Illinois College of Medicine, Chicago, 1922; formerly health officer of East Moline; a member of the Student Army Training Corps at Iowa University during World War I; commissioned a first lieutenant in the Officers Reserve Corps in 1924; began active duty as a first lieutenant in the medical corps, Army of the United States, on Aug. 14, 1942; served at Camp Breckenridge, Ky., the Army Medical Center in Washington, D. C., and the Billings General Hospital in Indianapolis; relieved from active duty as a captain on Nov. 10, 1943; member of the Iowa and Illinois Central District Medical Association and the Association of American Physicians and Surgeons; on the staffs of the Moline Public Hospital, Moline, and St. Anthony's Hospital in Rock Island; taught obstetrics for four years at the Lutheran Hospital in Moline, serving as the 1945 staff president; died in the Veterans Administration Facility, Hines, Ill., June 10, aged 51, of cerebral thrombosis.

Lewis Henry Koplik ⊕ New York; Western Reserve University School of Medicine, Cleveland, 1928; diplomate of the National Board of Medical Examiners; member of the New York Academy of Medicine, the Harvard Club of New York, the New York Pathological Society, the American Association of Pathologists and Bacteriologists and the Biological Photographic Association and the New York Pediatric Club; instructor in pediatrics at Cornell University Medical College; assistant health officer at the Kips Bay Yorkville Health Center in New York; interned at the Children's Hospital in Boston and was an instructor in pathology at Harvard Medical School; at the time of his death attending physician and member of the board of the Willard Parker Hospital, where he had been an intern, resident and later visiting physician; died at his summer home at Miller Place, L. I., July 22, aged 41, following an operation for the removal of a pituitary tumor.

Harold Denman Meeker ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1902; formerly professor of surgery at the New York Polyclinic Medical School and Hospital; fellow of the American College of Surgeons; consulting surgeon, New York Polyclinic Hospital; member of the medical board of the Doctors Hospital and a consultant to the Somerset Hospital, Somerville, N. J., Yonkers General Hospital, Yonkers, Broad Street, St. Clare's and Downtown hospitals; in 1927 appointed surgical director to the Reconstruction Hospital and in 1935 honorary surgeon in the police department; awarded an honorary degree of master of science from Wesleyan University; died May 26, aged 69, of cerebral hemorrhage.

Benjamin A. Shepard ⊕ Kalamazoo, Mich.; Detroit College of Medicine, 1904; past president of the Michigan Trudeau Society and the Michigan State Tuberculosis Society; past president and secretary of the Kalamazoo Academy of Medicine; past and honorary president of the Kalamazoo Tuberculosis Association; member of the board of directors of the National Tuberculosis Association; fellow of the American College of Physicians and the American College of Chest Physicians; served as medical director of the Pine Crest Sanatorium, Oshtemo; died June 16, aged 65, of coronary occlusion.

Sylvanus F. Basinger, Elyria, Ohio; Cleveland Homeopathic Medical College, 1906; member of the American Medical Association; acting city health commissioner; on the staff of the Elyria Hospital, where he died June 9, aged 67, of chronic myocarditis and pulmonary edema.

Joseph F. Battaglia ⊕ Buffalo; University of Buffalo School of Medicine, 1920; school physician for the city health department; on the staffs of Buffalo Hospital of the Sisters of Charity and the Louise de Marillac Maternity Hospital; died June 3, aged 49, of coronary occlusion.

Abraham Louis Blecker ⊕ Memphis, Tenn.; Memphis Hospital Medical College, 1912; on the staffs of the Methodist and Baptist hospitals; associated with and in 1929 president of the staff of St. Joseph's Hospital, where he died June 13, aged 58, of uremia.

Fred George Bushold, Lawrence, Mass.; Tufts College Medical School, Boston, 1904; died in the Bessie Burke Memorial Hospital June 8, aged 64, of cerebral hemorrhage.

Charles Willard Cole, Norton, Kan.; Central Medical College of St. Joseph, Mo., 1903; member of the American Medical Association; died May 20, aged 67, of coronary occlusion.

Walter Frank Coleman, Hickory Flat, Miss.; University of Tennessee College of Medicine, Memphis, 1915; member of the American Medical Association; also a druggist; served on the board of aldermen; died June 11, aged 60, of carcinoma.

Rufus George Collins ⊕ Chicago; Chicago Medical College, 1885; once on the staffs of the Mercy Hospital and the Michael Reese Hospital, where he died June 24, aged 86, of bronchopneumonia.

George Herbert Davis, East Rochester, N. Y.; University of Vermont College of Medicine, Burlington, 1884; died in the Genesee Hospital, Rochester, April 16, aged 82, of heart disease.

Terence Thomas Dawson, Seattle; Creighton University School of Medicine, Omaha, 1928; member of the American Medical Association; interned at Creighton Memorial St. Joseph's Hospital in Omaha; died May 1, aged 42, of cerebral hemorrhage.

Louis Alfred Dessen ⊕ Hazleton, Pa.; Medico-Chirurgical College of Philadelphia, 1911; specialist certified by the American Board of Radiology, Inc.; member of the Radiological Society of North America, Inc., and the American College of Radiology; veteran of the Spanish-American War; consultant radiologist, Hazleton State Hospital; died July 10, aged 65, following an operation for carcinoma of the colon.

John Lydall Dixon, Woodbury, Ga.; Atlanta Medical College, 1895; member of the American Medical Association; died in North East, Pa., May 20, aged 69, of pneumonia.

Warren M. Dodge, Farmington, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1893; died in the Miller Hospital, St. Paul, April 28, aged 78, of carcinoma of the sigmoid.

Edward Sylvester Donnelly, Woodburn, Ore.; John A. Creighton Medical College, Omaha, 1912; died in St. Vincent's Hospital, Portland, May 25, aged 60, of heart disease.

Herschell V. Donovan, Cerro Gordo, Ill.; St. Louis College of Physicians and Surgeons, 1895; died in Chicago June 2, aged 72, of arteriosclerotic heart disease.

Arthur Wheeler Drew ⊕ Lieutenant Colonel, U. S. Army, retired, Encinitas, Calif.; Northwestern University Medical School, Chicago, 1913; Medical Field Service School in 1921 and the Army Medical School in 1922; served during World War I; entered the medical corps of the U. S. Army as a first lieutenant on July 1, 1920; retired with the rank of lieutenant colonel on Aug. 31, 1938, for disability in line of duty; died in the U. S. Naval Hospital, San Diego, July 23, 1944, aged 64, of coronary heart disease.

Homan Valentine Duggan ⊕ Brooklyn; Long Island College Hospital, Brooklyn, 1893; on the staffs of the Williamsburgh and Wyckoff Heights hospitals; died April 29, aged 73, of coronary disease.

William Lewis Faul, Russellville, Ohio; Cincinnati College of Medicine and Surgery, 1900; member of the American Medical Association; served as county auditor and as county health commissioner; died May 30, aged 70, of carcinoma.

John Grant Foley, Pineville, Ky.; Hospital College of Medicine, Louisville, 1890; member of the American Medical Association; also a dentist; on the staff of the Pineville Community Hospital; died June 12, aged 81, of heart disease.

Robert Sabin Forbes ⊕ Duluth, Minn.; University of Pennsylvania School of Medicine, Philadelphia, 1910; fellow of the American College of Surgeons; served during World War I; on the staffs of the Miller, St. Luke's and St. Mary's hospitals; died April 9, aged 58, of cirrhosis of the liver.

Chester Erwin Fulton, Springfield, Mo.; State University of Iowa College of Medicine, Iowa City, 1888; member of the American Medical Association; instrumental in organizing and

erecting the old Springfield Hospital, where he served as surgeon; died May 22, aged 84, of heart disease and uremia.

Jesse Funderburg, Piqua, Ohio; Columbus Medical College, 1886; formerly county coroner; served on the staff of the Piqua Memorial Hospital; died April 14, aged 82, of cerebral hemorrhage.

Robert Wilson Getty, Deer Lodge, Mont.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; member of the American Medical Association; resident on the staff of the Montana State Tuberculosis Sanitarium; served as coroner and deputy health officer of Valley County; died on the train at Gold Creek April 8, aged 77, of coronary heart disease.

Vincent John Grauten ⊕ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1917; served during World War I; on the staff of the Presbyterian Hospital, where he died June 7, aged 55, of carcinoma of the prostate.

Richard Alexander Hale, Houston, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1919; member of the American Medical Association; part owner of the Park View Hospital, where he died May 20, aged 52, of coronary thrombosis.

John Goold Harvey, Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; served during World War I; fellow of the American College of Physicians; died in the Veterans Administration Facility, Dearborn, May 24, aged 69, of Buerger's disease and cerebral hemorrhage.

Friedrich Alexander Hecker ⊕ Ottumwa, Iowa; University of Kansas School of Medicine, Kansas City, 1913; also a dentist; specialist certified by the American Board of Internal Medicine; member of the Society of American Bacteriologists and the American Society of Clinical Pathologists; fellow of the American College of Physicians; pathologist, St. Joseph Hospital, where he died suddenly June 3, aged 66, of coronary thrombosis.

John Blakeslee Henry ⊕ Lawrence, Kan.; University Medical College of Kansas City, Mo., 1903; on the staff of the Lawrence Memorial Hospital, where he died May 8, aged 67, of cerebral hemorrhage.

Thomas James Henry, Apollo, Pa.; Medical Department of the University of Wooster, Cleveland, 1884; member of the American Medical Association; served as vice president of the First National Bank of Apollo; died May 30, aged 86, of cerebral hemorrhage.

Freeman St. Clair Hitchcock ⊕ Greenwich, Conn.; New York Homeopathic Medical College, New York, 1907; associated with the Crest View Sanitarium; served on the board of the Neurological Institute in New York; died in the Greenwich Hospital June 7, aged 62, of heart disease.

William Frank Hunt, Davenport, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1896; died in the Mercy Hospital May 26, aged 74, of prolonged fever and influenza.

Milton T. Jay, Portland, Ind.; Medical College of Ohio, Cincinnati, 1890; past president of the Jay County Medical Society; formerly county health commissioner; president of the Jay County Draft Board from 1917 to 1919; a captain in the 139th Field Artillery of the Indiana National State Guard; formerly postmaster; served as president of the board of directors of the Portland City Library; died in Indianapolis May 25, aged 77, of cardiovascular disease.

Markus Frederick Christian Bang Jelstrup, Big Lake, Minn.; Northwestern University Medical School, Chicago, 1903; on the staffs of the Deaconess Hospital, Grand Forks, N. D., and St. Luke's Hospital, Fargo, N. D., died April 10, aged 76, of coronary occlusion followed by angina pectoris.

Michael William Kapp, San Jose, Calif.; Cleveland Medical College, Homeopathic, 1895; member of the American Medical Association; retired member of the California Medical Association; formerly on the staff of San Jose Hospital; died May 28, aged 79, of paralysis agitans.

Thomas S. Kennedy, Eustis, Fla.; Hospital College of Medicine, Louisville, Ky., 1901; Spanish-American War veteran; served as sanitary officer of the West Florida district and assistant state director of rural sanitation; died May 25, aged 67, of massive gastric hemorrhage.

John Kimmel Kiser, Kittanning, Pa.; Cleveland Homeopathic Medical College, 1901; member of the American Medical Association; on the staff of the Armstrong County Hospital; died May 24, aged 69, of hemorrhages from ulcers.

Morris Henry Koch, Allentown, Pa.; Bellevue Hospital Medical College, New York, 1880; member of the American Medical Association; on the staffs of the Sacred Heart Hospital and the Allentown Hospital, where he died in May, aged 86, of senility.

Henry Alfred Lange, Providence, R. I.; College of Physicians and Surgeons, Baltimore, 1909; served in France for the American Red Cross during World War I; on the staff of the Homeopathic Hospital; died in the Rhode Island Hospital May 22, aged 60, of injuries received from a fall, polioencephalitis and hypertensive cardiovascular disease.

Herbert Wood Matthews, Penn Yan, N. Y.; Starling Medical College, Columbus, 1896; member of the American Medical Association; served during World War I; past president of the Yates County Medical Society; formerly chief of staff of the Soldiers and Sailors Memorial Hospital; died June 5, aged 72, of diabetes mellitus.

Frank Alexander May, Palmyra, Ind.; University of Louisville (Ky.) Medical Department, 1909; member of the American Medical Association; on the staff of St. Edward Hospital, New Albany, where he died May 2, aged 62, of postoperative mesenteric thrombosis and gangrene of the gallbladder.

Charles Walsh McQuillen ⊕ Charles City, Iowa; State University of Iowa College of Medicine, Iowa City, 1913; on the staff of the Cedar Valley Hospital; died May 30, aged 58, of heart disease.

John Tipton McVey, Bremen, Ohio; Ohio State University College of Medicine, Columbus, 1913; member of the American Medical Association; formerly vice president of the Fairfield County Medical Society; served on the staffs of the Ohio Hospital for Epileptics, Gallipolis, Massillon State Hospital in Massillon and the Columbus State Hospital in Columbus; on the staff of the Lancaster Municipal Hospital, Lancaster, where he died June 7, aged 61, of coronary occlusion.

Nathaniel Kingsbury Noyes ⊕ Plymouth, Mass.; Dartmouth Medical School, Hanover, N. H., 1890; a captain in the medical corps of the U. S. Army during World War I; health board physician in Duxbury from 1895 to 1925; visiting physician at the Jordan Hospital for many years; associate medical examiner of the Third Plymouth District for three terms; member of the Massachusetts Association of Health Boards and the Massachusetts Medico-Legal Society; died April 12, aged 80, of heart disease.

Arthur L. Payne, Eau Claire, Wis.; Medical College of Ohio, Cincinnati, 1890; died May 15, aged 79, of coronary thrombosis and diabetes mellitus.

Edward Rayburn Ridley ⊕ Detroit; University of Colorado School of Medicine, Denver, 1911; associate physician for the Detroit Edison Company; on the staff of the Harper Hospital, where he died May 30, aged 56, of heart disease and hypertension.

Harry Sloan Saks ⊕ Denver; University of Kansas School of Medicine, Kansas City, Kan., 1930; captain, medical reserve corps, U. S. Army, not on active duty; on the staffs of the Beth Israel, St. Anthony and Colorado General hospitals; died May 31, aged 39, of heart disease.

Frank Waldo Scott, Muskogee, Okla.; University of Nebraska College of Medicine, Omaha, 1910; served during World War I; served on the staffs of various Veterans Administration facilities and at the time of his death as chief of the outpatient and reception service, Veterans Administration Facility in Muskogee, where he died April 15, aged 57, of myocardial failure.

Arthur Edgar Smith, Cohoes, N. Y.; University of Vermont College of Medicine, Burlington, 1891; served in the medical corps of the U. S. Army with the rank of captain during World War I; died May 14, aged 81, of acute dilatation of the heart.

William D. Spearman, Social Circle, Ga.; University of Georgia Medical Department, Augusta, 1900; died April 30, aged 69, of angina pectoris.

Frank Spencer, Detroit; Michigan College of Medicine and Surgery, Detroit, 1900; member of the American Medical Association; died in St. Mary's Hospital May 19, aged 73, of bronchopneumonia.

Martin Frank Wright, Burlington, W. Va.; University of Maryland School of Medicine, Baltimore, 1890; member of the American Medical Association; served as president and secretary-treasurer of the Potomac Valley Medical Society and as vice president of the state medical association; in 1943 made honorary life member of the West Virginia State Medical Association; died June 21, aged 75, of cerebral hemorrhage

MARTYRS IN THE SINKING OF THE U. S. S. COMFORT

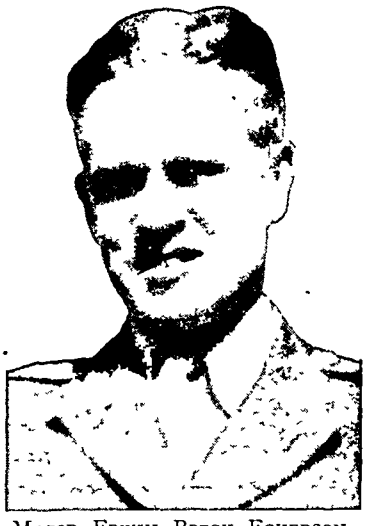
The Hospital Ship was attacked April 28 by a Japanese "suicide" pilot off the coast of Okinawa



CAPT. CHARLES D. CLARK, M. C., A. U. S., 1909-1945



CAPT. WILLIAM A. MACPHERSON, M. C., A. U. S., 1907-1945



MAJOR EDWIN BRECK ECKERSON, M. C., A. U. S., 1905-1945

Charles Dougherty Clark, South Bend, Ind.; Wayne University College of Medicine, Detroit, 1939; interned at the Grace Hospital in Detroit and served a residency at the Royal Oak Hospital in Royal Oak, Mich.; medical director of the Bendix Aviation Corporation; began active duty as a captain in the medical corps, Army of the United States, on July 1, 1942; aged 35

William Alexander Macpherson ✠ Downey, Calif.; College of Medical Evangelists, Los Angeles, 1935; interned at the Orange County Hospital in Orange; diplomate of the National Board of Medical Examiners; specialist certified by the American Board of Ophthalmology; served as assistant physician on the staff of the Sage Memorial Hospital in Ganada, Ariz., and on the staffs of the Los Angeles County Hospital in Huntington Park, the Bell Mission Hospital in Bell and the Suburban Hospital in South Gate; began active duty as a captain in the medical corps, Army of the United States, on Oct. 15, 1942; assigned to BTC number 5, Army Air Forces Technical Training Command in Kearns, Utah; aged 38

Edwin Breck Eckerson ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1931; diplomate of the National Board of Medical Examiners; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons and the New York Academy of Medicine; member, New York Surgical Society; instructor in surgery at his alma mater; member of the board of directors and assistant attending surgeon at St. Luke's Hospital, where he served an internship; assistant attending surgeon at the New York Post-Graduate Medical School and Hospital and the Mount Vernon (N. Y.) Hospital; formerly resident at Lahey Clinic, Boston; began active duty as a captain in the medical corps, Army of the United States, on May 14, 1942; later promoted to major; chief surgeon on the U. S. S. *Comfort;* aged 39.

Ernest Foss Jr., Newburyport, Mass.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1941; interned at the Rochester General Hospital in Rochester, N. Y.; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 15, 1942 and assigned to the 19th General Hospital at Camp Livingston, La ; later promoted to captain; aged 31.

Wallace Lea Chesbro ✠ Lieutenant Commander (MC), U. S. Navy, Springfield, Mass.; Tufts College Medical School, Boston, 1938; interned at the Boston City Hospital; served a residency at the Robert Breck Brigham Hospital in Boston; began active duty as a lieutenant (jg) in the medical corps, U. S. Naval Reserve, on March 17, 1941; entered the medical corps of the regular navy as a passed assistant surgeon in the same rank on April 29, 1942; subsequently promoted to the ranks of lieutenant and lieutenant commander; aged 31.

John Francis O'Brien Jr., Waterford, Conn.; Georgetown University School of Medicine, Washington, D. C., 1943; interned at St. Francis Hospital in Hartford; began active duty as a first lieutenant in the medical corps, Army of the United States, on Oct. 6, 1944; trained at Carlisle Barracks, Pa., and at Moore General Hospital, Swannanoa, N. C.; aged 27.



CAPT. ERNEST FOSS JR., M. C., A. U. S., 1914-1945



LIEUT. COMDR. WALLACE L. CHESBRO (MC), U.S.N., 1913-1945



LIEUT. JOHN FRANCIS O'BRIEN JR., M. C., A. U. S., 1917-1945

Correspondence

A MEXICAN TREATMENT FOR CANCER—A WARNING

To the Editor:—Many cancer patients from the United States have recently been attracted to Mexico City by reports of a new, allegedly successful method of treatment. We have taken occasion carefully to investigate the situation and we have prepared this statement of our opinion for the benefit of our colleagues who may be wondering about the matter.

Personal investigations reveal a modernistic building for hospitalization with inadequate laboratory or other scientific facilities. The physician in charge has a courteous and considerate bedside manner. We think that he makes his patients feel better by virtue of his personality. There is no positive evidence that he or his associates are successful by their peculiar methods in interrupting the usual course of a malignant process.

The theoretical bases for the method of treatment are extraordinary. While they make use of current scientific concepts, they are not in accord in any way with established biochemical or pathologic considerations. It is proposed that local sensitivity to pain is determined by the acid-base reaction of tissues. It is claimed that general sensitivity to pain can be estimated from urinary reaction. Alterations may then be made in diet or by medication, to change urinary p_H, in order to relieve sensitivity to pain. There is no objective satisfactory scientific evidence to support these ideas. In a similar way, a theory has been elaborated to cover various aspects of the control of malignant growth. Practically this results in the preparation of various glandular and tissue brews which are digested in various ways for parenteral and oral administration. No positive evidence exists to indicate the value of these preparations in treating malignancy.

A characteristic but unfortunate aspect of the matter is that no satisfactory clinical records are kept. Various statements are made from time to time in notebooks, but no attempt has been made, as far as we know, to provide clinical records that would be at all acceptable for clinical appraisal according to modern standards.

It is concluded that little benefit may result from cancer patients going to Mexico City for this new "treatment."

CHAUNCEY D. LEAKE, PH.D., Galveston, Texas.
E. W. BERTNER, M.D., Houston, Texas.
C. A. CALHOUN, M.D., Houston, Texas.
R. T. COOKSEY, M.D., Madison, Wis.
LOWELL S. GOIN, Los Angeles.
WELLWOOD NESBIT, M.D., Madison, Wis.
CHARLES PHILLIPS, M.D., Temple, Texas.
HAROLD P. RUSCH, M.D., Madison, Wis.
WILLIAM D. STOVALL, M.D., Madison, Wis.

FIRST AID FOR IVY POISONING

To the Editor:—As one who is allergic to ivy poison, I was of course interested in the editorial in THE JOURNAL, June 23. Some thirty years ago I suffered from a violent dermatitis, which came on promptly after beginning to use my fur gloves that had been moth proofed with synthetic camphor. The discomfort was intense and resistant to everything I tried. The eruption was similar to that of an intense ivy poisoning. In desperation, after the condition had run on for about a week, I thrust my wrists under the stream from the hot water faucet, in and out quickly to avoid scalding. At first the itching was so much intensified that it was almost a pleasure, but each succeeding plunge brought less response, until the itching was entirely relieved after about a dozen applications and remained so for several hours. I repeated the same course of treatment, and the whole thing cleared up in a day or two. Following this clue, I tried the scalding hot water treatment in other cases of pruritus, including several of ivy poison, with the same result. A beginning case of ivy poison can be immediately stopped from itching and will dry and frequently will not even need a second treatment. I was infected several times this spring myself, as we have a lot of the stuff growing about my home. One treatment suffices to cure it and I do not give it a second thought. This has been my only treatment for this condition and it always works. I have used it with the same success in practically all the different forms of pruritus that have come under my care.

FRANCIS E. PARK, M.D., Boston.

DEVELOPMENT OF RED BLOOD CELLS

To the Editor:—I was interested in the answer to a question in THE JOURNAL, June 16, page 552, regarding the development of red blood cells, since it cites my 1938 article as the sole reference. There are, however, certain corrections and additions which are necessary in order to make your reply not only more accurate but also more practical and functional.

The idea set forth in the first sentence of your answer is essentially the one which some of us have been trying to put across for a number of years. However, the influence of Doan, Cunningham and Sabin has been so great during the past twenty years that it will be a long time before many of our largest and best medical schools realize the correctness of your first sentence. From personal experience in the East during the last eight years I would say that the majority of investigators do not believe that there are two generations of red blood cells.

The terminology which you suggest has been used by some of our histologists (Bloom) for a number of years and represents one of the schemes adopted by Maximow. However, clinical pathologists and general pathologists, especially in Europe, have been favoring the use of the term erythroblast alone in the general sense and not for a specific stage of red cell development. Not a few, but a vast majority, of authorities outside the United States use the term normoblast for all precursors of the definitive series. In our country there is a definite trend in that direction among the Midwestern clinicians, but not so with histologists. Such a classification has its merits when applied to a study of red blood cell development in pernicious anemia before and after treatment, where we recognize a megaloblastic series in the former and a normoblastic series in the latter.

The problem of red cell development is not solved, nor is it likely to be in the near future. Perhaps it is for the histologist but not so for the pathologist. For example, instances have been reported in which the patient, sometimes a child, appears to have a temporary or partial deficiency of anti-pernicious anemia principle. The red blood cell development does not seem to be either normoblastic or megaloblastic. Lambin and de Weerdt have described intermediate erythroblasts. I have been reluctant to recognize such a cell line until recently.

Any exposition of the red cell problem which cites my work as a reference would certainly be incomplete and inaccurate without some mention of the importance of nuclear structure as a means of cell identification. Bloom and his school have maintained that the greatest difference in appearance between the primitive and definitive generations is one of size. However, when dry smears are made of blood from the yolk sac, umbilical cord, fetal liver and bone marrow it is found that, regardless of cell size, the nuclear pattern is quite characteristic and distinctive. More and more emphasis should be placed on the value of nuclear structure in order for clinicians and pathologists to interpret properly blood and bone marrow cells.

OLIVER P. JONES, PH.D., Buffalo.
Professor and Head of Anatomy, University of Buffalo School of Medicine.

MORE ON MARIHUANA AND MAYOR LA GUARDIA'S COMMITTEE REPORT

To the Editor:—I read Dr. Bowman's communication, which appeared in THE JOURNAL, July 21.

There has come to my desk a reprint of an article from the *Indian Journal of Medical Research*, January 1942, entitled "Cannabis Sativa in Relation to Mental Diseases and Crime in India," by Col. Sir R. N. Chopra, who has been conducting a drug addiction inquiry for many years at the School of Tropical Medicine, Calcutta, India. Dr. Chopra is the author of "Tropical Therapeutics." The investigations by Dr. Chopra and his associates cover many years of scientific study, and their findings are representative of the entire population.

Some of Dr. Chopra's studies on hemp drug addiction in India were published in July 1939 in the *Indian Medical Research Memoirs*. His recent report on "Cannabis Sativa in Relation to Mental Diseases and Crime in India" is the result of long intensive study of 1,800 hemp drug addicts and destroys most of the conclusions of the New York Mayor's Committee, which studied, according to Bowman, 72 prisoners and 5 volunteers for a comparatively short period. The Chopra report indicates profound knowledge and prolonged study of the problem. Six hundred established cases of hemp drug insanity were studied and 1,238 hemp drug addicts were studied to show the relation between addiction to hemp drugs and crime.

The report summarizes that "excessive indulgence in narcotics, such as Indian hemp, is apt to produce in healthy individuals and in susceptible individuals mental confusion which may lead to delusions with disorientation and disordered movements. . . . Sometimes it may release subconscious impulses and lead to violent crime. . . . Inquiries in various jails and mental centers revealed that in quite a number of cases simple indulgence even in a single ganja or charas (marihuana) smoke was responsible for a heinous crime. . . . Fits of aggressive mania are not infrequently observed after indulgence in hemp drugs. Impulses of a suicidal and morbid nature have been known to occur. . . . Our studies in mental hospitals in the field (tables I and VII) and in prisons show that not infrequently addiction to hemp drugs was the immediate cause of a sudden unbalance of mind and the commission of a crime."

A copy of this article will be mailed free of charge to any one addressing a request to the U. S. Bureau of Narcotics, Tower Building, 14th and K streets N.W., Washington, D. C.

H. J. ANSLINGER, LL.B., Washington, D. C.
U. S. Commissioner of Narcotics.

WHOLE BLOOD AND CITRATED BLOOD

To the Editor:—Dr. Scannell's communication in THE JOURNAL, June 23, attempts to correct what he considers to be an error and brings to light a skeleton which most of us thought had been securely and permanently locked away in a closet.

The term "whole blood" has been most frequently applied to blood obtained from so-called live donors and administered by the direct method of transfusion. Others have applied the term to citrated or preserved blood. As has been pointed out repeatedly, both views are incorrect. Strictly speaking, whole blood must be a substance from which none of its component parts have been removed—cells, serum and/or plasma. Any of these components may be used separately according to indication, and they make up what might be referred to as whole blood but should simply be designated as "blood." When blood is mixed with an anticoagulant or preservative it might be called, as has been suggested, "modified blood."

The statement "Whole blood and citrated blood are as different as black and white" is therefore entirely erroneous. It serves only to create further confusion.

I must also take exception to the statement "severe reactions following the use of citrated blood are far more frequent than when whole blood is used." It is safe to state that most workers are now agreed that such is not the case. Certainly the literature affords ample proof to the contrary, and statistics of blood banks furnish further proof (Geiger, Jacob: History of Blood Transfusion, *Exper. Med. & Surg.* 2:83 [Feb.] 1944). May I quote from the annual report of the Lincoln Hospital Blood Bank for the year 1944:

Total number of transfusions	1,348
Modified blood (citrated bank blood)	1,018
Indirect blood transfusions (bank blood)	1,017
Direct blood transfusion ("live donor")	1
Pooled plasma (prepared from bank blood)	278
Resuspended cells	52
Reactions:	
1. Severe (hemoglobinuria in a case of hemolytic anemia)	1
2. Minor	
(*a*) Urticaria	12
(*b*) Pyrogenic	5
Percentage of severe reactions	0.07
Percentage of minor reactions	1.3

Finally I should like to point out that in Lincoln Hospital we instituted the practice of routine Rh determination in the latter part of the year. While the Rh factor may unquestionably be responsible for an occasional severe reaction, and while we heartily endorse this precautionary step, we cannot agree with the conclusion that, "as a result reactions have been eliminated when whole blood is used." Transfusion reactions can and must be kept at a minimum, but they must still be classified as (1) avoidable and (2) unavoidable. Let us concentrate on the avoidable reactions and not quibble about those that are unavoidable.

JACOB GEIGER, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Aug. 11, page 1125.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various centers, Jan. 18. *Oral.* Various centers, Oct. Final date for filing application is Oct. 20. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York 24.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, May 27. Final date for filing application is Feb. 1. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I.* Various centers, Feb. 2. Final date for filing application is Nov. 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 2-5 and Los Angeles, Jan. 18-22. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: *Written.* Various centers, Dec. 9. *Oral.* Chicago, February 1946. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

29:555-660 (May) 1945

Chronic Auricular Tachycardia with Unusual Response to Change in Posture. Report of 2 Cases. R. Miller and J. S. Perelman.—p. 555.
Wolff-Parkinson-White Syndrome. Report of 5 Cases. R. W. Robinson and W. G. Talmadge.—p. 569.
*Prognostic Significance of Auricular Fibrillation in Association with Myocardial Infarction. J. M. Askey and O. Neurath.—p. 575.
*Gastrointestinal Symptoms of Progressive Myocardial Disease. R. L. McMillan, F. E. Cowden and J. B. Reinhart.—p. 580.
Coronary Occlusion in Industry: A Study of 84 Cases with Reference to Subsequent Employability. E. B. Levine and E. Phillips.—p. 588.
Relation of Resting Heart Rate to Increase in Rate Due to Exercise. W. W. Tuttle and Elizabeth Powell Salit.—p. 594.
Acute Bacterial Endocarditis in the Aged. F. D. Zeman and S. Siegal.—p. 597.
Auricular Heart Sounds in Auricular Flutter. H. H. Hecht and G. B. Myers.—p. 610.
Acute Benign Pericarditis. Report of 2 Cases in Young Adults. W. G. Talmage.—p. 623.
Electrocardiographic Changes in Active Duodenal and Gallbladder Disease. N. E. Clarke.—p. 628.
Momentary Atrial Electrical Axes: III. A-V Nodal Rhythm. A. Ruskin and G. Decherd.—p. 633.
Orchitis and Hydrocele After Cardiac Infarction. B. Kisch.—p. 641.
Silicosis of Pericardium: Case Report. Marguerite G. Stemmerman.—p. 642.
Congenital Tricuspid Insufficiency: Report of Case. Viola G. Brekke.—p. 647.

Auricular Fibrillation with Myocardial Infarction.—Askey and Neurath studied 84 patients with auricular fibrillation observed among a group of 1,247 patients with myocardial infarction admitted to the Los Angeles County Hospital, an incidence of 7.7 per cent. The diagnosis of myocardial infarction was accepted only when the history and the electrocardiogram were typical. Auricular fibrillation was diagnosed only when confirmed by electrocardiograms. The mortality rate among patients with a myocardial infarction plus auricular fibrillation was much higher than in a group without auricular fibrillation. If the auricular fibrillation disappeared in one day, the mortality rate was slightly increased; if it persisted longer than one day, the mortality rate increased greatly. If no reversion to sinus rhythm occurred, death ensued in 89 per cent. One third of the deaths were due to systemic emboli. Persistence of arrhythmia could be correlated with preexisting cardiac damage. Cardiac damage, however, was not the sole cause of the high mortality rate and high incidence of embolism. Auricular fibrillation increased the mortality rate and incidence of embolism regardless of whether congestive failure was or was not present. Whether or not auricular fibrillation was found in the first electrocardiogram was a fairly reliable way of predicting whether the arrhythmia would be persistent or transient. In only 8 of the 55 cases in which auricular fibrillation was found in the first tracing did the arrhythmia disappear, whereas in 27 of 35 in which the arrhythmia followed myocardial infarction sinus rhythm returned. If the auricular fibrillation followed myocardial infarction, the prognosis was about the average if it disappeared in one day or less, but if it lasted more than one day the prognosis was much worse because then the arrhythmia persisted in about one third. The worst prognosis was among those whose auricular fibrillation was known to have existed before (99 per cent mortality with 57 per cent dying of systemic embolism) and among those who had a previous infarct (96 per cent mortality, with 30 per cent systemic embolism).

Gastrointestinal Symptoms of Heart Disease.—McMillan and his associates state that, when nausea and vomiting are dominant symptoms in a case of heart failure, one should not only consider as possible factors drugs, congestion of the abdominal viscera and disorders of the blood metabolites (such as occur in uremia) but should also entertain the possibility that progressive myocardial disease may be the cause of the symptoms. The mechanism of nausea and vomiting induced by progressive myocardial disease is believed to be analogous to that caused by digitalis, which has been shown to be due to a reflex arising in the heart itself. When coronary thrombosis occurs in a patient with preexisting narrowing of the smaller arterial branches a vicious cycle may ensue; the decline in the cardiac output and small pulse pressure lead to a further coronary insufficiency and progressive myocardial fibrosis, which brings about a further decrease in the cardiac output. In cases of heart failure in which there is a small pulse pressure with a high diastolic pressure, the outlook is poor.

American J. Digestive Diseases, Fort Wayne, Ind.

12:187-218 (June) 1945

Some Biologic Considerations of Gallstones. H. Gauss.—p. 187.
Etiology of Peptic Ulcer: New Hypothesis. R. A. Steven.—p. 192.
Changes in Volumes of Blood and Extracellular Fluid in Bowel Obstruction of Rabbit. C. A. Ender and R. C. Herrin.—p. 193.
Effect of Aluminum Hydroxide on Food Utilization in Human Subjects. R. D. Grondahl and E. S. West.—p. 197.
Some Effects of Magnesium Trisilicate Ingestion on Blood, Urine and Feces of Human Subjects. E. S. West and C. Pennoyer.—p. 199.
Incidence of Gastritis in Gastric Ulcer. J. L. Horner and H. Scheff.—p. 202.
Luetic Rectal Stricture. A. Melamed and S. M. Feld.—p. 203.
Differential Diagnostic Problems in Diseases of Mesenteric Glands. E. Muehsam.—p. 206.

American J. of Obstetrics and Gynecology, St. Louis

49:719-830 (June) 1945

Estimation of Work of Obstetric Labor and Its Significance in Heart Disease. J. J. Sampson, Elise M. Rose and R. Quinn.—p. 719.
Comparative Action of Posterior Pituitary and Ergonovine in Third and Fourth Stages of Labor. Observations Based on 5,000 Deliveries. M. Left.—p. 734.
Supravesical Extraperitoneal Cesarean Section (Waters' Type). Experience with 250 Operations. E. G. Waters.—p. 739.
*Sulfonamide Therapy in Gonococcal Infection in Women: Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfadiazine. H. C. Hesseltine, Lucile R. Hac, F. L. Adair and D. K. Hibbs.—p. 746.
Exercises in Dysmenorrhea. J. O. Haman.—p. 755.
Therapeutic Interruption of Pregnancy. Katherine Kuder and W. F. Finn.—p. 762.
Pregnancy in Rudimentary Horn of Uterus. F. W. Muslow.—p. 773.
Postoperative Vesicouterine Fistula. R. T. Frank.—p. 776.
Carcinoma Following Pregnancy with Spontaneous Cure. W. Levine and S. Weiner.—p. 778.
Pregnancy After Renal Biopsy in Hypertensive Disease. R. S. Siddall.—p. 782.
Demonstration Model for Uterotubal Insufflation. I. C. Rubin.—p. 786.
Surgical Treatment of Absence of Vagina. Report of 2 Cases. F. E. Whitacre and C. Y. Che.—p. 789.

Sulfonamide Therapy in Gonococcic Infection in Women.—Hesseltine and his associates report a four year study of sulfonamide therapy in gonococcic infection in women. They have treated 1,126 women with sulfanilamide, sulfapyridine, sulfathiazole or sulfadiazine. Criteria of cure required that patients be observed at least two months following therapy before they could be discharged as cured. A follow-up study was made on 575 patients who were discharged as cured or who failed to respond to therapy. Of these, 430 (75 per cent) responded to one course of therapy and were discharged cured; 145 had repeated or recurrent positive cultures and received further therapy. The authors arrive at the following conclusions: Sulfadiazine is the drug of choice for treatment of gonococcic infection of women. Sulfathiazole is slightly less effective. Both drugs gave better results and were better tolerated than sulfanilamide or sulfapyridine. Diagnosis of gonorrhea and criteria of cure, wherever possible, should be based on cultural studies. Patients should be observed through at least one negative menstrual period and preferably two. Negative smears and cultures taken just after the menstrual period should be required. Considerable information is obtained from cultures taken during therapy. The menstrual period is

the best provocative test. Complications of salpingitis or bartholinitis were not associated with more failures of therapy than acute uncomplicated cases. Drug fast strains were produced in the adult women in less than 1 per cent of the cases.

American Journal of Surgery, New York

68:279-406 (June) 1945

Air Embolism, with Special Reference to Its Surgical Importance. H. S. Martland.—p. 281.
Hernia in Infancy and Childhood. A. H. Iason.—p. 287.
Pediatric Urologic Problem Important to General Practitioner. R. U. Whipple.—p. 297.
Primary Omental Torsion. J. I. Anton, J. E. Jennings and M. B. Spiegel.—p. 303.
Intercostal Nerve Block in Balanced Anesthesia. S. Belinkoff.—p. 318.
Operation for Anal Fistulas: Some Reasons for Failures. R. J. Jackman.—p. 323.
Fixity of Facial Expression Following Undermining of Skin Over Nose: Modified Method by Which It Is Avoided. A. P. Seltzer.—p. 326.
Failure of Cure of Pelvic Infections Following Use of Penicillin. T. B. Marwil.—p. 336.
Prosthetic Restorations After Amputations About the Hand. A. M. Brown.—p. 338.
Transverse Incision for Appendectomy. S. D. Murray.—p. 344.
Clinical Use of Red Cell Amino Acid Mixture as Substitute for Whole Blood Transfusions. B. G. P. Shafiroff, I. S. Barcham and H. Doubilet. —p. 348.
Bridge Operation for Dupuytren's Contracture. L. A. Palmer and J. L. Southworth.—p. 351.
Response to Preoperative Irradiations as Clue to Management of Breast Cancer. L. M. Levi.—p. 355.

Annals of Internal Medicine, Lancaster, Pa.

22:639-772 (May) 1945

Heart Disease in Jungles of South Pacific: Some Observations Made Among Melanesians of New Hebrides and Solomons Islands Area. A. S. Hyman.—p. 639.
Comparative Value of Several Liver Function Tests. M. Teitelbaum, A. C. Curtis and S. M. Goldhamer.—p. 653.
Clinical Use of New Types of Modified Protamine Zinc Insulin. R. Sanz del Fierro and E. L. Sevringhaus.—p. 667.
Abdominal Manifestations of Rheumatic Fever: Description of Right Rectus Syndrome. N. Reitman.—p. 671.
Anorexia Nervosa: Diagnosis and Treatment of Inanition Resulting from Functional Disorders. J. M. Berkman.—p. 679.
Electroconvulsive Shock Therapy and Cardiovascular Disease. V. L. Evans.—p. 692.
Present Status of Chemotherapy in Tuberculosis. H. C. Hinshaw, W. H. Feldman and Karl H. Pfuetze.—p. 696.
*Bronchospirometry. M. Pinner, G. C. Leiner and W. A. Zavod.—p. 704.
Duodenal Ulcer, with Perforation Following Cutaneous Burn. V. W. Koch and W. A. Fischer.—p. 719.

Bronchospirometry.—Pinner and his associates present a summary of the results of bronchospirometric studies which were pursued at the Montefiore Hospital, New York. The use of a soft rubber tube, instead of the metal bronchoscope, has made the method less uncomfortable and more reliable. Bronchospirometry is indicated whenever an irreversible operation on one lung is contemplated in order to determine the functional capacity of the contralateral lung. It also permits the study of various physiopathologic problems. Spirometry may give nearly normal findings on patients in whom bronchospirometry reveals extensive damage of one lung and compensatory changes in the other lung. X-ray and clinical findings do not permit definite conclusions as to pulmonary function. Pleural involvement often causes severe functional damage of the lung, whereas parenchymal lesions may have relatively little effect on pulmonary function. During pneumothorax treatment the collapsed lung shows the following changes: decrease of oxygen intake, minute volume, tidal air, vital capacity, reserve air and complementary air; increase of ventilation equivalent. Compensation is achieved by an increase of the oxygen intake in the contralateral lung. This is done only in part by increased ventilation; oxygen intake is further increased by a better utilization of the ventilated oxygen, i. e. a decrease of the ventilation equivalent. The contralateral effect of unilateral pneumothorax is manifested by a decrease of the vital capacity, reserve and complementary air of the contralateral lung. Thoracoplasty causes similar functional changes as does the pneumothorax but, on the average, these changes are less severe following thoracoplasty than those during collapse by pneumothorax and, at least in some cases, less severe than those in lungs following the abandonment of pneumothorax. Lungs reexpanded following pneumothorax treatment frequently show extensive functional impairment. Change in the patient's posture from the recumbent to the left or right side does not affect the percentage distribution of the vital capacity between the left and the right lung. Attempts at immobilizing a hemithorax by sandbags weighing up to 20 pounds and by strapping with adhesive tape do not achieve a reduction of the ventilation or respiratory work of the underlying lung.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

89:1-122 (June) 1945

Infantry Battalion Medical Section in Combat.—p. 80.
New Plastic Orbital Implant. J. R. Nieder and J. L. Campbell Jr. —p. 88.
Cross Connection Hazards in Military Hospitals. S. C. Martin.—p. 90.
*Waldmann Vaccine for Foot and Mouth Disease in Liberated Italy, 1944. R. W. Rushmore.—p. 94.
Trench Foot: Diagnostic Value of "Ischemic Pain." A. E. Schecter and C. A. Ragan.—p. 98.
March Fracture of First Rib (Barrack Bags Fracture). S. E. Proctor, T. A. Campbell and A. S. Abramson.—p. 101.
Intrapericardial Use of Penicillin. L. B. Smith and W. P. McHugh. —p. 106.
Modification of Eve Method of Resuscitation. S. B. Lapin.—p. 110.

Waldmann Vaccine for Foot and Mouth Disease.—Rushmore says that late in 1944 the Veterinary Corps of the Army of the United States produced and distributed 36,000 adult bovine doses of the vaccine. There has not been a reported incidence of the disease in any 1 of the 36,000 vaccinated animals. In Rome Province 15,000 dairy cattle and calves were vaccinated in September and October. During the first week in November a herd of 280 nonvaccinated dairy cattle and calves centrally located in Rome Province became infected, with a mortality of 20 calves and 7 cattle. Four months later none of the 15,000 vaccinated animals have reportedly shown any symptoms of the disease, though the infection was reported in 6 nonvaccinated dairy herds.

Florida Medical Association Journal, Jacksonville

31:499-550 (May) 1945

Gallbladder Disease as Related to Anatomic and Physiologic Abnormalities. E. B. Campbell.—p. 521.
History of Medicine in Duval County: Part IV. W. Merritt.—p. 523.

31:551-606 (June) 1945

Inguinal Hernia in the Army. M. N. Camp.—p. 575.
Wartime Problems of Local Health Department. W. W. Rogers. —p. 578.

Hawaii Medical Journal, Honolulu

4:231-262 (May-June) 1945

Surgical Lessons Learned in World War II. H. K. Gray.—p. 233.
Advances in Surgery During Present War. F. Raine.—p. 236.
Medical Lessons Learned in World War II. H. L. Meltzer.—p. 239.
Clinical Advances in Medical Problems Occasioned by World War II. A. W. Hobby.—p. 243.
Aims and Aspirations of Territorial Association of Plantation Physicians. H. M. Patterson.—p. 246.

Journal of Experimental Medicine, New York

81:539-666 (June) 1945

Comparison of Effects of Pyridoxine and Pantothenic Acid Deficiencies on Nervous Tissues of Swine. R. H. Follis and M. M. Wintrobe. —p. 539.
Cellular Dynamics in Intestinal Mucosa: Effect of Irradiation on Epithelial Maturation and Migration. N. B. Friedman.—p. 553.
Individual Blood Differences in Mexican Indians, with Special Reference to Rh Blood Types and Hr Factor. A. S. Wiener, J. Preciado Zepeda, Eve B. Sonn and H. R. Polivka.—p. 559.
Proteolytic Enzyme Produced by Group A Streptococci, with Special Reference to Its Effect on Type Specific M. Antigen. S. D. Elliott. —p. 573.
Loss of Group Carbohydrate During Mouse Passages of Group A Hemolytic Streptococcus. A. T. Wilson.—p. 593.
Neoplastic Potentialities of Mouse Embryo Tissues: I. Findings of Skin of C Strain Embryos Transplanted to Animals. P. Rous and W. E. Smith.—p. 597.
Neoplastic Potentialities of Mouse Embryo Tissues: II. Contributory Experiments: Results with Skin of C3H and Webster-Swiss Embryos: General Considerations. W. E. Smith and P. Rous.—p. 621.
Studies on Denaturation of Antibody: II. Effect of Protein Concentration on Rate of Denaturation of Diphtheria Antitoxin by Urea. G. G. Wright.—p. 647.

Journal of Nutrition, Philadelphia

29:365-438 (June) 1945

*Acute and Chronic Ascorbic Acid Deficiencies in Rhesus Monkey. J. H. Shaw, P. H. Phillips and C. A. Elvehjem.—p. 365.
Availability of Vitamins from Yeasts: I. Absorption of Thiamine by Human Subjects from Various Types of Bakers' Yeast. Helen T. Parsons, Anne Williamson and Mary L. Johnson.—p. 373.
Id.: II. Accessibility to Rats for Growth of Thiamine in Various Types of Bakers' Yeast. Helen T. Parsons, Audrey Foeste and Helen Gilberg.—p. 383.
Retention of Thiamine, Riboflavin and Niacin in Cooking Pork and in Processing Bacon. S. H. Jackson, A. Crook, V. Malone and T. G. H. Drake.—p. 391.
Dental Caries in the Cotton Rat: III. Effect of Different Dietary Carbohydrates on Incidence and Extent of Dental Caries. B. S. Schweigert, J. H. Shaw, P. H. Phillips and C. A. Elvehjem.—p. 405.
Relation Between Absorbed Nitrogen, Nitrogen Balance and Biologic Value of Proteins in Adult Dogs. J. B. Allison and J. A. Anderson.—p. 413.
Nutritional Value of Yeast Protein to Rat and Chick. A. A. Klose and H. L. Fevold.—p. 421.
Effect of Feeding Succinylsulfathiazole to Rats Receiving Purified Diets High in Carbohydrate, Protein, Fat or Protein and Fat. L. D. Wright, Helen R. Skeggs and K. L. Sprague.—p. 431.

Ascorbic Acid Deficiencies in Rhesus Monkeys.—Shaw and his associates produced ascorbic acid deficiency in Rhesus monkeys. Acute deficiency could be produced in young monkeys in from thirty to fifty days. In the acute phase there was a precipitous loss of weight, slight tenderness of the joints and heavy residues on the tooth surfaces. No gingival changes were observed. When a single test dose of ascorbic acid was given, there was a rapid and complete alleviation of these signs. In the chronic state of ascorbic acid deficiency a series of gingival changes was observed which was accompanied by increasing food deposits on the teeth and dental tartar. There was severe tenderness and soreness at all the joints accompanied by a considerable swelling. Bone resorption occurred on the bone cartilage junctions, especially at the ends of the long bones of the legs. Late in the chronic deficiency period a severe loss of hair was observed, and there was some dermatitis. After a month of treatment with ascorbic acid there had been a moderate increase in weight, a great increase in activity and a loss of soreness about the joints. There had been no improvement in the hair coat. Both the loss of hair and the dermatitis could be cured or prevented by the administration of crystalline biotin. In 3 of the 6 chronically deficient monkeys there was a high incidence of dental caries. These data indicate that the signs of acute chronic ascorbic acid deficiencies in monkeys are distinctly different. They may partially explain the differences observed in experimentally produced and in spontaneous scurvy in man.

Oklahoma State Medical Assn. Jour., Oklahoma City

38:189-234 (May) 1945

Responsibility of Physician in Preventive Proctology. E. Moore.—p. 189.
Survey of Extraocular Motor Anomalies. C. A. Royer.—p. 191.
Political Control of Medicine. G. H. Garrison.—p. 195.

38:235-276 (June) 1945

Common Eye Conditions Among Military Men. W. W. Sanger.—p. 235.
Tonsillectomy in Young Children with Allergy. G. C. Moore.—p. 238.
Cancer of Rectum and Rectosigmoid. R. L. Murdoch.—p. 239.

Public Health Reports, Washington, D. C.

60:577-604 (May 25) 1945

*Serial Passage of Plasmodium Gallinaceum in Chick Embryos. V. H. Hass, H. A. Feldman and Frances M. Ewing.—p. 577.
Universal Type Concrete Slab for Precast Ditch Linings. W. V. Parker and H. A. Johnson.—p. 582.
*Growth of Pasteurella Tularensis in Yolk Sac of Developing Chick Embryo. C. L. Larson.—p. 587.

60:605-632 (June 1) 1945

Comparative Potencies of Several Typhus Vaccines. R. Donovick and R. W. G. Wyckoff.—p. 605.
Sickness Absenteeism Among Industrial Workers, Fourth Quarter of 1944, with Note on Seasonal Variation. W. M. Gafafer.—p. 612.

Serial Passage of Plasmodium Gallinaceum in Chick Embryos.—Haas and his associates have carried Plasmodium gallinaceum through fourteen serial passages by inoculating 10 to 13 day old chick embryos intravenously with parasitized blood. The infection produced in chick embryos by this method is highly fatal, with the majority of deaths from malaria occurring on the ninth day. There has been an overall mortality rate of 39 per cent within the first forty-eight hours after inoculation, apparently due to the difficulties inherent in the method. Enough embryos survive this early critical period to make the method a practical and reliable one for carrying this parasite in the chick embryo. The presence of a green color in infected embryonic membranes or fluids and in the liver and spleen of the embryo itself permits a ready and easy diagnosis of the presence of malarial infection and obviates the necessity for examining numerous blood films for parasites.

Growth of Pasteurella Tularensis.—Larson shows that Pasteurella tularensis grows readily on chick embryos when introduced into the yolk sac. Chick embryos are as susceptible as mice, and the concentration of organisms in the tissues and fluids of infected chick embryos approaches that obtained in infected mice.

Tennessee State Medical Assn. Journal, Nashville

38:121-152 (May) 1945

Medical Practice in Tennessee. K. C. Copenhaver.—p. 121.
Some Remarks on Osteomalacia in China. F. E. Whitacre.—p. 126.

38:153-202 (June) 1945

Proceedings of the House of Delegates, 112th Annual Meeting, Tennessee State Medical Association, Maxwell House, Nashville, Tennessee April 8, 1945.—p. 153.

United States Naval Med. Bulletin, Washington, D. C.

44:1125-1352 (June) 1945

Foreword to Symposium on Amputation: From the Naval Amputation Center, U. S. Naval Hospital, Mare Island, California. J. P. Owen.—p. 1125.
A. Early Care of Amputation Patients. J. M. Greer.—p. 1128.
B. Definitive Surgical Management of Amputations. H. H. Kessler.—p. 1133.
C. Manufacture and Fitting of Artificial Limbs. D. D. Toffelmier and M. Laurence.—p. 1149.
D. Plastic Surgery of Amputation Stumps. G. B. O'Connor and H. H. Kessler.—p. 1167.
E. Revision of Thigh Amputation. P. F. Olson.—p. 1180.
F. Revision of Below Knee Amputation Stumps. O. S. Nesting.—p. 1187.
G. Painful Stumps and Their Treatment. D. F. Coburn.—p. 1194.
Compression Dressing of Amputation Stumps. D. C. McKeever.—p. 1211.
Transportation of Patients by Naval Air Transport Service. J. P. Pollard, N. L. Yood and J. G. McWilliams.—p. 1213.
Intertrochanteric Fractures of Femur: Early Care on Hospital Ship. H. Lusskin.—p. 1221.
Atmospheric Blast Concussion: Medical Aspects. R. A. Klemm.—p. 1228.
Wounds of Eye, Ear, Nose and Throat. F. P. Smart.—p. 1231.
Thoracic Casualties From the Marianas. H. D. Adams.—p. 1234.
Care of Burn Casualty. F. H. Wanamaker.—p. 1239.
Pneumonia in U. S. Navy—1882-1942: Part II. As Cause of Incapacitation and Mortality. D. F. Smiley and H. A. Raskin.—p. 1245.
*Tropical Eosinophilia: Report of Case. W. R. Hirst and W. J. McCann.—p. 1277.

Tropical Eosinophilia.—Tropical eosinophilia was first described by Weingarten as a disease apparently peculiar to the coastal areas of India. The syndrome is characterized by a gradual onset with malaise, weight loss, a low grade temperature, a paroxysmal dry hacking cough and physical findings similar to those of bronchial asthma. After several weeks a chronic stage is reached, at which time the patient may be subfebrile and the weight loss may cease, but paroxysms of coughing and wheezing may persist. The spleen may be palpable early in the febrile stage. X-ray examination of the chest in the febrile stage reveals a diffuse bilateral mottling of the lung fields, resembling the picture of acute miliary tuberculosis. Subsequent x-ray studies of the lungs reveal increased bronchial markings as in chronic bronchitis. There is massive eosinophilia. Hirst and McCann cite the history of a naval officer who had been on overseas duty in Central America and the Central and South Pacific islands exclusively. The patient had had symptoms of the disease for nearly two years. The dramatic response of the patient to arsenotherapy suggests a spirochetal or protozoan causation. The fact that the patient had never been in India suggests that either the disease exists endemically in the South Pacific area as well as in India or that it is transmissible directly from man to man. This syndrome should be considered in the differential diagnosis of any illness presenting a high eosinophilia. In cases with a massive eosinophilia, when no known cause can be found, a therapeutic trial of an arsenical may be warranted.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Medical Journal of Australia, Sydney

1:313-336 (March 31) 1945

Rubella During Pregnancy of Mother, with Its Sequela of Congenital Defects in Child. N. McA. Gregg.—p 313.
*Congenital Deaf-Mutism as Sequela of Rubella-like Maternal Infection During Pregnancy. D. G. Carruthers.—p. 315.
Influence of Malaria on Kline and Complement Fixation (Wassermann) Tests for Syphilis. C. B. Cox and M. J. Durant.—p. 320.

Congenital Deaf-Mutism.—Details observed in the study of deaf-mute children whose mothers were infected with rubella during pregnancy are presented. As the result of an appeal to doctors by the New South Wales Department of Public Health, 147 cases of congenital defects have been reported; in 102 of this series a history of maternal rubella was recorded. Of the children 74 are deaf. It has not been possible for Carruthers to tabulate the details of the whole series, but 17 patients have been under his private care. Analyses have been made to determine whether the stage of pregnancy at the time of infection of the mother or the intensity and duration of the mother's illness bears any relation to the nature and degree of congenital abnormalities subsequently to be found in the child. It seems likely that the importance of the stage of pregnancy at which infection occurs is that, if it is in the first six weeks, fetal damage will be widespread and may include the eyes, both divisions of the ears, the heart and perhaps many other parts. After the sixth week the eyes may escape, the heart may be spared and the semicircular canals may become normally developed; but the cochlea is still liable to be damaged, and the growth may be retarded. After the third month damage to the fetus is rare. Many of the children give some evidence of hearing over the tone range 512 to 2,048. In testing the caloric labyrinth reactions there was noted among others that none of the "rubella" group were made sick even when pronounced nystagmus was induced. The utricle and the semicircular canals do not appear to be left untouched by the maternal infection. Regarding associated defects, not 1 of the 17 patients has evidence of cataract. No evidence of ductus arteriosus was observed, but stunting of growth is evident in 11 of 17 patients and microcephaly in 3.

Quarterly Journal of Medicine, Oxford

14:1-56 (Jan.) 1945

Poliomyelitis Epidemic in Malta, 1942-1943. H. J. Seddon, T. Agius, H. G. G. Bernstein and R. E. Tunbridge.—p. 1.
Genetic Linkage in Man, with Particular Reference to Usefulness of Very Small Bodies of Data. J. A. F. Roberts.—p. 27.
*Treatment of Postarsphenamine Jaundice with Sulfur-Containing Amino Acids. R. A. Peters, R. H. S. Thompson and A. J. King, D. I. Williams and C. S. Nicol.—p. 35.

Treatment of Postarsphenamine Jaundice.—Peters and his associates say that, although infection has long been regarded as a probable factor in the etiology of many cases of postarsphenamine jaundice, the arsenicals themselves have never been exonerated. It has been shown repeatedly that the administration of different arsenical compounds to experimental animals can produce damage and necrosis of the liver cells in the absence of coincident spirochetal or other infection. Since a high protein diet can prevent bilirubinemia and liver damage in dogs after weekly intravenous injection of oxophenarsine hydrochloride, it was decided to study the effect of the oral administration of certain sulfur-containing amino acids on the course of postarsphenamine jaundice. The authors studied 468 cases of postarsphenamine jaundice. The conclusions are based on the treatment of 150 severe cases selected from the total of 468. Three groups of patients were treated respectively with cysteine, methionine and casein, control patients being observed simultaneously throughout. The rate of recovery of the patients was observed clinically and by serial estimation of the serum bilirubin levels. A slight but statistically significant increase in the rate of return to normal was noted in the patients receiving cysteine or methionine. Casein, in the dosage used, did not bring about any beneficial effect.

Semana Médica, Buenos Aires

52:469-502 (March 15) 1945. Partial Index

*What One Can Expect of Surgical Therapy of Essential Arterial Hypertension. C. Patiño Mayer, L. Lepera, F. A. Pataro and V. F. Pataro.—p. 469.

Sympathectomy in Essential Arterial Hypertension.—Patiño Mayer and his collaborators report good results from sympathectomy followed by potassium thiocyanate therapy early in the phase of malignant essential hypertension and of sympathectomy in essential hypertension with moderate sclerosis with or without spasticity. Blood pressure in his cases returned to normal and remained normal up to date, two or three years after the operation. Symptoms of increased intracranial pressure and of cardiac, renal and pulmonary disturbances and nervousness were greatly diminished. The prognosis as far as the comfort and duration of life is concerned was much improved.

Klinicheskaya Meditsina, Moscow

22:1-80 (Nos. 10 & 11) 1944. Partial Index

Treatment of Ulcerative Disease. T. M. Rybakov.—p. 3.
*Symptomatology of Prescorbutic States. M. T. Arinkin.—p. 9.
*Dry Serum Therapy in Albumin Deficiency States. A. A. Bagdasarov, M. S. Dulcin, P. M. Alperin, V. V. Vinogradov and F. E. Loginova.—p. 15.

Symptomatology of Prescorbutic States.—According to Arinkin, one of the first objective symptoms in the incipient stage of scurvy is pallor of the skin and of the conjunctiva. The pallor is probably caused by a spasm of the peripheral blood vessels or by alterations in the blood itself. In the more advanced stage there is pain and tenderness about the joints, particularly of the lower extremities, with a still later appearance of periarticular swellings and discoloration due to hemorrhages into the deep tissues. Some patients complain only of bleeding gums. The author studied 14 patients from 14 to 27 years of age with manifestations of the incipient stage of scurvy. Study of the peripheral blood of these patients revealed insignificant alterations on the part of the red cells, such as mild hypochromia and mild erythropenia. The sternal punctate, however, showed an abnormal increase in the number of microblasts and normoblasts. In the author's experience, in all anemic states, with the exception of aplastic anemia, there exists a parallelism between the degree of anemia and the hyperplasia of the erythroblastic tissue of the bone marrow: the more severe the anemia of the peripheral blood, the greater the percental content of nucleated reds in the bone marrow. This hyperplasia of the erythroblastic tissue of the bone marrow in the preanemic state of scurvy is an index of general intoxication of the organism.

Dry Serum Therapy in Albumin Deficiency States.—Bagdasarov and his associates employed transfusions of dissolved dry human serum in the treatment of clinical states characterized by albumin deficiency. The advantage of this method is that the serum can be given in concentrated solutions with albumin content as high as 28 per cent. Such a serum should exert a favorable effect on osmotic pressure, the water exchange and the tendency to edema. Addition of glucose to the solution increases its effectiveness. The authors administered 170 transfusions to 30 patients with manifestation of alimentary disturbances characterized by symptoms of albumin deficiency, increased capillary permeability and manifestations of hypovitaminosis, chiefly of B_2 and B_1. The dry serum was diluted in concentrations amounting to from two to four times the normal relationship and given every three or four days in amounts varying from 50 to 100 cc. The post-transfusion reactions were few and, when present, were mild. The therapeutic effect was both pronounced and persistent. There was an initial increase followed by decrease in diuresis, disappearance of edema, increase in weight, improvement in muscle tone, termination of diarrhea and normalization of the blood picture. Five patients with alimentary edema treated with repeated small transfusions of conserved blood responded well to this treatment, but the therapeutic effect was not as definite as in the cases treated with concentrated serum solution, particularly with regard to normalization of the albumin content of the blood.

Acta Medica Scandinavica, Stockholm

118:1-260 (Sept. 9) 1944. Partial Index

*Type of Respiration in Severe Hypoglycemia. K. Lundbaek.—p. 56.
Iron Content of Serum of the Aged, Particularly in Relation to Chronic Leg Ulcers. S. Eckerström.—p. 69.
Copper in Serum. A. L. Nielsen.—p. 84.
*Renal Changes in Fatal Sulfathiazole Damage. H. Bergstrand.—p. 97.
Metabolism of Copper in Man. A. H. van Ravesteyn.—p. 163.
Nitrous Gas Poisoning Among Welders Using Acetylene Flame: Study of 16 Cases, Including Four Deaths. T. Lindquist.—p. 210.

Respiration in Hypoglycemia.—Lundbaek describes a characteristic type of respiration which occurs during severe hypoglycemia and which has been observed in connection with metabolic experiments. This type of breathing is characterized by the occurrence of varying depth of respiration, jerky expirations and postinspiratory and postexpiratory pauses. This type of respiration is due to a general hypo-oxidation of the cerebrum resulting from hypoglycemia. The hypoglycemic type of respiration may become important in the differential diagnosis between diabetic coma and insulin reaction.

Renal Changes in Fatal Sulfathiazole Damage.—Bergstrand describes the pathologic changes in 7 cases in which sulfathiazole damaged the kidneys. At least 5 of these patients died of uremia. The changes were the same in all cases. They were characterized by focal destruction of the uriniferous tubules at the sites at which sulfathiazole crystals had precipitated. Hyaline protein deposits with perifocal round cell infiltration and hemorrhage were observed around the sulfathiazole crystals in the destroyed tubules. These gave the microscopic picture a characteristic appearance. The renal pelvis showed destruction of epithelium, hemorrhages, and inflammatory cell infiltration in the wall and in the fat of the hilus. The author suggests that inflammatory edema of the kidneys and urinary passages, which was produced by precipitated sulfathiazole crystals, was the chief cause of the uremia.

Nordisk Medicin, Stockholm

22:797-824 (April 28) 1944. Partial Index

*Paroxysmal Tachycardia in Infants. J. F. Christensen.—p. 797.
Hormone Elimination in Urine in 2 Male Schizophrenia Patients. E. Høyrup.—p. 801.
Cystic Tumors in Lymphatic Vessels in Ligamentum Latum. V. Albeck.—p. 803.

Hygiea

Are Red Blood Corpuscles in Adults Formed from Erythroblasts? Lisa Boström.—p. 805.

Paroxysmal Tachycardia in Infants.—Christensen says that 37 cases of this disorder in infants have been reported; 7 were in the first week of life, 19 in the first month. About 100 cases in childhood have been reported. Two additional cases in infants aged 3 weeks and 6 months respectively are described. The onset is usually characterized by listlessness, restlessness, loss of appetite, vomiting and diarrhea, with a gradually affected general condition. The cardiac rate during attacks is from 250 to 300. There may be symptoms of heart failure, possibly collapse, convulsions and unconsciousness. There was a congenital heart defect in only 3 of the 37 cases, all fatal. When no organic heart changes are found, the disturbance probably depends on failure of the central or autonomous regulation of the heart. In older children the attacks are more often caused by diseases which have led to injury of the myocardium or of cardiac innervation. The prognosis is good in uncomplicated paroxysmal tachycardia. Digitalis, strophanthin and mecholyl are the most effective drugs.

22:825-890 (May 5) 1944. Partial Index

Origin and Fate of Bile Pigments in Organism and Pathogenesis of Jaundice: Review. T. K. With.—p. 825.
Intestinal Perforation Due to Rectoscopy. J. P. Strömbeck.—p. 832.

Hospitalstidende

*Parenteral Iron Therapy: Concluding Reports. S. Dahl.—p. 835.
Roentgen Examination for Pulmonary Tuberculosis as Routine Examination in Hospitals. U. Gad.—p. 837.
Relation Between Clinical Symptoms and Results of Gastroscopy in Patients with Achylia: Gastroscopic Studies, VI. T. Christiansen.—p. 838.

Parenteral Iron Therapy.—The indication for this therapy, intravenous as well as intramuscular, is hypochromic anemia when all other treatment has been ineffective. Intragluteal injections of 11.95 mg. of metallic iron every second or third day gave good results in the 8 cases reported, 2 of which were of anemia after infectious disease, 2 of cancer anemia and 2 of simple anemia. The iron concentration in the serum rose slowly. There were no toxic symptoms. In spite of the immediate by-effects of intravenous iron therapy this method may be more agreeable to the patient than the intramuscular, which seems to give more rapid results but has the drawback of often causing protracted pain at the seat of the injection. Because of the toxicity of iron salts, daily doses above not quite 12 mg. of metallic iron should not be given.

Hygiea

*Diagnostic Value of Chlorine Ion Content in Cerebrospinal Fluid and Relation Between Chlorine Ion in Cerebrospinal Fluid and in Blood. F. Karlström.—p. 839.
Thyrotoxicoses. John Hertz.—p. 856.
Allergy, Hypersensitivity to Histamine and Treatment with Histamine in Various Forms of Headache, Especially Migraine. B. Chronholm.—p. 865.

Chlorine Ion in Cerebrospinal Fluid.—Karlström's material comprises 428 cerebrospinal fluids from 355 patients. In acute poliomyelitis, epilepsy and other diseases of the central and peripheral nervous system the chlorine ion and sugar content of the cerebrospinal fluid and the chloride and sugar index in the blood are within normal limits. In tuberculous meningitis and bacterial (not tuberculous) meningitis the chlorine ion and sugar content of the cerebrospinal fluid and the blood chloride and blood sugar index are lower than normal. Extremely low values for the chlorine ion content of the cerebrospinal fluid point either to tuberculous or to bacterial meningitis; a value lower than 526.5 mg. of sodium chloride per hundred cubic centimeters is pathognomonic for tuberculous meningitis.

22:891-926 (May 12) 1944

Hospitalstidende

Treatment of Gonorrhea with Sulfathiazole and Fever Shock. P. V. Marcussen.—p. 891.
Two Instances of Hypercalcemia (Lymphogranulomatosis Benigna-Hyperparathyroidism). T. Espersen.—p. 894.
Hemeralopia in Patient Treated with Thyroid Which Responded to Administration of Liver Preparation. Karen Marie Hansen.—p. 898.

Hygiea

Orthopedic Treatment of Infantile Paralysis. E. Severin.—p. 899.
Protein Metabolism in Nerve Cells in Connection with Function. H. Hydén.—p. 904.
Experimental Investigation on Physiodynamics of Bullet with Half Casing. H. Hinricsson.—p. 908.

22:927-960 (May 19) 1944. Partial Index

Serum Iron in Erythremia (Polycythemia Vera). S. Dahl.—p. 927.
Death After Hysterosalpingography. A. Lachmann.—p. 929.

Finska läk.-sällsk. handl.

Plastic Surgery in War Lesions. P. E. Aschan.—p. 933.

Hygiea

New Strain of Tubercle Bacilli Isolated in England from Voles and Immunization Experiments with It. F. Wahlgren, G. Olin and G. Widström.—p. 943.
Pathologic Heart Condition (Auricular Flutter) in Myotonia. G. Biöck.—p. 946.

22:961-1002 (May 26) 1944

Peridural Anesthesia. N. Blixenkrone-Møller and K. Trautner.—p. 961.

Hygiea

Relation Between Peptic Ulcer and Pulmonary Tuberculosis. E. Forsgren.—p. 973.
*Renal Changes in Myeloma and Their Pathogenesis. R. Lagercrantz.—p. 977.
Compensated Elimination of Ammonia in Renal Insufficiency. J. Tomenius.—p. 981.

Renal Changes in Myeloma.—Study of the unusually large material of 22 cases of myeloma, Lagercrantz says, shows that there is probably a connection between Bence Jones albuminuria and the renal changes in myeloma. The constant changes in myeloma are injury to the tubular epithelium, but the characteristic feature of the disease is the abundant, probably secondary formation of large compact albumin cylinders which block the tubuli, cause inactivity atrophy of the nephrones and stimulate formation of giant cells. In the later stages of the disease a contracted kidney develops.

Book Notices

Penicillin and Other Antibiotic Agents. By Wallace E. Herrell, M.D., M.S., F.A.C.P., Assistant Professor of Medicine, the Mayo Foundation, Rochester, Minn. Cloth. Price, $5. Pp. 348, with 45 illustrations. Philadelphia & London: W. B. Saunders Company, 1945.

A noteworthy accomplishment of the war effort in relation to medicine has been the development of antibiotic therapy. This applies especially to penicillin. Although the advances have been phenomenal, adequate information concerning the therapeutic indications of penicillin has been made available to the medical profession, as well as other pertinent knowledge. Nevertheless in such a rapidly developing field a crystallization of the subject in the form of a monograph is desirable, with the realization, however, that such an effort may be superseded in the near future by information not available at present.

Herrell has endeavored to summarize the extensive fundamental and clinical studies on penicillin and other antibiotic agents. The first hundred pages are devoted to the basic investigations on penicillin. This includes a historical survey; methods of preparation; its physical, chemical and antibacterial properties; absorption, diffusion and excretion, and assay methods. Precise information concerning the chemistry of penicillin is not available, and probably the mechanism of its antibacterial activity is not known.

The succeeding 150 pages are devoted to the clinical use of penicillin. In the main there will be general agreement with the recommendations. Herrell is an enthusiastic advocate of the continuous intravenous method for administering penicillin, particularly to patients with severe infections. His objection to the intermittent, intramuscular mode of injection is that it causes local discomfort and that abrupt rises and falls in blood concentration are not desirable in the therapy of severe infections. One need not utilize 2 to 4 cc. of isotonic solution of sodium chloride for an injection of 10,000 to 20,000 units of penicillin. Most preparations of penicillin now available can be readily dissolved in saline solution, so that only 0.5 to 1 cc. is necessary for such doses. The more convenient intramuscular method may be employed successfully for the treatment of even the severest infections, provided adequate amounts of penicillin are used.

The widest application of penicillin has been made in the management of war wounds, both prophylactically and therapeutically. Several excellent reports have recorded the results in detail. This experience will be of considerable aid in civilian practice. It is unfortunate that more emphasis along these lines has not been incorporated within this monograph. The last section is devoted to other antibiotic agents such as tyrothricin, streptothricin, streptomycin and the less important preparations. The discussion on tyrothricin is one of the best reviews that has appeared. Although interest at present is focused on streptomycin, only twelve lines are devoted to clinical results and no final conclusions are made.

The text is presented in a concise and lucid manner. Each of the twenty-five chapters concludes with key references to the literature. Considering the wartime restrictions, the format, type, grade of paper and the reproduction of illustrations are excellent.

G. I. Nightingale: The Story of an American Army Nurse. By Theresa Archard, Captain, A. N. C. Cloth. Price, $2.50. Pp. 187. New York: W. W. Norton & Company, Inc., 1945.

Captain Archard's story is a story of a typical American girl and her companions, all army nurses. She takes us with her from an American home through a year's "training for defense," through the shock of Pearl Harbor. With her we embark for "overseas." We experience the tedium of waiting, the excitement of unknown perils which lie ahead. We "shake down" our organization—we embark for unknown destinations and finally wade ashore in an amphibious landing. With her we experience the fear, the thrill, the excitement of battle and exult in the justified pride of our task well done. With her and her unit we advance and retreat and advance with the tide of battle. We experience the thrill of a life saved by skill, of comfort and surcease from pain through the work of our hands. In her story we see what a well organized team of doctors, nurses and enlisted men can do for the relief of suffering and the prevention of death, even under the most trying circumstances. In her story we have the record of the 48th Surgical Hospital, which did so much with so little and finally spent itself in its work for its patients, but in so doing pointed the way for the many others which followed it.

The story is authentic. Captain Archard has captured the moods of the men and women who make medical history in the armed forces. She calls her story "G. I. Nightingale." "G. I." is commonly interpreted as "Government Issue"; it might well be paraphrased "Granite, Iron," for the women of this historical record are made of rigid stuff. Florence Nightingale would be truly proud of her successors.

How parallel is this record with that of Florence Nightingale in the Crimea! As Florence Nightingale brought cleanliness to Scutari and reduced its death rate from 47 per cent to 2 per cent, so do our nurses bring cleanliness to our improvised military hospitals around the world and in so doing make it possible for those who have fallen in battle to rise up and walk the earth again.

This story illustrates woman's great contribution to modern medicine. It shows at its best that unbeatable team the Doctor and the Nurse.

It is a story of hard work, of winning against great odds; but through it all Captain Archard never loses her sense of humor. She laughs at her fears, she laughs at her plights, she laughs at herself and her nurses in soldier's coveralls. She laughs at her skinny body wasted from short rations and North African malaria.

Técnica e tática na calculose do hépatocolédoco. Por Piragibe Nogueira, Docente livre de Clinica cirurgica da Faculdade de medicina da Univer-sidade de São Paulo. Paper. Pp. 117, with illustrations. São Paulo, 1944.

In this work, which is Dr. Piragibe's thesis presented to the Faculty of Medicine of São Paulo in partial fulfilment of the right to conduct courses in operative surgery at the medical school, the author summarizes his experience in dealing with hepaticocholedochal lithiasis, besides discussing the literature. It is a concise synopsis on the subject, with 140 references.

The monograph is divided into eight chapters, on history, definition, anesthesia, surgical anatomy of the biliary ducts, access to the biliary ducts, exploration and operative technic, secondary operations and case reports, conclusions and references. In the chapter on surgical anatomy the author describes the various pitfalls that exist in operating on the gallbladder, illustrating the different anomalies that can be found in the ducts, their blood supply and their relation to the hepatic blood vessels. Dissection on cadavers substantiates the author's statements. Although no personal statistical data are given and only case reports are published, the author shows experience in this field; he is of the opinion that operative cholangiography is of value but not an essential means of exploration in the hands of an experienced surgeon who can make good use of palpation, probing and irrigation for assuring patency of bile ducts.

A Study of Certified Sickness Absence Among Women in Industry. By S. Wyatt, assisted by R. Marriott, W. M. Dawson, Norah M. Davis, D. E. R. Hughes and F. G. L. Stock. Medical Research Council, Industrial Health Research Board, Report No. 86. Paper. Price, 9d. Pp. 34, with 4 illustrations. London: His Majesty's Stationery Office, 1945.

This investigation substantiates in large measure American experience in the employment of women. Twenty thousand women were observed. Respiratory, digestive and functional nervous disorders were most serious offenders. Gynecologic disorders are relatively unimportant as reflected in average days of sickness per worker, but in average length of individual absence they rank first in the married group and second in the single. Seven and eight tenths per cent of the total work days were lost. Married women lost 17.4 days, single women 10.6. Conditions of work had recognizable effect on sick absence. The importance of good medical and attendance records in industry is stressed. Although these studies were carefully controlled and based on certified absences of two days or more, there are many factors which affect lost time not directly assignable to health but which nevertheless are reflected in the statistics.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SIGNIFICANCE OF LOW BASAL METABOLIC RATE —THYROID EXTRACT AND VITAMIN B.

To the Editor:—Does taking thyroid, either the right amount or an overdosage, take up the vitamin B from the system? What conditions other than hypothyroidism would account for a low basal metabolic rate?

George A. Bakke, M.D., Oakland, Calif.

ANSWER.—The administration of desiccated thyroid and the presence of hyperthyroidism appear to increase the requirement of the body for vitamin B. However, if the diet is well balanced and adequate in amount supplementary therapy with B complex is not necessary. It has been suggested that the administration of vitamin B_1 to patients with hyperthyroidism is valuable in improving their preoperative condition. The evidence for this statement is not convincing.

There is a large group of patients with basal metabolic rates of —15 to —25 per cent who do not appear to have hypothyroidism. When their rates are increased by the administration of desiccated thyroid these patients become nervous and suffer from palpitation, indicating that the slight depression in their level of metabolism may not be the result of hypothyroidism. An important cause of low basal metabolism is, of course, hypopituitarism, but in this condition the low metabolism is a result of hypothyroidism which develops secondary to the pituitary deficiency. In patients with this abnormality, raising the metabolism by the administration of thyroid produces definite improvement but does not correct many of the abnormalities that are not related to the hypothyroidism, as, for example, the hypogonadism.

In patients with myxedema the basal metabolism may be raised to normal with dinitrophenol without producing any effect on the myxedematous condition. Observations such as these indicate that there may be many factors controlling the total metabolism that are not clearly understood at present. When one is faced with the problem of determining whether or not hypothyroidism is present, the best thing is probably to make a therapeutic trial of administering thyroid. If improvement occurs when enough is given to raise the basal metabolism to normal it may be concluded that hypothyroidism is the cause of the low rate. If improvement does not result, it may be concluded that hypothyroidism is not present and the administration of thyroid may actually be harmful.

TOXICITY OF PARALDEHYDE AND INSOMNIA

To the Editor:—What is the effect of prolonged daily administration of paraldehyde in doses of 8 to 16 cc.? Is this likely to produce toxic symptoms or harmful effects? I have a patient who suffers from insomnia and this is the only thing that produces sleep now. She has taken barbital and its derivatives in doses of 10 to 20 grains almost daily for the past ten to fifteen years, and it no longer produces the desired result. She has been treated by prominent psychiatrists without definite effect. At that time she was getting results with barbital, and they told her she would have to continue it the rest of her life. I know that continued use of paraldehyde is likely to produce chronic poisoning with symptoms similar to chronic alcoholism, but what about the toxicity in regard to internal organs? Has paraldehyde been administered over indefinite periods without harmful effects? Can any other drug be suggested for this patient? Chloral hydrate has been tried. What will disguise the odor of paraldehyde on the breath? M.D., South Carolina.

ANSWER.—The chronic toxicity of paraldehyde is not well known but is generally stated to be similar to that of alcohol, including the mental aberrations. Tolerance may develop. A postmortem examination of a man who had taken 4 to 8 cc. of paraldehyde daily for several months, and 75 cc. or more on his final night, showed principally hyperemia of the stomach and upper intestine, without any severe visceral degenerations (McFall, J. E. W.: Paraldehyde Poisoning, *Brit. M. J.* **2**:255 [Aug. 8] 1925). There is no way to disguise the odor of paraldehyde on the breath. Nightly sedation for insomnia is unwise. Daytime problems carried over into the night, or a simple habit of inversion of sleep, may be responsible and should be approached from the psychotherapeutic standpoint, if possible. Rather than substitute another drug for a person who is obviously easily habituated, a period of institutional care under a psychiatrist is suggested.

COUGH REMEDIES

To the Editor:—I have been accustomed to prescribe guaiacol carbonate or terpin hydrate for coughs that were or showed a tendency to become chronic. Now these two drugs are discontinued because they were deleted from the U. S. Pharmacopeia. What is recommended in their place?

M.D., New York.

ANSWER.—So far as is known guaiacol carbonate and terpin hydrate are still official in the National Formulary and the U. S. Pharmacopeia. Guaiacol carbonate is highly insoluble and probably inactive with respect to cough. Terpin hydrate, although of long empiric usage, also is of questionable value either to reduce or to lessen cough.

When coughing is unproductive and associated with a "tickle" in the throat, any substance with a strong local action is likely to bring relief. Sweet, alcoholic preparations with a pungent taste are effective. One such agent is Elixir of Terpin Hydrate, N. F., to which the terpin hydrate presumably lends only flavor. Others are Aromatic Elixir, U. S. P., and Elixir of Glycyrrhiza, U. S. P.

When the cough is persistent, and especially if it is productive, suppression is indicated but should be intermittent, to allow drainage of the bronchial tree on the one hand and yet prevent the fatigue of constant coughing. For this purpose codeine is the agent of choice in doses of 15 mg. administered every three or four hours. It is preferably dispensed in liquid form, to obscure the bitter taste, and to add to the local effect in the mouth and throat. For this purpose any of the vehicles previously mentioned may be used.

Like terpin hydrate, sodium iodide and ammonium chloride are drugs of long usage in cough, particularly with the intent of thinning tenacious sputum. Here also the alleged effect appears to be greatly exaggerated over that actually produced.

POSITIVE WASSERMANN REACTION AND BOECK'S SARCOID

To the Editor:—What is the significance of a 4 plus Wassermann reaction in the presence of Boeck's sarcoid? What is now considered to be the best form of treatment? What is the prognosis? M.D., Oklahoma.

ANSWER.—Boeck's sarcoid is regarded by some investigators as an atypical form of tuberculosis, although others disagree with this view. Placing it in the group of inflammatory diseases, one must consider the possibility of a false positive serologic reaction for syphilis. B. D. Davis (Biologic False Positive Serologic Tests for Syphilis, *Medicine* **23**:359 [Dec.] 1944) has studied this problem very thoroughly. Among the diseases listed in which such a false positive test may occur are tuberculosis and miscellaneous infections. Davis also outlines the requirements for a verification test. Therefore, control studies (Kahn test, quantitative Wassermann test) are indicated in a case of Boeck's sarcoid with a 4 plus Wassermann reaction before definitely establishing the clinical diagnosis of syphilis. In this connection it is interesting to note that quite frequently hyperglobulinemia is found in patients with Boeck's sarcoid. However, as Davis points out, "there appears to be a widespread but unwarranted impression that false positive serologic tests are often caused by any conditions which give rise to a marked hyperglobulinemia."

Treatment of Boeck's sarcoid has usually been purely empirical and includes the use of arsenicals, tuberculin, iodides, gold salts, hyperpyrexia, ultraviolet irradiation, roentgen rays and radium. The latter have been successful in the treatment of skin lesions, particularly in the Darier-Roussy type, and also in the Boeck lesion. Evaluation of any form of treatment is difficult because of the tendency of the lesions to spontaneous resolution. Earlier workers have not found roentgen therapy of benefit in the systemic lesions. Middleton sums up this experience in the latest edition of Cecil's Textbook of Medicine with the statement that roentgen and radium therapy offer nothing in this disease. Recently, however, several reports on the treatment of enlarged lymph nodes and of hilar and pulmonary sarcoid have been favorable. Pohle and his associates (Pohle, E. A.; Paul, L. W., and Clark, Elizabeth A.: Roentgen Therapy of Boeck's Sarcoid, *Am. J. M. Sc.* **209**:503 [April] 1945) recommend moderate doses of roentgen rays applied either to the mediastinum or to the involved lymph glands, using the same technic as is customary in the treatment of inflammatory disease. Eight of their 14 cases were observed sufficiently long to permit at least preliminary conclusions: in 4 of the first 8 cases the therapeutic result was good, in 1 instance excellent, in 1 satisfactory and in 2 only fair. Untoward reactions were not observed in any one of their treated cases.

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STUDIES IN RHEUMATIC FEVER

I. THE PHYSIOLOGIC EFFECT OF SODIUM SALICYLATE ON THE HUMAN BEING, WITH PARTICULAR REFERENCE TO THE PROTHROMBIN LEVEL OF THE BLOOD AND THE EFFECT ON HEPATIC PARENCHYMA

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UNITED STATES NAVAL RESERVE

In the course of many years the therapeutic usefulness of salicylates has become well established. With dosages within reasonable limits, the untoward reactions which sometimes have developed always have been of minor importance. Recently, however, several papers and editorials have appeared which suggest that even with relatively small doses of salicylates the tendency to hemorrhage is increased; this tendency is indicated by the fall in the prothrombin content of the blood and, in some instances, by an increase in the blood coagulation time.[1]

During the treatment of large numbers of young adults with active and inactive rheumatic fever hemorrhagic tendencies have been noted infrequently in this hospital, and even when this tendency has occurred it did not appear to be correlated with the administration of salicylates. This broad clinical impression was so divergent from those results recently reported that a control study was undertaken to determine primarily the effect of salicylates administered orally on the level of prothrombin in the blood. Secondarily it was thought useful also to correlate the salicylate level in the blood with any change in prothrombin levels that might occur and to observe the effect of such salicylate levels on the liver, sedimentation rate, blood count and renal function.

From the Rheumatic Fever Unit of the United States Naval Hospital, Corona, Calif.

Lieutenant Butt is on leave of absence from the Division of Medicine, Mayo Clinic, Rochester, Minn.

Ensign W-V(S) Rosalie Ruth Ryan, U.S.N.R., supervised and aided in the laboratory procedures used in this study, and Ruth F. Stribey, HA2/c, U.S.N.R., aided in making the charts.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the United States Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Meyer, O. O., and Howard, Beryl: Production of Hypoprothrombinemia and Hypocoagulability of the Blood with Salicylates, Proc. Soc. Exper. Biol. & Med. **53**: 234-237 (June) 1943. Shapiro, Shepard: Studies on Prothrombin: VI. The Effect of Synthetic Vitamin K on the Prothrombinopenia Induced by Salicylate in Man, J. A. M. A. **125**: 546-548 (June 24) 1944. ish, M. H., and Campbell, H. A.: Studies on 'rothrombinopenic Effect of Salicylate in Man, & Med. **53**: 251-254 (June) 1943.

PLAN OF STUDY AND METHODS

The group for study comprised 113 young men who were afflicted with rheumatic fever. The large majority of these patients at the start of the study had inactive rheumatic fever and were ambulatory; a small group (22) were having a recurrence of active polycyclic rheumatic fever at the start of the study or had one during the study. All of the 113 patients were given the same general diet furnished by the Navy and all except those who were confined to bed were allowed to continue their usual routine activities under military supervision. Arbitrarily the 113 patients were divided into two groups. One group of 57 served as controls. The remaining 56 were given varying daily doses of salicylates for four weeks, while the 57 control patients were given orally only sodium bicarbonate in varying doses during the same period of time.

During the first week the 56 patients who received salicylates were given 25 grains (1.6 Gm.) of sodium salicylate orally together with 10 grains (0.65 Gm.) of sodium bicarbonate twice daily; the controls received only 10 grains of sodium bicarbonate twice daily. The medication given to both groups during the four weeks is listed in the accompanying table. No medication was administered during the fifth week to either group of patients except for a few who still remained ill.

During the study 5 of the 56 patients receiving salicylates had to discontinue their medication and were dropped from the study. Two of the 5 developed acute appendicitis, 1 required confining disciplinary action and 2 developed severe nausea and vomiting. The results, therefore, are based on study of only 51 patients who received salicylates. Only 3 of the controls had to be eliminated from the study. One of the 3 required an operation for severe cellulitis of the leg, 1 required disciplinary action and, after careful study of the third, it was decided that the correct diagnosis was rheumatoid arthritis and not rheumatic fever. The final results concerning the controls represent data from 54 patients.

The prothrombin content of the blood was measured by modification of the method first proposed by Quick in which the prothrombin time of whole plasma is measured in seconds.[2] During the course of this experiment more than 1,500 prothrombin times were determined and certain observations were made that would be evident only in such a large group. The factors of

2. Magath, T. B.: A Method for Determining the Prothrombin Clotting Time, in Walters, Waltman, and Snell, A. M.: Diseases of the Gallbladder and Bile Ducts, Philadelphia, W. B. Saunders Company, 1940, pp. 563-564.

time, room temperature and kind of thromboplastin used were found to be extremely important. Determinations on normal controls were done at the beginning, middle and end of the series of determinations on the two groups of patients. On one or two occasions it was necessary to record a longer normal prothrombin time for the half of our group of patients whose tests were run last. The prothrombin times on the patients receiving sodium salicylate were always determined before those on the "control" patients. This procedure lessened any effect of greater lapse of time on the prothrombin time of this group of patients. Experiments showed that on a typical hot southern California day the prothrombin time was lengthened from one to four seconds if the plasma stood for two hours, and if the plasma was allowed to stand even longer the prothrombin time was proportionately increased. Stored plasma from the plasma bank showed no prothrombin activity. The source of thromboplastin used for the tests varied. From June 14 to June 25, 1944 dried rabbit brain prepared by Magath's method was employed. From June 26 to July 7 Bacto Thromboplastin as prepared by the Difco Laboratories was used, and from July 8 to July 26 fresh rabbit lung prepared by the method outlined in the "Clinical Chemistry Notes of the Naval Medical School" was employed. These frequent changes in source of thromboplastin were undesired but forced by necessity of obtaining material. Diluted plasma (12.5 per cent) was tried, but the rather indefinite end point led us to discard this method. To rule out individual variations in so-called normals, our daily normal values were determined from the blood from two or three members of the laboratory staff.

Plan for Administration of Drugs

Time	Control Group	Patients Given Sodium Salicylate
First week	10 grains (0.65 Gm.) of sodium bicarbonate 2 times a day	10 grains of sodium bicarbonate plus 25 grains (1.6 Gm.) of sodium salicylate 2 times a day
Second week	10 grains of sodium bicarbonate 4 times a day	10 grains of sodium bicarbonate plus 25 grains of sodium salicylate 4 times a day
Third week	10 grains of sodium bicarbonate every 4 hours day and night	10 grains of sodium bicarbonate plus 25 grains of sodium salicyl ate every 4 hours day and night
Fourth week	10 grains of sodium bicarbonate every 4 hours day and night	10 grains of sodium bicarbonate plus 30 grains (2 Gm.) of sodium salicylate every 4 hours day and night
Fifth week	No medication	No medication

The sedimentation rate was measured by the method of Westergren. Liver function was measured by the intravenous sulfobromophthalein method;[3] the blood samples were taken at intervals of five and thirty minutes after injection of 2.5 mg. of sulfobromophthalein per kilogram of body weight. The serum bilirubin was measured by the method of Malloy and Evelyn[4] and the van den Bergh reaction by the method described by Kolmer and Boerner.[5]

The method outlined by Brodie, Udenfriend and Coburn[6] was used for the determination of blood salicylates. A few minor changes were made to allow the work to be done more conveniently in the necessarily large volumes of the experiment. It was more convenient to use serum rather than the plasma recommended by the authors. A large series of comparative studies on the salicylate content of plasma and serum was run and the difference of + or — 2 mg. per hundred cubic centimeters was considered insignificant. Owing to the difficulty of obtaining a large supply of Pyrex glass stoppered bottles, an attempt was made to find an adequate substitute. The common 4 ounce "French Square" bottle with a bakelite screw cap was highly satisfactory and is in wide use in pharmacies. The inner layer of cork and paraffin in the bottle cap must be removed before use. Screw caps of plastics other than bakelite are dissolved by ethylene dichloride and therefore cannot be used. The ordinary Kahn shaker in use in most clinical laboratories is adequate for shaking the mixture and has the additional advantage of holding thirty-six to fifty bottles.

There is no loss of salicylates by allowing the blood to stand overnight, and the procedure may be interrupted at any point for a considerable length of time. Ethylene dichloride is toxic and should be used only with forced ventilation. Since ethylene dichloride should not be pipetted, a tapered small graduated cylinder holding 30 cc. was found suitable for measuring the chemical for the purpose of the test.

In ten days prior to the start of the study all 113 patients had the routine tests just described. The prothrombin time was determined three times and the sedimentation rate twice during this period. All prothrombin times were well within normal limits. The sedimentation rates of a few patients were elevated. During the four weeks of the study the concentration of hemoglobin, number of erythrocytes and leukocytes, urinalysis, dye retention test, serum bilirubin and van den Bergh reaction were determined once weekly on the 51 patients who were receiving sodium salicylate. The Quick prothrombin time was determined three times a week, as were the sedimentation rate and the level of salicylate in the blood. All studies were carried out only once a week on the 54 controls.

In the course of the study of the 105 patients it was observed that some of the subjects were not taking the medicaments properly in spite of strict supervision. This fact was easily determined by observing the blood salicylate levels of these patients. In another study in which the primary purpose was to determine the effect of the administration of sodium bicarbonate on the level of salicylates in the blood the prothrombin time was watched closely. In this group of 9 patients supervision of medication was extremely strict and all 9 patients received the prescribed medications. They were given 150 grains (10 Gm.) of sodium salicylate daily for three weeks either with or without sodium bicarbonate. The Quick prothrombin time and blood salicylate level were determined daily except on Sundays on these 9 patients. The results on this group will be mentioned in connection with the results of the study of prothrombin content of the blood.

3. Rosenthal, S. M., and White, E. C.: Clinical Application of the Bromsulphalein Test for Hepatic Function, J. A. M. A. **84**: 1112-1114 (April 11) 1925.

4. Malloy, Helga T., and Evelyn, K. A.: The Determination of Bilirubin with the Photoelectric Colorimeter, J. Biol. Chem. **119**: 481-490 (July) 1937.

5. Kolmer, J. A., and Boerner, Fred: Approved Laboratory Technic: Clinical, Pathological, Bacteriological, Mycological, Parasitological, Serological, Biochemical and Histological, ed. 3, New York, D. Appleton-Century Company, Inc., 1941, p. 234.

6. Brodie, B. B.; Udenfriend, Sidney, and Coburn, A. F.: The Determination of Salicylic Acid in Plasma, J. Pharmacol. & Exper. Therap. **80**: 114-117 (Jan.) 1944.

In order to correlate our results with the recent work of others we reviewed the literature on the various points we were studying and have compared the pertinent observations of others with our observations.

COMPARISON OF RESULTS OF OUR STUDY WITH DATA FROM LITERATURE

Prothrombins.—In February 1943 Link and his associates [7] at the University of Wisconsin reported in their continued studies on hemorrhagic sweet clover disease that the quantitative chemical degradation product of dicumarol was salicylic acid.[8] This finding prompted these workers to study the effect of salicylates on the prothrombin level of the blood in rats. They found that a single dose of salicylic acid induced a temporary hypoprothrombinemia in rats when the rats were maintained on a ration low in vitamin K. This phenomenon did not occur when the rats were on a diet containing sufficient vitamin K. Furthermore, menadione protected the rat against the hypoprothrombinemic producing action of salicylic acid. It was observed that a dose of 25 mg. of sodium salicylate administered intravenously to rats on a diet deficient in vitamin K increased the prothrombin time of diluted plasma (12.5 per cent) from a normal of 39 to 72 seconds. In addition, it was found that on the low vitamin K ration rats receiving 100 mg. of salicylic acid daily developed severe hypoprothrombinemia in twenty days. Rats on the artificial ration, which was extremely low in vitamin K, developed a temporary mild hypoprothrombinemia even after single oral doses of 10, 25 or 100 mg. of salicylic acid.

Shortly after this report, two studies appeared which indicated that salicylates administered to man had an effect on the prothrombin level similar to that observed originally by Link and his associates in rats. Meyer and Howard reported that the prothrombin level of most of 13 subjects who received 80 grains (5.3 Gm.) of acetylsalicylic acid daily for periods of three to eleven days was reduced to about 50 per cent of normal, and in addition the coagulation time increased from an average control level of 18 to 25 minutes. These authors usually noted an effect on the prothrombin level the day after the first administration of the drug, but in most instances the maximal effects were not observed until the drug had been administered for three or four days or more. When administration of the drug was discontinued, the prothrombin level and coagulability of the blood usually returned to normal in from two to four days. From 75 to 80 grains (5 to 5.3 Gm.) of sodium salicylate was administered to 6 patients in divided doses for periods of seven to eight days and 40 grains (2.6 Gm.) in divided doses to three others for periods ranging from three to eight days. The effects on the prothrombin and coagulation time were similar in all respects to those of acetylsalicylic acid. It was noted further that the administration of menadione would protect the persons receiving salicylates from hypoprothrombinemia. Similar observations were made by Shapiro also, who reported that from his clinical studies approximately 1 mg. of synthetic vitamin K would counteract the prothrombinemic inducing action of 1 Gm. of acetylsalicylic acid.

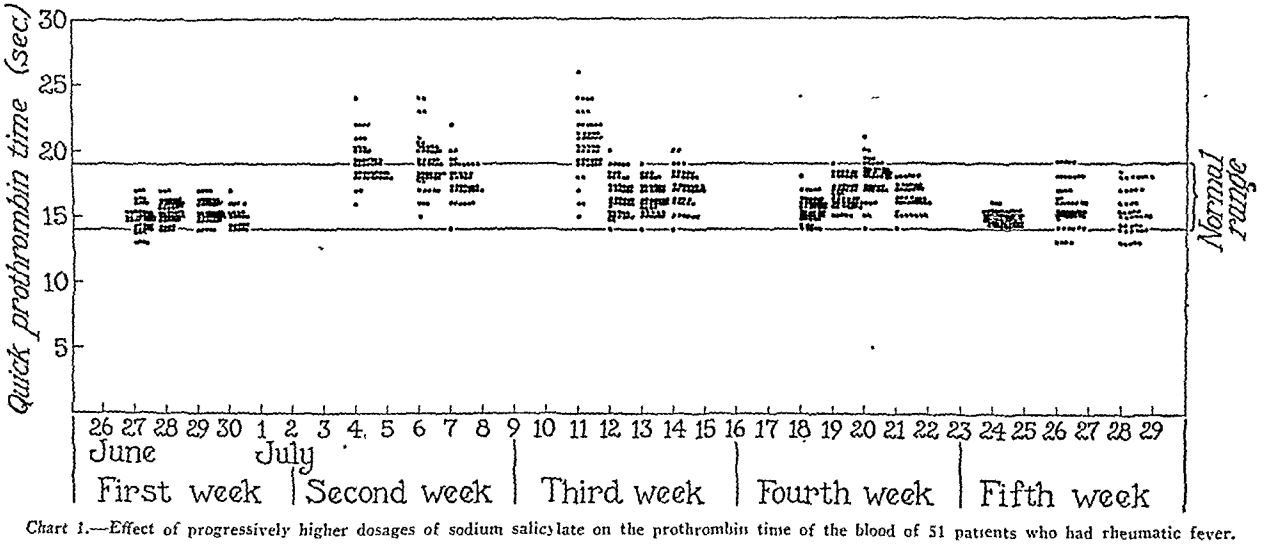


Chart 1.—Effect of progressively higher dosages of sodium salicylate on the prothrombin time of the blood of 51 patients who had rheumatic fever.

Since the appearance of these two clinical studies, several editorials have pointed out that the administration of salicylates might not only be a factor in production of hemorrhagic manifestations among patients with rheumatic fever who are receiving salicylates but also might account for some of the unexplained hemorrhages that occur in acetylsalicylic acid addicts.

In chart 1 is demonstrated graphically the effect of the administration of sodium salicylate over a long period on the prothrombin content of the blood of the 51 patients. It will be observed that during the first week when the daily dosage was 50 grains (3.2 Gm.) of sodium salicylate there was no change in the prothrombin time from normal levels. In the second week, however, two days after the dosage had been increased to 100 grains (6.6 Gm.) the prothrombin time began to increase. It was not, however, until the patients had been receiving 150 grains (10 Gm.) of sodium salicylate daily for two days that a good percentage of them had an elevation in the prothrombin time. Even with increased salicylate dosage the prothrombin time did not increase beyond the initial increase or remain high in all cases. This phenomenon is difficult to explain but tends to support the original observation

7. Link, K. P.; Overman, R. S.; Sullivan, W. R.; Huebner, C. F., and Scheel, L. D.: Studies on the Hemorrhagic Sweet Clover Disease: XI. Hypoprothrombinemia in the Rat Induced by Salicylic Acid, J. Biol. Chem. **147**: 463-474 (Feb.) 1943.

8. A side observation in our present study is pertinent; namely, that salicylate could not be detected in the blood of a patient who had great prolongation of the Quick prothrombin time following the ingestion of dicumarol.

by Link and his associates [7] that the prothrombin time in rats is affected little by increase in dosage of salicylic acid from 10 to 100 mg. It is difficult to compare our results with previous reports primarily because our studies have been carried out over a much longer period and the dosages employed have been increasingly larger. At no time during this study were any abnormal hemorrhagic manifestations noted in the 51 patients taking salicylates.

In chart 2 are represented graphically the weekly prothrombin determinations on the controls. This group showed no appreciable change in their prothrombin time over the period of four weeks during which they received sodium bicarbonate.

In chart 3 are represented graphically the prothrombin determinations for 9 patients who received 150 grains (10 Gm.) of sodium salicylate daily with or without sodium bicarbonate over a period of three weeks. As previously noted by other investigators, the prothrombin time did not rise until about the second or third day. The salicylate level in the blood of all these patients was between 30 and 50 mg. per hundred cubic centimeters throughout the study. In spite of this high level of salicylates in the blood there was no great progressive increase in the number of patients who had an abnormal prothrombin time. Even on this therapeutic dosage of salicylates the increase of prothrombin time was not pronounced, and at no time in any case was any hemorrhagic manifestation noted.

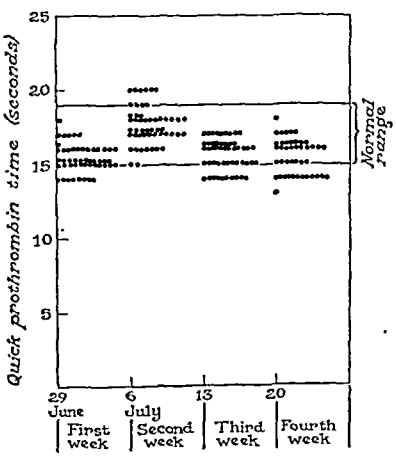


Chart 2.—Effect of progressively higher dosages of sodium bicarbonate on the prothrombin time of the blood of 54 patients who had rheumatic fever and were serving as controls for this study.

Hepatic Parenchyma.—Hanzlik and Wetzel [9] have reported that salicyl is not chemically changed by the liver. They reported that in dogs with hepatic degeneration from phosphorus poisoning the urinary secretion of salicyl was as prompt and as good as in normal control dogs. Smyth and Whipple [10] found no effect from sodium salicylate, in therapeutic doses, on the excretion of bile salts in dogs with permanent biliary fistulas. In the present studies the van den Bergh reaction was indirect for all patients in both groups before, during and after the study. Likewise the serum bilirubin was not increased above normal in any instance nor was the hepatic function altered as measured by the dye retention method. It is realized that there are many more sensitive tests of liver function which might have detected some minor degree of hepatic parenchymal damage in these cases. However, the interpretation of such minor alterations in liver function is indeed difficult. It is our impression from this study that sodium salicylate, even in large doses, has little, if any, deleterious effect on the hepatic parenchyma.

9. Hanzlik, P. J., and Wetzel, N. C.: The Salicylates: XI. The Stability and Destruction of the Salicyl Group Under Biological Conditions, J. Pharmacol. & Exper. Therap. **14**: 25-42 (Sept.) 1919.
10. Smyth, F. S., and Whipple, G. H.: Bile Salt Metabolism: IV. Negative Influence of Drugs, Atropine, Pilocarpine, Phlorhizin, Quinine, etc., J. Biol. Chem. **59**: 655-659 (April) 1924.

Levels of Salicylate in the Blood.—Only for a short period have satisfactory methods been available which could measure the salicylate level in the blood of man. Although the salicylate level was determined three times a week for five weeks on the 51 patients who were taking salicylates, these results are not shown for several reasons. It was noted in this study that even in the third and fourth weeks of medication there were instances in which the salicylate level of the blood was still less than 20 mg. per hundred cubic centimeters. It was difficult to believe that any of these patients with such low levels possessed any abnormality in regard to absorption of the drug. In light of some of our more recent studies on absorption, the only explanation is that these subjects in some manner did not take the salicylates which were ordered for them. In fact, some later admitted that this was the truth. Such an unfortunate circumstance is nearly unpreventable in a large military institution and parallels closely the experience of medical officers attempting to maintain adequate prophylaxis with atabrine in troops in the South Pacific area and of those trying to give prophylactic dosages of sulfadiazine.

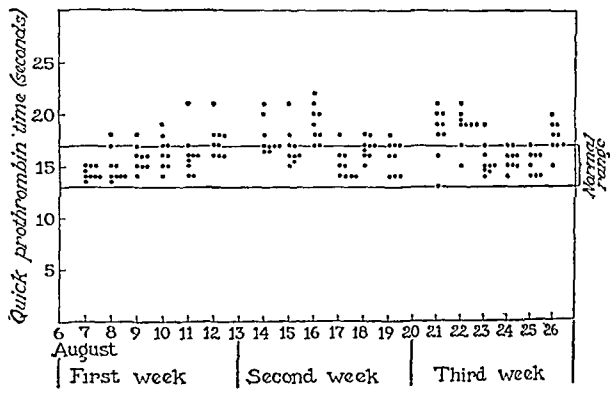


Chart 3.—Effect of the [illegible] grains (10 Gm.) of sodium salicylate with and [illegible] on the prothrombin time of 9 patients who had [illegible] level of salicylates in the blood of all these [illegible] 0 mg. per hundred cubic centimeters.

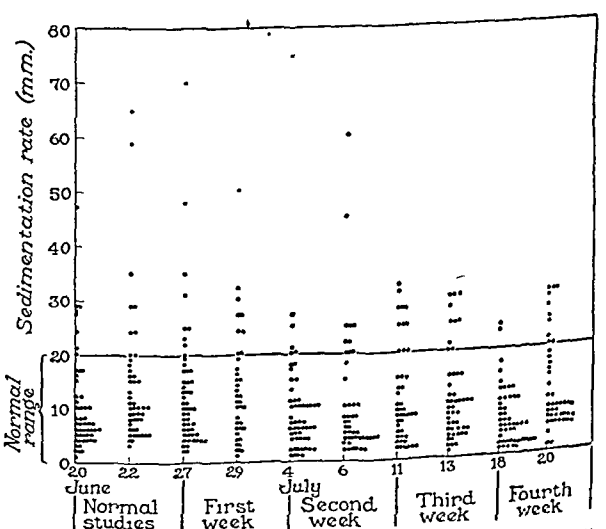


Chart 4.—The normal and triweekly blood sedimentation rates of 51 patients with rheumatic fever who were taking sodium salicylate in increasing amounts.

A large majority of the patients, however, took the drugs as ordered and the blood salicylate level of all

of these when they received 150 grains (10 Gm.) of sodium salicylate a day varied between 30 and 50 mg. per hundred cubic centimeters. After medication was discontinued, the blood salicylate level fell rapidly and was nearly zero at the end of three or four days. From this study it would seem that adequate level of salicylate in the blood is maintained in most persons on an oral dosage of 100 to 150 grains (6.6 to 10 Gm.) of sodium salicylate daily.

Sedimentation Rate.—The effect of administration of salicylates on the sedimentation rate has been a subject of considerable controversy for many years. Some students believe that the administration of salicylates in most instances is followed by a fall in the sedimentation rate. Others feel that the fall in the sedimentation rate is at least speeded by the administration of this drug. Many others, however, are equally convinced that the administration of salicylates has little effect on the alterations, up or down, of the blood sedimentation rate in rheumatic fever. Charts 4 and 5 represent graphically the sedimentation rates for

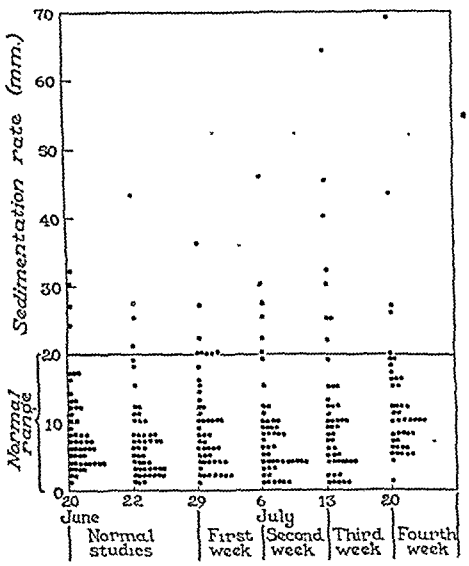


Chart 5.—The normal and weekly blood sedimentation rate of 54 patients with rheumatic fever serving as controls. These patients were receiving sodium bicarbonate in increasing amounts.

both groups of patients studied. It will be observed in chart 4 that in spite of continuous administration of salicylate a few patients, as mentioned before, had recurrence of acute polycyclic rheumatic fever with a subsequent rise in the blood sedimentation rate. Most of these men had an adequate salicylate level in the blood. In spite of the continued high dosage of salicylates, the sedimentation rate remained elevated in a few of these patients throughout the study. The controls, however, had nearly the same number of rises in the blood sedimentation rate as the patients treated with sodium salicylate; in most instances these too represented a recurrence of rheumatic fever.

It has been shown by Coburn [11] and others that the administration of large doses of salicylates in a first acute attack of rheumatic fever is followed by a rather rapid fall in the blood sedimentation rate. The present studies suggest that patients with polycyclic rheumatic fever do not respond clinically, nor does the sedimentation rate respond to the administration of salicylates in a manner comparable to that observed in a first acute attack. At present there is no known explanation for this interesting phenomenon.

Urine.—Hanzlik [12] reported that the administration of sodium salicylate in full therapeutic doses invariably causes the appearance of albumin, leukocytes and granular casts or castlike bodies in the urine of normal, rheumatic, convalescent, febrile and afebrile persons. They observed that quantitatively the albuminuria reached its maximum at the time of symptoms of salicylism and then gradually diminished and eventually disappeared. They further noted that the administration of sodium bicarbonate in amounts equal to the dosage of salicylates had no effect on the albuminuria. Our findings are nearly exactly opposite to those reported by Hanzlik. A few leukocytes were found in specimens of urine from only 6 of the 51 patients who received large doses of sodium salicylate. In each of these 6 cases the leukocytes were found in only one specimen of urine. Similar observations were made on 8 of the controls. In neither group of patients was albuminuria noted on any occasion.

Blood.—In charting the effect of salicylates and sodium bicarbonate on the hemoglobin and erythrocyte count, it is our impression that both the hemoglobin level and the erythrocyte count decreased slightly. This, however, may result from the disease rather than from the drug. The leukocyte count was unaffected in either subjects or controls.

COMMENT

This study confirms previous reports that the administration of sodium salicylate results in some effect on prothrombin content of the blood. This study made with undiluted plasma shows, however, that this effect is not great and that with even large dosage the prothrombin content of the blood is not dangerously reduced and hemorrhage from therapeutic administration of salicylates is certainly unlikely. Many instances have been recorded in the literature [13] in which administration of salicylates in fatal doses has been followed by hemorrhagic changes as noted at necropsy. Purpura, however, occurs in many cases of rheumatic fever in which the prothrombin time is normal and salicylates are not being given. To assume that such objective findings in cases of rheumatic fever are a result of salicylate therapy is misleading. On the other hand, if any surgical procedure is contemplated or arises as an emergency in case of rheumatic fever in which large doses of salicylates are being administered, vitamin K obviously should be given before and after operation.

As with dicumarol, the increase in prothrombin time following administration of salicylates is not noted until twenty-four to thirty-six hours after administration of the drug. There seems to be little correlation between the increase in prothrombin time and the level of salicylates in the blood. In other words, when once the rise in the prothrombin time has taken place, an increased dosage of salicylate seems to have no tendency to cause a further increase in the prothrombin time.

The question arises as to why patients taking salicylates do not all have an increase in the prothrombin time. The work of Link and his associates indicates that the level of vitamin K in the diet has a profound influence on the hypoprothrombinemic action of salicyl-

11. Coburn, A. F.: Salicylate Therapy in Rheumatic Fever: A Rational Technic, Bull. Johns Hopkins Hosp. 73: 435-464 (Dec.) 1943.

12. Hanzlik, P. J.: Actions and Uses of the Salicylates and Cinchophen in Medicine, Medicine 5: 197-373 (Aug.) 1926.

13. Wetzel, N. C., and Nourse, J. D.: Wintergreen Poisoning, A. Path. 1: 182-188 (Feb.) 1926.

ates in rats. The difference in the intake of vitamin K might explain why only certain ones of our patients developed hypoprothrombinemia following administration of salicylates. It also would be interesting to know whether prothrombin A or prothrombin B is affected by administration of salicylates.

SUMMARY

From this study the following observations were made:

1. The administration of sodium salicylate with sodium bicarbonate in therapeutic doses to patients with rheumatic fever is followed by an increase in the Quick prothrombin time. In none of the cases reported were any hemorrhagic manifestations noted following the administration of salicylates.

2. Under the circumstances of this study, the administration of salicylates had no deleterious effect on the hepatic parenchyma.

3. A dosage of 150 grains (10 Gm.) of sodium salicylate daily is followed in most instances by a blood level of salicylate of 30 to 50 mg. per hundred cubic centimeters. When the level of salicylates in the blood falls much below these figures, one can suspect that the patient is not taking the drug.

4. In recurrent attacks of polycyclic rheumatic fever the sedimentation rate is little affected by the administration of salicylates.

5. Long continued high dosage of salicylates is followed by a slight reduction in the hemoglobin content and erythrocyte count. The leukocyte count is unaffected by salicylates, as is the urine.

STATISTICAL STUDY OF 265 CASES OF HEAT DISEASE

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LIEUTENANT COLONEL JAMES F. WADDILL
AND
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MEDICAL CORPS, ARMY OF THE UNITED STATES

When work involving muscular exertion is performed by the human body over a sustained period of time in an atmosphere having a high external temperature and a high humidity, the pathologic effects of heat accumulation are frequently observed. Such a condition represents a potentially serious medical problem and one which may prove rapidly fatal in its later stages. Its proper control and treatment are highly important, especially when a large number of individuals are concerned.

This problem has been recognized and studied by many industrial plants and organizations over some years, and a great deal of progress has already been made in its management.

Modern warfare has focused further attention on heat exhaustion because of its high casualty rate in operations under adverse climatic conditions, especially in tropical and semitropical locations. Both the British and American armies have encountered the problem in training as well as in combat operations. In the Iraq campaign the casualty rate among British troops was higher from heat (8 per cent) than from all other causes (4.1 per cent).[1]

At this post the high incidence of heat exhaustion during the summer months has been a major medical concern. Fort Eustis is located along the southern coastline, situated on a low flat peninsula, bounded on the north and south by rivers. During the months of June, July and August there is a high external temperature with a high humidity and a low wind velocity. Troops, particularly unseasoned troops, undergoing training under such climatic conditions show a high casualty rate from the effects of heat. In the summer of 1942, 4 cases of heat stroke were admitted to the hospital in shock with pulmonary edema and terminated fatally despite heroic treatment. This experience stimulated an intensive investigation of the available data on heat disease, and the present report deals with the results of our investigation and subsequent management of the problem.

PHYSIOLOGIC CONSIDERATIONS

Man, as a warm blooded animal in contrast to a cold blooded animal, possesses certain mechanisms to maintain a constant body temperature despite the temperature of the environment. This stability of temperature represents the resultant of the balance between the mechanisms of heat production and heat loss.[2] If one of these mechanisms fails, there is a consequent gain or loss of body heat. The genesis of the condition commonly termed heat exhaustion or heat stroke usually occurs from a diminution or failure of the means of heat loss possessed by the human body.

According to Wiggers,[3] body heat is lost or dissipated by the following routes:

(*a*) Small amounts by warming the food and respired air and with the excretions (although this is not in universal agreement with all authors).

(*b*) About 15 per cent by saturation of the air in the lungs and by heat absorbed in eliminating carbon dioxide.

(*c*) The remainder (over 80 per cent) by conduction, by convection, by radiation and by vaporization of water.

The heat loss through radiation, convection and conduction depends mainly on:[4]

(*a*) Air temperature and other environmental conditions (i. e the humidity).

(*b*) The nature and amount of clothing.

(*c*) The quantity of heat produced in the body reflected by the degree of body temperature.

It is well known that the exposed skin surface acts as a black body radiator to the direct rays of the sun and thus will absorb heat rapidly from this source. The infra-red or heat waves may however be deflected by satisfactory clothing.

It is very important to evaluate properly the part played by the vaporization of water as a means of heat loss in the production of pathologic effects from heat accumulation. Below atmospheric temperatures of 28 to 30 C. (82.4 to 86 F.) vaporization of water from the skin plays little part as a means of heat dissipation[5] (about 25 per cent and a third of this is due to loss of water by respiration).[6] While the percentage of heat loss by vaporization of water is nearly constant below this level, as the external temperature rises above it and approaches 35 C. (95 F.) vaporization of water becomes an increasingly impor-

1. Marsh, Frank: Etiology of Heat Stroke and Sun Traumatism, Tr. Roy. Soc. Trop. Med. & Hyg. 24: 257-288 (Nov.) 1930.

2. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, ed. 3, Baltimore, Williams & Wilkins Company, 1943, p 1047.

3. Wiggers, C. J.: Physiology in Health and Disease, ed. 3, Philadelphia, Lea & Febiger, 1939, p. 929.

4. Best and Taylor,[2] p. 1048.

5. Best and Taylor,[2] p. 1051.

6. Wiggers,[3] p. 932.

tant means of heat dissipation until at or near 35 C. it is practically the sole means of heat loss.[7] Effective vaporization of water from the skin surface depends chiefly on the ability of the surrounding air to absorb additional moisture (i. e. the degree of relative humidity) and to some extent by movement of the surrounding air.

Another important feature of effective heat dissipation under adverse weather conditions is that the relative humidity of the air has little effect on heat loss by convection; probably the most important factor influencing heat loss by this means is air movement (wind velocity).[5] This is of some importance in properly correlating the wind velocity with other meteorologic data in relation to possible or probable incidence of heat disease over any given period.

From the foregoing discussion it would seem that the relative humidity would be the most important meteorologic reading in considering atmospheric conditions likely to produce heat effects. This is not totally true. The relative humidity per se does not seem to be the critical factor. On two days, June 8 (fig. 1) and July 8 (fig. 2) the relative humidity was high (86 and 85), but also comparatively low dry bulb and wet bulb temperatures were existent with a low wind velocity. No heat cases occurred. Conversely, on June 2 and 3 (fig. 1) the relative humidity was low (43 and 41 respectively) but the dry and wet bulb temperatures were high, with a wind velocity of approximately 10 miles per hour. The incidence of heat cases was high, especially on June 2.

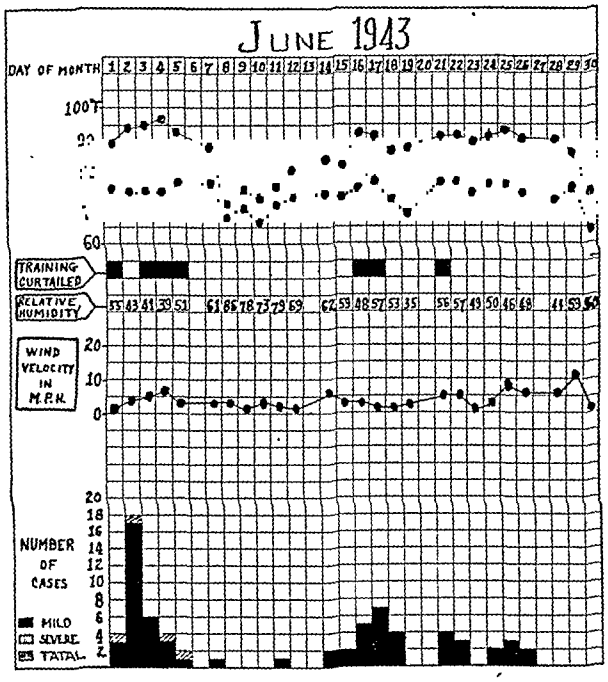


Fig. 1.—Highest daily dry temperature with corresponding wet bulb temperature, relative humidity, wind velocity and number of and severity of cases each day during June 1943. In figures 1, 2 and 3 the upper (solid line) temperature curve is dry bulb and the lower (broken line) is wet bulb.

On the other hand, the wet bulb temperature seems to be a good indicator of the probable incidence of heat disease. The possible explanation for this is that the wet bulb temperature is the resultant of two factors: the external temperature and the degree of saturation of the air with water vapor (humidity). At temperatures of 28 to 30 C. (82.4 to 86 F.) and below, the mechanisms of convection, radiation and conduction play a large part in total heat loss, sufficient to compensate for little loss by vaporization of water. At temperatures of over 30 C. (86 F.) vaporization of water plays an increasingly predominant role, but even a comparatively low relative humidity of the atmosphere is not a sufficient compensation to prevent heat accumulation with high wet and dry bulb readings, if the wind velocity is low.

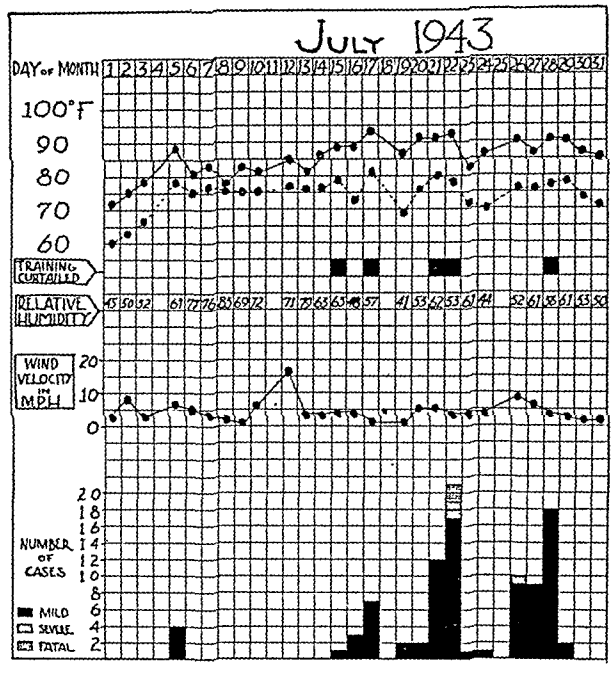


Fig. 2.—Highest daily dry temperature with corresponding wet bulb temperature, relative humidity, wind velocity and number and severity of cases each day during July 1943.

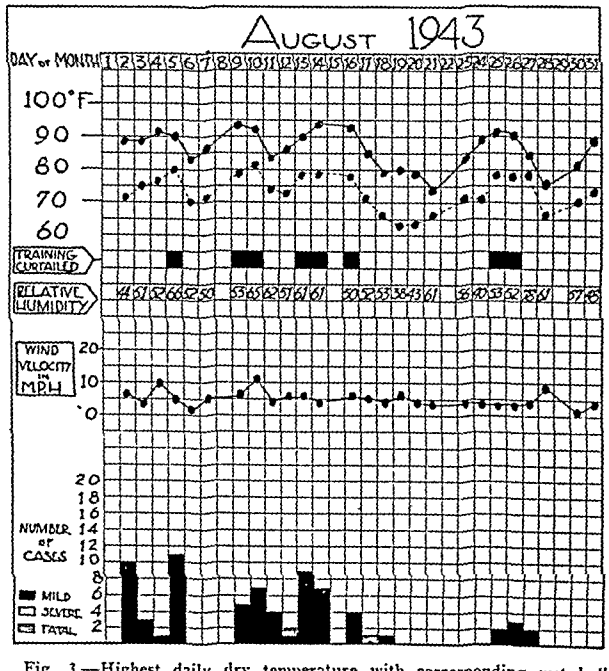


Fig. 3.—Highest daily dry temperature with corresponding wet bulb temperature, relative humidity, wind velocity and number and severity of cases each day during August 1943.

7. Wiggers,[2] p. 933, figure 205.

Figures 1, 2 and 3 show clearly the effect of physical exertion on the incidence of heat disorder. No heat cases were seen on any Sunday during the three month period illustrated, a day on which physical training, activity and exposure to direct rays of the sun were at a minimum.

INCIDENCE AND SYMPTOMATOLOGY

The pathologic manifestations of the effects of heat accumulation in the body are generally grouped under the general term of heat disease.

This is divided into:

Heat cramps (muscle cramps from salt loss).[8] (This is, however, not entirely specific for heat cases alone, as it may occur in any environment as a result of salt and fluid loss.)

Heat prostration,[9] characterized by weakness, usually some temperature elevation, anorexia, headache, abdominal distress, nausea, vomiting and visual disturbances.

Heat exhaustion, when evidence of circulatory failure is present in addition to the effects of heat accumulation. High temperature may or may not be present, depending on the degree of shock present.

Heat stroke, representing a failure of the heat regulatory mechanisms with hyperpyrexia as the predominant feature; coma may or may not be present.[9]

The onset of heat distress may be gradual and insidious and elicit only casual attention, but an abrupt rapid change into one of the more serious forms is not uncommon.

The accompanying table shows the statistical data on the incidence, symptomatology and effects of physical training on heat disease based on our observation of 265 cases from May 1 through September 1943.

Statistical Study of 265 Cases of Heat Disease

May–September 1943

Geographic Location of Cases:		
Home states		
Southern		15.8%
Northern		81.5
Stay in hospital:		
3 days or less		88.0%
Training activity:		
Patients in first 4 weeks of training		39.0%
Patients in 5-8 weeks of training		38.0
Patients past 8 weeks of training		23.0
Age limit (18-39 years):		
Patients 18-21 years of age		53.0%
Patients 22-30 years of age		25.0
Patients over 30 years of age		22.0
Symptomatology:	Mild Cases	Severe Cases
Nausea	18.0%	13.0%
Vomiting	5.0	13.0
Vertigo	74.0	88.0
Headache	19.0	53.0
Muscle cramps	14.0	13.0
	8.0	0.0
	48.0	100.0
	31.0	37.0
Cyanosis	5.0	50.0
Tachycardia	40.0	100.0
Fever (over 99.6 F.)	78.0	100.0
Systolic blood pressure under 100 mm. of Hg.	4.0	75.0
Comatose	0.0	84.0
Treatment:		
Oxygen (100%) inhalation	48.0	100 0
Isotonic solution of sodium chloride (intravenous)	27.0	25 0
Plasma	12.0	88 0
Sedation (mild)	28.0	75.0

The striking difference shown in the incidence of heat disease between men of the Northern and Southern sections of the country is probably more apparent than real, because comparative figures for the entire population of the post showing the number of men from various geographic localities were not compiled.

For the five month period of May through September 1943 there was a total of 265 cases of heat disease seen at the station hospital: 23 in May, 70 in June, 92 in July, 72 in August and 7 in September.

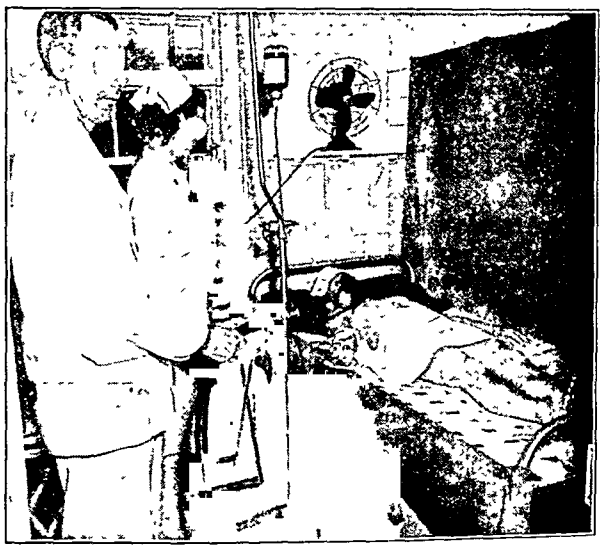


Fig. 4.—Equipment for the treatment of heat disease. Fan under lattice bed is not shown.

TREATMENT

Initial experiences based on our own series of cases revealed that the rapidity with which treatment was begun after the diagnosis was made exerted a major influence on the prognosis of the case. This is especially true in the more severe forms of the disorder. For this reason a special treatment room, especially equipped and staffed by trained personnel, was set up in one of our wards (shown in figure 4). A patient suffering from heat disease is regarded as a medical emergency, and his prompt arrival in the ward is expedited by every possible means. Any intermediary treatment or examination in the hospital or field is discouraged.

For purposes of therapy, cases were divided into two general classes: (1) those without shock or circulatory failure (heat prostration; muscle cramps or spasm due to salt depletion); (2) those with circulatory failure or shock present or impending (heat exhaustion; heat stroke). The latter two classes of heat disease were regarded as severe forms of the same pathologic process but of different degree; the former predominated by the picture of circulatory collapse, while the latter appears largely as a severe metabolic change characterized chiefly by hyperthermia. The circulatory changes observed in heat exhaustion have been compared to those noted in mild adrenal cortical insufficiency.[10]

In the milder cases of group 1 generally complaining only of weakness, headache, nausea and malaise, sedation is promptly given (bromides, phenobarbital or sodium amytal by rectum or hypodermically to avoid nausea); an ice cap is placed on the head; a tap water sponge bath is given; increased ventilation over the exposed surface of the body is secured with electric fans; an increased intake of fluids and salt in the form of salinized water (0.1 per cent) cooled to 50 degrees is forced orally. If nausea and vomiting were present,

8. Talbott, J. H.: Water and Salt Requirements in Health and Disease, J. A. M. A. **119**: 1418 (Aug. 22) 1942.
9. Wiggers,[3] p. 941.
10. Duncan, Garfield, G.: Diseases of Metabolism, ed. 1, Philadelphia, W. B. Saunders Company, 1935, p. 268.

1,000 cc. of 0.9 per cent sterile saline solution was given slowly by the intravenous route or by hypodermoclysis, depending on the individual indications of the particular case. The intravenous administration of 0.9 per cent saline solution seemed specific for relief of muscle (heat) cramps.

The temperature, pulse, respiration and blood pressure were checked at hourly or half-hourly intervals, depending on the exigencies of the case, until a stable, normal level was reached.

If the rectal temperature is over 102 F. the skin surface of the trunk and extremities is sprayed at five minute intervals with a fine mist tap water spray delivered from any suitable spray equipment, and increased evaporation of this is effected by directed air currents from electric fans. When the rectal temperature reaches 102 F. or is initially below this reading, the fan-spray is not advised, as too rapid cooling of the body may be subsequently produced. While the spray is in use, the temperature is checked every fifteen minutes.

In the treatment of the more severe cases in the second group (heat exhaustion, heat stroke) in which shock may be present, the rapid restoration of the circulating fluid volume is perhaps the chief objective to be accomplished. In heat stroke rapid cooling of the body is the main objective of therapy. In addition to the general principles of therapy already discussed additional procedures are used:

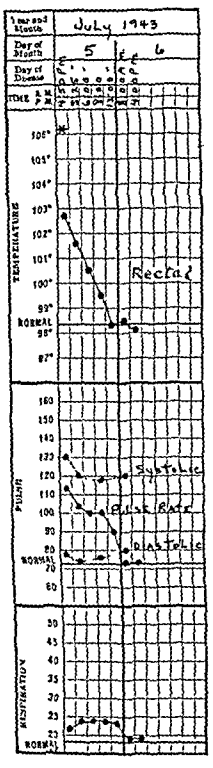


Figure 5

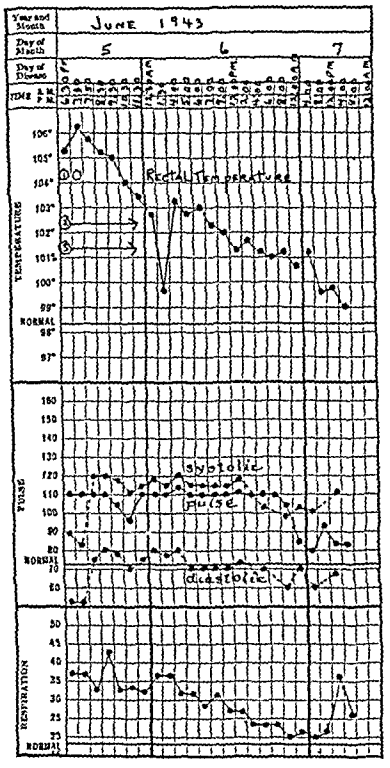


Figure 6

Fig. 5 (F. B., white man).—Clinical course of a mild case of heat disease following treatment. Treatment (*) 1,000 cc. of isotonic solution of sodium chloride intravenously and tepid sponge.

Fig. 6 (L. A., white man).—Clinical course of a severe case of heat disease following treatment. Treatment: (1) 500 cc. of blood plasma, (2) body surface kept wet with fine tap water spray, (3) 100 per cent oxygen by B. L. B. mask.

1. Five hundred cc. of plasma by vein is given immediately and repeated in thirty to forty-five minutes if the blood pressure response has not been satisfactory. The use of intravenous salt solution for this purpose has not seemed advisable to us owing to its ready diffusibility into the tissues through dilated and possibly damaged capillary walls. In addition, it is felt that this characteristic might aid in precipitating a pulmonary edema. Depletion of plasma and tissue chlorides[10] from excess sweating and fluid loss may be restored on recovery from shock.

2. One hundred per cent oxygen is administered by mask to combat the reduced oxygen carrying capacity of the hemoglobin, which is stated by Wiggers[11] to be reduced in this condition and the tissue oxygen deficit due to circulatory deficiency.

3. The extremities are massaged to stimulate circulation through these parts.[12]

4. Circulatory stimulants such as ephedrine, caffeine, amphetamine or metrazol are used as additional aids in restoring an adequate circulation, if needed.

Figure 5 shows the response to treatment in a mild case (group 1, no plasma or oxygen therapy given); intravenous saline solution was given on admission. Figure 6 reveals the response in a more severe case to treatment (group 2, plasma and oxygen given). The prompt response of the blood pressure to plasma can be seen.

During the five month period of 1943 three fatalities occurred, a mortality rate of 1.1 per cent. Although no figures for comparison of therapeutic results by different methods of treatment are available to us, this routine has seemed a satisfactory method of approach on the basis of our results.

PATHOLOGIC FINDINGS

A detailed description of the pathologic findings will not be given in this paper, as these are to be the subject of a separate report from the Pathology Department. The final pathologic diagnoses based on postmortem examinations in 3 fatal cases in 1943, however, will suffice to show the common findings and their similarity:

(*a*) Subendocardial hemorrhages of the interventricular septum near the base of the aortic and pulmonic vessels and adjacent areas of the papillary muscle, with involvement of the conduction system. (All 3 cases showed these findings.)

(*b*) Petechial hemorrhages involving scattered areas of (1) the cerebrum, (2) the duodenal mucosa, first and second portions, (3) subserous areas of the large intestine, (4) the peritoneal serosa, (5) the lungs, (6) the kidneys.

(*c*) Hemorrhages and edema of the brain involving the midbrain, hypothalamus, pons, hippocampus, meninges and periventricular region of the thalamus (1 case).

(*d*) Intra-alveolar hemorrhage of the lungs, bilateral, acute (1 case).

(*e*) Passive congestion of the liver, spleen, kidneys and lungs (3 cases).

All three fatalities occurred in men who had undergone strenuous physical exertion under adverse climatic conditions with high wet and dry bulb temperatures. One of these men was found to have died in his barracks during the night, following a day of strenuous physical activity.

Clinically, in several nonfatal cases with pronounced hyperthermia, scattered subcutaneous petechial hemorrhages over the surface of the trunk and extremities were noted. Differentiation of the more severe forms of heat disease, especially those with petechial lesions and other forms of acute pathologic change such as meningococcic infection, bacterial endocarditis, typhus

11. Wiggers,[3] p. 944.
12. Circular Letter No. 136, S G O., War Department, A. S. F. Washington, D. C., July 28, 1943

and typhoid, may at times be difficult. Blood culture, agglutination tests, examination of the skin lesions [13] plus a careful physical examination and history will at times be necessary in order to arrive at a correct diagnosis. Trauma likewise in obscure cases will have to be ruled out.

HOUR	8:20	9:20	10:20	11:20	12:20	1:20	2:20	3:20	4:20	6:00
JULY 21–1943									No. Patients 12	
Dry Bulb	80	81	83.5	85	87	89	89.5	91	90.5	91
Wet Bulb	76	76	77.5	77	78.5	80	79	80	78	78
Humidity	83	80	76	70	68	67.5	63	62	57	56
Wind Velocity	3	3	3	2	3	3	2	5	4	2
JULY 22–1943									No. Patients 20	
Dry Bulb	80	83	84	87.5	90.5	91	93	92	92	91
Wet Bulb	76	77	77	79.5	78.5	79	79	79	78	78
Humidity	83	76	73	70	58	58	53.5	56	53	56
Wind Velocity	3	5	5	3	4	3	3	4	2	2
JULY 23–1943									No. Patients 1	
Dry Bulb	73	74	77	78	79	80	82	81.5	81	81
Wet Bulb	68	68	68.5	69	69.5	70	72	70.5	71	70.5
Humidity	78	74	65	67	62	61	61	68	61	61
Wind Velocity	5	10	7	4	5	5	3	7	2	4
JULY 24–1943									No. Patients 1	
Dry Bulb	74	76.5	79	78	82	83	84.5	86	84	82
Wet Bulb	69.5	70	70	70	71	70	70	70	70	70
Humidity	80	72	64	67	58	51.5	49	44	49	55
Wind Velocity	2	1	2	1	6	1	5	3	3	2

Suspension of Close Order Drill and Strenuous Training

Fig. 7.—Daily and hourly meteorologic chart maintained as a guide to the administrative control of excessive exercise.

PROPHYLACTIC CONTROL

Daily meteorologic data during the "hot season" of the year when atmospheric temperatures are high on both the wet and dry bulb thermometers are an important feature in exercising preventive control over a serious incidence of heat cases.

Our figures for critical wet bulb temperatures agree with those given in a recent British article [1] on heat effects in a tropical climate. Their findings were:

(*a*) Physical activity should be on a reduced scale at a wet bulb temperature of 75 to 76 degrees.

(*b*) At 79 degrees wet bulb all physical activity (such as long marches, drills and calisthenics) was halted for unseasoned troops.

(*c*) Seasoned troops who had been acclimated could carry on limited physical activity up to a wet bulb reading of 80 to 81 degrees.

Based on the British standards, our figures for curtailment or limitation of strenuous physical training were arbitrarily adopted. The correlation of the wind velocity with these figures was put in on an experimental basis. The limits thus in use at this post for the summer of 1943 were as follows:

(*a*) If the wind velocity is 10 miles per hour or over, the wet bulb temperature may go to 77 degrees before limiting physical activity if the dry bulb temperature does not exceed 88 F.

(*b*) With a wind velocity below 5 miles per hour (decreased means of heat loss by convection), if the wet bulb temperature reaches 75 to 76 degrees a dry bulb temperature of 88 F. is considered maximum for continuation of full physical activity.

(*c*) A wet bulb temperature of 78 to 79 degrees with a wind velocity below 10 miles per hour is considered to be the danger point for any physical activity if the dry bulb temperature is 88 F. or above.

Other important measures of preventive control are:

The intake of salt and fluid should be adequate. The use of 0.1 per cent salinized water for drinking purposes has been found by us to be the most practical means of securing this on a consistent basis. It has seemed to be superior to the distribution of salt tablets for consumption. It is palatable and well borne. The equivalent of 2 tumblers (500 cc.) is advised for consumption every sixty to ninety minutes by unseasoned troops during an exercise period on hot humid days.

The clothing should be light and well ventilated. The same type of protective head cover should be worn in direct sunlight.

The diet should be light and low in protein, especially the midday meal. It seems preferable to give the main meal in the evening after the strenuous work of the day is over.

ADMINISTRATIVE PROBLEMS

The medical administration of a military reservation located in a hot humid climate and used for conditioning trainees is a responsibility that must be recognized and met. To the post surgeon falls the duty of advising the commanding officer of the post when drills and exercise are to be curtailed or discontinued because of adverse weather conditions. To meet this responsibility scientifically it is essential that a diagrammatic hourly weather chart (fig. 7) be maintained during the summer months as a guide in curtailing the activities of troops when the heat and humidity reach a point of danger.

As shown, we have arrived at a standard of heat tolerance which is not necessarily ironclad but is subject to reasonable interpretation. A single day of heat does not receive the same serious consideration as a number of days of continuous high temperature. The longer the heat wave without respite, the more exacting the orders to curtail activity.

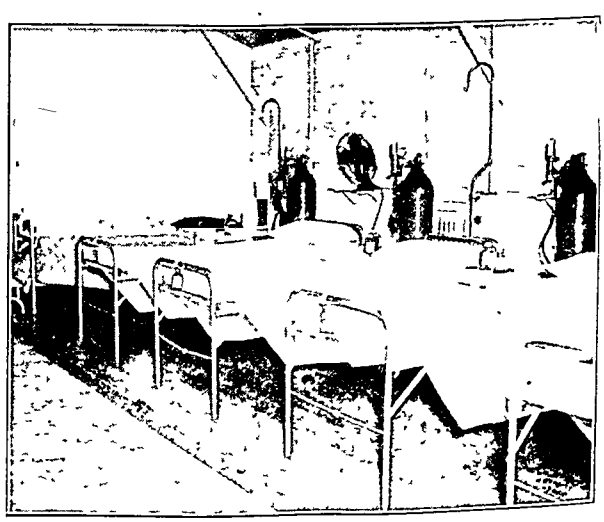


Fig. 8.—Air conditioned ward set up for immediate use. Bed in corner of room is the same equipment as that shown in figure 4. Remaining beds are set up for treatment of mild cases.

It was found that the most careful check-up system had to be employed to enforce the intake of salinized water as a preventive measure. All patients with heat exhaustion entering the hospital without a history of

13. Tompkins, V. N.: The Diagnostic Value of Smears from Purpuric Lesions of the Skin in Meningococcic Disease, J. A. M. A. 123:31 (Sept. 4) 1943.

taking the prescribed sodium chloride have been reported to headquarters for appropriate disciplinary action against the supervising officer for this oversight. This has brought results.

Instructor officers, trained in the Southwest section of our country (Texas), where the temperature is high, the atmosphere dry and the nights cold, have used woolen shirts to good advantage for the protection of their men on hikes and drills. The blast effect of stoking a furnace when the door is suddenly opened is not unlike the conditions met in heat with a dry atmosphere, where wool will ward off the rays of the sun that would otherwise penetrate cotton. This principle does not apply to high temperature with high humidity, where aeration is essential to the evaporization of moisture. This difference must at times be clarified.

Recently there have been stationed at this post British colonial troops wearing shorts with elbow length sleeve shirts. This uniform is military in appearance and the envy of our troops who are clothed in the conventional regulation long trousers and long sleeved shirts.

About eighteen months ago station hospitals were authorized one air conditioned postoperative recovery ward. Because of the urgent need at this hospital for the treatment of many cases of heat disease, this authorization was diverted to our heat project (fig. 8).

Pressure by military training centers not to curtail or cancel the activities of their prearranged program for reasons of excessive heat is not uncommon, since military instructors are limited in the time allotted to them for training. Night maneuvers constitute one way to regain lost time given up during the hot, humid daylight hours. As a safety factor, the control of this situation must be met by the post surgeon with diplomatic but unrelenting firmness.

SUMMARY

1. In a climate with a high atmospheric temperature, high humidity and a low wind velocity the incidence of pathologic effects from heat on the human body tend to be high.

2. The initial effects of heat accumulation in human beings may be mild and of insidious onset, eliciting only casual attention in its early stages. Such a condition, however, may abruptly and rapidly change into one of the more severe stages of the disorder accompanied by a high fatality rate.

3. Heat loss in man is chiefly accomplished by radiation, convection, conduction and vaporization of water.

4. As the external temperature rises above 30 C. (86 F.) vaporization of water becomes the increasingly predominant means of heat loss in the human body, until at or near 35 C. (95 F.) it is practically the sole means of heat dissipation.

5. While vaporization of water from the skin surface depends mainly on the degree of saturation of the air with moisture (relative humidity), the wet bulb temperature seems a more sensitive indicator of the probable incidence of heat disease at high atmospheric temperatures than the relative humidity per se.

6. Strenuous physical activity under adverse climatic conditions strongly increases the incidence of heat effects, especially when performed by persons not acclimatized.

7. In the treatment of the more severe cases in which circulatory failure or shock was present or impending, the intravenous administration of 1 to 2 units of plasma is recommended over the use of saline solution, owing to the ready diffusibility of the latter into the tissues. This characteristic of the latter solution presents certain disadvantages on this basis in a state of shock.

8. The use of 100 per cent oxygen by mask has proved advantageous in the treatment of shock in combating both a reduced oxygen carrying capacity of the hemoglobin and the tissue oxygen deficit.

EMERGENCIES IN THE ALLERGIST'S PRACTICE

GEORGE L. WALDBOTT, M.D.
DETROIT

Any one who treats a large number of allergic patients has had his share of emergencies. The very fact that he is dealing with hypersensitive individuals makes him more liable to accidents than other doctors. These experiences make him pause to reflect on and ponder over them, searching both for their causes and for ways of avoiding future occurrences. In the present article my own solution to this problem will be discussed, if, indeed, such a solution is possible. The subject will be presented under three headings: (A) accidents arising from skin tests, (B) accidents arising from treatment with allergenic extracts and (C) other emergencies in allergic patients.

DIAGNOSIS

Since parts 1 and 2 are concerned solely with the allergic reaction, I shall dwell briefly on its diagnosis and differential diagnosis. Regardless of whether such a reaction results from an injection of pollen extract, of animal serum, of an organic or nonorganic chemical or from inhalation or ingestion of some substance to which the patient is very sensitive, the symptomatology is very characteristic and well known. It is a combination of allergic respiratory symptoms with hives.[1] There is a tendency for the manifestation to concentrate in a preexisting shock organ; i. e., a patient with an eczema will develop considerable aggravation of the eczematous lesion, one with gastrointestinal symptoms may develop severe intestinal cramps, one with asthma may only show an attack of asthma without much accompanying urticaria, one with allergic symptoms in the uterus, uterine cramps. If the reaction is brought about by an intravenous injection, no symptoms other than collapse may be noticeable. In an individual whose allergy has been recently acquired, severe shock may overshadow all other symptoms, skin edema being completely absent. It seems as though these patients are not as yet able to react to the influx of the antigen into the system with the hives and with the usual asthmatic attack.

DIFFERENTIAL DIAGNOSIS

Confusion may arise by not clearly distinguishing these reactions from nonallergic ones which may result from any type of hypodermic medication. The following conditions should be considered in differential diagnosis:

1. *Syncope.*—The ordinary fainting spell is the most frequent source of diagnostic difficulties, especially if convulsions accompany the fainting. The low pulse rate and the relatively prompt recovery after the patient assumes a prone position permit one to make the proper diagnosis.

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1. Waldbott, G. L.: Systemic Reactions from Pollen Injections, J. A. M. A. 96: 1848 (May 30) 1931; The Prevention of Anaphylactic Shock,

2. *Febrile Reactions.*—These appear within an hour or two after an injection. They are brought on by contamination of the injected material with bacterial and other protein elements or by certain chemicals originating from rubber ware used in preparing the solutions.

3. *Focal Reactions.*—Focal reactions from hypodermic injection of any kind represent the activation of a dormant focus of infection.[2] On several occasions I have seen the flare-up of a chronic appendicitis, a furuncle, a tooth abscess or a sinus infection from an injection of pollen extract.[3]

4. *Reactions from Pulmonary Thrombosis.*—These are very rare. If the patient develops, immediately after an injection, a severe pain in the chest, cough and expectoration, followed by a low grade bronchopneumonia, this possibility should be kept in mind.

5. *Toxic Reactions.*—These result from the action of an injected drug. Thus the vasodilating effect of an intravenous injection of aminophylline or the characteristic response to epinephrine may be confused by the inexperienced with an allergic reaction.

A. REACTIONS FROM SKIN TESTS

During intradermal skin testing, reactions are brought about by an extreme degree of sensitivity to the tested material. Among the fatal cases reported in the literature, some may have been induced by the accidental introduction of the testing material into a small vein. Since such reactions are encountered but rarely in dermal tests, some clinicians believe that they can safeguard themselves against such accidents by taking the precaution of doing preliminary dermal tests before the intradermals are done. Generalized reactions however occur in spite of negative scratch tests.[4] The most obvious reason for this is the fact that scratch testing material loses its potency relatively soon.

The following precautions may be taken to prevent accidents from intradermal testing:

Rule 1. In children below 6 years of age, skin tests should never be done by the intradermal method. The most severe reactions are, in my experience, encountered in this age group. A great deal of trouble has been avoided in my own work since the introduction of this rule. Passive transfer tests in young children are not only most reliable to the physician but are also appreciated by parents and by children alike.

Rule 2. If, in the course of history taking, a patient mentions that the ingestion or inhalation of a particular antigenic material has given rise to asthma, hives or allergic shock, a C for caution is entered on the record. Automatically these materials are excluded from intradermal testing. In other words, if a patient develops an attack of asthma or of hives on being near a horse or on eating peanuts, it can be taken for granted that he is sensitive to the horsehair or the peanuts. If a quantitative study of this sensitivity is indicated, however, such extreme dilutions (i. e. 1:1,000,000) are used for testing as to exclude the possibility of any harm. Every twenty minutes a stronger dilution is administered, intradermally, until a fairly strong wheal is obtained.

Rule 3. An attempt is made to gain a general impression of the patient's state of sensitivity by the response to the tests which are done first. Pollens are well suited to serve as a guide for such an estimate because they are the most common reactors in allergic patients, and from the history a clue can be obtained as to the strength of concentration for the intradermal tests. If the reactions to pollens are very strong, all subsequent testing is done with a diluted set (1:10) instead of with the regular testing materials. Since tests for nuts, fish and beans have brought on more frequent reactions than other antigens, they are done last. Fish and nuts are frequently omitted altogether if the wheals from the other tests are unusually extensive.

Rule 4. This concerns the technic of testing. Arms and legs are preferable to the back for the tests because a tourniquet can be applied if necessary. Superficial veins should be carefully avoided. When the wheals are seen to spread out shortly after the injections, a tourniquet and epinephrine should be kept in readiness. After the tests have been given the patient should be carefully watched, particularly within the first few minutes. Incidentally, the layout of an allergist's office should be arranged in such a manner that all the patients are in constant view of the physician or his personnel. The closing of a door after skin testing should be carefully avoided. The treatment of the allergic reaction will be discussed later.

B. REACTIONS FROM TREATMENTS

For therapeutic purposes it is necessary to differentiate clearly between a reaction from the accidental puncture of a vein and one resulting from an overdose. Such a distinction determines not only the immediate treatment but also the course of subsequent injections. A further classification is indicated, depending on whether the extract is injected directly into the blood stream or next to a punctured vein, whence it gradually seeps into the blood stream. In other words, there are three clinically distinct types of reactions, each one requiring different treatment, namely the "overdose reaction," the "intravenous reaction" and the "backseepage reaction." The incidence of these reactions was recorded in a series of 18,775 injections of pollen extract as follows:[5] backseepage reactions, 1:1,564; intravenous reactions, 1:9,387; overdose reactions, 1:308.

Intravenous and Backseepage Reactions.—The intravenous reaction is characterized by the complete absence of a local swelling at the site of injection, by its onset within ten to twenty seconds after the injection and by its unusual gravity. Internal symptoms prevail, especially those attributable to edema of the lungs and of the liver, namely, collapse and extreme bronchospasm. The full climax occurs immediately, and, with the exception of generalized weakness or a low grade pulmonary infection, little if any after effect is noticeable when it has been brought under complete control.

In contrast with this the backseepage reaction requires between one and several minutes until the first symptoms appear. A local edema, which soon becomes intense, arises at the site of injection and spreads quickly over the body surface. There may be some blood at the site of the injection or, more often, a bloody suffusion under the skin which is rapidly replaced by a wheal. The symptoms are both cutaneous and internal. They are severe, and as a rule collapse is present.

In treating the intravenous and the backseepage reaction, speed is most essential in the immediate admin-

2. Hench, P. S.: Usual and Unusual Reactions to Protein (Fever) Therapy, Arch. Int. Med. 49:1 (Jan.) 1932.
3. Waldbott, G. L.: Allergic Shock from Substances Other Than Pollen and Serum, Ann. Int. Med. 7:1308, 1934.
4. Waldbott, G. L.: The Prevention of Anaphylactic Shock, J. A. M. A. 98:446 (Feb. 6) 1932.
5. Waldbott, G. L., and Ascher, M. S.: The Role of Accidental Puncture of Veins in the Production of Allergic Shock, Ann. Int. Med. 9:1232, 1936.

istration of large doses (1 to 2 cc.) of epinephrine. The lapse of even a minute will alter the outcome considerably. This is followed up by aminophylline (3½ to 7 grains, or 0.2 to 0.5 Gm.), administered intravenously. The needle should be kept in the vein and, if there is no tendency to recovery within a short time, epinephrine in doses of 0.1 to 0.3 cc. may be given intravenously. This is done very cautiously by attaching to the needle a 10 cc. syringe containing some epinephrine. Blood is withdrawn and carefully mixed with the drug, and a part of this mixture is injected very slowly. If epinephrine is injected into the blood stream in full strength without this precaution, even small amounts may lead to serious brain or cardiac injuries. It is difficult to say whether or not, in these extreme emergencies, concentrated solution of glucose, administered intravenously, and oxygen, may be of assistance.

For the prevention of a reaction from venipuncture, the following precautions are suggested: 1. An effort should be made to select an area for the antigenic injection between visible veins. 2. Before injecting the extract, the plunger should be repeatedly withdrawn for evidence of blood. 3. Immediately after the injection, the site should be inspected for escaping blood. 4. Cotton should be applied with pressure on the area from which blood escapes in order to prevent backseepage. It is readily appreciated that not one of these measures is, in itself, a definite safeguard. Watching the site for superficial veins before injecting does not preclude hitting a blood vessel in the lower layers. Absence of blood in the syringe on withdrawing the plunger does not indicate that a vessel has not been punctured. One must always be aware that a single drop of extract reaching the blood stream might induce relatively severe symptoms. Furthermore, the escape of blood from the site of the injection does not necessarily indicate that a vein has been punctured. The bleeding may be capillary or arterial in origin and, therefore, harmless. Nevertheless, one should remain on guard, prepared to administer epinephrine when blood is seen. Some have advocated combining small doses of epinephrine with the antigenic extract for prophylactic purposes.[6] I consider this practical only if the treatment is given by a nurse in the doctor's absence or when dealing with exceptionally sensitive patients. Incidentally, the self administration of extracts by patients is dangerous, since, on puncturing a vein, the patient would be unable to administer the necessary further treatment.

Overdose Reactions.—The reaction from an overdose is always initiated by a local edema at the site of the treatment. This has a tendency to spread and to become more or less itchy. It can often be seen expanding along the lymph channels before generalized urticaria and respiratory symptoms occur. No matter how large the overdose may have been, there is always a lapse of time of between a few minutes up to an hour before generalized symptoms arise. The shorter this time interval, the more severe the reaction is likely to be. After the initial control by epinephrine there is a tendency to recurring urticaria. This is in contrast with the immediate onset and the immediate climax in an intravenous reaction.

The overdose may be due to error in judgment concerning the patient's state of sensitivity. It may also be brought about by switching from an old extract to a fresh and more potent one. Occasionally the simultaneous absorption of other antigens to which the patient is sensitive accounts for the effect of an overdose. If a patient has inhaled or eaten an antigen to which he is sensitive shortly before his treatment, an otherwise adequate dose may result in an overdose reaction. Such an accumulative effect from inhaled and injected antigens is encountered when, on days of high pollen or fungus concentration in the air, reactions occur like an epidemic if the doses are not properly reduced.

For the prevention of overdose reactions the following points should be stressed: careful labeling of the various concentrations of extracts; clearly displaying the labels of the bottles in the racks; employing syringes of different color for the low and the highly concentrated extracts; thorough cleansing of the syringes before they are sterilized; careful gaging of the patient's state of sensitivity by initial tests; adequate reduction of the doses with fresh extracts, particularly after a previous overdose reaction has occurred.

As to treatment, the overdose reaction, unlike the intravenous one, does not require more than 0.1 to 0.2 cc. of epinephrine unless it is unusually severe. These small doses may have to be repeated if the symptoms do not subside. Larger amounts of epinephrine produce more discomfort to the patient than the reaction itself. The application of a tourniquet above the site of injection is of considerable value,[7] which is not true in an intravenous reaction. Aminophylline may be given intravenously if indicated for asthmatic wheezing. Careful inspection of the patient's arm within ten to fifteen minutes after the injection will serve as a warning of an impending reaction. The patient should not be permitted to leave the office until the injected area has been inspected.

C. OTHER EMERGENCIES

Fortunately emergencies other than those occurring during antigenic treatment and skin testing are not frequently encountered. Shock from ingestion of food to which the patient is very sensitive, or from inhalation of certain air borne antigens, exhibits the same manifestations as the allergic reaction from an injection and has to be dealt with accordingly. In shock from ingestion, plain water enemas and the induction of vomiting are helpful. In shock from inhalation, local applications of epinephrine to the nose and a nose spray with epinephrine 1:100 may be of assistance. The system tends to rid itself of the antigen by vomiting, diarrhea or a profuse flow of fluid from the nose, lungs and sinuses, which process should be encouraged by treatment.

An asthmatic attack may be so severe that it cannot be clearly distinguished clinically from allergic shock. The most frequent cause of such extreme attacks is the ingestion of an aspirin tablet. It would lead too far afield to present detailed treatment for this condition here. Of the many therapeutic measures recommended, the only reliable means for instantaneous relief are aminophylline and epinephrine; the value of glucose, oxygen, helium and other substances is debatable. If an extreme seizure of asthma fails to respond, a bronchoscope should be introduced into the lungs for aspiration and lavage of accumulated mucus. As a life-saving procedure, this is as startling in its results as tracheotomy in diphtheria.

Few have had an opportunity to witness edema of the glottis. This may occur in the course of urticaria, in allergic shock and in serum sickness. I have recently

6. Duke, W. W.: New Method of Administering Pollen Extract for Purposes of Preventing Reactions, J. A. M. A. 94: 767 (March 15) 1930.

7. Insley, S. W.: The Control of Immediate Shock Following Hypodermic Medication, J. A. M. A. 94: 765 (March 15) 1930.

seen a child who had recurrent laryngeal stridor and evidence of glottis edema, which responded promptly to small doses of epinephrine. The patient's father had died from the same condition. Skin tests done by the passive transfer method were negative. It could not be ascertained whether or not the patient's situation was psychogenic in origin. As the only prophylaxis which one might offer, these patients should be advised to carry with them epinephrine both for inhalation and for injection. Tracheotomy might be indicated if other measures have failed.

Another rare type of accident, to which little reference is made in the literature on allergy, is seen during extreme cyanosis in the course of an asthmatic attack. The patient usually jumps forward and falls on the floor, being completely unconscious for a period of from twenty to fifty seconds. He recuperates promptly and spontaneously. I have seen this in 3 patients in my office, and others have described this condition to me. It is evidently due to anoxemia of the brain, which adjusts itself spontaneously. The fainting brings about a general relaxation of the patient, which might effect a widening of the bronchi and thus the air passes more freely into the lungs.

Emergencies have been reported from the use of drugs in allergic patients, even from such valuable ones as epinephrine and aminophylline. An individual with serious cardiac damage, who had been in the habit of administering to himself 1 cc. of epinephrine several times daily, died instantaneously on taking such a dose. Blood was found escaping from the area of injection, indicating that he might have punctured a vein. In another case an injection of epinephrine had to be made intravenously because all other attempts at reviving the patient from allergic shock had failed. Severe cerebral disturbances such as aphasia, athetotic movements and paralysis of the facial musculature developed, similar to those described recently by Applebaum.[8] This condition lasted for two days but cleared up spontaneously, and it was interpreted as the effect of the drug on the cerebral vessels. Such experiences suggest the following precautions: discouragement of self administration of epinephrine among patients; avoidance of intravenous injections; whenever possible administration of small doses only.

Intravenous injections of aminophylline have been the source of fatal reactions.[9] It is true that the peculiar sensation in the face and the mouth which is typical of its action has caused patients to faint, but in my experience, with at least 20,000 injections,[10] I have never seen any serious ill effect from it. The injection is always made very slowly. Only one third to one half of the 3¾ grain (0.24 Gm.) ampule is used, which is sufficient to procure therapeutic results. If the patient's systolic blood pressure is below 90, 0.1 cc. of epinephrine is given subcutaneously shortly before the aminophylline is injected. Incidentally, sensitivity to either aminophylline or epinephrine has never been demonstrated.

In the allergic patient emergencies may arise from any other drug. Sensitivity to acetylsalicylic acid unquestionably accounts for the most serious ones. Morphine and other opiates follow next in importance. Agents to be injected for the purpose of sclerosing varicose veins may give rise to severe allergic reactions. The development of such sensitivity to a certain drug seems to depend largely on the amount of time which has elapsed since its previous administration. If this interval is between ten days and four weeks, the patient is most likely to become sensitized. Regular daily or weekly doses appear to be less harmful. Highly concentrated glucose or salt solutions can be safely employed for sclerosing veins if one wishes to eliminate the possibility of allergic shock. In considering the proper dose of drugs, it has been suggested to us by experiments on dogs[11] that the tolerance to a certain drug is lower in an allergic individual than in a normal one.

The allergist is often consulted by the surgeon, obstetrician and dentist concerning the "best" anesthetic to use for the allergic individual. An answer to this question must necessarily be highly speculative. In 1933 I[12] reported on sensitivity to ether and pontocaine during operation. Autopsies on 2 cases of death from pantocain hydrochloride illustrated that in such emergencies a distinction should be made between sensitization to pontocaine and intoxication from the drug, each condition requiring different therapeutic measures. It is very difficult to determine whether or not a person is sensitive to a certain anesthetic, because there is no sure means of testing for it. From the point of view of sensitivity nitrous oxide anesthesia is perhaps the most harmless one. To a patient sensitive to a certain local anesthetic a spinal anesthetic may be disastrous. In 2 patients subjected to bronchoscopy under intravenous anesthesia, severe spasm of the epiglottis occurred, presumably from the anesthetic employed. The surgeon's skill in prying the larynx open with the bronchoscope prevented asphyxiation.

The following recommendations can be made to the surgeon for an operation on an allergic individual: To have epinephrine and aminophylline on hand for immediate administration, perhaps to give small doses of these drugs prophylactically, shortly before the operation; to attempt avoidance of puncturing small veins when injecting a local anesthetic by repeated withdrawal of the plunger; to refrain from the use of opiates, if at all possible, which tend to depress the respiratory center; to avoid acetylsalicylic acid scrupulously in postoperative care. In such minor surgical procedures as bronchoscopy a barbiturate given by mouth is sufficient to bring about relaxation of the patient. If a patient has to have two operations within a short time, the critical time interval during which sensitization develops should be heeded and a different type of anesthesia employed for the second operation.

SUMMARY

1. Emergencies in the allergist's practice arise mostly from intradermal skin testing and from treatment with antigenic extracts.

2. The principal precautionary measures for the avoidance of reactions from skin testing are omission of tests for antigens to which there is a history of pronounced sensitivity and for others which are known to be common sources of generalized reactions (fish, nuts!); avoidance of intradermal tests in children below 6 years of age.

3. With therapeutic injections of antigenic extracts, caution should be exercised to avoid accidental punc-

8. Applebaum, I. L.: Cerebrovascular Accidents Following Epinephrine Injections, J. Allergy **15**: 392, 1944.
9. Merrill, G. A.: Aminophylline Death, J. A. M. A. **123**: 1115 (Dec. 25) 1943.
10. This is a conservative estimate, since every patient seen by me during an asthmatic seizure is given this drug intravenously.
11. Waldbott, G. L.; Blair, N. B., and McKeever, R.: Tolerance to Sodium Salicylates in Sensitized Animals, to be published.
12. Waldbott, G. L.: So-Called Thymic Death: Respiratory Sensitization to General and Local Anesthetics, Arch. Otolaryng. **17**: 549 (April) 1933.

ture of small veins ("intravenous" and "back-seepage reaction") which is by far more dangerous than the "overdose reaction." Each type requires different measures of prevention and treatment.

4. Other emergencies arise from inhalation and ingestion of antigenic materials to which the patient is very sensitive, from ingestion of drugs, from such common hypodermic medications as epinephrine, and from local and general anesthetics.

10 Peterboro Street

DERMATITIS FROM WEARING APPAREL

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Dermatitis from most types of wearing apparel has been reported usually as isolated instances. On occasions, however, large outbreaks have occurred among the general population because of the sale of new materials containing substances of unknown toxicologic properties which were placed on the market before testing for action on the human skin

Among articles of wearing apparel, dermatitis has been reported from fabrics such as silk, wool and synthetic fibers, from leather, artificial leather, furs, rubber and rubber containing materials such as rubber gloves, dress shields and girdles, socks, pajamas, brassieres, and many others. Metal and metal alloys used in jewelry and in eyeglass frames, wrist watches and straps have also caused dermatitis. Plastics used in spectacle frames, wrist watch straps, garters and suspenders have also been reported as causes of dermatitis.

FABRICS

While occasional cases of dermatitis have been reported as due to sensitivity to some of the unprocessed fabrics such as silk and wool, the majority of the reported cases of dermatitis due to the wearing of fabrics have been caused by the processed fabrics.

Fabrics as worn by the public consist of the basic fabric itself and all the chemicals which have been placed on them or in them, such as dyes and finishes, in order to make them salable or suitable for wearing purposes.

Sensitivity to Unprocessed Fabrics.—Sensitivity to silk has been reported.[1] Most of the reported cases have been from processed silk Very few authors differentiate between sensitivity to the raw silk and the chemical with which it was treated. The type of eruption described by most of the writers is of the urticarial type. Urbach [2] described an actual case of contact dermatitis from unprocessed silk.

Fabrics made from wool,[3] camel's hair [4] and other animal hairs have been reported as causes of allergic contact dermatitis. There are no cases of dermatitis reported from unprocessed fabric made from vegetable fibers such as cotton and linen, although dermatitis has been reported as occurring among pickers of flax and also from cottonseed oil (oil of gossypii).

A review of the literature of sensitivity to so-called basic fabrics shows that in most instances the sensitivity tests on which the diagnoses were made were performed not with the actual raw materials but with undyed or unfinished fabrics, so-called gray goods, which are already partially processed. Perhaps another fallacy in some of the reported tests has been failure to distinguish between the physical irritation caused by "wooly" or rough fabric and an actual allergic reaction. As a corollary, a dermatitis may be caused by the friction of a rough material where a patch test for the purpose of demonstrating sensitivity would be negative. In such cases the cause may be the mechanical friction resulting from actual wear

Synthetic Fibers.—Fabrics for wear are made of processed cellulose (rayon), of a number of synthetic resins, glass and casein.

Cellulose.—From cellulose is manufactured the various rayons such as viscose rayon and acetate rayon.[5] While many cases of dermatitis have been reported among the wearers of these rayons, all the cases were from the finished product and not from the unprocessed material.

Synthetic Resins.—The best known of the purely synthetic resin fabrics are polymers made from hexamethylenediamine and adipic acid and sold under the trade name of Nylon. Although some cases of dermatitis from nylon have been reported, it was shown that these cases were all caused by a certain finish and not the nylon itself.[6] Fabrics are now being made on a small scale from vinyl and styrene resins as well as from fiber made from casein. No cases of dermatitis have been reported from them.

Glass.—Glass is now being spun into fiber. In order to make these fibers suitable for weaving into fabric, certain resins are used on them. Cases of dermatitis have been reported from such glass fabrics. These

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From Dermatoses Section, Industrial Hygiene Division, Bureau of State Services, U S Public Health Service

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Urbach and Gottlieb [2]

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3 Wool
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Lord, L W Cutaneous Sensitization to Wool, Arch Dermat & Syph 26: 707 (Oct) 1932
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Sulzberger, M B, and Morse, J L Hypersensitiveness to Wool Fat: Report of 2 Cases, J A M A 96: 2099 (June 20) 1931.

4 Camel's hair Rowe, A H, and Rogers, H Allergic Dermatitis: Report of Case Due to Mohair, California & West Med 23: 1589, 1925

5 Rayon Barthelmy, H L Ten Years' Experience with Industrial Hygiene in Connection with the Manufacture of Viscose Rayon, J Indust Hyg & Toxicol 21: 141, 1939

6 Fabric finishes
Alperstein, B, Sherman, T, and Sherman, B K Edema of the Genitalia Complicating Resin Contact Dermatitis Due to Underwear, Arch Dermat & Syph 46: 829 (Dec) 1942
Cannon, A B Contact Dermatitis (Underwear Shorts), ibid 44: 1157 (Dec) 1941
Costello, N J, and Ryan, J E Dermatitis from Underwear Shorts Processed by Resin Finishes, ibid 46: 254 (Aug) 1942.
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Gould, A, Beresford, H, and Moore, N Resin Dermatitis from New Pajamas and New Shorts, New York State J. Med 41: 2236, 1941
Keil, H Dermatitis Due to Resin Finished Shorts and Fabrics, J Allergy 14: 477, 1943
Neilson, A W, and Reiches, A J Contact Dermatitis Due to Underwear, Arch Dermat & Syph 44: 218 (Aug) 1941
Schwartz, L: Dermatitis from New Synthetic Resin Fabric Finishes, J Invest Dermat. 4: 459 (Dec) 1941
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Schwartz, Spolyar, Gastineau, Dalton, Loveman, Sulzberger, Cope and Baer [13]

cases are due to the resins or the mechanical irritation of the rather sharp fibers and not to allergy to the glass.

Glass wool is made for insulating purposes. Dermatitis occurs in its manufacture and in its use, caused by the mechanical irritation of tiny sharp glass slugs and occasionally from sensitivity to the resin binder (phenol-formaldehyde) which it contains.[7]

Synthetic Films.—Some of the plastics in sheet form are used for protective clothing. Some of them are also laminated onto cotton or other natural fabrics in order to make them impervious. Rubber hydrochloride, vinyl resins, acrylic acid resins and cellulose acetate are used for these purposes. Dermatitis has been reported from the vinyl, the acrylic acid and the rubber hydrochloride films, but in all these cases it was due either to plasticisers or stabilizers used in the films.[8]

The following plasticisers, stabilizers and modifiers have been causes of dermatitis: tricresylphosphate, triphenylphosphate, dibutyl sebacetate, dibutyl tin delaurate, dibutyl tin laurate maleate, phenyl salicylate and resorcin-formaldehyde combination.

Rubber.—Dermatitis from wearing apparel made of rubber has been reported. Gloves, girdles, dress shields, gas masks, condoms and so on have all been reported to cause dermatitis. In all of these cases it was the compound placed in the rubber, such as the accelerator and antioxidants, or compounds formed on the surface of the rubber by "vapor cure" (sulfur monochloride) which have been the actual irritants, not the rubber itself.[9] The following accelerators, antitoxidants and so on have been the cause of dermatitis: hexamethylenetetramine, the guanadines, mercapto benzothiazole, tetramethyl thiuram monosulfide and disulfide, paratoluidine, orthotoluidine, triethyl trimethyl triamine and the antioxidants phenyl beta naphthylamine and monobenzyl ether of hydroquinone (leukoderma).

The accelerators named are contained in many rubber articles which do not cause dermatitis. They cause dermatitis only when they are contained in the rubber in such quantities that they "bloom" out or if they are so loosely incorporated that they can be leached out by the perspiration. The same statement applies to the antioxidants except monobenzyl ether of hydroquinone. This chemical can cause leukoderma even when it is properly incorporated into the rubber.[10]

Dermatitis from "vapor cured" rubber is caused by the fact that continuous changes take place on the surface of vapor cured rubber, and these changes result in the formation of sensitizing chemicals. Those who develop dermatitis from wearing vapor cured gloves (surgeons) may prevent dermatitis in the following manner: soaking the gloves in a 5 per cent solution of sodium carbonate for fifteen minutes and then rinsing in water; sterilizing by dry heat and wearing them dry and well powdered on the inside of the gloves every time the gloves are to be worn. The same procedure should be adopted by those sensitive to rubber gloves made directly from latex, because in such gloves the accelerators and antioxidants are more easily leached out by the perspiration.

Synthetic Rubber.—There are several types of synthetic rubber. The first one made in America was Neoprene, which is made from acetylene. There are now being manufactured Buna S made from butadiene and styrene, Buna N made from butadiene and acrilonitrile, and butyl rubber made from butylene and isoprene. Although these synthetic rubbers have been on the market for a comparatively short time the little wearing apparel, mostly gloves, has been made from them, some cases of dermatitis have been reported.

These synthetic rubbers are processed in the manner similar to that used for processing natural rubber and contain accelerators and antioxidants and other compounds, cured by heat as well as by sulfur monochloride. Most of the cases of dermatitis from synthetic rubbers are probably caused by the same compounds as cause dermatitis in natural rubber, although synthetic rubber does contain sensitizing substances not present in the natural rubbers.[11]

Dyes and Mordants.—Dermatitis due to fabric dyes is relatively infrequent among the wearers of the fabrics.[12] For some time it was the common impression among physicians that dermatitis due to wearing apparel was caused by the dyes in the fabrics.

When dermatitis is caused by the dyes, it is usually due to an idiosyncrasy to the dye itself or to a faulty process of dyeing, so that there is retained in the fabric some chemical which should not have been present. On occasion, dyes will cause dermatitis if one of the known sensitizing dyes are used.

When dyes themselves have been found to be the cause of the dermatitis it has been usually found that they easily come out of the fabric or "bleed." Condi-

7. Glass wool:
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Sulzberger, M. B., and Baer, R. L.: The Effects of Fiberglas on Animal and Human Skin, ibid. **11**: 482 (Oct.) 1942.

8. Antioxidant: Schwartz, L., and Peck, S. M.: An Outbreak of Dermatitis from Airplane Engine Covers, Pub. Health Rep. **58**: 625, 1943.

9. Rubber:
Flandin, C.; Rabeau, H., and Ukrainczyk: Three Cases of Occupational Dermatitis Due to "Accelerators" (Rubber Industry), Bull. Soc. franç. de dermat. et syph. **45**: 1683, 1938.
Burgess, J. F.: Surgical Gloves Dermatitis, Canad. M. A. J. **45**: 22, 1941.
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Stokes, J. H.; Lee, W. E., and Johnson, H. M.: Contact, Contact-Infective-Allergic Dermatitis of the Hands, with Special Reference to Rubber Glove Dermatitis, J. A. M. A. **123**: 195 (Sept. 25) 1943.
Osborne, E. D., and Putnam, E. D.: Industrial Dermatoses, with Special Reference to Allergy and Mycotic Dermatitis, ibid. **99**: 972 (Sept. 17) 1932.

10. Oliver, E. A.; Schwartz, L., and Warren, L. H.: Occupational Leukoderma, J. A. M. A. **113**: 927 (Sept. 2) 1939. Peck, S. M., and Sobotka, H.: Effect of Monobenzyl Hydroquinone on Oxidase Systems in Vivo and Vitro, J. Invest. Dermat. **4**: 325, 1941.

11. Schwartz, L.: Skin Hazards in the Manufacture and Processing of Synthetic Rubber, J. A. M. A. **127**: 389 (Feb. 17) 1945.

12. Dyes:
Ingram, J. T.: Dermatitis in Relation to Idiosyncrasy, Brit. J. Dermat. **44**: 422, 1932.
Ingram, J. T.: Dermatitis from Dyed Hair, Furs and Fabrics, Lancet **2**: 239, 1935.
Kadisch, E. L.: Contact Dermatitis Caused by Dyes in Wearing Apparel, New Jersey State J. Med. **43**: 1051, 1943.
Schwartz, L.: The Actual Causes of Dermatitis Attributed to Socks, Pub. Health Rep. **49**: 1176, 1934.
Schwartz, L., and Hocker, C. D.: Dermatitis Due to Heat Decomposition of Dyes, ibid. **51**: 493, 1936.
Schwartz, L.: Dermatitis from Wrist-Watch Straps, *ibid.* **51**: 423, 1936.
Tobias, N.: Dermatitis from Wearing Apparel, New Internat. *Clin.* **3**: 130, 1938.
Kellick, E. M., and Ingram, John T.: Dermatitis Following the Wearing of Dyed Fabrics, Dyer **69**: 248, 1933.
Cox, H. E.: Chemicals in Fabrics as Potential Skin Irritants, Brit. J. Dermat. **54**: 22, 1942.
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Epstein, Ervin: Eruptions and Photosensitivity Due to Dyed Fabrics, Arch. Dermat. & Syph. **41**: 1044 (June) 1940.

tions on the skin surface may help to determine the "bleeding" of the dyes from the fabric. For instance, some will bleed out in acid perspiration and others in alkaline. Since some of the dyes are soluble in fat solvents, a high fat content on the skin surface may help dissolve them out. It is also to be borne in mind that the dye intermediates are more likely to cause dermatitis than the finished dyes themselves and that under certain conditions, such as the heat of ironing, some dyes will break down into their intermediates.

Faulty dyeing process may cause dermatitis by leaving in the fabric some chemical irritant which should have been removed, as for instance in vat dyeing or in mordant dyeing the excess of the oxidizing or mordanting bichromate should be removed before the dyeing is finished; otherwise dermatitis may occur on those handling or wearing the fabric. Wool is often dyed by the aid of a mordant. Mordants are also used in certain dyeing processes other than wool dyeing. Of the mordants it is the dichromates which have caused dermatitis. The following dyes have been reported as causing dermatitis: amino-azo-benzine, auramine, brilliant indigo 4G, crystal violet, chrysoidine, hydron blue, iso-rosinduline, indanthrene violet R. R., ionamine A, metanil yellow, methyl violet, malachite green, orange R, orange Y, ponsol dark blue B R, sulfanthrene pink F. F., safranine, victoria blue, victoria green and resorcinol component dyes.

Special dyes are used for dyeing of rayon because the ordinary dyes do not easily penetrate the comparatively solid rayon fabric. Dermatitis has occurred from these special acetate dyes.

Fabric Finishes.—It has been shown that in most instances the dermatitis among the wearers of fabrics was caused by the finishes rather than by the dyes.[6]

Finishes are placed in fabrics to give them a better appearance such as luster, better feel and wearing properties, to prevent runs and unraveling, to make fabrics noncreasing and sometimes to hold the crease and to make them waterproof, mothproof, flameproof, moldproof and insectproof. Some of the finishes stay more or less permanently in the fabric. Other finishes are easily removed by the laundering and only a small part may remain after many washings. For this reason finishes which are removed by laundering are reapplied after each laundering.

Starches and sulfonated castor oil were the first finishes used and were applied to enhance the appearance and the feel of the fabric and thus increase its selling appeal. Dermatitis has never been reported from starch, but Schwartz showed that an improperly neutralized sulfonated castor oil (alkalinity) was the cause of a dermatitis from socks.

Antiwrinkle and Crease Holding Finishes.—More recently certain resins have been applied as finishes to make the fabric resistant to wrinkling or to hold its crease and, in the case of stockings, to prevent runs. These resins are usually applied in the dye bath and consist of modified natural or totally synthetic resins. Schwartz and his associates [13] showed that an outbreak of dermatitis thought at first to be due to a synthetic fabric was really due to a finish containing an ester gum. This finish was used on other fabrics and caused dermatitis.

The new synthetic resin finishes have caused a number of cases of dermatitis. The resins are applied from solutions or emulsions which leave a thin film of the resin on the fabric after evaporation of the solvents. The resins, ester gums, the formaldehyde type, methyl methacrylate, vinyl, styrene and glyptal resins may be applied in this manner. Some of the resins when applied in the form of emulsions containing uncured or partially cured resins are completely cured in the heat of the finishing bath and in the heat of the boarding process.

Completely cured resins do not as a rule cause dermatitis. When complete polymerization and stabilization does not occur, there may be enough free monomers or uncured resins remaining on the fabric to cause dermatitis in sensitive cases. Actual sensitization by the fabric can occur also.

Glycerin-phthalic anhydride resins are used in emulsions containing alkali such as ammonia or sodium hydroxide or triethanolamine. These resins may also contain impurities which are skin irritants.

The dicyandiamide-formaldehyde resins may undergo decomposition to form methylamines which may cause dermatitis. Other resins which cause sensitization dermatitis may be introduced into use as fabric finishes.

Waterproof Finishes.—In some of the older methods of waterproofing fabrics (1) the fabric was placed in the soap bath followed by alum or other aluminum salts in watery solution in order to deposit aluminum soap on the fabric or (2) an application of aluminum or lead soap from an organic solvent such as benzene was made. There are no recorded cases of dermatitis from the finished materials proved to be due to waterproofing agents containing these insoluble metallic soaps.

In still another method of waterproofing, the fabric after dyeing and drying is then passed through a solution of paraffin dissolved in a petroleum solvent and again dried over hot cylinders. When Japan wax was used instead of paraffin, dermatitis was seen from such coated fabrics because Japan and China wax are derived from a tree of the poison ivy family (Rhus vernicefera).

Fabrics have been treated with tar or resins and rubberized in order to make them waterproof. Dermatitis has been seen from such materials only among the processors of the fabrics.

Flameproofing.—Canvas and leather gloves, sleeves and aprons are used as a protective by welders to protect them against sparks. These materials may be treated with flameproofing chemicals. Asbestos also is used. Wearers of asbestos do not have dermatitis from it, as it is not worn next to the skin.

Cotton and silk are often flameproofed by treating with chlorinated naphthalenes, ammonium sulfamate, boric acid and borate, diammonium phosphate, antimony chloride or other substances. Although workers making clothing from these materials sometimes develop dermatitis and workers processing fabrics with chlorinated naphthalenes may develop chloracne, cases of dermatitis among the users of these fabrics have not been reported.

Delustering Agents.—Zinc sulfate, barium sulfate, aluminum sulfate and titanium oxides are some of the chemicals used as delustering agents. No dermatitis has been reported from their use.

Mothproofing and Lousicides.—Silico fluorides are most frequently used for [illegible] gh the chlornaphthalenes (naphtha [illegible] chlorphenols, synthetic camphor and others also are used. The solutions of silico fluorides are usually sprayed on the fabrics. The chlornaphthalenes and camphor used in the form of flakes or balls are placed in the clothes

13. Schwartz, L.; Spolyar, L. W.; Gastineau, F. M.; Dalton, J. E.; Loveman, M. B.; Sulzberger, M. B.; Cope, E. P., and Baer, R. L.: An Outbreak of Dermatitis from New Resin Fabric Finishes, J. A. M. A. 115:906 (Sept. 14) 1940.

or closets. Dermatitis has not been reported from fabrics exposed to these substances.

Since the outbreak of World War II, it has been found desirable for sanitary reasons and as a protective measure against typhus to treat clothing of our armed forces with chemicals known to kill lice and other related insects. The most widely used and effective agent at present is DDT (dichlor-diphenyl trichlorethane). It can be used alone or in combination with other insecticides. Other insecticides such as pyrethrum, rotenone (the active principle of derris and cube) and synthetic insecticides may be used.

The synthetic insecticides are usually primary irritants in strong concentrations, and the natural insecticides are sensitizers.

Antimildews.—With the advent of the war it has been found necessary to mildew-proof many articles of clothing and equipment made of fabric and leather to prevent their deterioration in tropical climates. Tenting, hammocks, camouflage and mosquito netting, knapsacks, canvas covers of all types, interlinings of shoes and many other articles have been treated with mildewproofing agents. They are so precipitated on the fabrics that they will be retained after many washings. While many chemicals are excellent fungicides, they cannot be incorporated into articles of clothing or equipment which are to be in close contact with the skin because they are primary skin irritants and sensitizers [14] in the concentrations in which they satisfy antimildew performance specifications against molds. Even if such irritant chemicals are incorporated into materials which are not to be in contact with the skin, such as sandbags and tenting, they have been the causes of dermatitis to the workers making those materials. This does not imply that such chemicals should not be used in fabrics which will not be worn next to the skin.

We have tested many of the compounds which have been suggested by our armed forces as mildewproofing agents by means of the "prophetic patch test" [15] Actual field trials have supported the value of this procedure,

TABLE 1—*Mildewproofing Agents*

	Percentage of Weight of Material
Phenyl mercury acetate	0.1
Pentachlorphenol	1.0
	1.0
	0.45
Allyl phenoxy ethoxy dimethyl [illegible]	1.0
	2.0
	1.0
	1.0
	1.8
	0.5
	0.45
	0.4
Phenyl mercury lactate	0.45
Tetra brom orthocresol	0.5
	4.0
	0.25
	0.45

when properly carried out, to rule out the use of those chemicals which would cause dermatitis.

The mildewproofing agents listed in table 1 in the incorporated concentrations given have been found to be skin irritants.

When some of the antimildews named in the table were used on fabrics which were also waterproofed by superimposing a wax, the patch tests were negative because the antimildew did not come in contact with the skin. However, under some conditions of manufacture the workers would have sufficient contact to cause dermatitis when the superimposed waterproofing material was rubbed off after continual friction with the workers' skin, thus exposing them to the action of the antimildew.

TABLE 2—*Substances Remaining in the Leather*

Dyes
Bismarck brown
Amido azo benzene
Amido azo toluene hydrochloride
Chrysoidine
Tanning agents
Chromates
Oak
Sumac
Quercitron
Finishes
Fish oil
Castor oil
Resins

Leather.—Dermatitis among leather workers is not infrequent because of the many primary irritants and sensitizers used in processing the hides to convert them into leather. However, the incidence of dermatitis due to wearing and handling leather goods is small compared to the millions of users. Dermatitis has been reported from hatbands, gloves, wrist-watch straps, pocketbooks, furs and other leather articles.[16]

Many of the chemicals used in processing hides to convert them into leather may be the cause of the dermatitis, but the tanning agents and the dyes have been found to be the most frequent causes of the dermatitis among the wearers and handlers of the finished leather goods. Recently another source of dermatitis among those exposed to the finished leathers has been introduced by the addition of mildewproofing agents to the leather. We have encountered a number of instances of dermatitis due to these chemicals, but as yet leather containing the mildewproofing agents has not been used for a sufficient time by the general public for reports of such cases to have appeared.

The majority of the cases of dermatitis due to contact with leather have been of the allergic type. The sensitizing chemicals may have been dissolved out of the leather by water or perspiration.

The sensitivity may have been acquired by contact with the chemicals in the leather, or the sensitivity may have resulted from previous contact with similar chemicals used in other articles of wearing apparel. The substances remaining in the leather listed in table 2 may be causes of dermatitis.

Antimildews and Fungicides.—We have found leather in which the following chemicals were used as antimildews capable of producing dermatitis: mercapto benzothiozol, tetrabrom ortho cresol, paranitrophenol, pentachlorphenol, salicyl anilid and dihydroxy dichlor diphenyl methane.

14 Antimildews:
Davies, J. H. T., and Barker, A. N.: Textile Dermatitis, Brit. J. Dermat. & Syph. **56**: 33, 1944.

15 Schwartz, L., and Peck, S. M.: The Patch Test in Contact Dermatitis, Pub. Health Rep. **59**: 546, 1944. Sulzberger, M. B., and Wise, F.: The Contact or Patch Test in Dermatology, Arch. Dermat. & Syph. **23**: 519 (March) 1931.

16 Leather
Chargin, Louis: Hatband Dermatitis, Arch. Dermat. & Syph. **26**: 1123 (Dec.) 1932.
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White, P.: Dermatergoses, New York, Paul B. Hoeber, 1928.

Lollar [17] performed patch tests with seven antimildews contained in leather in concentrations of 0.75 per cent and less and obtained reactions from para-chloro-meta-cresol, phenyl mercuri-acetate, ethyl mercuri phosphate and puratized N-5-X (organic mercurial).

Artificial Leather.—Materials designated as artificial leather may be made from cotton fabrics covered by cellulose nitrate and vegetable oils, synthetic resins or rubber solution, or latex may be impregnated into cotton or loosely felted papers or napped soft felted fabrics. In some instances the cotton fabrics are covered with plastics. Sheets of artificial leather may be made from loose fibers and scrap leather which are compressed after mixing with linseed oil. The grains of the different leather are then put on the surface by embossing machines or engraved press plates. Concentrated uncoagulated pastes of compounded latex and fibers are dried, pressed and vulcanized in another process of making artificial leather.

Dermatitis may occur from such artificial leather from the dyes, the resins, the formaldehyde, sulfur, the antitoxidants and other chemicals used in its manufacture.[18]

Shoes.—Dermatitis from shoes has been frequently reported in the literature.[19] A number of instances of dermatitis from the shoe polish have also been observed. Such instances have been more frequently reported in the European literature probably because Americans are not in the habit of polishing their own shoes as much as the Europeans. It is hard to conceive of a dermatitis from the outer leather of the shoes, since there is very little contact with the skin of the foot. The chemicals incorporated in the outer leather would have to go through the backing and through the socks in order to produce a dermatitis

The inner lining of the shoes as well as the backing contains chemicals which may cause dermatitis. The backing of the shoes contains adhesives, antimildews and fungicides. In a number of instances artificial leather may be used on the inside of the shoe.

Furs.—There are many reported instances of dermatitis due to the handling and wearing of furs.[20] While a dermatitis among the wearers of furs may occur from the mechanical friction of the coarse hairs against the skin or to a sensitivity to the unprocessed fur, such occurrences are rare. In the majority of such cases it is due to the dyes and the tanning agents.

Since the nonhairy hide of the pelt is covered by lining, only the fur itself comes in contact with the skin. Thus the chemicals used for tanning and dressing the fur rarely cause dermatitis, especially since they are present in only traces in the hair of the fur.

It is the dyes and the mordants used with them which are applied to the hairs that cause the dermatitis from wearing of furs. It is necessary for the wearer to be sensitized to these chemicals before the garment is worn or to have been sensitized by wearing the garment in order to develop dermatitis. Furthermore, in order to cause a sensitivity the furs must be so poorly dyed that they are leached out by perspiration or moisture. It is possible that, once sensitivity has developed, even a well dyed fur may cause dermatitis.

Paraphenylenediamine has been the chief cause of dermatitis from fur. The other oxidizing dyes, aniline black and ortho amino phenol, may also cause it. The chrome mordants are also possible etiologic factors.

Paraphenylenediamine is a white crystalline substance which itself is comparatively nonirritant. In using it for a fur it must be oxidized. The first oxidation product is said to be quinone diamine, which is an unstable compound capable of producing local irritation of the mucous membranes. This chemical is said to be the actual cause of dermatitis from paraphenylenediamine. Further oxidation results in the formation of a chemical known as Bandrowski's base, which is not yet the final black oxidation product but is not supposed to be irritant.

The reduction of the incidence of dermatitis among the users of furs is in the hands of the dyers. In recent years they have been aware of this fact and have processed the furs with greater care so that now we rarely see reports of cases. The preventive measures used by the dyers include the use of weak solutions of the dyes frequently applied or applied for longer periods rather than concentrated solutions for short periods, the careful oxidation of the dye and the thorough removal of excess or unoxidized dyes by washing and drumming.

Jewelry.—Dermatitis produced by jewelry has been reported.[21] In most instances it was due to metallic jewelry, but dermatitis can occur from some of the modern jewelry made from various plastics and other materials. Cases of dermatitis from earrings, necklaces, lockets, watches and spectacle frames have been reported.

Most of the reported cases of dermatitis from metallic jewelry have been attributed to the nickel. Such cases of nickel sensitivity have been found among the wearers of watches and spectacle frames made of nickel alloys, among which is the so-called white gold.

17. Lollar, R. M.: Report on a Study and the Development of a Mold Resistant Treatment for Leather, J. Am. Leather Chemists A. **39**: 12, 1944.

18. Artificial leather.
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19. Shoes:
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20. Furs:
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21. Jewelry:
Bonnevie: The Interpretation of Patch Tests in Nickel Eczema Reports, 9 Kongress d. Nordesch. Dermat. Vereins, Copenhagen, April 10, 1935.
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Higoumenakis, G. C.: Contribution to the Study of Dermatitis Due to Jewelry, Rev. franç. de dermat. et vénéreol. **11**: 211, 1935.
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Rabeau, H., and Ukrainczyk: On the Intolerance to the Nickel Cobalt Group, Bull. Soc. franç. de dermat. et syph. **45**: 1872, 1938.
Frank, H.: Occupational Eczema in Watch Makers, Schweiz. med. Wchnschr. **1**: 232, 1936.
Schwartz, L., and Tulipan, L.: Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, p. 635.

Schwartz and Tulipan report sensitization to platinic oxide in a worker handling this material, but we have been unable to find any instances of dermatitis in the literature from the wearing of platinum jewelry.

Andrews shows a photograph with the legend "dermatitis from chromium wrist watch." No particulars as to the exact cause of the dermatitis are given.

Feathers.—Contact dermatitis from feathers in wearing apparel is a rarity, since most of the wearing apparel made from feathers is used as ornaments on hats or other objects and there is but little contact with the skin. In the past, contact dermatitis due to feathers has been reported mainly among children who had contact with the feathers in pillows and bedding.[22]

DIAGNOSIS

Dermatitis from wearing apparel is not difficult to diagnose. The eruption begins at the place of contact with the offending material, usually five days or more after the garment has been worn. This is the period of incubation for the sensitivity to be established. The eruption may appear sooner if the person is already sensitive to the chemical in the wearing apparel which causes the dermatitis. The eruption is usually confined to the areas of the skin touched by the offending material. In exceptional cases, however, a generalized eruption may be present and sometimes systemic symptoms such as elevation of temperature may accompany the dermatitis.

It is recommended that the following facts be ascertained in order to make an etiologic diagnosis:

1. When did patient buy the wearing apparel?
2. From what firm?
3. Date when wearing apparel was first worn.
4. Date when eruption began.
5. What parts of body were first affected?
6. Extent of eruption.
7. Description of eruption.
8. What previous skin diseases?
9. Has the patient any history of allergy of the skin or the mucous membranes?
10. Were any drugs taken before the present eruption?
11. Did the patient come in contact with poison ivy or other irritant plant before the present eruption?
12. Is the eruption still present?
13. How long after the patient stopped wearing the apparel did the eruption persist?
14. Were patch tests performed? Give details and results.
15. Has the actual chemical in the wearing apparel causing the dermatitis been discovered?
16. What method was employed for determining the actual chemical causing the dermatitis?
17. Give the basic facts on which the diagnosis of dermatitis from wearing apparel was made.
18. What treatment was given?
19. Prognosis.

PATCH TEST

The patch test, properly carried out and interpreted, is the most practical method for demonstrating the actual cause of a contact dermatitis.[23] It has been recently used by manufacturers to determine the possible skin irritating or sensitizing properties of wearing apparel containing new chemicals before placing them on sale to the public.[15]

Technic of the Patch Test.—Before an attempt is made to describe the methods used for patch testing, clear distinction must be made between substances which are primary skin irritants and those which will be called sensitizers. It is obvious that a concentrated solution of a strong acid or alkali will burn or inflame any skin, the degree of injury depending on the concentration of the irritant, the amount applied, the duration of its action and the area to which it is applied.

A group of dermatologists acting as consultants to the Public Health Service have defined a primary skin irritant as follows:[24]

A primary cutaneous irritant is an agent which will cause dermatitis by direct action on the normal skin at the site of contact if it is permitted to act in sufficient intensity or quantity for a sufficient length of time.

Many chemicals which are primary irritants are also sensitizers, for instance, formaldehyde, alkaline bichromates, mercuric salts and phenols.

It is obvious that patch testing with strong concentrations of known primary irritants will result in reactions on any skin. This does not mean that patch tests should not be performed with dilute solutions of chemicals which in strong concentration are primary irritants. There are published lists of concentrations of chemicals which dermatologists have used to determine hypersensitivity; these concentrations, together with the time they are to remain on the skin, are recommended in an attempt to avoid the primary irritant action of the chemical.

The chemicals which are not primary irritants are responsible for the great majority of cases of contact dermatitis caused by wearing apparel, cosmetics, ornaments and the like. They induce a specific skin allergy and thus cause dermatitis.

They may be called sensitizers and were defined as follows by the group of consultant dermatologists:[24]

A cutaneous sensitizer is an agent which does not necessarily cause demonstrable cutaneous changes on first contact but may effect such specific changes in the skin that, after five to seven days or more, further contact on the same or other parts of the body will cause dermatitis.

Substances which are only sensitizers need not be diluted for patch test purposes.

The patch test when used for diagnostic purposes consists in applying a small portion of the suspected substance to a site of normal skin of the patient. This is covered with innocuous impermeable material, which is then sealed to the skin by adhesive plaster. There have been many modifications proposed in order to overcome certain objections.[25]

The diagnostic patch test is performed in the following manner:

22. Feathers:
Peck, S. M., and Soloman, Gustav: Eczema of Infancy and Childhood: I. Contacts as Etiologic Agents, with Particular Reference to Feathers, Am. J. Dis. Child. 46: 1308 (Dec.) 1933.
Peck, S. M.: Eczema of Infancy and Childhood: II. New York State J. Med. 34: 1, 1934.
Vaughn, W. T.: Practice of Allergy, St. Louis, C. V. Mosby Company, 1939.
Herrmann, F.; Sulzberger, M. B., and Baer, R. L.: Penetration of Allergens into the Human Skin, New York State J. Med. 44: 2452, 1944.

23. Patch test:
Downing, J. G.: Legal Aspects of Patch Tests, Arch. Dermat. & Syph. 44: 63 (July) 1941.
Goldman, Leon: Contact Testing of the Buccal Mucous Membrane for Stomatitis Venenata, ibid. 50: 79 (July) 1944.
Rostenberg, J., Jr., and Sulzberger, M. B.: Some Results of Patch Tests, ibid. 35: 433 (March) 1937.
Guild,[25] Rockstad,[25] Schwartz and Peck,[15] Sulzberger and Wise,[15] Consulting Staff.[24]

24. First Meeting of the Consulting Staff of the Dermatoses Investigations Section of the U. S. Public Health Service, Arch. Dermat. & Syph. 45: 1167 (June) 1942.

25. Guild, B. T.: Window Patch Test, Arch. Dermat. & Syph. 39: 807 (May) 1939. Rockstad, Ingvold: Patch Tests, New Modification, ibid. 41: 649 (April) 1940.

With Liquids.—Saturate a piece of four ply gauze ¼ inch square and apply it to uninflamed skin on the arm or back. The liquid from the gauze should not be permitted to trickle from the patch site. For insulation a 1 inch square of nonwaterproof cellophane is used. (Waterproof cellophane consists of regenerated cellulose coated with a water insoluble resin.) This is sealed to the skin with adhesive plaster about 2 inches square. When smaller pieces of adhesive plaster are used, patches are often lost or there is insufficient contact between the test substance and the skin. The reactions which may result from the adhesive plaster are separated from those resulting from the test substance by the uninflamed skin which is in contact only with the cellophane. In performing a number of patch tests, care should be taken to avoid overlapping of adhesive plaster, as this will cause intensification of the adhesive plaster reaction.

With Powders.—In performing patch tests with powders, the powder is placed on a piece of gauze in order to keep the reaction localized. If the gauze is moistened, it holds the powder better than when dry.

With Solids.—When solids insoluble in water are used, it has been found best to dissolve them in a solvent, making a saturated solution, and wetting a piece of gauze with this solution. The gauze is then allowed to dry before being placed on the skin in order to eliminate the action of the solvent. This procedure deposits the precipitated, finely divided substance on the gauze and brings about better contact with the skin.

When the insoluble solid is of a resinous character, the solution may be painted directly on the skin, the solvent allowed to evaporate and the cellophane and adhesive plaster applied. If the resin adheres firmly to the skin, it is not necessary to cover it with the cellophane and adhesive.

It is usually sufficient to leave the patch on for twenty-four hours, but sometimes when patching with low concentrations or with weak sensitizers it may be necessary to leave the patch on for three or four days, but not for more than five days, as the patient may by that time become sensitized to the patch itself. This is especially true of fabrics which contain no strong irritants and to which most people do not react. The reactions should be read not only on the removal of the patches but every day for at least five days thereafter. This is of special importance in testing fabrics. A later reaction indicates a lesser degree of sensitivity than an early reaction.

PATCH TEST WITH ARTICLES OF WEARING APPAREL

Fabrics.—A piece of the fabric about 1 inch square may be left on for two to five days. The reaction should be read each day up to three days after the removal of the patch. Best results are obtained while the dermatitis is still present. If the patch test is positive, the substances incorporated in the material can be ascertained from the manufacturer and tests performed with each of them. If this is not possible, the following procedure can be taken to determine roughly the class of allergens involved:

Soak the fabric in warm, slightly acid water for twenty-four hours to see if the dye bleeds. If it does, the water extract can be concentrated in vacuo and then a patch test can be made with the concentrated dye. In case the fabric is known to be flameproofed, the flameproofing chemical (if soluble in water) is in the solution. If the water extract is colorless, whatever remains after concentration or evaporation is the water soluble finish. Perform patch tests with this.

To remove the water insoluble finish, soak the fabric in ether for a few hours, allow the ether extract to evaporate on a watch crystal and patch test with the residue.

If possible, perform a patch test with the gray goods, i. e. cloth before any dye or finish is applied. This is important to pick up the rare cases of sensitivity to wool, cotton or silk.

Furs.—In patch testing with fur, the test should be carried out with the hairy side of the fur. If it is positive, rub the fur vigorously with a piece of gauze; should the gauze become discolored, the fur is so-called "dirty fur." A patch test should then be carried out with the gauze discolored by the dye. While most cases of fur dermatitis are due to dye, a dermatitis due to fur itself may be found occasionally.

Leather.—The first step in carrying out the patch test is to determine whether the leather is real or artificial. This can often be determined by tearing the leather. To test the leather, moisten a piece about ½ inch square with the patient's own perspiration from the axilla or with a solution approximating the sweat in p_H and patch test in the usual way. A positive patch test indicates a sensitivity to something in the leather.

To determine whether the dye is the cause of the dermatitis, soak a piece of the suspected material in water having the same p_H as perspiration. The material is left in the solution for about an hour and if the dye is dissolved it is said to "bleed." Evaporate in vacuo and patch test with the concentrated dye. If this reaction is negative, the previously positive reaction indicates that there is a sensitivity to the tanning agents or other chemicals which are not easily dissolved out with water.

To test the finishing oils or fats as possible causes of dermatitis, soak the leather in ether for fifteen minutes, pour off the ether into a water glass, evaporate to dryness, smear a piece of gauze with the fatty deposit and apply to the skin.

The other chemicals in the leather can be traced by patch testing with the leather in different stages of manufacture.

If the leather is artificial, the celluloid, rubber, plasticiser, dye or synthetic resin may be dissolved out by a solvent and used for patch tests.

Shoes.—In investigating suspected causes of dermatitis due to footwear, it is useless to patch test with the material on the outside of the shoe.

In investigating a shoe dermatitis, patch tests should be made with the backing. In some instances the leather on the inside of the shoe, such as the tongue, the inner sole and the sock lining, may be the cause of the dermatitis, but rarely if ever the outside leather. The chemical which causes the dermatitis must get through the sock or stocking. Therefore it is worth while to patch test with the sock or stocking (before washing), which should contain the eliciting agent.

Rubber.—In patch testing with sponge rubber, care must be taken to test with both the spongy and smooth surfaces, as in many instances there are differences in reactions obtained from these surfaces.

The dermatitis due to dress shields is often caused by the rubber which they contain; the active irritant is usually the chemical formed on the surface as a result of the acid or vapor cure. Cases of leukoderma in the

axilla have occurred from the antioxidant (mono benzyl ether of hydroquinone) in the rubber portion of the dress shield.

In cases of dermatitis suspected to be caused by elastic girdles, patch tests should be performed with the rubber in the thread as well as with the fabric. The rubber used in girdles is usually made in the same manner as the thin rubber of dress shields.

Jewelry.—In testing with jewelry, first test with the suspected material itself. Articles are rarely if ever made of the pure metal, and even the so-called pure gold and platinum jewelry contains other metals. It is necessary to determine the other metals which make up the alloy and patch test with each metal. In this regard we wish to call attention to the fact that in testing for nickel sensitivity the five cent piece is not a proper material, since it is made of 75 per cent copper and 25 per cent nickel. To test for nickel sensitivity a 5 per cent solution of nickel sulfate should be used. Similarly a one cent piece is not proper metal for testing for a possible copper sensitivity, since a penny in addition to copper contains 5 per cent tin and zinc. All of the silver coins contain 10 per cent copper.

PROVOCATIVE PATCH TEST

When patch testing with a dilute concentration of allergens such as are found in fabrics, the reaction in some cases may be negative even though from the history and by actual exposure the allergen seems to be the precipitating cause. If, however, at the same time the test is performed with the dilute concentration a second patch of a strong concentration is applied, positive reactions will develop at both sites if the actual allergen has been used. We [15] have called this phenomenon the "provocative patch test."

PROPHETIC PATCH TEST

The use of the patch test for the purpose of foretelling whether a substance will or will not produce dermatitis is a recent development and may be called the "prophetic patch test." It was introduced by one of us to determine possible irritant qualities of new chemicals used in the manufacture of wearing apparel, cosmetics or other articles coming in contact with the skin. The patch test is made on 200 or more individuals in the usual way. Since the chemicals or compounds to be tested are new ones, it is presumed that there has been no previous contact with them.

Two series of patch tests are carried out on the same individuals ten to fourteen days apart. The first series of tests would give reactions only with a primary irritant or with people who have been sensitized by previous contact with the chemical. The second series shows the number sensitized by the first series. Experience has shown that even one positive reaction among the second series may indicate that the test substance is a sensitizer which might lead to outbreaks of dermatitis if allowed to be used by large groups of people.

The pieces of material should be at least 1 inch square and allowed to remain on the skin for forty-eight hours. The larger the pieces used and the longer they are permitted to stay on the skin, the more likely we are to approximate actual wearing conditions and the more accurate the results of the test, because the subject is being exposed to larger amounts of the chemical the irritating properties of which are being tested. In a number of instances we have noted failures to induce sensitivity with a small piece of material (¼ inch square) when we succeeded with larger pieces (1 to 2 inches square).

WHEN AND WHERE TO PERFORM PATCH TESTS

The impression seems widespread that patch tests should not be performed while an eruption is still present, because a flare-up of the dermatitis might take place. The period most favorable to a positive reaction is at the time when the dermatitis is still present and active. A relative hyposensitivity may develop when the dermatitis is disappearing or after it has disappeared, with the result that the patch test would tend to be negative. Here too experience and judgment are necessary in choosing the proper time for performing the tests. Obviously when dealing with a patient who has a generalized dermatitis it is better either to wait until the eruption has improved or, if the test is carried out while the eruption is present, to use a low concentration of the suspected chemical.

A generalized eruption following the patch test indicates a high degree of sensitivity. Such eruptions are exceedingly rare. Flare-ups of quiescent eruptions are not uncommon following patch tests. These also indicate high degrees of sensitivity.

In cases of true allergic dermatitis, the skin all over the body is sensitive and patch tests can be applied at any convenient site. The most rapid reaction, all other factors being equal, will take place on the areas of skin where the keratin is thinnest. The thick keratin layer of the palms and soles not only explains the negative patch test which results at these sites but is the main reason why contact dermatitis is only occasionally seen in these locations.

INTERPRETATION AND READING OF PATCH TESTS

It requires considerable experience to interpret reactions to patch tests correctly.

Since the patch test was first employed, gradations of the reaction have been recorded by the symbols 1 +, 2 +, 3 + and 4 +. By this method an erythema on the area of skin to which the chemical was applied is indicated by 1 +, erythema and edema by 2 + and an erythema, edema, papules and a few vesicles by 3 +; erythema, edema, many vesicles and in some cases ulceration are recorded as a 4 + reaction.

The degree of reaction will be greatest at the site of greatest concentration. It is for this reason that weak concentrations of sensitizers must be left on longer. They should be observed for at least five days after the patches are removed. A reaction not present when the patch is removed but which becomes manifest less than five days after the patch is applied is considered a delayed reaction. The delayed reaction indicates that a low degree of specific sensitivity is present or that a weak concentration of the sensitizer was used. To report a patch test reaction properly there should be given (1) concentration of the chemical tests, (2) amount of the chemical used, (3) area of skin contacted, (4) site of application, (5) number of days patch test was left on and (6) periods after removal of the patch on which the readings were made. In this way a more comprehensive appraisal of the reaction in terms of the degree of sensitivity can be made.

The true allergic reaction as a rule increases rather than decreases in intensity for twenty-four to forty-eight hours after the patch test is removed. Reactions of primary irritation with few exceptions tend to subside after the removal of the irritant.

The evaluation of a weakly positive reaction (1 +) depends a great deal on the experience of the one making the patch test. In dealing with a fabric or other substance containing a weak concentration of a sensitizer, a 1 + or 2 + reaction is very significant. This

is especially true in industry, where not only may dermatitis be due to contact with the sensitizer in low concentration but there may be the added factor of friction, with exposure to large amounts of the chemical which is not present in the patch test.

A positive reaction which cannot be reproduced later with the same technic indicates that at the time the patch test was performed the patient was sensitive to the concentration and quantity of the chemical applied. A 1 + reaction which does not persist for twenty-four hours is probably a false positive or is caused by a mild primary irritant, maceration or pressure.

A negative patch test does not necessarily rule out the test substance as a causative agent. The negative reaction might be due to one of three causes: (1) Under the condition of the patch test the actual mechanism which produces the dermatitis is lacking, i. e. patch test does not equal actual conditions of wear, exposure friction, perspiration or the like, (2) the patient is no longer sensitive or (3) the actual sensitizer was not applied.

THE TREATMENT OF HERPES ZOSTER BY PARAVERTEBRAL PROCAINE BLOCK

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A recent discussion of herpes zoster [1] plainly indicates the unreliability of current therapeutic methods but fails to mention the one form of treatment which is likely to provide instantaneous and complete relief from pain. This method, which consists in blocking appropriate sympathetic ganglions with procaine hydrochloride, is not as well known as it should be because to our knowledge it has been described only once in the American literature; the article by Street [2] is a model of clinical writing and deserved wider circulation. However, Rosenak of Budapest [3] had previously reported a larger series of cases. We herein record our experiences with this treatment in 4 cases because we are persuaded that all other methods are obsolete. The total number of cases reported, including our own, is 29 and in only 2 of these was there failure to experience prompt and lasting relief from pain.

REPORT OF CASES

CASE 1.—Mrs. E. M., aged 68, presented a typical and extensive herpetic eruption in the distribution of the second and third left thoracic segments. Large amounts of acetylsalicylic acid and codeine sulfate had given no appreciable relief, and when she was admitted to the hospital on Dec. 19, 1943 she had had virtually no rest for seven days. On December 22, the tenth day of the disease and the sixth day of the eruption, the cervicodorsal and the second and third thoracic sympathetic ganglions on the left side were infiltrated with 1 per cent procaine hydrochloride by means of an anterior approach (fig. 1). Within ten minutes there developed a typical Horner's syndrome with increased warmth and dryness of the skin of the upper part of the back, the axilla, the upper extremity and the inframammary region, pain disappeared completely and no other medication was required. All observers agreed that the vesicles healed much more rapidly than was expected, and by December 27 healing was estimated as 90 per cent complete. There had been no recurrence of pain seven months later.

CASE 2.—L. B., a white man aged 50, had excruciating pain in the left flank and groin for two days before zoster lesions appeared on March 20, 1944. On this day the first, second, third and fourth lumbar ganglions were infiltrated with 1 per cent procaine hydrochloride according to the technic of Ochsner and DeBakey.[4] Some relief was obtained, but we had evidently selected the wrong segments. The following day the eleventh and twelfth thoracic ganglions were similarly injected and thereafter the patient had no more discomfort of any kind. Once again the lesions healed with conspicuous rapidity. Figure 2 shows the lesions on March 23, two days after the second injection. At this time the patient was having no pain whatever.

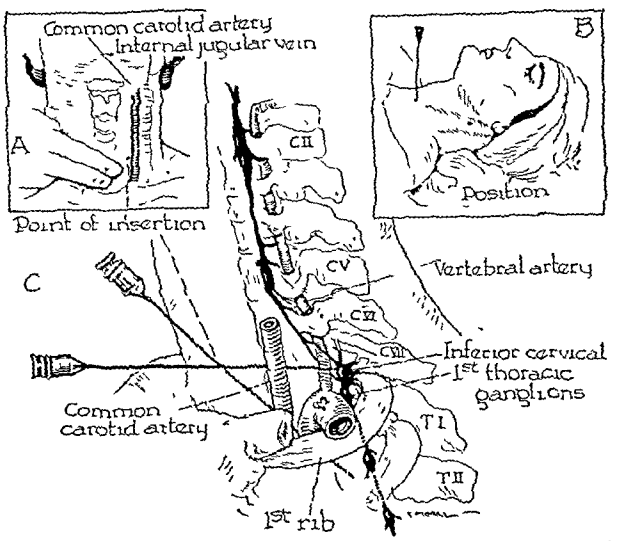


Fig. 1.—Technic of injecting the lower cervical and upper thoracic sympathetic ganglions.

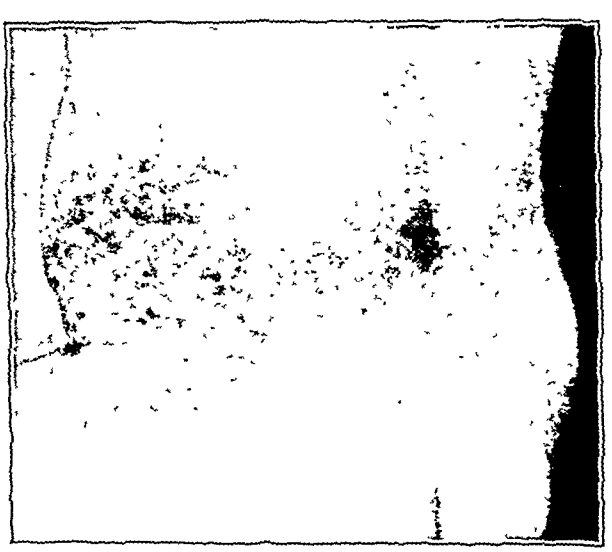


Fig. 2 (case 2).—Lesions forty-eight hours after paravertebral block. At this time the patient was having no pain whatever.

CASE 3.—D. D., a Negro girl aged 7 years, was admitted to Charity Hospital in New Orleans on April 27, 1944 because of a painful herpetic eruption over the left flank and was referred to us by Dr. R. V. Platou. A salve had been previously

From the Sections on Internal Medicine and Surgery, Ochsner Clinic, and the Departments of Medicine and Surgery, Tulane University of Louisiana School of Medicine.

1. Baird, P. C., Jr.: Medical Progress: Herpes Zoster, New England J. Med. **228**: 568-577 (May 6) 1943.
2. Street, A.: Use of Sympathetic Nerve Block in Herpes Zoster, Bell's Palsy, Mississippi Doctor **20**: 480-481 (April) 1943.
3. Rosenak, S.: Procaine Injection Treatment of Herpes Zoster, Lancet **2**: 1056-1058 (Nov. 5) 1938.
4. Ochsner, Alton, and DeBakey, Michael: Treatment of Thrombophlebitis by *Novocain Block* of Sympathetics: Technic of Injection, Surgery **5**: 491-497 (April) 1939; Therapy of Phlebothrombosis and Thrombophlebitis, Arch. Surg. **40**: 208-231 (Feb.) 1940.

applied to the lesions without benefit, and codeine sulfate was given with only slight relief. On April 28 the first, second and third lumbar sympathetic ganglions on the left side were infiltrated with 1 per cent procaine hydrochloride, and complete relief was obtained in ten minutes. The lesions involuted rapidly and by May 12 had almost completely healed

CASE 4.—A. P. L., a white man aged 52, was referred to one of us by Dr. Samuel B. Nadler on Oct. 17, 1944 with the lesions depicted in figure 3; this eruption appeared four days before. On the day of admission an attempt was made to inject the right stellate ganglion according to the technic described. Evidently the needle point was incorrectly placed, because only a fleeting Horner's syndrome developed and the skin of the right side of the face did not become warm and dry. Relief from pain was transitory and incomplete. Forty-eight hours later, however, the injection was repeated with excellent results. From then on he required no analgesics and, when seen a week later, stated that he had had only occasional stinging sensations around the periphery of the zoster eruption and healing was estimated as approximately 75 per cent complete. A third stellate block done at this time afforded satisfactory relief. We think now that more complete relief would have been obtained had the superior cervical ganglion also been injected.

TECHNIC

The technic of sympathetic block is not difficult and is practically without danger if only procaine or allied anesthetic drugs are used and if one is familiar with the anatomy. To block the cervicodorsal and the



Fig. 3 (case 4).—Location of zoster lesions treated by blocking the cervical sympathetic ganglions.

second and third thoracic sympathetic ganglions we prefer the anterior approach. By this method 10 cc. of 1 per cent procaine hydrochloride is used to flood the region of the cervicodorsal ganglions and another 10 cc. to flood the region of the second and third thoracic sympathetic ganglions. The patient is placed in a supine position with the head in the midline and slightly extended. A point is selected two fingerbreadths above the sternoclavicular junction and just medial to the pulsations of the common carotid artery (fig. 1). A 22 gage spinal puncture needle is then inserted straight down, the operator aiming to hit the transverse process of the seventh cervical vertebra. The needle is then withdrawn about 0.25 cm. If no blood is aspirated,

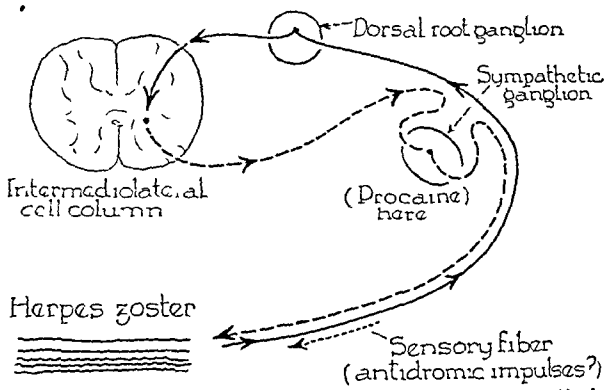


Fig. 4.—Schematic representation of the vicious cycle responsible for segmental vasospasm in herpes zoster.

10 cc. of 1 per cent procaine is injected slowly; the needle is left in place until Horner's syndrome appears; this usually occurs within two or three minutes. The needle is then withdrawn about 1 cm. and directed into the thorax, care being taken to keep it close to the body of the vertebrae near the junction of the transverse process. The region of the second and third sympathetic thoracic ganglions is then infiltrated with 1 per cent procaine hydrochloride.

COMMENT

According to Head and Campbell [5] the essential lesion in herpes zoster consists of an acute inflammatory process involving chiefly the dorsal spinal ganglions together with various degrees of degeneration in the corresponding sensory nerves, dorsal roots and posterior horn cells. This ganglionitis is marked by a round cell exudate, edema, hemorrhage, deterioration of the ganglionic cells and inflammatory changes in the sheaths. The corresponding ventral roots are involved to a much lesser degree, but Bielschowsky [6] found minor changes in the sympathetic chain. The extent of the dermal lesions seems to parallel the intensity of the ganglionitis. Adams [7] has recently reviewed the microscopic picture in detail.

With the location of the primary lesions in mind, it becomes necessary to explain if possible how it is that temporary chemical paralysis of the corresponding sympathetic ganglions, themselves apparently not affected, abolishes pain and promotes healing of the zoster vesicles. The dramatic response to procaine block suggests, of course, that vasospasm must be an important factor, and figure 4 has been constructed to present a tentative hypothesis. Herpes zoster is caused by a filtrable virus closely related to that of chickenpox,[8] although other agents (leukemia, tumor, abscess) are occasionally said to be responsible. In any event the irritative process in the dorsal root ganglion leads to vesicle formation either by peripheral migration of

5. Head, H., and Campbell, A. W.: The Pathology of Herpes Zoster and Its Bearing on Sensory Localisation, Brain **23**: 353-523, 1900.
6. Bielschowsky, cited by Hassin, G. B.: Histopathology of the Peripheral and Central Nervous Systems, Baltimore, William Wood & Co., 1933, chapter 5, pp. 72-73.
7. Adams, R. D.: Pathological Features of Herpes Zoster, Bull. New England M. Center **6**: 12-16 (Feb.) 1944.
8. Goodpasture, E. W., and Anderson, Katherine: Infection of Human Skin, Grafted on the Chorioallantois of Chick Embryos, with the Virus of Herpes Zoster, Am. J. Path. **20**: 447-453 (May) 1944.

the virus itself, as seems likely, or by antidromic stimulation of the sensory nerve. At the same time the cells in the corresponding intermediolateral column are receiving an excessive number of normally directed impulses from the irritated ganglion, a circumstance which results in increased sympathetic vasoconstrictor tone and segmental arteriolar spasm. Local axon reflexes may play a minor role, but the essential point is that procaine infiltration of the sympathetic ganglion interrupts a vicious cycle of nerve impulses. Since it is highly unlikely that the results are due to simple blockage of afferent sensory impulses traversing the sympathetic ganglion on their path to the dorsal root, one must assume that the postinjection hyperemia, however transient, relieves pain by dilution of retained metabolites and enhances dermal healing.

Ranson and Von Hess [9] have shown that a weak stimulus to the proximal end of a cut sensory nerve causes vasodilatation but that when the same nerve is affected by a medium or strong stimulus vasoconstriction is produced. Stricker [10] and others [11] have shown that when the distal end of the severed dorsal spinal root is stimulated erythema occurs. Langley [12] noted that when the distal end of the severed dorsal spinal root was stimulated there appeared a small area of erythema with paleness around it. Clinically similar paleness is noted around the herpetic lesions

We have had no opportunity to employ this method in the management of herpes zoster of the face. Hyndman [13] relieved pain in the distribution of the ophthalmic division of the fifth nerve by ablation of the cervicodorsal ganglion, although section of the posterior root of the trigeminal ganglion had failed to do so. This operation was done on the assumption that all the afferent sympathetic fibers from the "scalp, face and neck enter the central nervous system at or below the first thoracic segment." It should be noted, however, that all of Hyndman's cases were of postherpetic neuralgia and that it seems unlikely that efferent preganglionic fibers to the head leave the cord at this low level. If the theory of segmental vasospasm applies to acute cranial nerve herpes, we would expect anesthetization of the cervical ganglions to be ineffective. Should this prove to be true, Dr. Homer Kirgis has suggested to us that procaine block of the otic and sphenopalatine ganglions might give results

SUMMARY

1. Four cases of herpes zoster have been treated by infiltration of the appropriate sympathetic ganglions with procaine hydrochloride. In each instance relief from pain was instantaneous and permanent and the lesions healed rapidly.

2. Regional sympathetic block relieves herpetic pain by abolishing segmental vasospasm.

3. The technic of infiltrating the cervicodorsal and second and third thoracic sympathetic ganglions by the anterior approach is not difficult.

9 Ranson, S. W., and Von Hess, C. L.: The Conduction Within the Spinal Cord of the Afferent Impulses Producing Pain and the Vasomotor Reflexes, Am. J. Physiol. **38**: 128-152, 1915.

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THE TREATMENT OF PNEUMONIA WITH SULFONAMIDES AND PENICILLIN

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Until recently papers devoted to penicillin therapy have consisted largely of descriptions of the results obtained with this new chemotherapeutic agent, and the interest with which the reports were studied was enhanced by the great scarcity of the antibiotic. Now, however, we are reaching the point at which most descriptions of therapeutic triumphs are merely repetitious rather than informative. The important objective now is to become familiar with the limitations of our new weapon, to gage its usefulness in comparison with the agents it is replacing and to determine the optimal dosage and mode of administration for various diseases. Our purpose in this report is to consider these factors in relation to one of the diseases for which penicillin is most widely used, namely pneumonia.

Of the pathogenic organisms sensitive to penicillin, one of the most susceptible is the pneumococcus. In vitro its growth is completely inhibited by as little as 0.01 to 0.02 unit per cubic centimeter,[1] and in vivo protection tests have repeatedly demonstrated the remarkable ability of penicillin to combat overwhelming pneumococcic infections in mice.[2]

These experimental results have been confirmed clinically in many patients with pneumococcic pneumonia, but the reports have so far consisted mainly of small groups of cases included among presentations of the results obtained with penicillin therapy in general.[3] The one definitive study reported is that of Tillett, Cambier and McCormack,[4] who treated 46 cases of pneumococcic pneumonia, with three deaths. The results in general were excellent, and specific recommendations were made concerning dosage and routes of administration. Eight patients with pneumococcic empyema were also treated successfully with intrapleural penicillin.

One of the striking achievements of military medicine is the reduction in the mortality rate of lobar pneumonia from 28 per cent during World War I to approximately 0.7 per cent during the present war.[5] Many deaths during World War I were of course caused by staphylococcic and streptococcic pneumonias following influenza, but many of these fatalities could have unquestionably

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4 Tillett, W. S.; Cambier, M. J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and [illegible] with Penicillin, Bull. New York Acad. Med. [illegible]

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been prevented had our modern chemotherapeutic agents been available.

The present study is concerned with 255 cases of pneumonia, 175 pneumococcic and 80 primary atypical, occurring in soldiers at a large army post from November 1943 until March 1945. There were no fatalities. It must be pointed out, however, that in addition to chemotherapy at least two other important factors are partly responsible for this absence of deaths in a fairly large series. One factor is the youth, vigor and general good health and nutrition of the soldier, and the other is the short duration of time that is allowed to elapse in soldiers between the onset of symptoms and the institution of therapy.

COMPARISON OF THE RESULTS OF TREATMENT OF PNEUMOCOCCIC PNEUMONIA WITH SULFADIAZINE AND PENICILLIN

Although a control series was not reported, it was the impression of Tillett and his associates [4] that in cases of pneumococcic pneumonia treated with penicillin there was a more abrupt fall of the temperature to normal and more rapid clearing of the x-ray than in sulfonamide treated cases. It seemed particularly appropriate, therefore, to compare the temperature and x-ray, as well as other factors, in two carefully studied groups of soldiers, one treated with penicillin and the other with sulfadiazine.

TABLE 1.—*Incidence of Symptoms in the Patients with Pneumococcic Pneumonia Treated with Sulfadiazine and Penicillin*

	Sulfadiazine (% of Cases)	Penicillin (% of Cases)
Prodromes	44	52
Sudden onset	90	92
Chill	94	82
	94	87
	97	87
Dyspnea	75	90
Vomiting	38	36
Headache	77	90
Herpes	19	6
Cyanosis	40	34

One hundred patients with pneumococcic pneumonia were treated with sulfadiazine from November 1943 until March 1944, and 75 patients with penicillin from March 1944 until March 1945. Data concerning the age, race, length of service, duration of illness, clinical symptoms and signs and laboratory data are presented in tables 1 and 2. The similarity between the two groups in every category is striking and would be difficult to duplicate except in an organization such as the army, in which age, health, nutrition and environmental conditions are well standardized. Slightly greater differences were present in the types of pneumococci isolated from the sputum and in the incidence of bacteremia, as shown in table 3. The higher types occurred a little more frequently, and the incidence of bacteremia was slightly lower in the penicillin treated cases, but judging from the clinical and laboratory findings (tables 1 and 2) this was not reflected in the severity of the illness.

Sulfadiazine was administered in an initial oral dose of 4 Gm. followed by 1 Gm. every four hours for from five to seven days, the average total being 37.5 Gm. in 6.1 days. Penicillin was administered intramuscularly for three or four days, according to seven dosage schedules, the details of which are presented in table 6. No manifestations of toxicity were noted with either drug.

There were no deaths, so that the usual criterion in pneumonia therapy, the mortality rate, could not be used in evaluating the results. The factors which were carefully analyzed were the temperature, white blood cell count, x-ray, sputum, complications, relapses and general clinical response.

TABLE 2.—*Comparative Data on 100 Soldiers with Pneumococcic Pneumonia Treated with Sulfadiazine and 75 Treated with Penicillin*

	Cases Treated with	
	Sulfadiazine	Penicillin
Age		
18 to 25	51%	57.3%
26 to 30	25%	25.5%
31 to 35	13%	8.0%
Over 35	11%	9.3%
Race		
White	74%	70.0%
Colored	26%	30.0%
Duration of service in months		
1 to 3	41%	49.3%
3 to 6	14%	8.0%
6 to 9	5%	6.7%
9 to 12	7%	5.3%
Over 12	33%	30.7%
Duration of illness prior to treatment		
1 day	16%	22.0%
2 days	39%	44.0%
3 days	23%	20.7%
4 days	15%	9.3%
Over 4 days	7%	4.0%
Average initial white blood cell count	19,200	22,000
Lobes involved		
One	67%	71%
Two	21%	22%
Three	10%	7%
Four	2%	0%

A striking observation was made in connection with the temperature response. With sulfadiazine there was a gradual fall to normal during the first twenty-four to forty-eight hours, the average being twenty-six hours. With penicillin, on the other hand, the initial fall to normal was more abrupt, occurring in an average of only eighteen hours. In over half (57 per cent) of the patients receiving penicillin there was then a secondary rise in the temperature to over 100 F., which lasted for several hours; in contrast only 9 per cent of the sulfadiazine treated cases showed a similar secondary elevation. The average time required for the temperature to return permanently to normal, including the secon-

TABLE 3.—*Types of Pneumococci Isolated from the Sputum and Blood*

	Sulfadiazine (100 Cases)		Penicillin (75 Cases)	
Type	Number	(Bacteremia)	Number	(Bacteremia)
I	5	(3)	14	(1)
II	10		2	
III	6		3	
IV	6	(2)	6	
V	12		5	(1)
VI	1			
VII	14	(1)	10	(1)
VIII	9	(1)	4	
IX	2			
X	1		1	
XI	..			
XII	3			
XIII	2			
XIV	2			
XVII	..		2	
XVIII	1	(1)	1	
XX	..		1	
XXI	1			(1)
XXII	..		1	
XXIII	..		2	
XXV	..		1	
XXVIII	..		2	
Total	75 (75%)	(8) (8%)	55 (73.3%)	(4) (5.3%)

dary rise, was twenty-eight hours in the penicillin treated cases, which agrees closely with the twenty-six hour average for the sulfadiazine group. The typical course of a patient treated with penicillin is reproduced in chart 1.

Little difference was noted between the two groups in the time required for the white blood cell count to return to normal (under 10,000) and for complete roentgenographic resolution (table 4). From these figures superiority could be claimed for neither penicillin nor sulfadiazine. The early return to normal of both the white blood cell count and x-ray appearance is undoubtedly due in part to the good general condition of the patients and the short duration of the illness.

In 26 of the patients treated with penicillin, attempts were made daily to isolate pneumococci from the sputum by direct typing and mouse inoculation, and it was found that, although perhaps decreased in numbers, viable, virulent pneumococci could be recovered during and following therapy in every instance for as long as sputum could be obtained.[6] Although the methods used were somewhat different, these observations are essentially in agreement with those of Frisch[7] in sulfonamide treated cases.

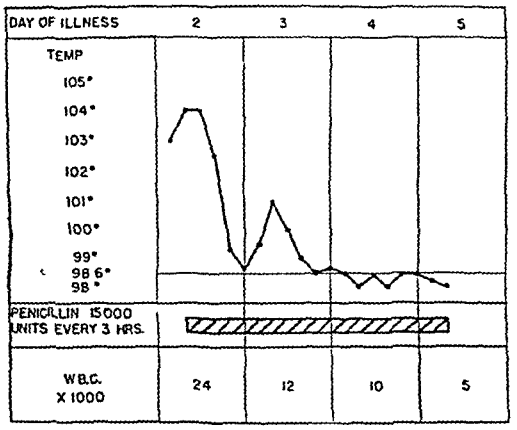


Chart 1.—Typical example of the abrupt initial fall in temperature, with a secondary rise to over 100 F., observed in 57 per cent of patients with pneumococcic pneumonia treated with penicillin.

Complications are listed in table 5. Sterile pleural effusions occurred with approximately the same frequency and severity with the two drugs, and 2 cases of empyema were observed with sulfadiazine, while there were none with penicillin. The 2 instances of spread to another lobe with penicillin both occurred on the second day of therapy, and 1 was questionable because the first x-ray was taken several hours before treatment was begun, so that these changes might have occurred in the interim. With sulfadiazine, however, in 5 cases there was a definite extension to another lobe after the second day of therapy. The 1 case of otitis media occurred two days after penicillin was discontinued in a patient treated for only three days, suggesting that the complication might have been prevented had treatment been continued.

No relapses occurred with sulfadiazine, while with penicillin there were seven. In every instance, however, the dose administered was grossly inadequate. When adequate amounts were administered, clinical relapses did not occur with either drug.

6. These studies of the sputum were made by the Commission on Acute Respiratory Diseases, Fort Bragg, North Carolina, and will be described in detail in a separate publication.

7. Frisch, A. W.: Sputum Studies in Pneumonia, Am. J. Clin. Path. 12:16, 1942.

In both groups there were a number of cases, 10 per cent with sulfadiazine and 4 per cent with penicillin, in which the response to therapy was considerably slower than the average. The temperature and white blood cell count declined slowly over a period of four to six days, and symptomatic improvement was similarly retarded. The clinical course of 1 such patient treated with sulfadiazine is presented in chart 2. The explanation of this lack of an immediate response to therapy is not entirely clear, but in some instances it may have been due to an incorrect diagnosis. It is often difficult to differentiate borderline cases of atypical pneumonia, bacterial bronchopneumonia and pneumococcic pneumonia, and the picture is further confused by the fact that there are probably cases of atypical pneumonia in which there is a secondary bacterial infection. Sulfonamide resistant pneumococci could have been responsible for some of the refractory cases; unfortunately, sensitivity tests were not performed. As far as can be determined, penicillin resistant pneumococci have not been encountered clinically.

TABLE 4.—*Duration of Leukocytosis and X-Ray Infiltration*

	Sulfadiazine	Penicillin
Time required for the white blood cell count to return to normal (below 10,000)		
1 day	14%	6%
2 days	41%	37%
3 days	21%	31%
4 days	6%	2%
Over 4 days	18%	22%
Time required for roentgen resolution		
1 week	28%	34%
2 weeks	41%	35%
3 weeks	13%	11%
4 weeks	18%	22%

DETERMINATION OF MINIMAL EFFECTIVE THERAPEUTIC DOSE OF PENICILLIN IN TREATMENT OF PNEUMOCOCCIC PNEUMONIA

Attempts were made to determine the smallest amount of penicillin which would give satisfactory clinical cures in cases of pneumococcic pneumonia. The cases were divided into five groups, with gradually diminishing amounts of penicillin, as indicated in table 6. The clinical results were good until the total dose was reduced to 60,000 units administered over a three day period. With this amount, in 5 cases there were two clinical relapses and 1 failure to respond to treatment; the other 2 patients showed an excellent response. To illustrate the initial effect of these small doses and the failure to prevent a secondary spread of the infection, the course of 1 of the patients in whom there was a clinical relapse is presented in chart 3. These results are in close agreement with those of Tillett and his associates,[4] who also noted relapses when the amount of penicillin administered was less than

TABLE 5.—*Complications Occurring During and Following Therapy of Pneumococcic Pneumonia with Sulfadiazine and with Penicillin*

	Cases Treated with	
	Sulfadiazine	Penicillin
Sterile pleural effusion	10 cases (10%)	5 cases (6.6%)
Empyema	2 cases (2%)	0
Spread of pneumonia to another lobe	5 cases (5%)	2 cases (2.6%)
Miscellaneous	Fibrinous pericarditis (1 case)	Acute otitis media (1 case)

120,000 units in three days. The relation of these observations to the optimal dosage will be considered in the comment.

THE TREATMENT OF PRIMARY ATYPICAL PNEUMONIA WITH PENICILLIN

It is now well established that the course of atypical pneumonia is not altered by treatment with the sulfonamides.[8] The disease is presumably also refractory to

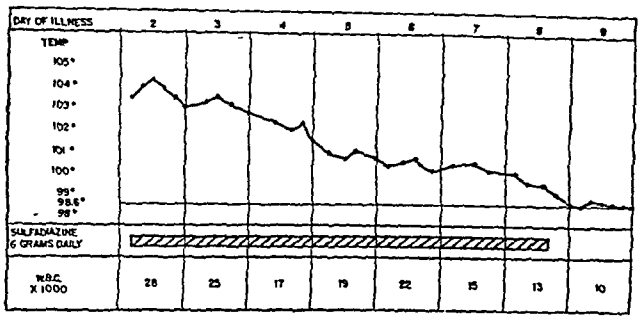


Chart 2.—Patient with the typical clinical picture of pneumococcic pneumonia (type VII) in whom the response to sulfadiazine therapy was much slower than usual.

penicillin, although certain recent evidence casts some doubt on this supposition. Thomas and his associates have isolated from patients a penicillin sensitive nonhemolytic streptococcus which is thought to be closely associated with atypical pneumonia, although a direct etiologic relationship is not claimed,[9] and it is theoretically possible that the action of penicillin against this organism might be of therapeutic value. Further, a more rapid clinical response and fall in temperature in penicillin treated cases than in nontreated patients is described in a recent report from the South Pacific.[10] The author points out, however, that the results cannot be regarded as more than suggestive since the number of cases is small.

Accurate evaluation of therapy in atypical pneumonia is difficult because of the extreme variability in the course of the disease. In single, isolated cases an apparent beneficial effect is often noted with penicillin; the course of 1 such patient who was seriously ill and recovered promptly following penicillin therapy is pre-

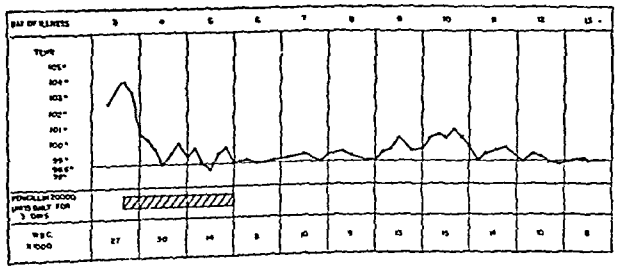


Chart 3.—Clinical relapse in a patient with pneumococcic pneumonia (type XXVIII) who received a total dose of only 60,000 units of penicillin.

sented in chart 4. In view of the natural variations of the disease, no conclusions can be drawn concerning the value of penicillin in this single case. Therapy can be evaluated only by treating a relatively large number of cases and comparing the results with those of suitable controls.

Accordingly, 40 patients with moderately severe atypical pneumonia were treated with penicillin 10,000 to 15,000 units every three hours intramuscularly for three days. The criteria used in selection were (1) duration of symptoms of less than five days, (2) initial temperature of over 102 F., (3) characteristic clinical and roentgenographic picture of atypical pneumonia and (4) initial white blood count under 10,000. Forty cases fulfilling the same requirements were selected for controls, and in both groups the time required for the temperature to return to normal following entry to the hospital was determined. The data and results are presented in table 7. The temperature was elevated for an average of 4.5 days for the treated cases as opposed to 5.2 days for the controls, a difference which cannot be regarded as significant. Further, there was no appreciable alleviation of symptoms or more rapid clearing of the x-ray when penicillin was administered. It can be concluded that penicillin has no beneficial

TABLE 6—*Efficacy of Various Dosage Schedules of Penicillin in Pneumococcic Pneumonia*

Group	Number of Cases	Treatment Schedule	Days of Treatment	Total Amount of Penicillin, Units	Failures or Relapses
		Penicillin in Saline			
1	10	30,000 units I.V.; beginning 1 hour later, 20,000 units every 3 hours I.M for 8 doses; then every 4 hours for 18 doses	4	570,000	0
2	20	15,000 units I.M. every 3 hours for 24 doses	3	360,000	0
3	10	15,000 units I.V.; beginning 1 hour later, 10,000 units I.M. every 3 hours for 23 doses	3	255,000	0
4	10	10,000 units I.M. every 3 hours 4 times daily for 3 days	3	120,000	0
5	5	5,000 units I.M. every 3 hours 4 times daily for 3 days	3	60,000	3
		Penicillin in Beeswax Oil			
6	12	100,000 units twice daily for 2 days, then once daily for 2 days	4	600,000	0
7	8	100,000 units once daily for 4 days	4	400,000	4

therapeutic effect on the course of atypical pneumonia. In seriously ill patients, however, in whom the outcome is uncertain and a secondary bacterial infection might mean the difference between recovery and death, the policy in this hospital is to administer penicillin 10,000 to 15,000 units every three hours intramuscularly until the patient is past the critical stage.

NEWER METHODS OF PENICILLIN ADMINISTRATION

Intramuscular injections of penicillin at frequent intervals (usually every three hours) are painful to the patient and time consuming for the nurse or doctor. Two methods of avoiding these difficulties which show considerable promise, but which are still in the experimental stage, are the intramuscular injection of penicillin-beeswax mixtures[11] and the oral administration of penicillin in various vehicles.[12]

During the last three months of this study, 20 patients with pneumococcic pneumonia were treated in this hos-

8. Primary Atypical Pneumonia: Commission on Acute Respiratory Diseases, Am. J. Pub. Health **34**: 347, 1944.

9. Thomas, L.; Mirick, G. S.; Curnen, E. C.; Ziegler, J. E., Jr., and Horsfall, F. L., Jr.: Studies on Primary Atypical Pneumonia: II. Observations Concerning Relationship of Nonhemolytic Streptococcus to Disease, J. Clin. Investigation **24**: 227, 1945.

10. Short, J. J.: Penicillin in the Treatment of Primary Atypical Pneumonia, U. S. Nav. M. Bull. **43**: 974, 1944.

11. Romansky, M. J., and Rittman, G. E.: Method of Prolonging Action of Penicillin, Science **100**: 196, 1944.

12. McDermott, W.; Bunn, P. A.; Benoit, M.; DuBoid, R., and Haynes, W.: Oral Penicillin, Science **101**: 228, 1945.

pital with penicillin-beeswax mixtures. The concentration of beeswax varied from 4 to 8 per cent, with 100,000 units of penicillin in each cubic centimeter of the mixture. In 12 patients 1 cc (100,000 units) was injected every twelve hours for two days and once daily for another two days, a total of 600,000 units in four days (table 6). The other 8 received 1 cc. daily for four injections, a total of 400,000 units in four days. In 16 of the 20 patients the response to therapy was excellent, in 3 there was a clinical relapse following cessation of treatment and in 1 the pneumonia continued to spread in spite of penicillin-beeswax therapy but responded immediately when, after three days, 15,000 units of penicillin in saline solution was administered every three hours. These four unsatisfactory responses to treatment all occurred in the group receiving 100,000 units once a day only, so that for many hours during each day effective concentrations of penicillin were not present in the tissues. It is of interest that these failures occurred with 400,000 units of penicillin in beeswax and peanut oil, whereas with penicillin in saline solution uniformly good results were obtained with a total of only 120,000 units.

The course of a patient who showed a good response to penicillin-beeswax therapy is presented in chart 5. Assays of the blood and urine are included, demonstrat-

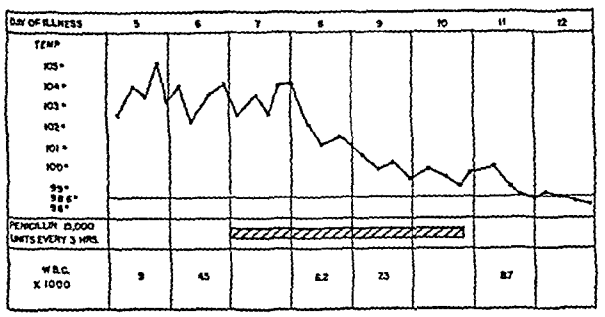


Chart 4.—Patient seriously ill with extensive bilateral primary atypical pneumonia, requiring oxygen therapy, in whom improvement was first noted shortly after institution of penicillin therapy

ing the prolongation of the action of penicillin. The concentrations of penicillin and beeswax in the present preparations are probably not optimal, and in general it may be said that the outlook for obtaining excellent results with one, or at most two, injections daily seems very good.

We have had no experience with oral penicillin in the treatment of pneumonia, but McDermott and Bunn [12] report excellent results A considerable amount is destroyed or lost in the intestinal tract, so that the amount required is several times as large as that needed for intramuscular injections. However, increasing production of penicillin, plus the fact that oral preparations do not need to be as highly purified as those used for intramuscular injections, may soon overcome this disadvantage.

COMMENT

In the present study, results obtained in the treatment of pneumococcic pneumonia with penicillin and sulfadiazine were almost identical, the only differences being a more abrupt fall in the temperature, and fewer instances of extension to another lobe during therapy, with penicillin. It is not to be inferred, however, that penicillin and sulfadiazine are therefore of equal value in the treatment of all cases of pneumococcic pneumonia, for such is not the case. The patients in the present series were vigorous, healthy young adults in whom treatment was instituted early and in whom the response to any adequate therapy should be favorable.

It should be further pointed out that these cases are not comparable to those observed in civilian hospitals,

TABLE 7.—*Comparison of 40 Treated and 40 Untreated Cases of Moderately Severe Atypical Pneumonia with Penicillin*

	Untreated	Treated
Average duration of symptoms prior to admission	3 7 days	3 2 days
Average initial white blood cell count	8,800	9,700
Average initial temperature	102 4	102.1
Average days of fever	5 2	4 5

in which the lower types of pneumococci predominate and in which the incidence of bacteremia is much higher than the 5 to 8 per cent in the present series. The absence of deaths is also difficult to evaluate in view of the likelihood that in this group of healthy young adults the mortality rate would have been relatively low with no specific therapeutic measures whatever. A final word of qualification should be added concerning the diagnosis, which is, as pointed out previously, admittedly difficult in borderline cases seen early in the course of the illness, even with the criteria of chills, fever, pleuritic chest pain, rusty sputum, leukocytosis, x-ray infiltration and, in most instances, isolation of pneumococci from the sputum.

The important conclusion to be drawn, then, is that since adequate doses of either drug will produce an

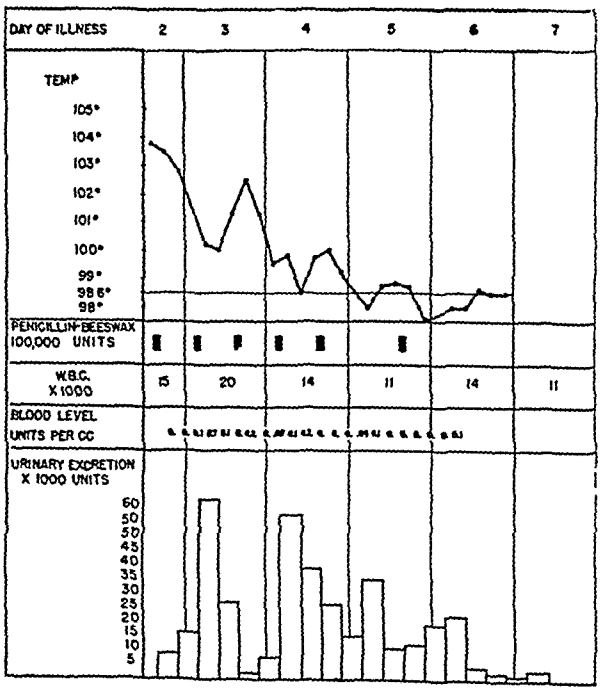


Chart 5.—Response of a patient with pneumococcic pneumonia (type I) to penicillin-beeswax therapy. Assays of the blood and urine are included.

equally satisfactory and, indeed, almost identical response, the lower cost and greater ease of administration may make sulfadiazine the drug of choice for this group of patients. Once the problems of cost and administration are overcome, however, penicillin will be favored because of its lack of toxicity and the probability that penicillin resistant strains of pneumo-

cocci will be encountered rarely if at all, whereas with the sulfonamides resistant strains occur in 2 to 6 per cent of the cases.[13]

Patients seriously ill with pneumococcic pneumonia should be treated with penicillin because of its greater antibacterial action. No large series is yet available, but from the dramatic results obtained in isolated cases [3] there is every reason to believe that the mortality rate of 6 to 10 per cent in civilian hospitals with the sulfonamides may be significantly reduced by penicillin. In addition to its use for patients seriously ill with pneumococcic pneumonia, penicillin is also the drug of choice at the present time for (1) patients sensitive to the sulfonamides, (2) patients with renal damage, (3) pneumonias caused by sulfonamide resistant pneumococci, (4) pneumonias in which the etiologic organism is the staphylococcus or beta hemolytic streptococcus and (5) complications of pneumococcic pneumonia, including empyema, meningitis and endocarditis.

Whether penicillin and sulfadiazine should ever be given together is questionable and involves the highly controversial subject of the possible synergistic action of penicillin and the sulfonamides. It is agreed that the action of the two together is greater than that of either one alone; the dispute centers about whether the resultant action is merely additive,[14] or whether the two combine to produce an action greater than that of the sum of the two separately, i. e., true synergism.[15] We favor the former view and are of the opinion that the bacteriostatic action of the concentrations of penicillin used clinically is so great that no significant difference is produced by the concomitant administration of a sulfonamide. This subject is reminiscent of the sulfadiazine plus antipneumococcus serum controversy, and the result is likely to be similar; in the end penicillin will probably be used alone.

Among the most important points brought out in the present study are the observations concerning the relationship between the mechanism of recovery in pneumococcic pneumonia and the proper therapeutic dose of penicillin. The presence of viable, virulent pneumococci in the sputum during and following therapy indicates that, similar to the sulfonamides, the action of penicillin is, broadly speaking, merely to inhibit the growth of the organisms and localize the infection. Actual recovery is brought about by the body's own defense mechanisms, the so-called "immunologic crisis" occurring usually about the sixth to the eighth day after the onset of the illness. Therefore it is important with penicillin, as with the sulfonamides, to administer treatment during most of this period in order to prevent a spread of the infection. As long as adequate amounts are given, the duration of treatment is more important than the size of the individual dose; for example, it is more rational to give 10,000 units every three hours for six days than 40,000 units every three hours for three days. This point is well illustrated by the complete absence of clinical relapses in the 100 cases treated with sulfadiazine for an average of 6.1 days. The results with penicillin are not strictly comparable, since the 2 failures to respond to treatment and the 5 clinical relapses were probably due more to inadequate doses of penicillin than to discontinuing therapy too soon. When adequate doses (120,000 units or more) were administered, three days of treatment gave excellent clinical results in these moderately severe cases. From our knowledge of the mechanism of recovery, however, it would certainly seem that, at least in seriously ill patients, treatment with penicillin should ideally be continued for five or six days. In order to conserve penicillin and to allow the patients to sleep through the night, penicillin is often administered only four times a day, allowing a period of almost twelve hours during which, for all practical purposes, no penicillin is present in the tissues. This scheme, first employed in pneumonia by Tillett and his associates,[4] has also been used in the present study and is unquestionably effective in many cases of lobar pneumonia. In the more severe cases, however, treatment should be given every three hours night and day, and the total duration of therapy should be at least five days. Specific treatment schedules which can be recommended are as follows: for moderately severe cases, 10,000 to 15,000 units every three hours four times a day for four to five days, and for seriously ill patients 15,000 to 20,000 units every three hours night and day for five or six days. Of course, if the temperature has not returned to normal and the patient has not shown an adequate clinical response, more prolonged treatment may be necessary.

With the newer methods of administration, penicillin-beeswax mixtures intramuscularly and oral penicillin, it may be possible to maintain an effective concentration of penicillin in the blood stream throughout the period of treatment. Although there are certain theoretical advantages to intermittent therapy, no convincing evidence has appeared to challenge the view that, as with the sulfonamides and other chemotherapeutic agents, the best results are likely to be obtained with a continuous effective blood level. For this reason, and because of the greater ease of administration, the present intermittent therapy will probably soon be replaced by these newer methods.

SUMMARY AND CONCLUSIONS

1. A study of the results obtained in 100 cases of pneumococcic pneumonia in soldiers treated with sulfadiazine and 75 treated with penicillin revealed that the response in the two groups was almost identical, the only differences being a more abrupt fall in the temperature, and fewer instances of extension to another lobe during therapy, with penicillin.

2. In studies designed to determine the minimal effective therapeutic dose of penicillin, 10,000 units four times daily for three days intramuscularly produced clinical cures in every instance, but with smaller doses there were relapses and failures to respond to treatment.

3. The clinical course of 40 patients with moderately severe primary atypical pneumonia, as compared with 40 controls, was not altered by treatment with penicillin.

4. Of 20 patients with pneumococcic pneumonia treated with penicillin-beeswax-peanut oil mixture, 12 made an uneventful recovery following six injections of 100,000 units (1 cc.) given over a four day period. Of the other 8 who received four injections of 100,000 units (1 cc. daily) over a four day period, 4 made an uneventful recovery, 1 failed to respond to treatment, and in 3 there were clinical relapses when treatment was discontinued.

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Clinical Notes, Suggestions and New Instruments

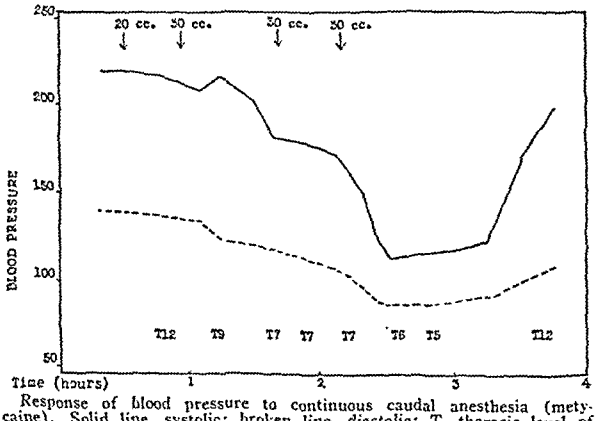
CONTINUOUS CAUDAL ANESTHESIA AS A TEST IN THE SELECTION OF HYPERTENSIVE PATIENTS FOR SYMPATHECTOMY

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The various methods now employed in the selection of patients for thoracolumbar sympathectomy appear to be unsatisfactory. Certainly no single test has been used which is capable of yielding reliable data as to whether or not sympathectomy will favorably influence hypertension. As the hypertensive state in man "appears to be the result of a number of different factors joining together in an infinite variety of combinations," careful evaluation of the neurogenic component seems essential for a decisive answer to the problem of selection. The sodium amytal, sodium nitrite and cold pressor tests have been found of limited prognostic value in relation to surgery, since they provide an inaccurate index of "sympathetic tone." Thus, poor results have been reported in many cases in which these tests had forecast a favorable outcome.

The observations of Hingson and Edwards,[1] as well as our own,[2] have convinced us that continuous caudal anesthesia may be effectively employed to produce functional denervation of the splanchnic vascular bed similar to the anatomic sympathetic block of the Smithwick operation. Furthermore, if the effects of the two procedures are strictly comparable the caudal anesthesia test might prove of value in identifying those patients who will respond to surgical sympathectomy with a favorable fall in blood pressure.

Accordingly, continuous caudal anesthesia with use of a 1.5 per cent solution of metycaine was carried out on 25 hypertensive patients. The upper level of skin anesthesia was maintained in the region of the fifth or sixth thoracic segments. By this means transient nerve block was obtained of strikingly similar distribution to that more permanently secured by surgical sympathectomy. Eighteen of the 25 patients so studied showed an appreciable fall in blood pressure to normotensive or hypotensive levels, the response suggesting a "neurogenic"



Response of blood pressure to continuous caudal anesthesia (metycaine). Solid line, systolic; broken line, diastolic; T, thoracic level of anesthesia.

origin of the hypertension, as shown in the accompanying chart. In 7 patients there was little or no alteration in the blood pressure as the result of this test, implying a humoral origin of the hyperpiesia ("essential" hypertension).

Lumbodorsal splanchnicectomy was performed according to the Smithwick technic on 5 of the "neurogenic" hypertensives and on 2 of the "essential" hypertensives. The caudal anesthesia test appeared to predict accurately the outcome in all 7 cases. Furthermore, the levels of blood pressure obtained under caudal anesthesia showed a striking correlation with the blood pressure readings following surgical sympathectomy, as shown in the table.

Results of Studies

Case	Age	Blood Pressure * Before Test	Blood Pressure * Caudal Test	Blood Pressure * Post-operative †	Comment
1	44	200/130	140/ 90	136/ 90	Grade 3 eyegrounds; normal cardiac and renal functions
2	42	230/126	140/100	150/ 94	Grade 2 eyegrounds; normal cardiac and renal functions
3	21	200/140	163/128	180/130	Grade 4 eyegrounds; early congestive heart failure, poor kidney function
4	36	180/130	90/ 70	96/ 62	Grade 1 eyegrounds; normal cardiac and renal functions
5	46	160/110	176/110	184/108	Grade 1 eyegrounds; normal cardiac and renal functions
6	45	210/130	136/ 86	140/ 92	Grade 2 eyegrounds; normal cardiac and renal functions
7	47	220/140	120/ 84	126/ 90	Grade 2 eyegrounds; normal cardiac and renal functions

* All pressures were measured with the patient lying down.
† Postoperative follow-up was one to six months.

The method appears to be safer than high spinal anesthesia and is more easily controlled. No significant untoward reactions were encountered. It is hoped that other clinics will undertake to evaluate this test further.

A CASE OF HEMOLYTIC ANEMIA RELIEVED BY REMOVAL OF AN OVARIAN TUMOR

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West-Watson and Young [1] in 1938 reported an instance of hemolytic anemia being relieved after removal of a dermoid cyst of the ovary with simultaneous removal of the gallbladder. A splenectomy performed four months before had been without benefit. They felt that removal of the ovarian tumor was responsible for relief rather than removal of the gallbladder, since cholecystectomy, which is performed frequently in hemolytic anemia, apparently does not affect the hemolytic process.

In 1939 Watson [2] reported a case of hemolytic anemia in a 17 year old girl which was not relieved by removal of an ovarian cyst (type not stated) but relief followed splenectomy.

Singer and Dameshek [3] described in 1941 a patient with a hemolytic anemia not benefited by splenectomy but relieved by removal of a dermoid cyst of the ovary six months after splenectomy.

We have recently observed a woman with a similar type of anemia who had cessation of a hemolytic process following removal of an ovarian tumor. At the same operation much of the small intestine was freed from a capsule of fibrous tissue.

REPORT OF CASE

Mrs. C. B., a white woman aged 35, a nurse, first seen at Vanderbilt University Hospital in January 1942, complained at that time of pain at various sites, mostly of the extremities, and of a widespread, painful, erythematous skin eruption. Pain in the calves of her legs had begun four years previously; skin lesions had appeared two years previously, and for one year the patient had had swelling of her face. For six months her hands and forearms had been turning blue and became painful on exposure to cold. There had been no loss of weight.

Dr. Homer L. Skinner performed the surgical operations.
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From the Cardiovascular and Surgical Services, U. S. Marine Hospital, Staten Island, N. Y.

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From the Department of Medicine, Vanderbilt University School of Medicine.

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In 1939 she had a spontaneous abortion at six weeks gestation; one year later an eight months pregnancy terminated in stillbirth. No information about the fetuses was available. For the previous year menstrual flow had been diminished in amount.

Physical examination on the first visit to this hospital showed her to be well nourished. There was a brownish pigmentation of the skin of the cheeks, neck and anterior axillary folds. There was a fusiform swelling of the fingers, and the overlying skin was shiny and atrophic and in areas was adherent to underlying tissue. There was a blotchy, red discoloration of her hands with focal areas of depigmentation. There was moderate periorbital edema. The thyroid isthmus and right lobe were diffusely enlarged. The heart and lungs were normal. Tenderness was pronounced in the muscles of the arms but was less severe in the muscles of the shoulder girdle and forearms. There were no further significant physical findings. The red blood cell count was 3.63 million per cubic millimeter, with 12 Gm. of hemoglobin per hundred cubic centimeters. The white blood cell count was 5,400 per cubic millimeter, with a normal differential count. The sedimentation rate was not increased. The urine was normal, and an electrocardiogram showed nothing abnormal. Fluoroscopy of the chest revealed no abnormality. Total serum protein was 7.19 Gm. per hundred cubic centimeters, with albumin of 4.33 Gm. and globulin of 2.86 Gm. per hundred cubic centimeters. Basal metabolism rates on two occasions were within normal limits. A diagnosis of dermatomyositis was made at that time.

Late in 1942 the patient was admitted to the Mayo Clinic, where the diagnosis of dermatomyositis was confirmed by muscle biopsy. There she was given "oxygen therapy," wheat germ oil, intravenous typhoid vaccine and a high caloric, high vitamin diet, all without benefit. She was then given sulfathiazole but developed a rash, nausea, edema and fever, so this drug was discontinued.

She was able to continue her work as a nurse until October 1942, when weakness and pain forced her to stop. Three months later she resumed work but had to stop again after six weeks. Throughout 1943 there was gradually increasing disability. In November 1943 her abdominal wall became covered with large vesicles which coalesced, followed by extensive exfoliation.

In January 1944, while in Ohio, she developed acute abdominal distention with nausea and vomiting and was admitted to a hospital, where a diagnosis of intestinal obstruction was made. This was treated by Wangensteen suction, rectal tube and parenteral fluids with gradual relief. She lost 17 pounds (8 Kg.) during a twenty-six day stay in that hospital. She was given one whole blood transfusion from her husband (both being type A) and had a chill. She believed she was jaundiced following this but was not certain. It is not known whether she was anemic at that time. A pelvic mass was felt and was thought to be the cause of the obstruction. She returned to Nashville and was admitted to a local hospital for consideration of operation. There she was found to be emaciated, weak and quite pale. A plain film of her abdomen showed what were apparently gallstones and what was interpreted as enlargement of the left kidney. On admission her red blood cell count was approximately 3 million, with 5 Gm. (?) of hemoglobin. Her reticulocyte count ranged from 8 to 10 per cent. She was given three transfusions of whole blood, with increasingly severe reactions. She became jaundiced after each transfusion, with much nausea and vomiting. Approximately one month after that hospital admission her red blood cell count had fallen to 1.75 million, with a hemoglobin of 5 Gm. She had become greatly debilitated.

It was suspected at that time that she was Rh negative. Such was the case and her husband was found to be Rh positive. She was then readmitted to Vanderbilt University Hospital.

On admission to this hospital on April 11, 1944 the patient appeared chronically ill. Her skin showed the changes of dermatomyositis. The skin and buccal mucous membranes were decidedly pale, as were the scleras, retinas and nail beds. The scleras showed a slight icteric tint. To the right of the umbilicus was a palpable, rounded, tender mass. This was found only intermittently; at times the abdomen was quite flat in this region. On pelvic examination another mass was felt which was thought to be a uterine fibroid.

On admission her red blood cell count was 2.04 million, composed largely of spherocytes; the white blood cell count was 5,500, with a normal differential; hemoglobin was 7.5 Gm.

Urine and stool examinations were essentially negative. A reticulocyte count on admission was 2.6 per cent and one week after admission was 20 per cent. The icterus index was 27.

Blood was sent to Dr. Louis K. Diamond of the Blood Grouping Laboratory in Boston, where confirmation of Rh negativity was obtained. At the same time it was found that her serum agglutinated not only group O, Rh positive cells but also group A and group O, Rh negative cells. It was demonstrated that cold agglutinins were not present. The nature of these panagglutinins has not been determined to date.

Course in Hospital

Date	Red Cells in Millions	Hemoglobin in Grams	White Cells	Reticulocytes, %	Packed Cell Volume, %	Fragility Test (Saline) Hemolysis Begins	Fragility Test (Saline) Hemolysis Completed
1/20/42	3.63	12	5,400	..	39		
2/../44	3.00	5	.....	8-10			
Three transfusions, with reactions							
3/../44	1.75	5					
Found to be Rh negative and transferred to Vanderbilt Univ. Hospital							
4/ 8/44	2.04	7.5	5,500				
4/10/44	2.09	6	.....	2.6			
					Patient	0.52%	0.38%
					Control	0.46%	0.38%
4/12/44	....	6.8					
4/13/44	....	...	.....	20			
4/14/44	....	7					
4/16/44	....	...	.....	..			
4/17/44	2.35	6.6					
4/18/44	1.93	5.8	.....	20			
4/19/44	2	6					
4/21/44	2.29	6.5					
4/25/44	2	5	8,000				
4/28/44	1.76	5	14,500				
5/ 3/44	2.6	5.8	13,000	..			
5/ 5/44	2.45	5.8	16,500				
Removal of intestinal obstruction and extirpation of ovarian cyst							
5/ 6/44	1.9	5.4					
5/ 8/44	1.78	4.5	3,800	9			
5/11/44	2.25	...	.....	3.2			
5/12/44	2.40	5.5	.....	4			
5/14/44	....	...	.....	..	..	0.48%	0.38%
						0.44%	0.38%
5/15/44	2.04	5.6	4,000				
5/18/44	2.77	5	.....	10			
5/20/44	2.84	7.2	5,000	10.2	26		
5/23/44	3.63	7.8	.....	6	27.5		
5/26/44	3.45	7.5	7,800	8.5	27		
5/31/44	3.17	8.5	8,600	3			
Discharged							
6/ 8/44	3.51	9.8	.....	3			
6/21/44	3.43	9.7					
7/ 3/44	3.10	10					
7/19/44	3.46	10.5					
8/ 4/44	3.84	10.5					
8/16/44	2.97	9.5					
8/28/44	3.97	10.8	.....	8.4			
9/18/44	3.46	10	.....	..	32		
11/15/44	3.80	11					
Readmitted							
11/22/44	3.30	11.8	5,000				
11/25/44	3.59	10.8	9,550				
11/29/44	3.60	10	.....	<1	..	0.48%	0.31%
						0.46%	0.31%
12/ 3/44	4.12	9.7	8,900				
12/13/44	3.37	9	10,700				
Discharged							
2/21/45	4.12	12					

Fragility test showed increased fragility of the patient's cells.

Patient: Hemolysis began at 0.52 per cent, complete at 0.38 per cent.

Control: Hemolysis began at 0.46 per cent, complete at 0.38 per cent.

An attempt was made to demonstrate autoagglutinins, but these could not be demonstrated.

Repeated attempts to find compatible blood for transfusions were to no avail, though all cross matching was done with Rh negative blood. Three lots of pooled plasma were found

to agglutinate her cells. Two lots of type A plasma were found to cause no agglutination and she was given 500 cc. of this on successive days. She went progressively downhill, becoming increasingly anemic. Seventeen days after admission the red blood cell count had dropped to 1.93 million, with a hemoglobin of 5.8 Gm.

It was then suggested by Dr. J. K. David that her pelvic tumor might be a dermoid cyst of the ovary in light of the report of Singer and Dameshek. In spite of her extremely poor condition an exploratory laparotomy was advised. This was performed by Dr. L. W. Edwards on May 5, almost one month after admission. When the abdomen was opened a considerable amount of straw colored, mucoid material was found free in the peritoneal cavity. Much of the small intestine was contained in a large fibrous capsule; in addition to this a large right ovarian cystic tumor was found. The capsule was stripped away, the intestine freed and the ovarian cyst removed. During the first five postoperative days, three transfusions of type A pooled plasma, 500 cc. each, were given without reaction. It was noted on the day after operation that one lot of type A plasma which had caused appreciable agglutination of her red blood cells was at that time entirely compatible. During the twenty-six days following operation, without whole blood transfusions, the red blood cell count rose from 1.9 million to 3.17 million and the hemoglobin from 5.4 Gm. to 8.5 Gm. Reticulocytes dropped from 20 to 3 per cent, and the fragility test became normal with hemolysis beginning at 0.48 per cent and completed at 0.38 per cent saline. No spherical red blood cells were seen at that time. On microscopic examination the ovarian cyst was found to be a pseudomucinous cystadenocarcinoma. She was discharged on the twenty-sixth postoperative day much improved.

Following discharge in June 1944 the patient continued to do well except for slight exacerbations of her dermatomyositis. In November she began having severe cramping pains in her legs, which were partially controlled by the use of quinine. Her red blood cell count rose progressively from 3.17 million at discharge to 3.8 million by the middle of November. Her hemoglobin rose from 8.5 Gm. to 11 Gm. and the packed cell volume from 27 to 32 per cent in this period. Reticulocyte counts remained around 3 per cent.

On Nov. 22, 1944 she was readmitted to this hospital thirty-six hours after the onset of severe abdominal pain, distention, nausea and vomiting. A diagnosis of acute intestinal obstruction was made, and she was operated on several hours after admission. A large adhesive band was found obstructing the lower ileum. This was cut, with immediate relief of the obstruction. The intestine at this time was entirely free and appeared normal in color. There were no signs of recurrence of the ovarian tumor. The postoperative course was complicated only by an acute parotitis, which disappeared after the administration of 280,000 units of penicillin over a three day period.

On this admission the red blood cell count was 3.30 million, hemoglobin was 11.8 Gm. and the white blood cell count was 5,000. Reticulocytes were less than 1 per cent. At the time of discharge on the twenty-sixth postoperative day her red blood cell count was 3.37 million, with 9 Gm. of hemoglobin.

Since leaving the hospital she has had considerable pain in her extremities similar to that suffered earlier in the course of her dermatomyositis. On Feb. 21, 1945 her red blood cell count was 4.12 million, with 12 Gm. of hemoglobin.

COMMENT

It appears highly probable that removal of the ovarian tumor in our patient accounted for the improvement of her hemolytic anemia. That removal of the fibrous capsule about much of the small intestine played any part in relief of the anemia seems most unlikely. Granting that some degree of intestinal stasis was caused, any anemia resulting would be expected to be macrocytic in type.[4] The anemia here described was essentially normocytic and normochromic. Many of the red blood cells were spherical prior to operation. This cell type disappeared following operation. It would seem that some material elaborated by the ovarian tumor acted as a hemolysin. According to the concept of Dameshek and Schwartz,[5] spherocytosis with consequent hemolysis resulted from the action of this "hemolysin" on the red blood cells. Although hemolysis was arrested following removal of her tumor, all of her various agglutinins were found by the Blood Grouping Laboratory of Boston to be undiminished three months after operation.

As far as can be determined, ours was the first instance in which removal of an ovarian tumor alone sufficed to effect pronounced improvement in a hemolytic process. Two other reports mentioned record relief of hemolytic anemia following removal of an ovarian tumor when previous splenectomy had been without benefit. There is another report of failure to relieve hemolysis by removing an ovarian cyst with later relief following splenectomy. Thus a possible synergistic effect of spleen and ovarian tumor is suggested in the cases reported by others. However, it is not possible to state that removal of the tumor alone might not have been effective in the cases in which this operation was preceded by splenectomy.

Two of the three tumors here reported were dermoid cysts; the classification of the other tumor was not stated. Broadly speaking, it is possible to regard many ovarian tumors as one-sided developments of teratomas, dermoid cysts being merely one variety. Hence our patient's tumor was possibly of the same type as described by the authors mentioned.

This can be considered an example of a symptomatic hemolytic anemia as has been reported[3] in leukemia, Hodgkin's disease, carcinomatosis and other conditions. Doubtless the anemia seen so frequently in association with various malignant tumors is often of this type. Failure to classify it as such is probably largely due to inadequate study of the blood. It seems futile to speculate on the possible relationships of her tumor and hemolytic anemia to her dermatomyositis and her anti-Rh agglutinins.

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SPONTANEOUS RUPTURE OF THE SPLEEN IN MALARIA

FATAL CASE

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A case report of spontaneous rupture of the spleen during a malarial paroxysm is presented to draw attention to this unusual complication of malaria. The incidence of splenic rupture in malaria is rare. Sporadic cases have been reported from the tropics[1] as complications of chronic malaria or of malignant tertian malaria (Plasmodium falciparum). This case is unusual in that it occurred in New England in a relapse of benign tertian malaria (Plasmodium vivax) which had been of relatively short duration.

REPORT OF CASE

A white man aged 28, a medical technician, was admitted to the A. A. F. Regional Station Hospital, Westover Field, at 4 p. m. on April 22, 1944 complaining of chills, fever and vomiting. His present illness began on April 19, three days prior to admission, with drowsiness, fever, chills and low backache, which the patient attributed to a recurrence of malaria and for which he took 3 grains (0.2 Gm.) of quinine. He was home on furlough at the time and did not think it necessary to seek medical care. The following day he felt better and was able to resume normal activity. On April 21, the day before admis-

From the Laboratory and Medical Services, A. A. F. Regional Station Hospital, Westover Field, Mass.

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sion, he suddenly had a chill and fever and he vomited several times and was brought to the hospital the following day.

This soldier had been stationed on islands in the South Pacific for sixteen months and had returned to the United States in June of 1943. While in the malarious districts he had taken atabrine daily as suppressive therapy and had not had an attack of clinical malaria. About two weeks after returning to this country and after discontinuing the atabrine therapy he had his first attack of malaria and was hospitalized for four weeks. At this time it was discovered that he was unable to tolerate atabrine in large doses. His second attack occurred three months later when he was hospitalized for two weeks. His third relapse was milder and followed in four months. This took place one month prior to his present illness, which was his fourth recurrence in a period of nine months. The past history and family history were essentially negative. He was born and spent his life in New England. There was no history of recent or old trauma to the abdomen or chest.

Physical examination on the afternoon of admission revealed that the patient was well developed and well nourished and did not appear acutely ill. The temperature was 99.8 F. rectally, the pulse rate 80 and the respiratory rate 20. The skin was of normal texture and had a yellowish tint consistent with previous atabrine therapy. The eyes, ears, nose and throat were normal. There was no nuchal rigidity. The thoracic cage was symmetrical, with no respiratory restriction. The lungs were clear to percussion and auscultation. The heart was not enlarged. The heart sounds were of good quality and there were no murmurs present. The abdomen was soft; the spleen was palpable 1 fingerbreadth below the left costal margin and was not tender; the liver was not felt. The external genitalia were normal. Rectal examination was negative. There was no cervical, axillary or inguinal adenopathy. The extremities were normal, with no evidence of arthritis or muscular weakness. Reflexes were physiologic.

Thick and thin blood smears made shortly after admission showed a small number of ring forms and trophozoites of Plasmodium vivax. The red blood cell count was 4.47 million; hemoglobin 88 per cent (Sahli); white blood cell count 6,500, with 69 per cent polymorphonuclears and 31 per cent lymphocytes. The urine was normal.

The patient did not receive any antimalarial therapy that evening. He had a very comfortable night. At 8:50 the following morning he had a shaking chill which was accompanied by vomiting. His temperature rose rapidly, reaching a peak of 106 F. in two hours, and then began to subside. The pulse rate was 110 to 120 and of good quality. He was seen by several members of the medical service, who thought his condition was satisfactory and saw no cause for alarm. At 11:30 a. m. he began to vomit profusely. Shortly thereafter he complained of numbness of his legs, severe epigastric pain and blindness. There was no pain referable to either shoulder. He then went into circulatory collapse, with a cold and clammy skin and an imperceptible pulse. Air hunger soon became evident. There was no rigidity of the abdomen noted. In spite of heroic therapeutic measures the patient died within thirty minutes. The diagnosis of a ruptured abdominal viscus was entertained only in retrospect, after the patient had died.

Autopsy was performed two hours after death. The peritoneal cavity was found to be filled with 2,500 cc. of fresh and for the most part unclotted blood. The source of the massive hemoperitoneum was a rupture of the spleen. The spleen weighed 400 Gm. and measured 15 by 13 by 4 cm. There was a transverse laceration through the capsule across the midportion of the spleen anteriorly. There were no adhesions between the capsule and the under surface of the diaphragm or any of the surrounding viscera. The capsule of the spleen had been dissected free from the underlying parenchyma, from which it was separated by a small amount of fresh soft blood clot. The capsule readily slipped back over the upper and lower poles of the spleen, completely decapsulating the organ. The spleen itself was of an unusually soft, mushy, almost diffluent consistency. There were several small stellate lacerations of the pulp at the lateral border of the spleen. The cut surface was reddish purple and contained large and prominent malpighian corpuscles. The pulp scraped readily. Sections of the spleen were cut with great difficulty, owing to the extremely soft character of the organ. The liver was not enlarged, and the brain showed no gross abnormalities. The only other findings at autopsy were an obliquely patent foramen ovale, cholelithiasis and old healed minimal apical tuberculosis.

Histologically the spleen and liver showed a considerable increase in reticuloendothelial cells, many of which contained small amounts of brown pigment. The spleen showed a relative decrease in the number of trabeculae, and the cells of the splenic pulp were widely spread apart. There was a small amount of hemosiderin in macrophages about a few of the blood vessels in the brain. No intact malarial parasites could be demonstrated on the sections, and there was no histologic evidence in any of the viscera of plugged or thrombosed capillaries.

COMMENT

The presence of a large number of American troops in regions of the world where malaria is hyperendemic has focused attention on this disease as a leading military and medical problem. The return of thousands of men to this country and their discharge into civilian life will make malaria a disease to be seriously considered in differential diagnosis, even in those parts of the country where malaria was previously rare or nonexistent. The preponderant number of cases of recurrent malaria that are seen in this country are due to Plasmodium vivax. It is worthy of note that malaria due to Plasmodium vivax, commonly referred to as "benign tertian" malaria, may give rise to serious and fatal complications.

Spontaneous rupture of the spleen is not a commonly encountered condition. In a recent review of the literature Zuckerman and Jacobi [2] cite 21 cases of spontaneous rupture of the normal spleen without a history of antecedent trauma. Spontaneous rupture of the diseased spleen is more common [3] and may occur in active cases of typhoid or malaria. It may also occur in any of the diseases causing splenomegaly, such as leukemia, Banti's syndrome or kala-azar. Spontaneous rupture of the spleen has been reported by Ziegler,[4] King [5] and Friesleben [6] in the acute phase of infectious mononucleosis. In the 3 cases which Ziegler reports there was one death; 2 patients were saved by surgical intervention.

Rupture of the spleen in malaria, while it has been reported, is nevertheless an uncommon complication. The increasing incidence of malaria in this country may bring an increase in the frequency of this disastrous complication. It is only by an awareness of its occurrence and an alertness on the part of medical personnel in recognizing and promptly initiating heroic surgical procedures that a fatal outcome can be averted.

The etiologic factors in spontaneous rupture of the spleen when no definite history of trauma can be elicited are speculative. The rupture may be due to minor trauma overlooked or forgotten by the patient. Other etiologic possibilities may be sudden increase in intra-abdominal pressure attendant on violent straining, coughing, sneezing or vomiting. An unrecognized source of trauma may be overzealous palpation of the abdomen during physical examination. The extremely soft mushy spleen that is encountered in acute malaria may be especially vulnerable to these minor stresses. Caution is therefore urged in palpating the abdomen and especially in palpating for the spleen in acute malaria.

The symptoms of acute splenic rupture are those due to irritation of the peritoneal surfaces by the extravasated blood and those due to blood loss. The first group of symptoms manifests itself by sudden pain in the epigastrium or left upper quadrant or by referred pain in the left shoulder. In the 21 cases reported by Zuckerman and Jacobi,[2] vomiting occurred in 12. It was a prominent feature in our case. The second group of symp-

2. Zuckerman, I. C., and Jacobi, M.: Spontaneous Rupture of the Normal Spleen, Arch. Surg. 34: 917 (May) 1937.

3. Dudgeon, H., Jr.: Spontaneous Rupture of the Spleen, South. M. J. 34: 1247 (Dec.) 1941.

4. Ziegler, E. E.: Infectious Mononucleosis: Report of a Fatal Case with Autopsy, Arch. Path. 37: 196 (March) 1944.

5. King, R. B.: Spontaneous Rupture of the Spleen in Infectious Mononucleosis, New England J. Med. 224: 1038 (June 19) 1941.

6. Friesleben, M.: Splenectomy for Spontaneous Rupture, Deutsche Ztschr. f. Chir. 173: 45, 1922.

toms is due to acute massive blood loss with the familiar picture of circulatory collapse.

Diagnosis is made by an awareness of the possibility of rupture of the spleen in acute malaria, both malignant and benign, and the immediate recognition of the symptoms. The treatment is immediate splenectomy.

SUMMARY

A patient with a recurrence of Plasmodium vivax malaria sustained an apparently spontaneous rupture of the spleen during a paroxysm and went into collapse, dying in a short while from exsanguination into the peritoneal cavity. The spleen at autopsy was extremely soft and mushy and it is of more than academic interest to know whether the trauma of physical examination or of violent coughing or vomiting may have been a factor in producing the rupture. The degree of parasitemia was very slight and there was no histologic evidence of plugged or thrombosed capillaries in any of the viscera.

ADDENDUM

Since the preparation of the foregoing case report we have been informed by the director of the Army Institute of Pathology that there are 3 similar cases in its files. In 2 of these cases the diagnosis was made post mortem. In the third case the diagnosis was made during life and a splenectomy was performed, resulting in the recovery of the patient.

Council on Industrial Health

THE EFFECT OF FLUORESCENT LIGHT ON VISION

The following statement, submitted to the Council on Industrial Health by the Joint Committee on Industrial Ophthalmology representing the Section on Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology, has been approved for publication.

C. M. PETERSON, M.D., *Secretary.*

Fluorescent lighting has been regarded by physicians and others as possessing harmful qualities not found in other forms of artificial illumination or in daylight. Both the ultraviolet and infra-red components have been suspected. The Joint Committee on Industrial Ophthalmology, after consultation with specialists in the production and use of light, holds the following opinion:

1. The ultraviolet energy from clear blue summer skylight is three to four times as great per footcandle as fluorescent light.

2. Light from fluorescent lamps resembles daylight more closely than that from tungsten-filament lamps. This color resemblance to daylight is a desirable quality.

3. Infra-red energy found in fluorescent lighting as now manufactured produces no known physiologic effect except that due to heating. Fluorescent light generates less heat per candlepower than tungsten lamps.

4. Glare occurs in any system of lighting. Its solution rests with illuminating engineers.

5. Individual differences occur in the level of illumination (footcandles) required to provide a satisfactory degree of visual efficiency and eye comfort. Twenty footcandles is essential for such critical tasks as reading. Higher levels of illumination are desirable for prolonged seeing, for discrimination of fine details and where low contrast prevails. These standards can be readily maintained in working places through use of properly installed fluorescent lighting.

6. Excessive light may produce symptoms of eyestrain in susceptible individuals regardless of source. Constitutional factors should be corrected as well as the amount and kind of light.

7. Noticeable flicker is largely eliminated in modern fluorescent installations.

SUMMARY

Fluorescent light is not harmful to vision. It should not cause eyestrain if properly installed and used.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

NEO-SYNEPHRINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 284).

The following additional dosage form has been accepted:

FREDERICK STEARNS & COMPANY, DETROIT

Solution Neo-Synephrine Hydrochloride, 1 per cent: 1 cc. ampuls and 5 cc. vials. Neo-synephrine hydrochloride 1 per cent, sodium bisulfite 0.10 per cent and sodium chloride 0.6 per cent.

MENADIONE (See New and Nonofficial Remedies, 1944, p. 638).

The following dosage forms have been accepted:

ENDO PRODUCTS, INC., RICHMOND HILL, N. Y.

Tablets Menadione: 1 mg. and 2 mg.

Solution Menadione (in corn oil) 2 mg. per 2 cc.: 2 cc. ampules. Each cubic centimeter contains 1 mg. menadione.

CHLOROAZODIN (See New and Nonofficial Remedies, 1944, p. 125).

The following additional dosage form has been accepted:

WALLACE & TIERNAN PRODUCTS, INC., BELLEVILLE, N. J.

Surface Active Saline Mixture of Azochloramid: 4.7 Gm. envelops. Each envelop containing azochloramid 0.14 Gm., sodium tetradecyl sulfate 0.47 Gm. and buffered saline mixture 4.09 Gm. for the preparation of 473 cc. of isotonic solution.

PENICILLIN (See Supplement to New and Nonofficial Remedies, 1944, p. 18).

The following dosage forms have been accepted:

HEYDEN CHEMICAL CORPORATION, NEW YORK

Penicillin Calcium Salt: 100,000 Oxford unit or 200,000 Oxford unit ampuls or vials.

MCNEIL LABORATORIES, INC., PHILADELPHIA

Penicillin Sodium: 100,000 Oxford units in 20 cc. vials.

CARROLL DUNHAM SMITH PHARMACAL COMPANY, ORANGE, N. J.

Penicillin Sodium Salt: 20 cc. vial containing 100,000 Oxford units, packaged with a 20 cc. vial of isotonic solution of sodium chloride.

THE WARREN-TEED PRODUCTS COMPANY, COLUMBUS, OHIO

Penicillin Sodium Salt: 100,000 Oxford unit vials.

COMMERCIAL SOLVENTS CORPORATION, NEW YORK

Penicillin Sodium Salt: 100,000 Oxford unit vials.

Penicillin Calcium Salt: 100,000 Oxford unit vials.

SULFADIAZINE (See New and Nonofficial Remedies, 1944, p. 178).

The following dosage form has been accepted:

WYETH INC., PHILADELPHIA

Tablets Sulfadiazine: 0.5 Gm.

CONTRACEPTIVE JELLIES AND CREAMS (See New and Nonofficial Remedies, 1944, p. 339).

The following dosage form has been accepted:

CONTRA CREME AND DIAPHRAGM CO., SEVERNA PARK, MD.

U. S. trademark 355,838.

Contra Creme: A stearic acid cream having a p_H of 7.3, packaged from the formula:

Phenylmercuric acetate	0.06%
Triethanolamine	0.06
Glycerin	2.5
Glycol monostearate	3.5
Stearic acid	12.0
Distilled water to make	100.00

Dosage.—An applicator which is included in the package is attached to the tube and half filled with the creme. The contents of the applicator are then inserted carefully into the vagina.

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SATURDAY, AUGUST 25, 1945

THE WAR ENDS

Suddenly the war ended. Men and women were mostly jubilant; some sorrowful, some even apathetic, with a feeling of exhaustion. The control over gasoline was removed; almost immediately roads were overwhelmed with traffic. Along the curbs stood motor cars with tires that burst or springs that cracked or engines that stuck—reminders that motoring will have to await a return to normalcy. So also with human beings—the stresses and strains of the war reveal themselves in a variety of inadequacies—combat neurosis was not limited to the military services.

The end of the war in Europe brought to the headquarters of the American Medical Association a veritable deluge of letters from medical officers urging that steps be taken at once to insure their instant separation from the service. Occasionally a wife wrote saying "You got my husband into this; now you get him out!" The letter from five medical officers in England, published in THE JOURNAL, stimulated groups here and there in various military installations to send similar communications. Several were received signed by more than a score of medical officers ranging from lieutenant colonels to lieutenants. Now the war is over—and the planning that contemplated a war ended in Europe must be done over for a war ended also in the Pacific.

The wounded are still coming home. For maximum recovery the armed forces carry the wounded to centers where they receive the attention of specialists. The Army Medical Department has already indicated that replacements for what the Army calls "scarce specialists" are not available.

War's end finds many, many questions of vital interest to American medicine as yet unsettled. The supply of medical and premedical students; the disposal of Army and Navy surplus medical supplies; a proper organization and system for medical services to veterans; the maintenance of intensified, coordinated research; the redistribution and relocation of returning medical officers; the provision of adequate numbers of residencies in the specialties; the development of medical care in the areas of occupation; the reestablishment of interchange of medical information throughout the world—these are but a few of the many problems that demand prompt consideration, careful planning, possible solution.

Much proposed legislation affecting medical care in postwar America is already before the Congress. New measures tremble in the minds of Senators and Congressmen and in the thoughts of personnel in governmental agencies who seek new fields to conquer. The Office of Defense Transportation relaxed to the extent of permitting groups of 150 individuals to attend conventions. Such relaxation does not, however, permit the assembling of the House of Delegates of the American Medical Association. Yet an early meeting of this body is desirable so that the policies of the Association regarding many problems may be established through its democratically selected official group.

These are truly, even as in war, times that try men's souls. Scientifically minded physicians will realize that now, even as in war, haste must be made slowly. With sympathetic understanding, with the determination to see the job through to its fortunately happy ending, with the resolve to sink individual desires just a little more for the common good, let us practice more forbearance, so that our world may be that much sooner again a well ordered civilization.

DIABETIC NEUROPATHY

Although pathologic conditions of the peripheral nerves have long been recognized, little unanimity prevails concerning the etiology and symptomatology of such conditions. So-called diabetic neuropathy has been considered by some to be the result of degenerative changes resulting from the disease of the peripheral arteries, by others the result of nutritional deficiency resulting from dietary modifications. The subject has been investigated anew by Rundles [1] in the medical wards of the University Hospital of Ann Arbor, Mich. Among some 3,000 diabetic patients treated since 1936, the diagnosis of diabetic neuropathy was made in 125. Most diabetic patients who develop organic disease of the peripheral nerves have apparently had antecedent periods of grossly neglected or poorly managed treatment. The disordered metabolism of diabetes seems to be the etiologic factor in this complication. Severe polyneuropathy was precipitated, sometimes acutely, after periods of diabetic neglect, by common infections, surgical procedures and other events capable of aggravating the severity of diabetes. Not only may the

1. Rundles, R. W.: Diabetic Neuropathy: General Review with Report of 125 Cases, Medicine 24: 111 (May) 1945.

peripheral motor and sensory neurons be involved, according to Rundles, but also spinal nerve roots, autonomic pathways concerned with temperature regulation, postural blood pressure adjustment, vasomotor control and intestinal and bladder function. He reports that he has not seen a patient in whom diabetic neuropathy actually preceded the appearance of diabetes mellitus. This observation is in agreement with that of Joslin and Root, who state that the symptoms of diabetic neuropathy always start during a time of uncontrolled diabetes.

Rundles finds that diabetic neuropathy tends to occur in patients with mild diabetes, many of whom have had neither diabetic acidosis nor coma, as well as in those with more severe diabetes. In 25 of his cases there had been no diabetic treatment at all before the hospital admission. Of the remaining patients who had some treatment, every one seemed to have received only what would be called poor treatment. Liver enlargement was found in 38 patients with diabetic neuropathy, excluding those with cardiac, biliary tract and other recognized hepatic disease. Among early symptoms were muscular cramps, aching and muscular weakness, especially of the legs, and these symptoms were characteristically made worse on exposure to cold and at night. The lower extremities were affected more severely, almost without exception. The peroneal nerve was more vulnerable than the tibial, the ulnar more vulnerable than the radial or median. Occasionally symptoms occurred predominantly in the pudendal, femoral or intercostal nerve areas, or asymmetrical areas in the extremities. With uncontrolled diabetes the tendency was toward increasing severity and persistence of symptoms. Events which seemed to produce or precipitate neuritic changes in this group were severe upper respiratory infections, influenza, pneumonia, pyogenic infections, toxic hyperthyroidism, diabetic acidosis, diabetic coma and surgical operations. Diminished or absent tendon reflexes constituted the commonest neurologic abnormality. The cutaneous sensibilities were blunted peripherally in about half of the patients. Pronounced muscle tenderness was present in 46 cases. The vibratory sense at the ankles was diminished in 37 patients and absent in 20. Complete foot drop was present in 10 cases. The abnormal pupils were in most instances miotic, reacting sluggishly to light, better on accommodation. Irregular and unequal pupils were observed. Thirty-nine spinal fluid examinations were made in 31 patients. Ten fluids were normal, while 13 had excess total protein ranging from 48 to 80 mg. per hundred cubic centimeters. Disturbed gastrointestinal function appeared to be a common accompaniment of diabetic neuropathy and one which the author, in view of the other evidence of disturbed autonomic nerve function, as well as the high incidence in the same patients of genitourinary and sphincter abnormality, considered the result of autonomic nerve disease.

Thirty-two of the patients in this study had genitourinary and sphincter disturbances. Complete lack of sexual potency was recorded in 19 patients, and this often preceded any other symptom of peripheral nerve disorder. Eighteen patients were found to have an atonic type of bladder paralysis. Cystometric examinations in 13 of these showed impaired or absent sense of feeling, low expulsive force and an increased bladder capacity. The sphincter disturbances appeared to be the result of involvement of the pudendal nerve. The bladder paralysis of diabetic neuropathy is an atonic neurogenic paralysis similar to that seen in tabes dorsalis, pernicious anemia with peripheral nerve and posterior column disease and alcoholic neuropathy.

Some of the patients with diabetic neuropathy exhibited unusual degrees of peripheral sympathetic nerve damage, as revealed by sweating deficiencies, loss of vasomotor and pilomotor control, dependent edema and certain types of skin alteration. This type of edema is presumably due to involvement of the vasomotor nerves. Defective orthostatic regulation of the blood pressure was found in 8 of the patients. The blood pressure in the supine position was usually normal, but the systolic and, to a lesser degree, the diastolic pressure declined precipitously on standing, causing faintness, dizziness and syncope.

The successful treatment of diabetic neuropathy requires expert diabetic management. Rundles found that administration of insulin was the most effective means in the control of this complication. He insists that it should be given at least for the duration of the active neuritic disease. Benefit was not observed from the addition of vitamins, and in particular of thiamine. This observation lends support to the opinion of Meiklejohn [2] as to the role of thiamine in the causation of polyneuritis. A poorly understood and disturbing phenomenon encountered in the treatment of diabetic patients with associated neuropathy is the acute intensification of the neuritic disease which sometimes occurs shortly after control of the diabetes is undertaken. Neuritic disease may also appear for the first time in those with a history of prolonged diabetic neglect a few weeks after treatment is begun.

This study points out the association of diabetic neuropathy with chronic unregulated diabetes and suggests a metabolic cause, the nature of which, however, has not thus far been elucidated. The author emphasizes that diabetic neuropathy, as well as retinopathy and hepatomegaly in their early stages, are reversible changes, provided they are recognized early and are properly treated.

2. Meiklejohn, A. P.: Is Thiamine the Antineuritic Vitamin? New England J. Med. 223:265 (Aug. 22) 1940.

THE CELLULAR SOURCES OF ANTIBODIES

The production of antibodies in lymph nodes was first demonstrated by McMaster and Hudack[1] by grinding lymph nodes of 20 to 30 mice with sand and determining antibody titers in the extract. The observations of McMaster and Hudack were confirmed by Ehrich and Harris[2] by comparing antibody titers in the pad of the hind foot of the rabbit (which was the site of injection of antigen), the lymph contained in the peripheral lymph vessels, the popliteal lymph node (the only node regional to the site of injection), the efferent lymph and the blood serum.

As to the cells involved in antibody formation, Ehrich and Harris first showed that the cellular response in the lymph node during antibody production was chiefly a lymphocytic one, and the simultaneous rise of cells in the efferent lymph from about 18,000 per cubic millimeter of lymph to 60,000 or more was almost entirely lymphocytic (more than 99 per cent of all cells were lymphocytes). Following this observation, Harris, Grimm, Mertens and Ehrich[3] demonstrated that, during antibody formation in the lymph node, antibodies were contained largely in the lymphocytes, the supernatant lymph plasma containing only a fraction of the antibodies present in the lymph.

In accord with the observations of Ehrich and his associates, Dougherty, Chase and White[4] noted that after repeated intra-abdominal injections with sheep erythrocytes the cells from pools of the minced inguinal, axillary, cervical and mesenteric lymph nodes and thymus contained about double as much antibody as the serum of these animals. Recently White and Dougherty[5] and Kass[6] showed that cells from pools of minced lymph nodes also contained normal gamma globulin. Though these cells probably consisted mostly of lymphocytes, a considerable number of monocytes and probably granulocytes must have been present also. Their contention that the antibodies and gamma globulin were contained in lymphocytes may be regarded as valid, however, in the light of the earlier work of Harris, Grimm, Mertens and Ehrich, whose method furnished them with an almost pure strain of lymphocytes (more than 99 per cent of all cells were lymphocytes).

Dougherty, Chase and White came to the conclusion that "antibodies are concentrated in lymphocytes," "the lymphocyte functioning as a carrier of antibody," and that "the active production of antibodies by lymphocytes has not been established." However, Ehrich and Harris[7] pointed out that the reticuloendothelial theory of antibody formation was not really supported by evidence, but their own observations as well as all the older facts fitted better into a lymphocytic theory of antibody formation, in which possibly the granulocyte as well as the macrophage also played an essential role.

Whatever conclusion will finally prevail, it may now be regarded as established that the lymphocyte is not merely an undifferentiated hemocytoblast but has something to do with gamma globulin and antibodies. It either stores or produces these globulins. The evidence available at present favors the latter theory.

1. McMaster, P. D., and Hudack, S. S.: J. Exper. Med. **61**: 783 (June) 1935.
2. Ehrich, W. E., and Harris, T. N.: J. Exper. Med. **76**: 335 (Oct.) 1942.
3. Harris, T. N.; Grimm, E.; Mertens, E., and Ehrich, W. E.: The Role of the Lymphocyte in Antibody Formation, J. Exper. Med. **81**: 73 (Jan.) 1945.
4. Dougherty, T. F.; Chase, Jeanne H., and White, Abraham: Demonstration of Antibodies in Lymphocytes, Proc. Soc. Exper. Biol. Med. **57**: 295 (Nov.) 1944.
5. White, Abraham, and Dougherty, T. F.: Effect of Prolonged Stimulation of Adrenal Cortex and of Adrenalectomy on Numbers of Circulating Erythrocytes and Lymphocytes, Endocrinology **36**: 207 (March) 1945.
6. Kass, E. H.: The Occurrence of Normal Serum Gamma Globulin in Human Lymphocytes, Science **101**: 337 (March 30) 1945.
7. Ehrich, W. E., and Harris, T. N.: Science **101**: 28 (Jan. 12) 1945.

Current Comment

THE AUTOMOBILE NUMBER—1906

On April 21, 1906 THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION—circulation 45,000 copies—issued a special number called the Automobile Number. A facsimile, prepared by the Advertising Department of the American Medical Association, is now being circulated to persons interested in the promotion of motor cars and accessories. The facsimile will take many an American physician back to the early days of his trials and tribulations with the motor cars of a vintage of three decades ago. Some of the amazing articles in this issue bear such interesting titles as "The Auto Too Much Trouble to Keep in Order," by F. A. Swezey, M.D., Wakonda, S. D.; "Synopsis of a Chicago Experience," by Arthur R. Edwards, M.D., Chicago; "Four Years' Success with a Steam Car," by J. G. Henry, M.D., Winchendon, Mass.; "Tires and Roads Are the Chief Automobile Troubles," by William Allen Pusey, M.D., Chicago; "Statistics on Auto, Horse and Pulse," by Charles P. Sylvester, M.D., Dorchester, Mass. In an interesting article entitled "The Physician Who Should Not Purchase an Auto" W. W. Beveridge, M.D., Asbury Park, N. J., asserts that the careless physician cannot run an auto. There are some striking comparisons between the use of the automobile and of the horse in medical practice. Reproductions of the advertisements of that day add to the interest of the text. The illustrations reveal not only the strange motor cars of 1906 but some demonstrations of what was considered a natty costume for a physician of that day. A copy of this interesting reproduction is available at 25 cents to those physicians who will address their request to the American Medical Association.

NUTRITION OF SCHOOL CHILDREN

Discussion of the part played by nutritional disorders in the rejections of young men for military service directs attention again to the importance of proper nutrition during the period of growth. Too little thought has been devoted in the past to this aspect of child care. The need for improvement is emphasized by recent surveys made on the dietary habits and nutritional status of children in this country. The Florida State Board of Health [1] reports a survey conducted early this year in various counties throughout the state. Over 2,000 children of rural and urban communities from grades 1 through 12 were examined for the presence of specific signs of nutritional deficiencies and anemia. The incidence of such findings was disconcertingly high, the more so because they occur in an area where sunshine and fresh produce should be plentiful. For example, in some sections well over 50 per cent of the children showed at least slight signs of rickets and also indications of vitamin C deficiency. In one isolated rural area 50 per cent of those examined had gum signs indicative of a lack of vitamin C. The frequency with which signs suggestive of other deficiency states such as the roughened skin or granulated eyelids of vitamin A deficiency and the angular stomatitis of riboflavin need was as high as 64 per cent for vitamin A and 85 per cent in the case of riboflavin in some of the nutritionally poorest groups. Anemia was not encountered as frequently in these children as the more specific entities, although the hemoglobin levels of Negro children were found to be generally lower than those of the white children in the same area. A concurrent dietary survey was made to determine the types of foods eaten by Florida school children. The information secured by this means corroborated the observations made on the children themselves. Not only were many valuable types of foods such as colored vegetables, citrus fruits and milk missing from the diet lists of a goodly proportion of the children questioned, but the reports show also that many children go without one meal during the day, usually the breakfast, or eat a breakfast which is totally inadequate. Facts of similar import are revealed from the national survey of children's diets made by the *Ladies Home Journal* as reported in that publication.[2] Here again it was found that a distressingly high percentage of children from all types of homes receive meals which are poorly selected. These studies show that many children are not receiving their share of the benefits of this country's resources in the way of good foods for the maintenance of good nutrition. Scientific investigation has demonstrated the dietary needs of children and adults for optimal health. Invariably the foods can be made available if the proper knowledge and interest are applied. The recent authorization of Congress for the expenditure of $50,000,000 by the Department of Agriculture to continue school lunch programs for the coming year will no doubt assist local groups to provide adequate lunches for children in all schools participating. The extent of the problem calls for more and more communities to avail themselves of all means of improving the nutrition of their children if the health and efficiency of future generations are to be safeguarded.

1. Florida Health Notes **37**, May 1945.
2. Ladies Home Journal, October 1944.

OXIDATIVE CAPACITY OF THE BODY

Determination of the levels of pyruvic and lactic acids in the blood has been of use in studies related to carbohydrate metabolism and thiamine deficiency. The applicability of this procedure has been extended by the work of Friedemann and his associates,[1] in which it was shown that these tests can be made under more normal conditions of activity than the fasting state. The effects of such factors as food, activity and anoxia were tested. Hourly blood samples were taken on 10 subjects eating regular meals and performing their tasks of office and laboratory work. The pyruvic and lactic levels rose to a maximum from one to two hours after an average meal and returned to the original level in three to four hours, roughly paralleling the blood sugar level, but the lactic-pyruvic ratio remained essentially constant throughout. Further observations on persons engaged in laboratory and office work and on medical students indicated that light activity does not materially affect the lactic-pyruvic ratio, although fluctuations from the mean were found in the period immediately after meals as well as later. The arithmetical mean of this ratio for these active subjects was nearly identical with that found in 16 hospital patients confined to bed over an extended period, in spite of their differences in activity. In studies made on a trained runner the lactic-pyruvic ratio after walking a mile rapidly closely approximated that observed in sedentary workers, while the ratio rose sharply with the greater demands for oxygen incident to increasing the speed of running the mile. Of particular interest are the values obtained under simulated conditions of high altitude. Below 15,000 feet the ratio of these acids remains unchanged, whereas above this altitude the lactic acid content of the blood rises to produce an increase in the lactic-pyruvic ratio. That this is related to the anoxia produced was demonstrated by the administration of oxygen or return to 10,000 feet altitude, in which case the ratio returned to normal. This evidence of disruption in the oxidative processes of the body at altitudes previously known to be incompatible with life now offers a physiologic explanation for this well established fact. These observations made under varying conditions of oxygen requirement support the author's [2] contention that the lactic-pyruvic ratio serves as a measure of the relative oxidative conditions of the body. Further application of this procedure may be expected to provide information on such controversial questions related to oxidative capacity as physical fitness and the use or abuse of rest as a therapeutic agent.

1. Friedemann, T. E.; Haugen, Gladys E., and Kmieciak, T. C.: III. The Level of Pyruvic and Lactic Acids and the Lactic-Pyruvic Ratio in the Blood of Human Subjects: The Effect of Food, Light Muscular Activity and Anoxia at High Altitude, J. Biol. Chem. **157**: 673 (Feb.) 1945.
2. Friedemann, T. E., and Barborka, C. J.: The Significance of the Ratio of Lactic to Pyruvic Acid in the Blood After Exercise, J. Biol. Chem. **141**: 993 (Dec.) 1941.

MEDICINE AND THE WAR

ARMY

CIVILIAN SPONSORED ARMY TECHNICAL UNITS TO BE CONTINUED

In a recent announcement by the War Department, it was stated that army technical units sponsored and manned by civilian institutions and organizations will not be disbanded after the war. The War Department granted authority early in the war to numerous civilian institutions and organizations to sponsor military units which required personnel with a high degree of professional or specialized training. In general, this authority was confined to the fields of medicine, motor and rail transportation, motion pictures, motor maintenance and communications.

Following is a list of the medical units now serving in the Army of the United States which will go on a reserve status when the Army is demobilized after the war:

2d Evacuation Hospital—St. Luke's Hospital, New York.
7th Evacuation Hospital—New York Post-Graduate Hospital, New York.
9th Evacuation Hospital—the Roosevelt Hospital, New York.
12th Evacuation Hospital—Lenox Hill Hospital, New York.
18th Evacuation Hospital (inactive)—Methodist Hospital, Indianapolis.
22d Evacuation Hospital (inactive)—Milwaukee County Hospital, Wauwatosa, Wis.
25th Evacuation Hospital—West Suburban Hospital, Oak Park, Ill.
27th Evacuation Hospital—University of Illinois, Urbana, Ill.
35th Evacuation Hospital—Gallinger Municipal Hospital, Washington, D. C.
38th Evacuation Hospital—Charlotte Memorial Hospital, Charlotte, N. C.
45th Evacuation Hospital—West Suburban Hospital, Oak Park, Ill.
46th Evacuation Hospital (inactive)—University of Georgia, Augusta.
48th Evacuation Hospital—Rhode Island Hospital, Providence.
49th Evacuation Hospital (inactive)—Starling Loving, University of Ohio, Columbus.
50th Evacuation Hospital (inactive)—Worcester City Hospital, Worcester, Mass.
55th Evacuation Hospital (inactive)—Anker Hospital, St. Paul.
56th Evacuation Hospital—Baylor University Medical School, Dallas, Texas.
73rd Evacuation Hospital—Los Angeles County General Hospital, Los Angeles.
77th Evacuation Hospital—University of Kansas Hospital, Kansas City, Kan.

64TH MILITARY GENERAL HOSPITAL CITED

The Meritorious Service Unit Plaque was recently presented to the 64th Military General Hospital, which is sponsored by the Louisiana State University School of Medicine. Its medical officers are members of the faculty and alumni of the school. The 64th General Hospital was cited "for superior performance of exceptionally difficult tasks and outstanding devotion to duty in the Peninsular Base Section for the period Aug. 1, 1944 to Oct. 1, 1944. This medical unit was the first hospital in line of evacuation of casualties from fighting in the Arno River sector. This hospital quickly adapted itself to field hospital technics. From Aug. 1, 1944 to Oct. 1, 1944 the professional service of the hospital functioned on a twenty-four hour basis. The superior care of medical patients and battle casualties was consistent with the unselfish ideals of the medical service of the United States Army. With rigid discipline and full knowledge of and devotion to its mission the 64th General Hospital upheld the highest traditions of the United States and of the Allied Nations."

MEDICAL MEETING HELD IN SICILY

A medical meeting was held at the Reale Accademia Peloritana, Messina, Sicily, on June 14 at which many papers were read and discussed and new discoveries announced. Dr. Domenico Pisani is the head of the Accademia.

HOLD MEETING AT U. S. ARMY GENERAL HOSPITAL, CAMP PICKETT

Army medical men recently held a get-together at the U. S. Army General Hospital at Camp Pickett, Va., with a trio of prominent civilian medical specialists and exchanged views on topics ranging from streamlined methods of treating complicated fractures and tropical diseases through the postwar medical world picture. Dr. Guy Leadbetter, president-elect of the American Academy of Orthopedic Surgeons and associate professor of surgery at George Washington University, Washington, D. C., demonstrated a new technic he has developed for correcting ununited fractures of the hip bone by operating on a soldier patient. Besides Dr. Leadbetter, the visiting medical men were Dr. William Harvey Perkins, dean of the Jefferson Medical College of Philadelphia, Dr. Lewis C. Scheffey, professor of gynecology at the same institution, and Col. Walter D. Wise, surgeon consultant of the Third Service Command.

Major Vladimir G. Urse, chief of the neuropsychiatric section of the General Hospital at Camp Pickett and one of several army physicians participating in the round table discussion, stressed the increasing importance of further study of the relationship between stomach disorders and psychoneuroses. The individual must be considered as a total organic being, inclusive of his situation, in diagnosis, he said.

CHIEF ADMINISTRATIVE OFFICER FOR THE OFFICE OF THE SURGEON GENERAL CITED

Col. Joseph Carmack, formerly of San Antonio, Texas, was recently awarded the Cross of Knight Commander, Order of the Crown of Italy, in recognition of his meritorious services during the Italian campaign. In the official citation Colonel Carmack, chief administrative officer for the Office of the Surgeon General, ETOUSA, was praised for his long and meritorious service in the campaign which saw the liberation of Italy.

BRAZILIAN AIR SURGEON VISITS SCHOOL OF AVIATION MEDICINE

Brigadeiro do Ar Angelo Godinho dos Santos, Air Surgeon of Brazil, and his aides, 1st Lieut. Fernando dos Santos and 2d Lieut. Jose dos Santos, visited the AAF School of Aviation Medicine, Randolph Field, Texas, during a three week tour of army and navy medical installations throughout the United States. Accompanying Brigadeiro Godinho are Brig. Gen. G. Reinartz, commandant of the School of Aviation Medicine, Lieut. Col. William A. Glasier, from the office of the Air Surgeon, and Major Andrew Masset, interpreter.

MAJOR TRYGVE GUNDERSEN SUCCEEDS COLONEL DERRICK T. VAIL

Major Trygve Gundersen, formerly consultant in ophthalmology, Mediterranean Theater of Operations, and ophthalmologist of the Sixth General Hospital, was recently assigned to the Office of the Surgeon General as chief, ophthalmology branch, Surgical Consultants Division. He replaces Col. Derrick T. Vail, who will become professor of ophthalmology and head of the department of ophthalmology, Northwestern University, Chicago.

THE EMERGENCY MEDICAL CARE OF ARMY PERSONNEL

Procedure to Be Followed by Civilian Physicians and Hospitals

Army personnel spend various lengths of time on leave or furlough at their respective homes, some of whom no doubt will require medical attention during this period. When possible, such personnel should be referred to the nearest federal medical installation for care and treatment. If the condition of the patient is such that immediate treatment or hospitalization is necessary, civilian medical attendance is authorized at public expense under existing regulations. This does not apply to Army personnel who are absent without authorized leave or to those who obtain elective medical treatment in civilian hospitals or by civilian physicians.

Service Command Surgeons

Location	*Component States*
Service Command Surgeon Headquarters First Service Command 808 Commonwealth Avenue Boston 15	Maine New Hampshire Vermont Massachusetts Rhode Island Connecticut
Service Command Surgeon Headquarters Second Service Command Governors Island New York 4	Delaware New Jersey New York
Service Command Surgeon Headquarters Third Service Command U. S. Post Office and Court House Baltimore	Maryland Pennsylvania Virginia
Service Command Surgeon Headquarters Fourth Service Command Post Office Building Atlanta 3, Ga.	North Carolina South Carolina Georgia Florida Alabama Tennessee Mississippi
Service Command Surgeon Headquarters Fifth Service Command Fort Hayes Columbus 18, Ohio	Ohio West Virginia Indiana Kentucky
Service Command Surgeon Headquarters Sixth Service Command Civic Opera Building 20 North Wacker Drive Chicago 6	Illinois Michigan Wisconsin
Service Command Surgeon Headquarters Seventh Service Command New Federal Building Fifteenth and Dodge Streets Omaha 2	Missouri Kansas Iowa Nebraska Minnesota North Dakota South Dakota Wyoming Colorado
Service Command Surgeon Headquarters Eighth Service Command Santa Fe Building Dallas 2, Texas	Texas Oklahoma Arkansas New Mexico Louisiana
Service Command Surgeon Headquarters Ninth Service Command Fort Douglas, Utah	Washington Oregon Idaho Montana Utah Nevada California Arizona

In case of emergency treatment or hospitalization, the individual or his attending physician should notify the appropriate service command surgeon as determined by the accompanying tabulation and give the following information:

Full name.
Military rank.
Army serial number.
Military address, including organization and home station (orders in possession of military personnel will give this information).
Diagnosis.
Estimated duration of treatment and approximate date when patient's condition will permit transfer to an Army hospital if hospitalization is required.

All bills for medical treatment or hospitalization will be submitted to the appropriate service command surgeon and must show the soldier's name, rank, serial number, organization and home station.

The accompanying tabulation indicates the appropriate service command surgeon for reporting medical care of Army personnel and submitting bills for payment. For either purpose the location of the hospital or the physician rendering the care determines the appropriate service command surgeon. In some instances it will be necessary for the service command surgeon to forward the bills to another command for payment.

ARMY AWARDS AND COMMENDATIONS

Major General Morrison C. Stayer

Major Gen. Morrison C. Stayer, formerly of Carlisle, Pa., was recently awarded the Oak Leaf Cluster to the Distinguished Service Medal in recognition of his achievements as chief of the U. S. Army surgeon in the Mediterranean Theater of Operations. The citation accompanying the award read "for exceptionally meritorious and distinguished service in a position of great responsibility in the Mediterranean Theater of Operations during the period March 3, 1944 to May 31, 1945. Charged with safeguarding the health and lives of American troops in the battlefields of Italy and southern France and in areas notorious for the prevalence of malignant and exotic diseases, General Stayer as theater surgeon prompted the medical services under his control to achieve a record which is generally regarded as a superior standard of efficiency. Under his direct supervision many important contributions to military medicine were advanced by installations located throughout a widely dispersed area. General Stayer held to the concept that mere saving of life was not enough and that surgery and wound management demanded complete recovery without disability or disfigurement, requiring the fullest utilization of highly developed methods and technics. His brilliant professional attainments, untiring energy and devotion to the welfare of the officers and men of the Army of the United States are in keeping with the highest traditions of the military service." Dr. Stayer graduated from Jefferson Medical College of Philadelphia in 1906 and was commissioned in the regular Army in 1908.

Captain Lawrence J. Caruso

Six military awards and citations have been awarded to Capt. Lawrence J. Caruso, formerly of Brooklyn. The Silver Star was awarded to him for gallantry in action against the enemy in the vicinity of St. Laurent-sur-Mer, Normandy. He voluntarily remained under intense enemy fire administering first aid and directing the evacuation of casualties. He assisted in the removal of injured soldiers from mine fields and succeeded in removing them to safety despite his own injuries, for which he was awarded the Purple Heart.

In August 1944 he received an Oak Leaf Cluster to his Silver Star by courageously entering an area receiving severe bombardment by enemy aircraft, administering first aid and directing the evacuation of casualties.

The Bronze Star was awarded to him for meritorious achievement in connection with military operations in the summer of 1944.

A Certificate of Merit was awarded in March 1945 for heroism in entering a burning building and extinguishing a fire which was threatening his men as well as the destruction of a large quantity of medical supplies.

He was recently awarded a second Oak Leaf Cluster for other meritorious service.

Dr. Caruso graduated from the Long Island College of Medicine, Brooklyn, in 1940 and entered the service June 20, 1942.

Captain Robert E. Vorisek

Capt. Robert E. Vorisek, formerly of New York, was recently awarded the Silver Star for gallantry in action at Colasion Point, Leyte. It is reported that with magnificent courage and determination Captain Vorisek exposed himself to flying shell fragments to administer medical attention to a number of casualties during intense enemy artillery shelling. When the order was given to evacuate the area, Captain Vorisek remained until all casualties had been treated and removed to a safer area. Dr. Vorisek graduated from the Long Island College of Medicine, Brooklyn, in 1941 and entered the service Dec. 30, 1942.

NAVY

INTERNSHIPS AND NAVY V-12 MEDICAL SCHOOL GRADUATES

Navy V-12 Bulletin 317, issued by the Bureau of Naval Personnel, describes the procedures currently in effect regarding internships for Navy V-12 medical students.

Students may elect to apply for internships either in naval hospitals (if 21 years of age or over) or in civilian institutions. In either case they will be appointed to the rank of Lieutenant (junior grade) MC or MC(S), U. S. Naval Reserve.

Students desiring assignment to a naval hospital should make application to the Bureau of Medicine and Surgery via their commanding officers after completion of their junior year. Candidates will receive official notification via their commanding officers as to their acceptance approximately six weeks from the date of receipt of application. In any case applications must be made at least sixty days prior to graduation. Commissions as well as active duty orders to a naval hospital will be transmitted to the student through his commanding officer on graduation.

Graduates who are not given time to take state board examinations prior to reporting for active duty at a naval hospital will, at the appropriate time after reporting, submit a request to the commanding officer for such leave as may be necessary to participate.

In view of the acute shortage of medical officers in the Navy and the Naval Reserve, it is the desire of the Bureau of Medicine and Surgery that every effort be made to encourage V-12 medical students to apply for intern training in naval hospitals.

Students electing to serve civilian internships or not selected for naval internships are advised to make every effort to contract for rotating internships, to commence within thirty days of graduation.

At least sixty days before graduation date the commanding officers of Navy V-12 units at medical schools submit lists of senior V-12 medical students scheduled to graduate indicating applicants who have been selected for intern training in naval hospitals and those who are committed to civilian internships.

LIFE SAVING FACILITIES IN PACIFIC

Rear Admiral Richard H. Laning (MC), U.S.N., inspector of Medical Department Activities, Pacific Ocean Areas, recently reported to Rear Admiral William J. C. Agnew (MC), U.S.N., acting chief of the Bureau of Medicine and Surgery, Washington, D. C., that the life saving facilities in the Pacific are at their peak in preparation for developments against the enemy. Boding well for future naval and amphibious operations, said Rear Admiral Laning, are improvements made in air evacuation of casualties, shipment by air of whole blood, deployment of newly added hospital ships, construction of additional fleet and base hospitals in forward areas and gains which have been achieved in prevention and control of communicable diseases.

NEW OCCUPATIONAL THERAPY BUILDING

A new occupational therapy building was recently opened at the National Naval Medical Center, Bethesda, Md., with a daily capacity of 300 patients in the fourteen workshops. A staff of 15 is under the direction of Lieut. (jg) M. S. Vetting (W) U.S.N.R., with Lieut. Comdr. H. S. Etter (MC), U.S.N.R., having general supervision. Dr. Etter is rehabilitation officer of the Naval Hospital.

COMMANDS UNITED STATES NAVAL HOSPITAL AT ST. ALBANS

Capt. Edwin D. McMorries (MC), U.S.N., recently took command of the United States Naval Hospital at St. Albans, Queens, L. I., N. Y. Capt. Lester L. Pratt (MC), U.S.N., who had been medical officer in command of the hospital since its inception in February 1943, will leave to become district medical officer of the Thirteenth Naval District, with headquarters in Seattle.

NAVY AWARDS AND COMMENDATIONS

Lieutenant Henrik W. Szylejko

The Navy and Marine Corps Medal was recently awarded to Lieut. Henrik W. Szylejko, formerly of Philadelphia. The citation read "For heroism while serving as senior medical officer of the United States Landing Ship Tank 496 during the invasion of France from June 6, 1944 to June 13, 1944. When his ship was damaged by enemy action on the night of the 11th of June Lieutenant (jg) Szylejko was knocked unconscious by the terrific concussion. On regaining consciousness he carried the unconscious form of a fellow officer to a stretcher in the passageway leading topside and went to his battle station in the crews' quarters. After giving first aid to the living, he proceeded to the conn, where besides others he found the dead bodies of the captain and the executive officer. He gave first aid to an army doctor who had collapsed as a result of a broken back. He then proceeded to inspect the ship to ascertain the damage and to distinguish the living from the dead. He dragged one man topside during this tour. After making certain that everything had been checked, he gave the order to abandon ship. After the ship had been abandoned Lieutenant (jg) Szylejko boarded the rescue ship to which the more seriously injured had been removed and undertook to render medical aid to 11 unconscious men topside. He continued his efforts on board this ship and aboard a hospital ship to which he was later transferred until the pain in his chest became too terrible and he began to spit blood. The courage, professional skill and leadership displayed on this occasion were in keeping with the best traditions of the United States Naval Service." Dr. Szylejko graduated from Georgetown University School of Medicine, Washington, D. C., in 1943 and entered the service Jan. 10, 1944.

Lieutenant Charles Woodrow Styron

The Bronze Star was recently awarded to Lieut. Charles Woodrow Styron, formerly of Boston, "for heroic achievement as medical officer of an assault battalion during operations on Saipan, Marianas Islands, from June 15 to July 10, 1944. Although repeatedly in such close proximity to the enemy that mortar fire fell on his aid station and sniper fire killed persons in his vicinity, Lieutenant Styron carried on steadfastly in his ministrations to the wounded. On one occasion during heavy Japanese fire he continued to operate his station in a forward position while the remainder of the command post personnel fell back to a safer position. By his cool and capable direction of activities he was responsible for the efficient functioning of all medical personnel attached to the battalion despite the most difficult combat conditions. His gallant conduct throughout this period was in keeping with the highest traditions of the United States Naval Service." Dr. Styron graduated from Duke University School of Medicine, Durham, N. C., in 1938 and entered the service July 1, 1942.

Lieutenant Commander John Winston Fish

Lieut. Comdr. John Winston Fish, formerly of Louisville, Ky., was posthumously awarded the Bronze Star, according to the citation, "for heroic achievement while serving as flight surgeon of Air Group Eighteen, attached to the U. S. S. *Intrepid*, during air operations against enemy Japanese installations, aircraft and surface vessels in the Philippine Islands Area from Oct. 10 to Nov. 6, 1944. A skilled and courageous surgeon, Lieutenant Commander Fish continuously performed his duties under extremely hazardous conditions and made recommendations which aided materially in maintaining the Air Group's morale and physical well-being over an extended period of intensive operations. On October 29, while under intense fire from an enemy attack, he was the first to administer medical aid to the wounded and, by his quick and effective action, saved several lives that otherwise would have been lost. His heroism and unfailing good humor were an inspiration to the crew and his gallant conduct was in keeping with the highest traditions of the United States Naval Service." Dr. Fish graduated from the University of Louisville School of Medicine in 1934 and entered the service March 21, 1942.

VETERANS

WAR MANPOWER COMMISSION TO URGE ENROLMENT OF VETERANS IN MEDICAL SCHOOLS

On August 21 Mr. Paul V. McNutt, director of the War Manpower Commission, issued a release indicating that the War Manpower Commission, cooperating with the Army and Navy, will endeavor to enroll 12,000 students for the medical and dental schools of the United States this fall from among the veterans who are now available for release from the armed forces.

Of this number 8,000 are for medical schools and 4,000 for dental schools, the veterans being entitled to support for their education under the G. I. Bill of Rights. In his release Mr. McNutt stated that the Army would require permanently 10,000 physicians, the Navy 5,000 physicians and the Veterans Administration 15,000 physicians and that additional physicians would be needed for service abroad

Mr. McNutt also estimated that the overall deficiency in the United States during the postwar period would amount to 35,000 physicians.

PERMANENT ESTABLISHMENTS FOR RESTORATION OF INJURED VETERANS

Soldiers' memorials in the form of permanent establishments for the restoration of injured veterans, rather than stone and bronze monuments, is the aim of the Baruch Committee on Physical Medicine. Founded in 1944 by Bernard M. Baruch with an endowment of $1,190,000, the committee had for its purpose the development of physical medicine. The subcommittee on war and postwar physical rehabilitation and reconditioning, made up almost entirely of medical corps officers of the armed services, has sent out a blueprint of an ideal war memorial. After erection of treatment centers, and as time goes on, civilian patients, especially those injured in modern industry, may be sent to the centers by their physicians or surgeons, their care helping to meet expenses. Returned veterans may be placed in centers close to their homes. So situated they will not feel neglected and forgotten but, on the contrary, would be provided for under circumstances arranged and assembled for their rehabilitation with the sole aim of restoring them to normal life and useful activity.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Dibble General Hospital, Menlo Park: Diagnosis and Treatment of Arthritis, Dr. Stacy R. Mettier, September 3; Nephritis, Dr. Leslie L. Bennett, September 3.

DeWitt General Hospital, Auburn:

SEPTEMBER 14 (AFTERNOON SESSION)

1 Care of Paraplegic Patients:
  a. Neurologic Lesions and Considerations, Dr. Howard Naffziger.
  b. Immediate Care of Spinal Cord Injuries, Capt. Rudolph Ziegler.
  c. Treatment of Decubitus Ulcers, Major Harry Benteen.
  d. Methods of Locomotion and Conditioning, Lieut. Jack Gregory.
  e. Program of Ambulation at DeWitt General Hospital, Lieut. Elwyn Shonyo.
  f. Urologic Care, Major D. C. Malcolm.
  g Occupational and Vocational Rehabilitation, Lieut. Col Ambrose Storck.
2. The Arthritides and Therapy, Dr. S. R. Mettier.
  a. Surgical Reconstruction, Capt Fred Rhinelander.
3. Peptic Ulcer Symposium:
  a. Diagnosis and Medical Regimen, Major J. J. Kane.
  b. Amylase Test; Diagnostic Aid in Abdominal Pain, Capt. Melvin Kirstein.
  c Roentgenologic Findings, Major Walter Scribner.
  d 4Psychosomatic Considerations, Capt Jerome Weinberger.
  e Surgical Treatment, Dr. Alton Ochsner.

SEPTEMBER 14 (EVENING SESSION)

4 Vascular Diseases.
  a Organization, Equipment and Function of a Vascular Center, Lieut. Col. Ambrose Storck
  b Classification and Medical Discussion, Capt. John Waller.
  c Anatomic Considerations and Treatment of Varicose Veins, Dr. Stanton Sherman.
  d Phlebography in Deep Venous Obstruction, Major Arthur Koepsell.
  e. New Method for Testing and Developing Collateral Circulation, Captain Massell.
  f. Treatment of Arteriovenous Aneurysm, Major Norman Freeman.
  g Basic Vascular Tone in Sympathectomy, Lieut William Rector.

SEPTEMBER 15 (AFTERNOON SESSION)

5 Surgical Treatment of Empyema, Dr. Alton Ochsner.
6 The Alcoholic Patient, Dr. Alexander Simon.
7. Outline of Care of Psychiatric Patients, Major Daniel Sullivan.
8 Pulmonary Coccidioidomycosis, Dr Charles Smith.
9. Inguinal Hernia
  a Anatomic Considerations, Dr John Saunders
  b Repair of Primary and Recurrent Hernia, Major Harry Benteen.
10 Orthopedic Presentations:
  a. Reconstructive Surgery of the Hand, Dr. Sterling Bunnell.
  b Experience in Treatment of Compound Fractures, Lieut. Col. E. K. Prigge.
  c. Treatment of Severely Injured Elbow, Capt. Elbert Davis.

SEPTEMBER 15 (EVENING SESSION)

11 Neurosurgical Symposium:
  a. Diagnosis of Protruded Intervertebral Disk, Capt. Manuel Sall.
  b. Surgical Treatment and Prognosis of Protruded Intervertebral Disk, Lieut Comdr. Keith Bradford.
  c. Correction of Cranial Defects, Major Tracy Haverfield.
  d. Peripheral Nerve Repair, Lieut. Bertram Selverstone.
  e. Management of Combined Bone and Nerve Lesions, Capt. Jerome Sweeney.
  f. Reeducation of Aphasic Patients, Lieut. Joseph Wepman.
12 Methods of Therapy in Dermatoses, Capt. Eugene Bereston.
  a Roentgen Therapy and Cautions, Major Walter Scribner.
13. Penicillin Therapy in Chronic Sinusitis, Capt. Robert Chait.
14. Administration of Fluids, Plasma and Blood in Prolonged Surgery, Major G. C. Langsdorf.
  a. Laboratory Adjuncts in Blood Matching and Blood Bank, Lieut. Col Irving Madoff.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, July 28, page 959)

CALIFORNIA

St Joseph's Hospital, San Francisco. Capacity, 245; admissions, 7,327 Sister M. Raymond, Superior (interns, January 1 and April 1, 1946)

Santa Clara County Hospital, San Jose. Capacity, 453; admissions, 4,682 Dr Henry E Dahleen, Superintendent (resident—tuberculosis, disqualified for military service).

CONNECTICUT

Bridgeport Hospital, Bridgeport Capacity, 416; admissions, 10,234. Mr Oliver H. Bartine, Superintendent (interns, April 1, 1946).

ILLINOIS

Belmont Community Hospital, Chicago. Capacity, 125; admissions, 4,180. Mrs. Gertrude F Scofield, Superintendent (interns, September 1945; January and July 1946)

MASSACHUSETTS

Memorial Hospital, Worcester Capacity, 215; admissions, 7,713. Dr. Winthrop B. Osgood, Superintendent (3 interns).

NEW YORK

Auburn City Hospital, Auburn. Capacity, 355; admissions, 6,198 Mr. Jerome F. Peck Jr., Acting Superintendent (resident—mixed service).

Coney Island Hospital, Brooklyn. Capacity, 300, admissions, 5,519. Dr. Saul M. Penner, Superintendent (6 interns)

Israel Zion Hospital, Brooklyn. Capacity, 518; admissions, 9,867. Dr J. Prager, Executive Director (interns, October 1, 1945; April 1, 1946)

PENNSYLVANIA

Western State Psychiatric Institute and Clinic, Pittsburgh Capacity, 136; admissions, 104. Dr. Grosvenor B. Pearson, Director (12 residents—psychiatry, including 10 disqualified for military service)

UTAH

St Mark's Hospital, Salt Lake City Capacity, 238; admissions, 4,838. Mrs Olive V. Wardrop, Superintendent (intern, October 1).

Thomas D Dee Memorial Hospital, Ogden. Capacity, 400; admissions, 8,405 Mr L. H Evans, Superintendent (interns)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Jacob C. Geiger, director of public health of the city and county of San Francisco, was recently awarded the decoration of the Orden de Vasco-Nunez de Balboa, grade of Knight Commander, for services to Panama.

Alameda County Society Begins Monthly Bulletin.—With the August issue the *Bulletin of the Alameda County Medical Association* made its appearance. The cover shows the Oakland bridge, and the contents discuss the proposed activities of the association under a recently inaugurated "accelerated program." Dr. Milton H. Shutes is the editor.

FLORIDA

Election of State Medical Board.—Dr. Joseph B. Kollar, Vero Beach, was elected president of the Florida State Board of Medical Examiners at a meeting in Jacksonville June 25, succeeding Dr. Howard G. Holland, Leesburg. Dr. Frank D. Gray, Orlando, was named vice president and Dr. Harold D. Van Schaick, Miami, was reelected secretary-treasurer.

GEORGIA

Personal.—Mrs. Stewart R. Roberts has been appointed assistant secretary of the Fulton County Medical Society, effective July 1.

Edwin Watson Resigns.—Dr. Edwin R. Watson has resigned as director of the division of maternal and child health of the Georgia State Department of Public Health to enter private practice in Macon. He has been connected with the state department for eight years. Dr. Guy G. Lunsford, director of local health organizations, will serve as acting director of the maternal and child health division, according to *Georgia's Health*.

Rabies Control Supervisor Named.—Leland Edson Starr, Ph.D., formerly assistant dean of the school of veterinary medicine and professor of pathology, Alabama Polytechnic Institute, and recently in private practice of veterinary medicine in Roanoke, Va., has been appointed state rabies control supervisor with the Georgia Department of Public Health, effective July 12. Dr. Starr will assist counties in setting up local organizations for rabies control, in accordance with the new rabies control law which requires vaccination of all dogs, according to *Georgia's Health*.

ILLINOIS

Personal.—Dr. Sandor Horwitz, Peoria, recently completed fifty years in the practice of medicine.——Dr. and Mrs. Edward A. Elfeld, Arlington Heights, recently celebrated their fiftieth wedding anniversary.

Sixteen Deaths from Poliomyelitis.—An outbreak of infantile paralysis in Rockford and surrounding area has been responsible for 140 cases and sixteen deaths since July 1, newspapers report. Rockford reported 71 cases, Winnebago County 61 and Stephenson, Boone and Carroll counties 8.

Chicago

Appointments in Pharmacology at Illinois.—Dr. Carl C. Pfeiffer has been appointed professor and head of the department of pharmacology, materia medica and therapeutics at the University of Illinois College of Medicine, effective on his release from the U. S. Navy, August 15. Dr. Pfeiffer graduated at the University of Chicago School of Medicine in 1937. He was pharmacologist with Parke, Davis & Co. from 1941 to 1943, when he entered the Navy. Earl Randall Loew, Ph.D., research pharmacologist with Parke, Davis & Co., has been named associate professor of pharmacology, materia medica and therapeutics, and Dr. Klaus R. W. Unna, formerly research associate with the Merck Institute of Therapeutic Research, Rahway, N. J., and recently instructor in pharmacology, University of Pennsylvania School of Medicine, Philadelphia, has been named assistant professor in the department of pharmacology at Illinois.

INDIANA

George Clowes Retires.—George Henry Alexander Clowes, Ph.D., since 1920 director of the research laboratories of Eli Lilly and Company, Indianapolis, has retired.

State Meeting Canceled.—The 1945 annual session of the Indiana State Medical Association, which was scheduled for French Lick Springs, October 2-4, has been canceled. The regular annual meeting of the house of delegates will be held sometime in the future at Indianapolis on the call of the president.

Physician Receives Service Award.—Dr. Harold P. Graessle, Seymour, was recently presented with the first annual "Seymour Distinguished Service Award" to be sponsored annually by the Seymour Rotary Club. The recipient of the award can be any citizen of the Seymour area who has rendered a service during the previous eighteen months that will have a lasting influence on the life in Seymour, it was stated.

MAINE

Reappointments to Medical Board.—Governor Horace A. Hildreth on July 11 reappointed Dr. Adam P. Leighton, Portland, and Dr. Currier C. Weymouth, Farmington, as members of the Maine Board of Registration of Medicine. Dr. Leighton, with his reappointment, began his thirty-first year as member and secretary of the board.

MARYLAND

Communicable Disease Control Ordinance Enacted.—An ordinance has been enacted by the city council of Baltimore to strengthen the program of the city health department to prevent communicable diseases in Baltimore. The ordinance authorized the commissioner of health to make and adopt rules and regulations to prevent and control the spread of communicable diseases and to provide punishment for any violations.

Southern Health District.—The city council has recently enacted an ordinance providing for the acquisition of land and construction thereon of a health center in south Baltimore to be known as the Southern Health District Building. While the Eastern Health District was established in 1932, the Western Health District in 1935, the Southeastern Health District in 1937 and the Druid Health Center in 1939, the new Southern Health District edifice will be the first building excepting Sydenham Hospital ever to be erected in Baltimore expressly for the use of the city health department. The commissioners of finance of the city are empowered to issue certificates of indebtedness to an amount not exceeding two million dollars to finance the project.

Rodent Control Study.—John T. Emlen Jr., Ph.D., Davis, Calif., has been appointed research associate in the department of parasitology of the Johns Hopkins School of Hygiene and Public Health to take charge of investigations on rodent ecology and control, according to *Science*. The program, supported by a grant from the Rockefeller Foundation, is being carried out with the cooperation of the rodent control division of the city of Baltimore. It is a continuation and expansion of the field studies which Curt P. Richter, Ph.D., of the Johns Hopkins University School of Medicine developed during the last three years in cooperation with this division. Dr. Richter will serve on the advisory committee for this expanded program and is continuing his laboratory investigations on the behavior of wild rats as part of the new program.

MICHIGAN

State Meeting Canceled.—The proposed 1945 annual session of the Michigan State Medical Society has been canceled.

Changes in Health Officers.—Dr. Joseph A. Murphy was recently appointed health officer of Whitehall. Dr. Albert E. Heustis Jr. has been named director of Branch County with headquarters in Coldwater, succeeding Dr. Ira O. Church, who resigned to go to California (THE JOURNAL, July 7, p. 742). Dr. John J. Angel has been appointed village health officer of Wayne.

Personal.—Dr. Thomas E. DeGurse, Marine City, was recently guest of honor at a dinner in recognition of his completion of fifty years in the practice of medicine. He was presented with a leather portfolio, and speakers at the dinner included Drs. Andrew S. Brunk, Detroit, L. Fernald Foster, Bay City, president and secretary respectively of the Michigan State Medical Society, Oscar D. Stryker, Fremont, Clarence E. Umphrey and Eldwin R. Witwer, Detroit, councilors of the state society, and William J. Burns, LL.B., Lansing, executive secretary of the society. Dr. DeGurse has served

as councilor of the state medical society and president of the St. Clair County Medical Society. — Arthur D. Emmett, Ph.D., assistant director of research with Parke, Davis & Company, Detroit, retired July 1 to become consultant. Dr. Emmett has been in charge of the vitamin division for twenty-nine years.

Clinical Teaching in Internal Medicine.—The department of postgraduate medicine of the University of Michigan Medical School, Ann Arbor, has arranged a clinical teaching program for every Thursday afternoon beginning September 13 and continuing through December 20 at the University Hospital. The program is designed to serve the needs of practicing physicians who are interested in problems of internal medicine. It will consist of clinical discussion on ward rounds conducted each day by two different members of the senior staff of the department of internal medicine and will end with a conference of the entire medical staff and review of recent interesting electrocardiograms.

MINNESOTA

Illegal Practitioner.—On July 6 Mrs. Florence M. Johnson, Minneapolis, was sentenced by Judge Frank E. Reed of the district court to a term of one year in the Hennepin County Jail following her plea of guilty to a charge of practicing massage without a license. The sentence was stayed for one year on condition that the defendant close her office, dispose of her equipment and absolutely refrain from the practice of healing or massage in any manner in the future. In investigation the state board of medical examiners showed that Mrs. Johnson had opened an office in the Medical Block, Minneapolis, in April 1945 and that she had in her possession a certificate dated June 24, 1940, which she had obtained from the Minnesota Clinical Institute, Minneapolis. The certificate was signed by John LeMay, president, and Dr. Cornelius W. Wall. The physician died in January 1944 and LeMay was under arrest on July 13 charged with practicing healing without a basic science certificate. Mrs. Johnson was operating a massage and bath parlor under the name of Fredjohn Health Center, charging $3 for her treatments.

MISSISSIPPI

Personal.—Dr. Rosier D. Dedwylder, Cleveland, on July 1 completed twenty-five years' service as director of the Bolivar County Health Department.

Medical Society Votes Against Four Year Medical School.—The Lauderdale County Medical Society, in special session July 12, adopted resolutions to the effect that the establishment of a four year medical school is not the answer to supplying an adequate number of doctors for rural citizens of Mississippi, according to the Jackson *News*. It was stated further that "the time is not propitious for establishing a four year school of medicine in Mississippi."

MISSOURI

Special Society Election.—Dr. Richard G. Helman, Kansas City, was recently elected president of the Kansas City Obstetrical and Gynecological Society. Other officers include Drs. Russell D. Etzenhouser, Independence, vice president, and John O. Kennedy, Kansas City, secretary-treasurer.

Health Lectures.—The Jackson County Health Forum will open its 1945-1946 lecture series on September 19 with a talk by Dr. Robert M. Stecher, Cleveland, on "Arthritis and Gout." "Medical Care for the American People" will be the theme of a symposium on October 17 with Senator Claude Pepper, Washington, D. C., and Dr. Louis H. Bauer, Hempstead, N. Y., Trustee of the American Medical Association, as speakers and with Dr. Morris Fishbein, Editor of THE JOURNAL, as moderator and interlocutor. Other lecturers in the series will be:

Dr. Irvine H. Page, Cleveland, November 21, High Blood Pressure and Your Kidneys.
Dr. Henry H. Turner, Oklahoma City, January 16, Your Glands Your Dynamo.
Dr. Walter H. Theobald, Chicago, February 20, Sinus and Colds.
Dr. Derrick T. Vail, Cincinnati, March 20, Save Your Eyesight.
Dr. Fishbein, April 17, Diet and Health.

OHIO

Legislation Concerning Health.—Recently enacted legislation, effective September 28, limits the use of the Ohio State Sanatorium, Mount Vernon, to the care and treatment of the mentally ill, mentally deficient and epileptic patients suffering from tuberculosis. Another bill appropriates $1,190,000 to the welfare department for construction and equipment at the sanatorium. A bill, effective September 21, makes definite that a child of school age afflicted with tuberculosis is included in the state educational program and sets at rest the question of responsibility for the education of the child.

New Department of Clinical Biochemistry.—Victor C. Myers, Ph.D., professor and head of the department of biochemistry, Western Reserve University School of Medicine, Cleveland, has been named director of a newly created department of clinical biochemistry at the school. The present department of biochemistry will be enlarged and a new director selected.

Appointment in Hearing and Speech Therapy.—Warren H. Gardner, Ph.D., San Mateo, Calif., has been appointed professor of hearing and speech therapy at Western Reserve University School of Medicine and director of clinical services of the Cleveland Hearing and Speech Center, according to the Cleveland *Press* of July 6. The appointment will be effective September 1. Dr. Gardner has been associated with the California state department of public health and has been conducting tests on school children of the state. The Cleveland Hearing and Speech Center recently was formed by the Cleveland Hearing Center and Speech Clinic at Western Reserve University (THE JOURNAL, June 9, p. 453).

Industrial Accidents.—The Ohio Industrial Commission recently reported that, of the 328,121 claims filed during 1943, 1,104 were for fatalities, 8 for permanent total disability, 2,797 for permanent partial disability, 46,604 for temporary disability over seven days, 25,860 for temporary disability of seven days or less and 251,748 for temporary disability which resulted in no time loss. The days lost through disabilities totaled 10,106,407. In 1943 the six principal agencies causing industrial accidents in the order of their standing were machinery 72,601 claims with 44 fatalities, hand tools 34,283 with 13 fatalities, metal stock (not otherwise listed) 34,487 with 11 fatalities, bundles, barrels, boxes, benches and the like 21,707 with 18 fatalities, flying objects, dust, cinders and the like 16,433 with no fatalities and pipes, rods, sheets or plates 17,173 with 12 fatalities.

PENNSYLVANIA

$100,000 for Cancer Research.—The Pennsylvania State Department of Health will receive $100,000 or what part of the sum may be needed to conduct cancer research to determine the cause, mortality rate, methods of treatment, prevention and cure of cancer and allied diseases, including the nature and extent of the facilities available in the counties and cities of the state for the diagnosis and treatment of these diseases. The appropriation was provided for in a bill recently signed by Gov. Edward Martin, according to the *Field Army News*.

Philadelphia

Lester Burket Named Professor of Oral Medicine.—Dr. Lester W. Burket, assistant professor, has been appointed professor and head of the department of oral medicine at the University of Pennsylvania Dental School.

George W. Raiziss Dies.—George W. Raiziss, Ph.D., head of the department of chemistry of the Dermatological Research Laboratories and later director of that organization on its merger with Abbott Laboratories, died July 16 in the Atlantic City Hospital, Atlantic City, N. J.

Pittsburgh

Course in Clinical Allergy.—The University of Pittsburgh School of Medicine announces an orientation course in clinical allergy, October 1-5, under the auspices of the American Academy of Allergy. The course will include lectures, demonstrations, case presentations and laboratory procedures covering all aspects of allergy. Round table discussions will be held in the evening. Allergists and internists from various parts of the country will make up the teaching faculty. Additional information may be obtained from Dr. William S. McEllroy, dean of the University of Pittsburgh School of Medicine.

SOUTH CAROLINA

Physician Wins Service Award.—Dr. Warren H. Burgess has been awarded the A. T. Heath Award for public service to the people of Sumter. The award, given annually by representatives of the city's four service clubs, consists of a silver service. Dr. Burgess has been practicing in Sumter since 1911 and has been city physician since 1914. He graduated at the Medical College of South Carolina, Charleston, in 1910.

Medical College Appointments.—Dr. John A. Boone, assistant professor of medicine, has been appointed assistant dean at the Medical College of the State of South Carolina, Charleston. Other changes noted in the Charleston *Evening Post*, June 16, included the election of Dr. Charles Frederick Williams as professor emeritus of psychiatry and the appointment of Dr. Coyt Ham as clinical professor of psychiatry. A reorganization of the neuropsychiatric department of the medical college also was announced. Dr. Douglas B. Remsen, assistant professor of medicine, is reported to have indicated that he would give up his private practice and serve as acting head of the reorganized department.

TENNESSEE

Ninety-Two Years of Age.—Dr. Henry C. Martin, Cookeville, on July 10 observed his ninety-second birthday. Dr. Martin graduated at Vanderbilt University School of Medicine, Nashville, in 1894.

Examining Board Election.—Dr. James H. Keeling, Knoxville, was elected president of the Tennessee State Board of Medical Examiners at its annual meeting in Nashville July 10, succeeding the late Dr. James K. P. Blackburn, Pulaski. Other officers include Drs. Thomas B. Yancey, Kingsport, vice president, and Harley W. Qualls, Memphis, secretary.

Personal.—Dr. William W. Frye, professor and head of the department of preventive medicine and public health, Vanderbilt University School of Medicine, Nashville, has been granted a six months leave of absence to serve on a special commission sent to China by the UNRRA to study the current cholera epidemic there, it is reported. During Dr. Frye's absence Dr. Alvin E. Keller will be acting head of the department of preventive medicine and public health.——Dr. Louis Levy, Memphis, was reelected president of the Memphis Symphony Society, Inc., June 19.

Changes in University Faculty.—Dr. Frank E. Whitacre has been promoted from associate professor to professor of obstetrics and gynecology and head of the division at the University of Tennessee College of Medicine, Memphis. Dr. William T. Pride, who is relieved as head of the division, will continue as professor. Dr. Whitacre, who from 1939 to 1941 was professor of obstetrics and gynecology and head of the department, Peiping Union Medical College, Peiping, China, was for two years interned in Manila by the Japanese. He has been connected with the university since January. Dr. James R. Reinberger has been promoted to professor of obstetrics and gynecology. Hugo M. Krueger, Ph.D., St. Louis, associate professor of pharmacology, St. Louis University School of Medicine, has been appointed assistant professor of pharmacology. Dr. Isadore N. Dubin, instructor and associate in pathology, Duke University School of Medicine, Durham, N. C., has been appointed assistant professor of pathology and bacteriology.

UTAH

Activities at Utah Medical School.—The Utah Medical Foundation has been established and incorporated at the University of Utah School of Medicine with a gift of $2,850 by the first graduating class of the four year school. The objective is to promote the cooperation of alumni and friends of the medical school in improving the undergraduate, graduate and research functions and to establish scholarships, lectureships, professorships, research and student loan funds. One of the first activities of the foundation was the establishment of the "Dr. W. R. Tyndale Lectureship in Medicine," honoring Dr. William R. Tyndale, a member of the staff of the Utah school since 1912. Dr. George W. Thorn, Hersey professor of the theory and practice of physic, Harvard Medical School, Boston, was the first speaker under the lectureship recently, discussing "The Role of Endocrine Glands in Adaptation" and "Fatigue of Thyroid and Adrenal." The U. S. Public Health Service has given a grant of $92,000 to the medical school for research in muscular dystrophy and related degenerative disorders. Dr. Maxwell M. Wintrobe, professor of medicine, is director of the study, to which an advisory committee of nationally known scientists will be appointed. The Church of Jesus Christ of Latter-Day-Saints has given the medical school $25,000 for rehabilitation, modernization and purchase of supplies and equipment for the department of pharmacology and physiology. New appointments include those of Horace W. Davenport, Ph.D., formerly associate in physiology, Harvard Medical School, Boston, as professor and head of the department of physiology, and George Sayers, Ph.D., formerly research assistant in physiologic chemistry (instructor) at Yale University, New Haven, as assistant professor of pharmacology.

VIRGINIA

Portrait of Harvey Jordan.—A feature of the recent commencement of the University of Virginia Department of Medicine, Charlottesville, was the presentation by members of the graduating class of a portrait of Dr. Harvey E. Jordan, dean. The presentation was made by Dr. Frederick V. Vance Jr., Bristol, Tenn., medical class president, and the speech of acceptance was given by John Lloyd Newcomb, LL.D., president of the university.

WEST VIRGINIA

Personal.—Dr. Hu C. Myers, Philippi, and Mr. John Hart, Charleston, have been appointed by Governor Clarence W. Meadows as members of the advisory committee to the legislative interim committee created for the purpose of making a complete study of public health problems in West Virginia (THE JOURNAL, June 23, p. 606). Dr. Myers is a past president of the Hospital Association of West Virginia and represents that organization on the advisory committee. Mr. Hart, who is director of Hospital Service, Inc., and Medical Service, Inc., Charleston, represents the medical-hospital service plans operating in West Virginia. The committee now has ten members.

WISCONSIN

Director Named for Hospital Survey.—Vincent F. Otis, business administrator of the Milwaukee County Asylum for Chronic Insane, Wauwatosa, has been appointed director of the hospital and health center survey in Wisconsin which was recently authorized by the state board of health. Mr. Otis will be responsible for the organization and supervision of the collection and analysis of facts pertaining to a statewide survey and the evaluation of plans and specifications for new and improved hospital buildings and health center needs. The recently organized state hospital advisory committee has agreed that "Hospital Schedules of Information" of the Commission on Hospital Care would be used for obtaining the desired information, and the commission's Public Health Center Schedules of Information would be used to gather the information concerning available health center facilities. Dr. Gunnar Gundersen, La Crosse, president of the state board of health, is the chairman of the state hospital advisory committee. Members of the committee's executive committee include Dr. Harold M. Coon, superintendent of the State of Wisconsin General Hospital, Madison; Mr. Charles H. Crownhart, Madison, secretary of the state medical society, and Dr. Carl N. Neupert, Madison, secretary of the state board of health.

GENERAL

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended August 11 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Division and State	Poliomyelitis Week Ended 8/11, 1945	Poliomyelitis Week Ended 8/12, 1944
New England States:		
Maine	12	0
New Hampshire	0	0
Vermont	2	3
Massachusetts	28	23
Rhode Island	0	1
Connecticut	11	10
Middle Atlantic States:		
New York	111	356
New Jersey	71	21
Pennsylvania	45	72
East North Central States:		
Ohio	14	57
Indiana	12	33
Illinois	73	27
Michigan	8	53
Wisconsin	6	8
West North Central States:		
Minnesota	2	24
Iowa	6	13
Missouri	5	2
North Dakota	0	2
South Dakota	0	0
Nebraska	13	4
Kansas	3	9
South Atlantic States:		
Delaware	3	9
Maryland	4	26
Dist. of Columbia	13	10
Virginia	27	35
West Virginia	0	15
North Carolina	7	60
South Carolina	13	6
Georgia	8	5
Florida	3	0
East South Central States:		
Kentucky	0	47
Tennessee	24	9
Alabama	8	6
Mississippi	3	5
West South Central States:		
Arkansas	2	2
Louisiana	2	11
Oklahoma	18	3
Texas	56	7
Mountain States:		
Montana	1	1
Idaho	0	1
Wyoming	0	0
Colorado	7	2
New Mexico	2	0
Arizona	0	3
Utah	18	2
Nevada	1	1
Pacific States:		
Washington	17	1
Oregon	2	20
California	10	11
Total	671	1016
First 32 weeks: 1944 and 1945	3,586	5,009
Median, 1940-1944	2,272	

LATIN AMERICA

Health Activities in Latin America.—*Nonmilitary Personnel to Receive Army Aid.*—The services and facilities of the Army medical department will be available to "non-Army personnel, their dependents and servants living at military stations in the Panama Canal Department" under a program announced in July. Dependents are classified as "wives, children, dependent husbands or other members of a family residing with War Department employees." Treatment will be furnished by army medical officers. According to an announcement, a medical officer will be permitted to call on patients in their quarters only when they are unable to walk to the dispensary. Civilian employees whose places of duty are at locations other than at the post at which they reside, who require medical attention during duty hours, may visit the station dispensary where employed. Patients requiring hospitalization will be sent to the Gorgas, Ancon, C. Z., and Margarita, C. Z., hospitals on the Pacific and Atlantic sides respectively.

Health Center Established.—A health center has been established in Iquitos, Peru, by the Servicio Cooperative Interamericano de Salud Publica. The building was made available by the former Peruvian agency known as the Supervision de Sanidad de la Montana. Beginning January 1947 the ministry of health and social welfare of Peru will be responsible for the maintenance of the health center. The health center is in connection with the policlinic that has been functioning for more than a year. Dr. Jorge Atkins is director.

FOREIGN

Tribulations of the Netherlands Red Cross.—Officials of the Netherlands Red Cross have had to wage a continuous struggle during the five years of the occupation to prevent the organization from falling under the complete domination of the Nazis. In their attempts to make the party-controlled "Winter Help" fund the sole relief agency in the country the occupation authorities placed all kinds of handicaps in the way of the Red Cross officials, according to the Netherlands Information Bureau. When it became known that the Germans would name the Dutch Nazi head of "Winter Help" secretary-general of the Red Cross, the entire staff worked night and day to remove their stocks to safe places, so that the Germans were unable to hand them over to the wehrmacht. At the same time 98 per cent of the staff resigned and the group was forced to operate clandestinely. In reprisal the Germans arrested several staff members and kept them in jail for various periods. They also confiscated all ambulances and automobiles on the pretext that they had been used to transport ammunition for the underground movement. But despite all German efforts, the staff members of the Red Cross continued their work in secret. Transport drivers who had gone into hiding to evade the German Security Police distinguished themselves on March 3 when The Hague was erroneously bombed by the Royal Air Force. The chairman of The Hague branch, Dr. Pieter Jelle Dietz, and several nurses were killed while on their way to help victims of that attack.

UNRRA Activities.—According to a recent report Lieut. Col. Virgil P. Sydenstricker, chief of the nutrition section, United Nations Relief and Rehabilitation, and Dr. Arnold P. Meiklejohn, specialist in nutrition attached to the Rockefeller Institute for Medical Research on leave to the UNRRA, were assisting in rehabilitation work in the concentration camp of Belsen.——Col. Daniel F. Wright, U. S. Public Health Service, now chief consulting engineer of the UNRRA sanitary department, Greece, is planning a project to eradicate malaria from Greece, where, it is reported, 87 per cent of the country is infected with the disease. The country will be divided into ten districts, to each of which will be assigned one physician, two sanitary engineers, nurses and the team of fifteen sanitary inspectors. It is planned to clear swamp lands through the use of DDT and to effect a cure of infected persons through the use of quinine.——Dr. Dudley A. Reekie, Minneapolis, on leave from the United States Public Health Service to work with the United Nations Relief and Rehabilitation Administration and now commanding medical officer of the UNRRA mission in Italy, reports that tuberculosis and malaria are being brought under control by projects carried forward in cooperation with the Italian government. The effect of the war has been to increase sharply the incidence of both diseases. The flooding and mining of the Anopheles breeding Pontine marshes by the Nazis during the occupation brought about renewed outbreaks of malaria; tuberculosis is being spread by returning Italian nationals who became infected in Germany. A preliminary survey to discover the incidence of malaria in the Pontine area carried out this spring at Fondi in the province of Latinia showed that 100 per cent of the population living in that section were infected. Flooding and mining of the area is slowing down the work of malaria prevention. However, for the control of the adult malaria-carrying mosquito UNRRA has shipped 45,000 square feet of window screening, which is being distributed to the people. Enough DDT oil solution to spray 1,200 houses in the most heavily mined or flooded districts has been made available. UNRRA will also provide trucks, bicycles and funds for the necessary labor of cleaning ditches and spraying chemicals. The UNRRA malaria control project is under the direction of Lieut. Col. Vincent B. Lamourex, an epidemic control engineer, who is chief consultant with the UNRRA staff in Italy. Plans are now in progress to send units of Italian engineers into other parts of the country to supervise malaria control work throughout the malaria season. This work is supplementary to the malaria programs of the military command and the Italian government.

Government Services

Regular Corps Appointments for Medical Officers in the U. S. Public Health Service

A competitive examination for appointment in the Regular Corps in grades of Assistant Surgeon (1st Lieutenant) and Senior Assistant Surgeon (Captain) will be held on the dates listed in the table.

Regular Corps appointments are permanent in nature and provide unique opportunities to qualified doctors for a life career in one or more of a large number of fields including research, general hospitals, special hospitals, foreign duty and federal, state and local public health programs. Assignments are made with all possible consideration of the officer's demonstrated abilities and experience. There is ample opportunity for professional growth and development. Examinations will be oral and written. The oral examination will be held at 9 a. m. at the several places listed on the dates shown. The written examination will be held on October 8, 9 and 10 at places convenient to the candidate and the service. Applicants for the grade of Assistant Surgeon must be citizens of the United States, must present diploma of graduation from a recognized medical school, must have had or be in process of completing an internship or its equivalent and must have a physical examination at place of oral examination by medical officers of the service. Applicants for the grade of Senior Assistant Surgeon must meet the aforementioned requirements and must have had an additional four years of training or experience. Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service, Bethesda Station, Washington 14, D. C.

Entrance pay for Assistant Surgeon with dependents is $3,411 a year and for Senior Assistant Surgeon with dependents is $3,991 a year. Promotions are at regular intervals up to and including the grade of Medical Director, which corresponds to full Colonel at $7,951 a year. Retirement pay at 64 is $4,500 a year. Full medical care, including disability retirement at three-fourth's pay, is provided. All expenses of official travel are paid by the government. Thirty days' annual leave with pay is provided. All commissioned officers have full military status for the duration of the present war.

Places and dates of oral examinations:

Atlanta, Ga.—Malaria Control in War Areas, 605 Volunteer Building	Sept. 13
Baltimore—Marine Hospital, Wyman Park Drive and 31st Street	Oct. 1
Boston—Marine Hospital, 77 Warren Street (Brighton)	Sept. 10
Chicago—Marine Hospital, 4141 Clarendon Avenue	Sept. 25
Cleveland—Marine Hospital, Fairhill Road and E. 124th Street	Sept. 27
Detroit—Marine Hospital, Windmill Pointe	Sept. 26
Fort Worth, Texas—U. S. Public Health Service Hospital	Sept. 15
Kansas City, Mo.—U. S. P. H. S. District No. 7, 603 B. N. A. Building	Sept. 22
Kirkwood, Mo., near St. Louis—Marine Hospital, 525 Couch Avenue	Sept. 24
Los Angeles—U. S. P. H. S. Relief Station, 406 Federal Building	Sept. 17
New Orleans—Marine Hospital, 210 State Street	Sept. 14
New York—Stapleton, Staten Island, Marine Hospital	Sept. 11
Norfolk, Va.—Marine Hospital, Hampton Boulevard Larchmont	Sept. 12
San Francisco—Marine Hospital, 14th Avenue and Park Boulevard	Sept. 18
Seattle—Marine Hospital, Judkins Street and 14th Avenue, South	Sept. 20
Washington, D. C.—U. S. P. H. S. Dispensary, Fourth and D Streets S.W.	Oct. 2

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 31, 1945.

The Farewell of the American Medical Officers

The forces of the United States are leaving this country with, of course, their medical officers. From the European Theater of Operations Major Gen. P. R. Hawley has written to the British Medical Association expressing great regret at their departure, which breaks the happy links formed with the medical profession in Britain. He states that it is his pleasant privilege as well as his urgent duty to express to the British Medical Association the deep appreciation of the medical officers "for all the courtesies extended to them by your splendid organization." The *British Medical Journal* says that the departure of the Americans will be sincerely regretted by their British colleagues. The presence of the American medical officers has been like a refreshing breeze at the British Medical Association House, the Royal Society of Medicine and elsewhere. In clinical and scientific meetings they have thrown their experience and ideas freely into the common pool. Many permanent friendships have been made, and the cause of Anglo-American unity has been greatly advanced by this most welcome of war invasions.

New Clinic for the Investigation of Deafness and Hearing Aids

The Medical Research Council has for some years been concerned with the problems of deafness through its committee on the physiology of hearing. It has recently formed three research committees—one to deal with the medical and surgical problems of deafness, the second to consider the design and performance of electroacoustic equipment, and the third to look into the education of the deaf. The provision of a suitable deaf aid at a reasonable cost and with easy maintenance is an urgent need for those who can be so relieved. The council is opening at the National Hospital, London (the great center of British neurology), a special clinic for the investigation and treatment of all kinds of deafness except that accompanied by active otitis with ear discharge. The Otological Research Unit will be under the direction of Dr. C. S. Hallpike, aural physician to the National Hospital and a member of the scientific staff of the Medical Research Council and of its Electroacoustics Committee. The new clinic should prove most useful, for the large number of persons who now require hearing aids can obtain them only at exorbitant prices, and their maintenance is an additional burden.

Grant from Great Chemical Firm for Scientific Research in India

As previously reported in THE JOURNAL (July 29, 1944, p. 924) the physiologist Prof. A. V. Hill, F.R.S., returned from a mission to India on behalf of the Royal Society. In his report to the society he stressed the need for greater scientific cooperation of British and Indian science. In spite of brilliant achievements Indian science is too narrowly based for the demands to which it will be subjected by the immense program of national reconstruction now being worked out. Britain can lend valuable aid by facilities for Indian research workers in this country, by lending scientists to India and by establishing effective liaison between the two countries. The main work will fall on the specialists societies in India, whose work is likely to be coordinated in the future by a minister of the government. Among the Indian societies Professor Hill particularly commended the National Institute of Sciences of India as best suited to form a scientific academy comparable to the Royal Society of London. A munificent offer has been made to it.

Lord McGowan, president of Imperial Chemical Industries, has written to Professor Wadia, president of the National Institute of Science of India, offering a number of research fellowships for the encouragement of Indians in chemistry, physics and biology, to be held at Indian universities and institutions. The sum offered is $100,000 over the next five to seven years. In his letter Lord McGowan states that until recent years the Royal Society was hampered by lack of funds and provision for the maintenance of scientific workers. This difficulty was overcome by the generosity of various benefactors including industrialists such as Mond and Messel. There seemed no better way of encouraging the advance of science in India and with it the general prosperity of the country than by offering these fellowships. Each will be worth $110 a month and will be tenable in the first instance for two years with possibility of extension up to three years. In addition there will be a grant for research expenses. The fellowships will be open to persons irrespective of sex, race or religion who are under the age of 35 years.

Great Hospital of the British Army Handed Back by the Americans

Eighteen months ago the British army handed over to the United States Army in this country its historic and greatest hospital, the Royal Victoria Hospital, Netley. The ceremony was described in THE JOURNAL at the time, but for security reasons the location was not given. In another picturesque ceremony the hospital has been returned to the British army by Brig. Gen. Charles B. Spruit, United Kingdom base surgeon of the United States Army. In receiving back the hospital Sir Alexander Hood, Director General of the Army Medical Service, said "We of the British Army Medical Service would like our American friends to have a tangible token to remind them of their stay here. I therefore present to the United States Medical Services the key of the hospital. I hope it will remind them not only of Netley but also of the fact that our services, which have so long been mutually supporting one another, are for all time united." Though the main buildings of Netley have been handed back, the American Medical Services still retain a hospital within its grounds.

Rockefeller Traveling Fellowships to Be Resumed

It is announced by the Medical Research Council that preliminary arrangements have been made for the resumption of the Rockefeller Medical Fellowships. These are provided from a fund entrusted to the council by the Rockefeller Foundation of New York. The fellowships are intended for graduates resident in Britain who have had some training in research work in clinical medicine or surgery or some other branch of medical science and who are likely to profit by a period of work at a center in the United States or elsewhere abroad before taking up positions for higher teaching or research in Britain. It is hoped to make a limited number of awards during the academic year 1945-1946, depending on the availability of candidates and the facilities for travel.

Munificent Grant by Wellcome Trustees for Rebuilding of Royal College of Surgeons

The late Sir Henry Wellcome of the firm known all over the world as Burroughs Wellcome & Co. was a great philanthropist who devoted his wealth to the endowment of research. He settled in England and in 1923 resolved to consolidate his many interests in this country, America and elsewhere—research laboratories, medical museums and libraries, development and manufacturing laboratories, distributing companies and organizations. For this purpose he formed the Wellcome Foundation. He died in 1936 at the age of 82 and left a will unique among

testamentary documents. All the shares in the foundation were vested in five trustees, whose aim he laid down to be "the advancing of research work bearing upon medicine, surgery, chemistry, physiology, bacteriology, therapeutics, materia medica, pharmacy and allied subjects." During his life he founded in London the Wellcome Laboratories of Tropical Medicine, the Wellcome Historical Medical Museum and Library and the Wellcome Museum of Medical Science, as well as other laboratories. He empowered his trustees to make grants for the foundation and extension of museums. They have granted $400,000 for the construction of three new museum floors at the Royal College of Surgeons on condition, according to the terms of the trust, that the name "Wellcome" is associated with the extension. The council of the college gratefully received the offer and decided to name one of the new buildings the "Sir Henry Wellcome Wing." The damage done to the college by German bombs has been described in previous letters to THE JOURNAL.

Legal Decision that an Antivivisection Society Is Not a Charity

The National Anti-Vivisection Society claimed exemption from income tax on the ground that it was a body established for charitable purposes only. Mr Justice Macnaghten has decided to the contrary, as the main object of the society was the total abolition of vivisection, and it had been proved that, if experiments on living animals was discontinued, it would constitute a serious obstacle to obtaining further medical knowledge of benefit to the public.

BOLIVIA

(From Our Regular Correspondent)

LA PAZ, July 31, 1945.

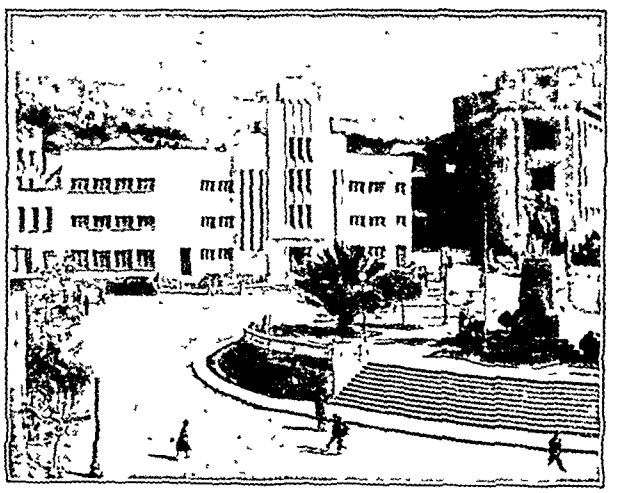
American Health Mission to Bolivia

The United States, through the Institute of Inter-American Affairs and its three divisions of Health and Sanitation, Food Supply and Training, offered to all Latin American republics its aid in furthering their health. In June 1942 Dr. Eugene H. Payne was sent by the institute to Bolivia to study existing health conditions and to furnish plans for their improvement. Dr. Payne visited the tropical regions of Santa Cruz, Beni and Pando, where the Bolivian high quality rubber is being produced and where malaria, ancylostomiasis and intestinal infections make any work hard. He studied the needs for medical care in the tin and tungsten ore mines situated high in the Andes as well as in the different towns. He presented an extensive health and sanitation report. The United States and the Bolivian government, through its Ministry of Labor, Health and Social Welfare, agreed on a two years cooperative program. A new, common organization was created under the name of "Servicio Cooperativo Interamericano de Salud Pública" under the direct supervision of the Bolivian minister of health. The program, to be completed by December 1944, included construction of two hospitals in the northern part of the country in the center of rubber production, construction and operation of some ten smaller dispensaries in the adjacent districts, construction of a leprosarium, establishment of several health centers, a central laboratory at Cochabamba, a nursing school and four sanitary launches. An educational program for the public as well as for physicians had to be started

Dr. Payne was appointed chief of the new organization. In 1942 construction of two hospitals with a capacity of 24 beds was initiated in Riberalta and Guayaramerin, with modern equipment including x-ray units and electric light plants as well as the building of a central laboratory to be situated next to the public hospital in Cochabamba, the second largest city in Bolivia.

In 1943 Dr. George C. Gergman of Los Angeles succeeded Dr. Payne as chief. The organization headquarters were moved from Cochabamba to La Paz for a closer contact with the different government authorities. Temporary dispensaries were started in Guayaramerin, Riberalta and Magdalena to cooperate with the Rubber Development Corporation, another agency of the government of the United States, which was anxious to preserve the health of the syringueros (rubber tappers). Dr. Charles von Pohle of the Medical Corps of the United States Army was appointed chief of the medical section.

A new agreement was reached between Bolivia and the United States in January of this year extending participation of the American health mission to December 1947. In April 1945, when Dr. Bergman left for Washington, D. C., A. E. Williamson took charge of the Servicio. The actual chief of the medical department is Dr. Donald H. Eckles of the Public Health Service of Pennsylvania. Among the health projects initiated were a health center in La Paz with a well baby and sick baby clinic, an antepartum and venereal disease dispensary and a tuberculosis survey department, which is still operating without x-ray units. These departments are operated on a part time basis. In the city of Cochabamba a general dispensary



Building of the health department at La Paz, Bolivia. In the same building is also a health center and the headquarters of the Institute of Inter-American Affairs.

with two physicians in charge has been operating for over a year; the building for the central laboratory was finished last year. In Guayaramerin and in Riberalta there are still the temporary hospitals and dispensaries, each in charge of a Bolivian physician. There are some four pharmacist's mates (practicante) stationed at different points, which were selected by the Rubber Development Corporation. A small malaria control group, led by Lieut. Saul Blatman of the U. S. Army, started working in May on a quick survey in Tarija in the southern part of the country and is stationed at Guayaramerin. Free vaccination against smallpox, typhus, typhoid and whooping cough are available at the health center and at the dispensaries.

Projects are under way to provide several towns with a safe drinking water supply and with sewage disposal systems, as well as the installation of x-ray units.

The administrative department has been organized and is under supervision of several American experts. There is also a public relations department, which offers once a week a short talk over a local broadcast station.

Health education was taken over by another agency of the United States government, the Committee of Coordination, which operates independently of the Servicio; interesting movies are shown to physicians and laymen.

The training division of the institute cooperates by granting several fellowships covering such subjects as medical sciences, nursing and sanitary engineering. Some holders of fellowships are already back from study in the United States and are forming the nucleus for the training of others in this country.

Medical service has been provided to people engaged directly in the war effort, promoting health and efficiency of rubber tappers and cinchona bark workers; this is an emergency work of a temporary nature. Other projects for a long term disease control, including hospital construction and malaria survey, are quite promising. To achieve all purposes, actual health work is indeed important, but mutual understanding through personal friendships is essential too, an experience every foreigner who resides for a time in the South has had to learn.

PARIS

(From Our Regular Correspondent)

June 30, 1945.

Interallied Surgical Conferences

The first interallied surgical conference, held on April 30 at the Val de Grace, reunited representatives of the American, English, Russian, Belgian and French health services and revived the tradition of common research and comparison of methods, which had begun so profitably in the course of the last war and which had been taken up again in 1939, but this time without America. Agreements for the general organization of the health service of the armies were drawn up for the American army by Col. Elliot Cutler, for the English army by Brigadier General Porritt and for the French army by Commanding Medical Officer Delvoye. General principles in the treatment of war wounded were presented by Colonel Cutler, Lieutenant Colonel Mitchell and Commanding Medical Officer Curtilliet. Colonel Cleveland, Lieutenant Colonel Eyre-Brook and Commanding Medical Officer Curtilliet presented reports on the treatment of war fractures. Emphasis was placed on the initial care, resuscitation and prophylaxis against infection, as well as on the equipment to be applied from the first lines, among these the pelvipedal (Tobruk) plaster and the thoracobrachial plaster. The discussion resulted in the drawing up of detailed instructions which were distributed widely among the doctors of the Allied armies and which codify the new data on war surgery. The next interallied conference, to be held this month, will consider the treatment of shock, wounds of the chest, abdominal and thoracoabdominal wounds and cranial injuries.

Budget for Public Health

The discussion of the budget for public health in the Consultative Assembly has revealed the lamentable state of health in France after the years of war and famine. The demographic situation, hardly satisfactory in the past, has become more serious. The number of deaths in 1939 exceeded the births by 29,000; the mortality rate was 15.5. Exclusive of the soldiers who died at the front, the prisoners and the deportees, it reached more than 18.0 in the course of the occupation and decreased to 17.0 in 1943. The infant mortality after the winter of 1944 was highest for this century. The morbidity followed the same trend. New cases of syphilis increased fivefold, typhoid fourfold and diphtheria threefold. Tuberculosis, amounting to 224 deaths per hundred thousand in 1930 and 172 in 1939, attained in 1942 the record figure of 234. There is a deplorable shortage of physicians, a catastrophic deficiency of nurses and social workers and lack of medicines. The number of hospitals is inadequate and their equipment is poor.

The minister of health has announced projected reforms, but the needs are of such magnitude that best intentions run the risk of only partial fulfilment. The political upheaval caused by the German occupation, the division of the country into two zones, later its reunion under complete Nazi control, and finally the liberation, have imposed on the legislative arrangements and the projected reforms certain modifications. When the provisional government of General de Gaulle came to power, a decree made a clean sweep of all the laws promulgated under the Vichy régime. But the majority of these laws were put back in force by the new minister. The names changed, but the basis and the doctrine remained unchanged.

The regulation of doctors, which before the war existed only in plan, was carried out under the German domination and has replaced the Confédération des Syndicates médicaux. The corporative idea was then in vogue and the syndicalist conception rejected. The government which then ruled France in the name of the Germans had in mind a program of reforms inspired by German institutions, but a program for which there was not enough time and the execution of which was nullified by the liberation. The present minister, M. Billout, has the task of reconstruction, to which he has applied himself since his entry into the ministry.

Several important features are to be noted in the program of the minister. Medical education is to be improved; the preparation of the physician will be more methodical and better balanced. A more rigid control will replace the liberty formerly enjoyed by the students. A better distribution of physicians over the entire territory is likewise contemplated. At the same time the training of medical aids, particularly of nurses, will be improved, and their social status bettered. Control of physicians created on a new basis, and regulated by the physicians themselves, control of midwives, of dentists and of pharmacists will be the task of the professions themselves. The old syndicates, reconstituted, will devote themselves to professional questions. A check will be established against the "fake" pharmaceutic specialties and the "black market" in medicines. The venereal diseases will be combated by education, prophylaxis, the rational organization of the services and the systematic search for carriers.

In Paris under the jurisdiction of special courts there will be 10,000 children and 30,000 in the provinces. More than 500,000 children do not attend school. These figures have been increasing since the beginning of the war. In a large number of these cases it is a question of temporary disorders associated with the war, the occupation and the famine; but these causes have not ceased to act. The absence of parents and elders, family disruptions, the unbearable material difficulties which have disorganized countless homes, are factors the moral and social disintegrating power of which cannot be measured.

Marriages

William Ferguson Pearce, Baltimore, to Lieut. Mary F. Young of Boston in Chalons-Sur-Marne, France, recently.

Franklin William Mallamo, Fairmont, W. Va., to Miss Dorothy Marie Bowler of Richmond, Va., June 18.

Lionelle Dudley Wells Jr., Holly Hill, S. C., to Miss Verdna Mildred Wohltmann of Charleston, June 28.

Leon Whitfield Robertson, Wake Forest, N. C., to Miss Virginia Mae Lancaster of Rocky Mount, June 23.

Victor T. Scoville, Constantine, Mich., to Miss Henrietta Fruend of Knoxville, Tenn., in Detroit, June 26.

Oliver Aiken Mays, Columbia, S. C., to Miss Anne Marilyn Swicegood of Summerville, March 5.

Edgar Joseph Reagan, Dayton, Ohio, to Miss Rosemary Blanche Stehle of St. Louis, June 16.

James Cuthbert Shecut, Orangeburg, S. C., to Miss Ella W. Lockwood of Charleston, July 2.

Walter Edward Bundy Jr., Oak Hill, W. Va., to Miss Jane Callison of Brooklyn, June 21.

Adolphus W. Dunn to Miss Doris Nash, both of Leaksville, N. C., June 23.

Deaths

David Linn Edsall, distinguished in medicine as a teacher and leader, died in Cambridge, Mass., August 12, aged 76.

Dr. Edsall was born in Hamburg, N. J., July 6, 1869. He received the A.B. degree at Princeton University in 1890, M.D. at the University of Pennsylvania, Philadelphia, in 1893 and the Sc.D. at Princeton in 1913 and Harvard University in 1928. Dr. Edsall, on concluding his postgraduate education in London, Vienna and Gratz, entered the practice of medicine in Philadelphia, becoming immediately associated with the work of the medical department of the University of Pennsylvania, first as associate in the Pepper Clinical Laboratory and subsequently as instructor in medicine, associate, assistant professor of medicine, professor of pharmacology and therapeutics and professor of medicine. In 1911 he went to Washington University School of Medicine, St. Louis, as professor of preventive medicine. From 1912 to 1923 Dr. Edsall served as Jackson professor of clinical medicine at Harvard Medical School, from 1918 to 1935 dean, carrying a concurrent appointment from 1921 to 1935 as dean of the Harvard School of Public Health. He became emeritus in 1935.

In the American Medical Association Dr. Edsall was chairman of the Section on Pharmacology and Therapeutics in 1909-1910, a member of the Council on Pharmacy and Chemistry from 1908 to 1918 and First Vice President in 1919. He held membership in a number of scientific groups, including the Association of American Physicians, American Philosophical Society and the Society for Prevention of Infant Mortality and a retired membership in the Massachusetts Medical Society. He was a fellow of the American Academy of Arts and Sciences and once president of the American Pediatric Society, the American Society for Clinical Investigation and the American School Hygiene Association.

His early war service included activities in a consultant and advisory capacity on many national committees as well as on those organized in Massachusetts. He was a member of the committee on public health of the National Food Administration, a member of a committee appointed by the Working Conditions Service of the Department of Labor to draft a code to protect the health of explosives workers and a member and acting chairman of the committee on health of explosives workers of the National Research Council. He had been a member of a committee of five directed to guide the development of a department of industrial medicine and hygiene at Harvard and served as editor in chief of the *Journal of Industrial Hygiene and Toxicology* when it was created.

Dr. Edsall was noted as an educator and as an investigator. His interests were varied, extending to the industrial and social sides of medicine. One of his most important contributions in industrial hygiene was the discovery of "a disorder due to exposure to intense heat" among stokers on battleships and elsewhere, once known as Edsall's disease. His interest in occupational diseases led to the founding of the Occupational Clinic in the Massachusetts General Hospital.

Hugh Cabot ⊛ Boston, died suddenly while sailing in Fisherman's Bay, Ellsworth, Maine, August 14, aged 73.

Dr. Cabot was born in Beverly Farms, Mass., Aug. 11, 1872, and graduated at Harvard Medical School, Boston, in 1898. He started practice in Boston in 1900, serving on the staff of the Massachusetts General Hospital from 1902 to 1919 and at Baptist Hospital from 1900 to 1919. He was assistant professor of surgery at Harvard Medical School from 1910 to 1918. After a year as clinical professor of surgery he went to the University of Michigan Medical School, Ann Arbor, as professor of surgery, a position held until 1930, serving a concurrent appointment as dean of the medical school from 1921 to 1930. He left Michigan to accept a professorship in surgery at the University of Minnesota Graduate School of Medicine, Minneapolis-Rochester, serving also as surgeon at the Mayo Clinic. Late in 1938 he went to Massachusetts.

Dr. Cabot was a member of the House of Delegates of the American Medical Association from 1911 to 1915 and chairman of its Section on Genitourinary Diseases, 1916-1917. He held membership in the American Surgical Association, American College of Surgeons, American Association of Genito-Urinary Surgeons, American Urological Association and the Clinical Society of Genito-Urinary Surgeons. He was a member of a numerous foreign societies related to his specialty, a member of the founders' group of the American Board of Surgery and a specialist certified by the American Board of Urology. During World War I he was chief surgeon of the Harvard Unit of the British Expeditionary Forces for a year in 1916 and commanding officer the following year; he held an honorary rank of lieutenant colonel in the Royal Army Medical Corps.

Dr. Cabot had been contributing to medical journals since 1900. He was the author of Surgical Nursing, the Doctor's Bill and the Patient's Dilemma and served as editor of *Modern Urology* in 1918 and its third edition in 1936.

During the later years of his life Dr. Cabot waged unrelenting war against the policies of the American Medical Association. He appeared in numerous public forums in opposition and also as a witness for the government in its indictment of the Association under the Sherman Act.

William Linder ⊛ eminent surgeon, died in Olive Bridge, Ulster County, N. Y., August 11, aged 72.

Dr. Linder was born in Beregszasz, Hungary, July 4, 1873, coming to the United States in 1886. He returned to Europe for his postgraduate studies after graduating at Bellevue Hospital Medical College in 1896. He served his internship at St. Catherine's Hospital, Brooklyn, later becoming a member of the gynecologic staff there. In subsequent years he was also a member of the Wyckoff Heights Hospital, Rockaway Beach Hospital and the Israel Zion Hospital of Brooklyn, where he was surgeon in chief. In 1935, to honor his twenty-nine years' association with the Jewish Hospital of Brooklyn, the board of directors elected him "dean of surgery," a special recognition to enable him to remain in active service to the hospital. In 1924 he joined the staff of Long Island College of Medicine, becoming emeritus professor of clinical surgery in 1935. A member of the founders group of the American Board of Surgery, Dr. Linder was a fellow of the American College of Surgeons and of the New York Academy of Medicine and past president of the Medical Society of the County of Kings and the Brooklyn Surgical Society. He spent his winters in Florida, where he was a member of the state medical society and a member of the staffs of the Jackson Memorial, Miami, and St. Francis hospitals, Miami Beach.

Claude Elson Boyd, Amory, Miss.; Birmingham Medical College, 1911; member of the American Medical Association; president of the Northeast Mississippi Thirteen Counties Medical Society in 1933; died in the Baptist Hospital, Memphis, Tenn., June 9, aged 63, of heart disease.

Elizabeth Campbell ⊛ Cincinnati; Woman's Medical College of Cincinnati, 1895; organized in 1909 the Cincinnati Visiting Nurse Association and in 1917 the Cincinnati Social Hygiene Society, serving both as their first president; founded in 1932 the Cincinnati Committee on Maternal Health, serving as chairman; in 1910 vice president of the Cincinnati Academy of Medicine; in 1942 given an honorary life membership in the American Social Hygiene Association, having served as a member of its board from 1925 to 1936 and from then until 1938 as vice president; in 1943 a portrait of her was unveiled at Christ Hospital in recognition of her forty-one years' service as a member of the staff; died June 7, aged 83.

Wilson Thompson Davidson ⊛ Colonel, U. S. Army, retired, Belton, Texas; University of Texas School of Medicine, Galveston, 1896; fellow of the American College of Surgeons; entered the regular army as an assistant in 1901; veteran of the Spanish-American War and World War I; retired with the rank of lieutenant colonel on June 10, 1920 for disability in line of duty; under the Act of June 21, 1930 became a colonel; died in the Veterans Administration Facility, Dallas, May 19, 1944, aged 75, of cerebral hemorrhage and arteriosclerosis.

Carrol William Downey, Tallapoosa, Ga.; Atlanta Medical College, 1898; member of the American Medical Association; died April 8, aged 69.

William Vincent Eckhart, Marion, Ind.; Jefferson Medical College, Philadelphia, 1941; interned at the Atlantic City Hospital in Atlantic City, N. J.; entered the medical reserve corps of the U. S. Army as a first lieutenant on June 6, 1941; began active duty in the medical corps, Army of the United States, on Sept. 14, 1942; placed on inactive duty in April 1945; killed in an automobile accident May 17, aged 29.

John Miles Gibbons, New York; University of Pennsylvania Department of Medicine, Philadelphia, 1899; also a lawyer; retired general counsel of the New York, New Haven and Hartford Railroad Company; died in St. Luke's Hospital May 29, aged 81.

Salada Leon Goad, Marlow, Okla. (licensed in Oklahoma under the Act of 1908); died in Duncan May 25, aged 77.

Smith Gorsuch ⊕ Castalia, Ohio; Ohio Medical University, Columbus, 1902; president of the Castalia Bank; member of the chamber of commerce; served as physician for the County Home; on the staff of the Providence Hospital, Sandusky, where he died May 23, aged 75.

Judge Gant Hambright, Roby, Texas; University of Louisville (Ky.) Medical Department, 1891; member of the American Medical Association; honorary member of the State Medical Association of Texas; died in a Sweetwater hospital May 28, aged 83.

Joseph Austin Hipp ⊕ Olney Springs, Colo.; St. Louis College of Physicians and Surgeons, 1904; died in May, aged 76.

Samuel Hill Howard, Durant, Miss.; Memphis (Tenn.) Hospital Medical College, 1890; died June 19, aged 81.

Algernon B. Kidd, Shreveport, La; Memphis (Tenn.) Hospital Medical College, 1894; died April 24, aged 72.

John Dorsey Knox ⊕ Warren, Ohio, Western Reserve University Medical Department, Cleveland, 1908; fellow of the American College of Surgeons; served during World War I; on the staff of the Warren City Hospital, where he died May 26, aged 63, of chronic myocarditis.

Carl Frederick Lewis, Jerseyville, Ill.; Bennett Medical College, Chicago, 1909; served overseas during World War I; died May 31, aged 60, of coronary thrombosis.

James Everett Maddux, Fulton, Calif.; Cooper Medical College, San Francisco, 1894; died in a hospital at Santa Rosa May 26, aged 81, of carcinoma of the stomach.

Mark Irving Makler ⊕ Lynn, Mass.; Northwestern University Medical School, Chicago, 1927; member of the New England Pediatric Society; on the staffs of the Children's Hospital in Boston and the Lynn Hospital, where he died May 14, aged 42, of Hodgkin's disease.

William C. Marshall ⊕ Yellow Springs, Ohio; Medical College of Ohio, Cincinnati, 1890; served as health officer of Greene County; on the staff of McClellan Hospital, Xenia, where he died May 31, aged 86, of coronary heart disease and arteriosclerosis.

George R. Meyer ⊕ Marshalltown, Iowa; State University of Iowa College of Medicine, Iowa City, 1895; died May 17, aged 74, of cerebral hemorrhage.

Robert Bogie Miller, Cincinnati; University of Cincinnati College of Medicine, 1941; served an internship and residency at the Cincinnati General Hospital; died in the Good Samaritan Hospital May 4, aged 29, of pulmonary tuberculosis



CAPT. VINCENT F. ATENE, M. C., A. U. S., 1913-1942



LIEUT. COMDR. D. H. BRUMBAUGH (MC), U.S.N.R., 1903-1945



CAPT. NEWTON ALEXANDER CANNON, M. C., A. U. S., 1914-1945

George B. Lawrence, Crab Orchard, Ky.; University of Louisville Medical Department, 1891; veteran of the Spanish-American War; died May 9, aged 80, of congestive cardiac failure.

Robert Bruce Miller, Lebanon, Ore.; University of Oregon Medical School, Portland, 1914; member of the American Medical Association; on the staff of the Lebanon General Hospital, died May 31, aged 59, of myocarditis and rheumatism.

KILLED IN ACTION

Vincent Francis Atene, Brooklyn; Creighton University School of Medicine, Omaha, 1938; interned at the Norwegian Lutheran Deaconesses' Home and Hospital; served a residency at the Victory Memorial Hospital and the Brooklyn Cancer Institute, began active duty as a first lieutenant in the medical corps, Army of the United States, on Jan. 23, 1941; promoted to captain; posthumously awarded the Purple Heart and a Presidential Citation; transport surgeon; killed in action in the European theater Dec. 1, 1942, aged 29.

Donald Harmon Brumbaugh ⊕ Redlands, Calif.; Stanford University School of Medicine, San Francisco, 1931; interned and served a residency at the San Bernardino General Hospital in San Bernardino; interned at St. Luke's Hospital in San Francisco; began active duty as a lieutenant commander in the medical corps of the U. S. Naval Reserve on Sept. 28, 1942; assigned as an area surgeon with marine artillery regiments at Camp Dunlap, Niland, Calif.; junior medical officer, U. S. S. *Hamlin,* a seaplane tender, in Tacoma, Wash., from April to September 1944, when he became senior medical officer on the U. S. S. *Birmingham;* received the Bronze Star Medal for action off Leyte in October 1944 while the *Birmingham* was aiding the U. S. S. *Princeton;* died in the Asiatic area May 4, aged 41, of extreme multiple injuries.

Newton Alexander Cannon, Vanleer, Tenn.; University of Tennessee College of Medicine, Memphis, 1941; interned at the Nashville General Hospital in Nashville, Tenn.; began active duty as a first lieutenant in the medical corps, Army of the United States, on Jan. 1, 1943, later promoted to captain; killed in action in Luzon, P. I., March 31, aged 30.

Ellsworth Eurit Moody ⊕ Joplin, Mo ; Washington University School of Medicine, St. Louis, 1914; specialist certified by the American Board of Pediatrics, Inc.; on the staffs of the Freeman and St. John's Hospital; died in Greenup June 10, aged 53, of injuries received in an airplane accident.

Oliver M. Morris, Sheridan, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1897; Indiana University School of Medicine, Indianapolis, 1908; died May 14, aged 76, of carcinoma of the stomach

Beriah Edwin Mossman, Youngstown, Ohio; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the American Medical Association, past president of the Mercer County (Pa.) Medical Society, city physician, served on the surgical staff of the Greenville (Pa.) Hospital; on the honorary staff of the Youngstown Hospital Association; chief of Mercer County (Pa.) Draft Board in 1917; died May 3, aged 70, of coronary thrombosis

Walter C. Myers ⊕ Savannah, Mo.; Central Medical College of St. Joseph, 1897; past president of the Andrew County Medical Society; died April 17, aged 69, of chronic nephritis.

Charles W. Nehl, St. Louis, American Medical College, St Louis, 1903; served as professor of osteosyndesmology and angiology at his alma mater, died April 22, aged 76, of chronic myocarditis.

William B. O'Bannon, Stanford, Ky.; Eclectic Medical Institute, Cincinnati, 1883; member of the American Medical Association; served as a member of the city council and as representative from Lincoln County to the state legislature; died April 22, aged 89.

William Henry Parsons, San Antonio, Texas; Hospital College of Medicine, Louisville, Ky, 1906; member of the American Medical Association; died May 22, aged 69, of cerebral hemorrhage

Artie Blair Paul, Portland, Ore.; Jefferson Medical College of Philadelphia, 1924; member of the American Medical Association; served during World War I; died in the Veterans Administration Facility, Roseburg, May 16, aged 51.

Francis John Pellegrino, Castleton, Vt.; Middlesex College of Medicine and Surgery, Cambridge, Mass, 1936; interned at White Plains Hospital in White Plains, N. Y.; began active duty as a first lieutenant in the medical corps, Army of the United States, on Aug. 24, 1942, with service terminated Sept. 20, 1944 because of physical disqualification; died in Boston May 20, aged 34.

Thomas Clayton Piles, Piedmont, Mo.; Missouri Medical College, St. Louis, 1890; past president of the Wayne County Medical Society; served as county coroner; on the staff of the Poplar Bluff (Mo.) Hospital April 10, aged 82, of chronic myocarditis and coronary occlusion.

George Washington Hull Presnell ⊕ Sikeston, Mo.; Barnes Medical College, St. Louis, 1897; mayor of Sikeston; served as alderman; past president of the Scott County Medical Society; served during World War I; died May 26, aged 71, of leukemia.

Peter Francis Purcell ⊕ Schenectady, N. Y.; Albany Medical College, 1911; served during World War I; on the staff of the Ellis Hospital; died May 2, aged 57, of dissecting aneurysm of the aorta.

Henry George Storner ⊕ Olean, N. Y.; University of Buffalo School of Medicine, 1923; served as a member of the Fifty-Fourth Battery in the Field Artillery Officers Central Training School at Camp Zachary Taylor, Ky., during World War I; on the staffs of St. Francis and Olean General hospitals; died May 15, aged 46, of heart disease.

Benjamin G. Swanson Jr., Atlanta, Ga.; University of the South Medical Department, Sewanee, Tenn., 1907; died in a Savannah hospital March 17, aged 62.



LIEUT. RICHARD CHARLES DIAMON
M. C., A. U. S., 1917-1944



LIEUT. FELICE GEORGE SACCO
M. C., A. U. S., 1918-1945



CAPT. ANDREW CLEVE HEATH
M. C., A. U. S., 1914-1944

KILLED IN ACTION

Richard Charles Diamon, Herminie, Pa., Jefferson Medical College of Philadelphia, 1943; interned at the Lankenau Hospital in Philadelphia; began active duty as a first lieutenant in the medical corps, Army of the United States, on Jan. 14, 1944, assigned to Northington General Hospital in Tuscaloosa, Ala.; killed in action due to air attack in Stalag, Germany, Dec. 23, 1944, aged 27.

Felice George Sacco, New York; Marquette University School of Medicine, Milwaukee, 1943; interned at the U. S. Marine Hospital in Staten Island; began active duty as a first lieutenant in the medical corps, Army of the United States, on Feb. 25, 1944; died January 15, aged 26, of wounds received in action in the Southwest Pacific area.

Andrew Cleve Heath, New Orleans; Louisiana State University School of Medicine, New Orleans, 1941; interned at the Charity Hospital; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 1, 1942; later promoted to captain; died of wounds received in Germany Dec. 21, 1944, aged 30.

Correspondence

ELECTROMYOGRAMS OF TREMORS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, July 7, a query appeared about electromyograms of tremors, by George H. Hoxie, M.D., Berkeley, Calif. The answer said that no tracings of the specific tremors described in the query are available in the medical literature. This answer was probably given by a writer who is not acquainted with literature outside this country. As a matter of fact, records of intention tremor were published by me in 1929 (Etude sur les phénomènes oscillatoires dans la sclérose en plaques, Royal Academy of Sciences at Amsterdam, Proc., vol 32, No. 1, 1929). The conclusion was that 80 per cent of so-called intention tremors have to be considered as atoxia instead of real tremors. Senile tremor and tremor of excitement were recorded in other publications. I mention Action-Tremor (*J. Nerv. & Ment. Dis.* **64**:1 [July] 1926; Phénomènes rhythmiques du système nerveux normal et malade, *Rev. neurol.* **1**:367; Tremors and Related Phenomena, *Nederl. tijdschr. v. geneesk.* **1**:472 [Jan. 28] 1928). A very good article entitled "The Nature of Tremors" was published in the *North Carolina Medical Journal* (**5**:15 [Jan.] 1944) by Arthur Allen Morris, M.D., from the Montreal Neurological Institute, Quebec, Canada.

A similar mistake was made some years ago by one of the authors in the reference of the answer to the query. The conception of tremor as a phenomenon of discharge in motor cells of the central nervous system and the pathophysiologic similarity of tremor and clonus was attributed to Wilson instead of to the undersigned.

HERMAN DE JONG, M.D., Durham, N. C.
Associate Professor of Neuropsychiatry,
Duke University School of Medicine.

THE GIANT CELLS IN HODGKIN'S DISEASE—ANCIENT ERROR IN MODERN MEDICINE

To the Editor:—It is difficult to determine just who is responsible for the preservation in modern medicine of the ancient error that the giant cells in the tissues of Hodgkin's disease were first described by the Austrian investigator Sternberg or by Dorothy Reed, an American. As a matter of truth they were first described by an Englishman, Greenfield, in 1878, twenty years before Sternberg called attention to them in 1898 and twenty-four years before the appearance of Reed's paper in 1902 and Andrew's paper at about the same time. Nevertheless these cells are frequently referred to as Sternberg's cells or as Dorothy Reed cells or as Sternberg-Reed cells and practically never as Greenfield's cells. In his presentation to the Pathological Society of London on April 2, 1878 on "Specimens Illustrative of the Pathology of Lymphadenoma and Leukocythemia," Greenfield followed the English custom of using the designation lymphadenoma synonymously with the term Hodgkin's disease. Greenfield stated that, in the microscopic examination of lymph "glands" in lymphadenoma ". . . . the fibrous stroma appeared coarser, and there were a large number of multinucleated cells adherent to the trabeculae, well seen on washing away the lymph cells. These multinucleated cells, containing from four to eight or twelve nuclei, were often collected in clusters in parts of the gland, especially where the fibrous change was progressing." One of his illustrations portrays numbers of multinucleated giant cells which, contrary to the statement just quoted from the text, show no connection with the surrounding fibrous trabeculae. This, however, is neither here nor there—the fact remains that the giant cells in the tissues of Hodgkin's disease were first described by Greenfield. Nor is it of much importance that he regarded them as multinucleated, thus differing from those who subsequently preferred to teach that the giant cells in Hodgkin's disease are mononuclear although multilobular but agreeing, in part at least, with those who believe that both varieties may occur. It seems to me that, if the giant cells in Hodgkin's disease are to be designated eponymously, the accolade should go to Greenfield (Greenfield, W. S.: *Tr. Path. Soc. London* **29**:272, 1878). In the same connection it is interesting to recall that Sternberg interpreted the histologic changes in pseudoleukemia (the German synonym for Hodgkin's disease) as revealing a "peculiar variety of tuberculosis of the lymphatic apparatus." The next year (1899), however, he courageously reversed himself and announced the view that the cause of pseudoleukemia is "still unknown." Although Sternberg's renunciation is seldom mentioned, his original opinion is resurrected sometimes to support the theme that tuberculosis follows Hodgkin's disease "like a shadow."

Hodgkin's disease provides another example of ill bestowed credit in the form of the Pel-Ebstein eponym. In 1887 Pel of Amsterdam and Ebstein of Göttingen independently of each other described a syndrome in Hodgkin's disease characterized by gradual ascent of the patient's temperature to 103 or 104 F., where it is maintained for a period of three or four days, sometimes longer, after which it descends and the patient remains afebrile for an interval of about ten days or two weeks (Pel, P. K.: *Berl. klin. Wchnschr.* **24**:644, 1887. Ebstein, W., *ibid.* **24**:565, 837, 1887). Similar reactions occur with almost predictable regularity over periods varying from several months to a year or more. Precisely the same syndrome was described by Murchison seventeen years previously in a paper which appears in the *Transactions of the Pathological Society of London* under the title of "A Case of 'Lymphadenoma' of the Lymphatic System, Spleen, Liver, Lungs, Heart, Diaphragm, Dura Mater, &c." (Murchison, C.: *Tr. Path. Soc. London* **21**:372, 1870). The histologic examinations were carried out by Burden Sanderson. Neither Murchison nor Sanderson seemed to be any too sure that the disease was an example of Hodgkin's "lymphadenoma." This uncertainty was reflected not only in the title of Murchison's paper, where the word lymphadenoma is in quotation marks, but also in the text, where he refers several times to the resemblance of the disease to "tubercle or cancer." Sanderson's woodcuts depicting the microscopic changes do not bear the slightest resemblance to the histology of Hodgkin's disease as it is now known. On the other hand one of them (page 385) shows microscopic features which are strangely reminiscent of the malignant tumor that is more or less familiarly known to pathologists as perithelioma or perithelial sarcoma, the naked eye appearances of which may resemble those of cancer and the structural unit of which is a small blood vessel. Incidentally, the syndrome in question, contrary to common precept, is not peculiar to Hodgkin's disease but has been noted also in certain forms of caseous pulmonary tuberculosis as well as in necrotic tumors, among them hypernephromas and perithelial sarcomas. Wherever encountered it would appear to be more appropriately referred to as Murchison's syndrome. By all this I do not mean to imply that writers on the subject of Hodgkin's disease are alone in the matter of rendering unto Caesar those things which do not rightfully belong to Caesar. That is by no means true, as witness the fact that Addison described primary progressive (idiopathic) pernicious anemia seventeen years before Biermer, that Parry of Bath described toxic diffuse goiter ten years before Graves and fifteen years before Basedow, that Winiwater, a Swiss army surgeon, described what is currently designated Buerger's disease twenty-nine years before the appearance of Buerger's paper, that Edward Selleck Hare in the days of his house officership at the Stafford Infirmary during the late eighteen thirties described the precise equiva-

lent of the now familiar "Pancoast's syndrome" (superior pulmonary sulcus tumor), including Horner's symptom complex, thirty years before Horner and nearly a century before Pancoast, and so on (Hare, E. S.: *London M. Gaz.* **1**:16, 1838-1839).

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NODULAR VASCULAR DISEASE OF THE LEGS

To the Editor:—The article "Nodular Vascular Diseases of the Legs," by Montgomery, O'Leary and Barker (THE JOURNAL, June 2, p. 335), should not go unchallenged. The authors have attempted to define a new entity, "nodular vasculitis," and to differentiate it from erythema induratum. Because the authors are eminent, there is danger that their conclusions will be accepted and that an ill defined entity will enter the medical nomenclature to confuse all physicians who are not dermatologists.

In the differential diagnosis between "nodular vasculitis" and erythema induratum they state that the nodules tend to be more painful in the former and that erythema induratum tends to occur in younger women. These distinctions are not valid, for the nodules of undoubted erythema induratum may be extremely painful and may occur at any age. After analyzing their paper, one must assume that they have really only one point of differentiation between "nodular vasculitis" and erythema induratum, and that is the presence or absence of undoubted tuberculous lesions elsewhere in the body.

The senior authors presented a woman aged 54 with a diagnosis of nodular vasculitis before the Minnesota Dermatologic Society in 1943 (O'Leary, P. A.; Montgomery, Hamilton, and Brunsting, L. A.: A Case for Diagnosis, *Arch. Dermat. & Syph.* **50**:212 [Sept.] 1944). The woman had purplish red, deep seated tender nodules of the medial and posterior aspects of the legs from the ankles to the middle of the thighs of five months' duration. In the antetibial areas were healed scars dating from a skin infection of several months' duration during childhood. Her father had pulmonary tuberculosis. A roentgenogram of the chest was normal and the tuberculin test with purified protein derivative elicited a negative reaction in the first dilution. A biopsy from one of the lesions showed obliterative changes in the vessels, areas of epithelioid cells, foreign body giant cells and collections of plasma cells. In the discussion of this case Dr. Montgomery minimized the significance of the presence of the giant cells and epithelioid cells and emphasized the predominance of the vascular changes. Yet six months later, as they state in their article in THE JOURNAL, this same woman presented a histologically proved tuberculous cervical adenitis and a strongly positive tuberculin test.

The various tuberculids which the dermatologist encounters are so typical in their appearance, distribution and clinical course that the detection of other tuberculous lesions are not necessary for a correct diagnosis—and so it is with erythema induratum.

The question as to whether or not there is an entity such as "nodular vasculitis" is of more than academic importance. If one should decide that such a diagnosis is acceptable in a particular patient, then that patient will be offered no other treatment than the wearing of elastic supports of some kind. However, if the diagnosis of erythema induratum is made, the prognosis may be excellent because erythema induratum frequently responds to treatment with tuberculin, gold sodium thiosulfate, neoarsphenamine or one of the newer trivalent arsenicals such as dichlorophenarsine hydrochloride-U. S. P.

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Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Aug. 18, page 1188.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: January. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS:* *Medical.* Little Rock, Sept. 20-21. Sec., Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, Nov. 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, Nov. 11. *Written.* Sacramento, Oct. 15-18. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO:* Denver, Oct. 2-5. Final date for filing application is Sept. 17. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT:* *Medical. Examination.* Hartford, Nov. 13-14. *Endorsement.* Hartford, Nov. 27. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, Sept. 10. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

ILLINOIS: Chicago, Oct. 9-11. Supt. of Registration, Department of Registration & Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Topeka, Dec. 6. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

MAINE: Portland, Nov. 13-14. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, Dec. 11-15. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 20-23. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSISSIPPI: Jackson, Sept. 26-27. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO:* Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 1-4. Sec., Dr. Jacob L. Lochner, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, October. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

RHODE ISLAND:* Providence, Oct. 4-5. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* Pierre, Jan. 15-16. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Capitol Bldg., Pierre.

TEXAS: Dallas, Sept. 4-6. Sec., Dr. T. J. Crowe, 918-920 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, March or April 1946. Sec., Dr. F. J. Lawliss, Richford.

WEST VIRGINIA: Charleston, Oct. 4-6. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN:* Madison, Jan. 8-10. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Oct. 1-2. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, Sept. 5-6. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Oct. 13. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 22-23. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 3. Sec., Dr. J. F. Conn, Box 655, DeLand.

IOWA: Des Moines Oct. 9: Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Oct. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

SOUTH DAKOTA: December. Sec., Dr. J. D. Alway, Aberdeen.

TENNESSEE: Memphis, Sept. 24-25. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Madison, Sept. 22. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee 3.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Optometry Practice Acts: Prohibition of Advertising Concerning Price Upheld.—The National Optical Stores Company operate five "stores" in Wisconsin. Apparently it was claimed that the stores in question merely sold optometrical merchandise, such as glasses, lenses and frames. It appeared, however, that glasses were sold on the prescription of an optometrist or physician and that a physician is kept in a store to prescribe glasses for the plaintiffs' customers under an "arrangement" in which a room is furnished the physician, the physician fixing a fee of $1 or $2 for examining the eyes of a customer and collecting directly from the customer. The plaintiffs, however, guaranteed the physician a specific amount as fees for a specific period. With respect to one of the Wisconsin "stores" an advertisement was inserted in one of the local papers that purported to offer bifocal double vision glasses of a $12 value for $3.88. The ad exhorted its readers to "get the glasses you need at prices you can afford"; that there was "no extra cost" and "no extra charge." A section of the Wisconsin optometry practice act (Wisconsin Statutes, section 153.10) makes it unlawful for any person to advertise directly or indirectly by any means whatsoever any definite or indefinite price or credit terms on lenses, frames, complete glasses or any optometric service or to advertise in any manner that will tend to mislead or deceive the public. Apparently the Wisconsin Board of Examiners in Optometry threatened to institute proceedings under this section and Benjamin D. Ritholz and others, who were copartners operating the stores, brought an action in equity to enjoin the board from prosecuting them for purported violation of that statute. They claimed that the statute was unconstitutional under the Fourteenth Amendment to the United States Constitution, which, among other things, prohibits a state from abridging the privileges or immunities of citizens of the United States or of depriving any person of life, liberty or property, without due process of law, or from denying to any person within its jurisdiction the equal protection of the laws. The trial court issued a judgment declaring the statute void as in contravention of the constitutional provision just noted and enjoined the board from proceeding against the plaintiffs. The board then appealed to the Supreme Court of Wisconsin.

As to the question as to whether or not, as applied to the practices of the plaintiffs, the provision of the optometry practice act prohibiting advertising any price or terms on optometric mechandise or optometric services violated the constitutional provision referred to, the court regarded itself as bound by its holding in *Modern System Dentists* v. *State Board of Dental Examiners,* 216 Wis. 190, 256 N. W. 922. In that case this court upheld certain rules validly promulgated by the Board of Dental Examiners specifically prohibiting advertising essentially the same as the advertising here involved. Ritholz and the other defendants claimed, however, that that case was not in point here because dentistry is a profession and selling glasses and lenses, such as was done by the National Optical Stores, is merely merchandising. But, answered the court, by their own advertising the plaintiffs profess to do more than merely sell glasses. They advertise to sell glasses to fit the needs of the public, which under the provisions of the optometry practice act requires the services of a person licensed to practice either optometry or medicine. Neither of these is mere merchandising. The basis of the rule applicable to dentists is not that they are professional men but that the advertising prohibited to them tends to deceive and mislead the public, and the reason for the rule is as applicable here as there. The instant statute does not purport to affect the mere merchandising of glasses that does not require the services of an optometrist to prescribe them. The plaintiffs may sell glasses that aid sight by merely magnifying or protecting against excessive sunlight. So they may sell stock glasses where the customer fits himself by trying on glasses in the seller's stock on hand. But we do not have to rest the constitutionality of this statute wholly on our previous decision in the dentist case. The evidence in this case shows that the advertising used by the plaintiffs actually does operate to defraud the public. The customers of the plaintiffs are mostly poor persons and by the plaintiffs' own testimony their advertisements are designed to reach "workers, foreigners and Negroes" particularly. They use the advertisements as a lure or bait, or, as they call it, "an inducement" to draw such persons to their stores. The advertisement on its face is dishonest. It manifestly aims and tends to mislead the public and is therefore fraudulent advertising. This conclusion is inescapable, in the court's opinion, in view of the "setup" in the plaintiffs' stores. The "arrangement" between the physician and the plaintiffs constitutes the physician an "employee" of the plaintiffs. By the testimony of the plaintiffs' general sales agent, when a customer arrives he is ushered into a room occupied by the physician employed by the plaintiffs, who proceeds to make the examination of the customer's eyes. When the physician has completed his examination, he writes out what he calls a prescription and demands $1 or, in some cases, $2 for it. If the customer protests the fee on the ground that the advertisement pursuant to which he came to the store represented that there would be "no extra charge" for examination, the physician answers that the fee is not for glasses but for the prescription. This is, continued the court, on its face a mere subterfuge. Nearly all customers "fall for it" and pay the fee. A plain bare fraud is thus perpetrated. The aim and practice of the plaintiffs, as shown by the testimony of their sales manager and by the "Manual of Instruction" to their salesmen, is to sell the customer the highest priced glasses and frames possible to foist on him even though the complete glasses advertised at $3.88 would supply his need as well. This in the case of a customer who is wealthy or is well to do may be good salesmanship, but it is against the public welfare when it is done to the poor or the class of customers whom the plaintiffs mostly serve. And so as to filching a dollar for examination from the class of customers with whom the plaintiffs mostly deal.

While there may be disagreement in the decisions of courts of last resort, continued the court, on the proposition as to whether or not an ordinary trader can be prevented from advertising the price at which he will sell eye glasses, there is unanimity in the court decisions in this field on the proposition that any advertising that tends to deceive or mislead is a fraud on the public and in our view that rule applies to the present plaintiffs. It is quite true that some of the advertising done by the plaintiffs is not within the ban of the statute. But clearly some of it is, and clearly the plaintiffs cannot enjoin all prosecution under the statute when part of its advertising is banned. Nor can they come into court for advice as to what advertisements they may make through seeking an injunction against prosecution for alleged legal advertising. If the plaintiffs are prosecuted under the statutes for advertising that they consider not fraudulent and the prohibition of it by statute therefore unconstitutional they can assert their claim in defense. This constitutes an adequate legal remedy and thus bars an action in equity.

The judgment of the lower court enjoining the enforcement of the section as against the plaintiffs was in effect reversed and the cause was remanded to the lower court with directions to dismiss the bill of complaint.—*Ritholz et al. v. Johnson et al., 17 N. W. (2d) 590 (Wis. 1945).*

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Annals of Surgery, Philadelphia

121:769-904 (June) 1945

Preparation of Battle Casualties for Surgery. H. K. Beecher.—p. 769.
Graduate Surgical Training in America. C. M. Smyth Jr.—p. 793.
*Local Fluid Loss, Nerve Stimuli and Toxins in Causation of Shock. D. B. Phemister and C. H. Laestar.—p. 803.
*Stainless Steel Wire Mesh in Repair of Small Cranial Defects. E. Boldrey.—p. 821.
Fracture of Atlas. J. J. Hinchey and W. H. Bickel.—p. 826.
Chest Wounds in Battle Casualties. J. P. West.—p. 833.
Problem of Massive Hemorrhage from Duodenal Ulcers of Patients Beyond Middle Life. H. K. Gray and W. S. Sharpe.—p. 840.
Pancreaticoduodenectomy for Islet Carcinoma. A. O. Whipple.—p. 847.
Suppurative Pancreatitis with Associated Liver Abscess. T. A. Shallow, S. A. Eger and F. B. Wagner Jr.—p. 853.
*Frozen Human Skin Grafts. M. M Strumia and C. C. Hodge.—p. 860.
Pyruvic Acid Method of Burn Slough Removal. C. R. Lam and Magda Puppendahl.—p. 866.
Bone Sarcoma in Polyostotic Fibrous Dysplasia. B. L. Coley and F. W. Stewart.—p. 872.
Spontaneous Rupture of Axillary Artery. F. B. St. John, J. Scudder and Dorothy L. Stevens.—p. 882.
Unusual Case of Meckel's Diverticulum. S. Gendel and M. G. Beaver. —p. 891.

Causation of Shock.—Experiments were conducted on 38 dogs divided into three groups. The trauma was limited to the right hind limb. No evidence was obtained from these experiments that either a flow of nociceptive stimuli from the injured field or toxin formation is an important contributing factor in the initiation of circulatory impairment or shock which followed. The animals in which the trauma was applied soon after the administration of spinal anesthesia were protected from shock principally by the blockage of the vasomotor and (less importantly) motor nerves, which greatly lowered the blood pressure and limited the hemorrhage to an amount that was too small to produce shock, instead of by blockage of afferent impulses. The maintenance of such a low blood pressure by spinal anesthesia for the prevention of shock during an operation on man is contraindicated, as the amount of anesthetic required would be too toxic. In all the experiments in which shock developed, the local blood loss was large and constituted the main causative factor. There appears to be no indication for the renewal of efforts to prevent shock by the blockage of afferent nerve impulses through the use of local or spinal anesthesia. Indications for the use of local or spinal anesthesia in shock are based on other grounds.

Stainless Steel Wire Mesh in Repair of Small Cranial Defects.—Boldrey says that small cranial defects ranging in size from burr holes to openings approximately 2 inches in diameter have excited little attention and have generally been shrugged off as of no serious consequence. Yet burr holes in the frontal region result in unsightly depressions and may be associated with tenderness. They have sometimes been filled with bone dust or with buttons removed with the trephine, but these bits of bone absorb rapidly and so fail in the purpose for which they are used. Stainless steel wire, when used in the skull, does not show the disadvantages attributed to it when it is used for orthopedic purposes in other bones of the body. Wire used to hold osteoplastic bone flaps in position or in myoplastic craniotomies becomes tightly embedded within the bone as osseous repair takes place. It seemed reasonable that a mesh of stainless steel wire would become anchored in connective tissue and possibly in bone at the edges of a cranial defect. The mesh was tried first in dogs and later the use of both the 0.0065 inch (40 by 40) and 0.0075 inch (28 by 28) screen was begun in patients. During the past eighteen months it has been used for small defects and has been regarded as satisfactory. There have been no ill effects. None of these patients have died or have required further surgery in the same region, so that no human pathologic material is available. When used to cover frontal burr holes, a layer of screen is placed between the dura and the skull before the bone flap is replaced. This remains in position without sutures. Another piece is added outside the skull, as the double mesh seems to give a better cosmetic result. With limitations, mesh appears to offer a safe, adaptable and readily available method of dealing with small cranial defects.

Frozen Human Skin Grafts.—Strumia and Hodge transplanted 41 autogenous split thickness grafts, preserved in the frozen state from one to sixty-one days, at temperatures of minus 20 to minus 25 C. (minus 4 to minus 13 F.), to 3 patients. These grafts resulted in 80.5 per cent permanent takes. Thirty-four control grafts of fresh skin in the same patients resulted in 86.4 per cent takes. The result of grafting does not appear to be affected by the time of storage of the grafts in the frozen state, at least within the experimental limits mentioned. Aside from the possible development of skin banks for homografts, the preservation of split thickness autogenous grafts in the frozen state allows the operator to obtain at one operation large numbers of grafts which may be employed for transplantation at any time later on.

Archives of Internal Medicine, Chicago

75:357-426 (June) 1945

Albright's Syndrome (Polyostotic Fibrous Dysplasia with Cutaneous Pigmentation in Both Sexes and Gonadal Dysfunction in Females). M. B. Dockerty, R. K. Ghormley, R. L. J. Kennedy and D. G. Pugh. —p. 357.
Infectious Mononucleosis: Analysis of 300 Cases with 3 Characterized by Rare Hematologic Features. J. T. Read and F. C. Helwig.—p. 376.
Azotemia Associated with Gastrointestinal Hemorrhage: Experimental Etiologic Study. R. Gregory, P. L. Ewing and H. Levine.—p. 381.
Aplastic Anemia and Its Association with Hemochromatosis. K. Zeltmacher and Margery Bevans.—p. 395.
Pernicious Anemia in Chinese. S. O. Schwartz and Lilly A. Rappolt. —p. 404.
*Large Doses of Ascorbic Acid in Treatment of Vitamin C Deficiencies. Emma D. Kyhos, E. L. Sevringhaus and Dorothy Hagedorn.—p. 407.
Primary Systemic Amyloidosis of Alimentary Tract. A. Golden.—p. 413.
Gastroenterology: Review of Literature from July 1943 to June 1944. W. L. Palmer, D. S. Harman and W. E. Ricketts.—p. 417.

Large Doses of Ascorbic Acid in Vitamin C Deficiencies.—Kynos and her associates studied the effects of large doses of synthetic ascorbic acid on urinary excretion, plasma and whole blood in 26 patients hospitalized for other ailments but judged to be also deficient in vitamin C on the basis of history, clinical signs and low plasma content of ascorbic acid. The efficiency of single doses of ascorbic acid of 100 to 500 mg. was excellent if the plasma level of ascorbic acid was low. Some patients received as much as 1.5 Gm. of ascorbic acid in one day without significant urinary loss, while the plasma content of vitamin C was increased to high normal levels. The total amount of ascorbic acid supplement required to produce a twenty-four hour excretion of 40 mg. or over varied from 0.5 to 2.0 Gm. and the amount required for saturation from 1.5 to 2.8 Gm. Intravenous administration of ascorbic acid resulted in slightly greater excretion in a few cases. The authors observed evidence of a wide individual variation in the renal threshold for ascorbic acid, the probable plasma level for this series being 1.1 and 1.9 per hundred cubic centimeters. It was not demonstrated that a determination of the whole level is superior to that of the plasma level in diagnosing vitamin C deficiency. Patients with low plasma values generally excreted very small amounts of ascorbic acid until the dose had raised the plasma levels above 1.0 mg. Patients having renal involvement or blood dyscrasias responded atypically to ascorbic acid treatment. Although age does not seem to influence the results of ascorbic acid treatment, there seems to be some evidence that sex plays a part. Fluctuations have been observed in the plasma content of ascorbic acid in connection with certain phases of the menstrual cycle.

Archives of Neurology and Psychiatry, Chicago

53:329-398 (May) 1945

*Experimental Studies on Headache: Transient Thickening of Walls of Cranial Arteries in Relation to Certain Phenomena of Migraine Headache and Action of Ergotamine Tartrate on Thickened Vessels. C. Torda and H. G. Wolff.—p. 329.
Cerebral Injury by Blunt Mechanical Trauma: Special Reference to Effects of Repeated Impacts of Minimal Intensivity; Observations on Experimental Animals. C. G. Tedeschi.—p. 333.
Studies of Sensation of Vibration: III. Evidence for Cortical Areas in Inhibition and Mediation of Tickle. G. K. Yacorzynski and L. Davis. —p. 355.
Pretraumatic Personality and Psychiatric Sequelae of Head Injury: I. Categorical Pretraumatic Personality Status Correlated with General Psychiatric Reaction to Head Injury Based on Analysis of 200 Cases. H. L. Kozol.—p. 358.
Effect of Sodium Amytal and Amphetamine Sulfate on Mental Set in Schizophrenia. P. E. Huston and Mary M. Singer.—p. 365.
Effectiveness of Diphenylhydantoin in Management of Nonepileptic Psychomotor Excitement States. F. A. Freyhan.—p. 370.
Human Pyramidal Tract: XI. Correlation of Babinski and Pyramidal Syndrome. A. M. Lassek.—p. 375.
Primitive Habits and Perceptual Alterations in the Terminal Stage of Schizophrenia. S. Arieti.—p. 378.

Migraine Headache.—Torda and Wolff state that distention of cranial arteries induces pain of an aching quality. The speed with which vasoconstrictor agents such as ergotamine tartrate reduce the intensity of the headache approximates the rate of constriction of the cranial arteries. In many patients the headache arises in the distended branches of the external carotid arteries, although any or all of the cranial arteries may be involved in migraine headache. Secondary to pain from prolonged distention of cranial arteries, the skeletal muscles of the neck and scalp contract and become painful. After several hours of such a headache the vessel may appear more prominent and distended. Instead of being collapsible it becomes rigid, pipelike and less readily compressible. Patients may report that after the first hour or two of an attack of migraine the quality of the headache may change in that the initial pulsating or throbbing headache turns into a steady ache. To account for these changes the authors have postulated that after sustained dilatation there occurs thickening or edema of the muscular and adventitial structures. Sections taken from the temporal artery of patients during attacks of migraine involving this structure revealed on microscopic examination that there was thickening of the arterial wall. Since comparable control sections during periods of freedom from headache cannot be obtained, the authors studied the structure of the arteries of the ears of 6 cats after infusion for two hours of 10 cc. of mammalian isotonic solution of three chlorides containing 0.5 mg. of acetocholine bromide per hundred cubic centimeters. Measurements demonstrated thickening of the walls of the infused vessels. Ergotamine tartrate was less effective in constricting arteries with thickened walls than arteries with normal walls. It is suggested that during attacks of migraine the cranial arteries involved may undergo similar changes after prolonged vasodilatation. Such changes may explain the rigid, pipelike texture of the arteries, the steady aching pain and the tenderness of these structures when headache has persisted for many hours. Also these changes may explain the decreased ability of ergotamine tartrate to reduce promptly the intensity of prolonged headache.

Archives of Otolaryngology, Chicago

41:319-394 (May) 1945

Problem of Aviation Deafness: The Airman, His History and His Plane. P. A. Campbell.—p. 319.
Effect of Barometric Pressure Changes on Hearing. C. M. Kos.—p. 322.
Effect of Aircraft Noise on Hearing. B. H. Senturia.—p. 327.
*Inhalation Method for Penicillin Therapy: Preliminary Report. E. W. Hagens, Mary Karp and C. J. Farmer.—p. 333.
*Use of Microcrystals of Sulfathiazole in Otolaryngologic Practice. D. G. Ornston.—p. 337.
Treatment of Extensive Cicatricial Stenosis of Larynx or Trachea. J. B. Erich.—p. 343.
Survey of Literature on Tuberculosis—1940-1943. G. E. Wilson, assisted by W. K. Stern.—p. 355.

Inhalation of Penicillin.—Hagens and his co-workers treated 22 patients with penicillin by the inhalation method. Urine and blood levels showed that the drug is absorbed from the lungs to a sufficient degree. Because of its local effect the inhalation of penicillin may be the method of choice in cases of pulmonary disease. The inhalation of penicillin results in temporary improvement in bronchiectasis, but the condition frequently lapses back shortly after therapy is discontinued. In most cases gram negative bacteria are encountered, so that another antibiotic substance is also necessary, one to which these bacteria are sensitive. Asthmatic patients who have a superimposed bronchial infection with an organism to which they possibly are allergic may be favorably influenced by treatment. Acute pulmonary conditions respond to the inhalation treatment. The method may be used advantageously in the treatment of children and other patients when the intravenous or the intramuscular injections of penicillin are unsuitable.

Microcrystals of Sulfathiazole in Otolaryngologic Practice.—Ornston used microcrystals of sulfathiazole as a 5 per cent or a 20 per cent suspension in isotonic solution of sodium chloride and as a 5 per cent suspension with 1 per cent paredrine hydrobromide in isotonic solution of sodium chloride. He presents his experiences with the microcrystals in the common cold and its complications, in subacute sinusitis, in chronic maxillary sinusitis, in otitis media, in mastoidectomy and in miscellaneous conditions. The local use of microcrystalline sulfathiazole to combat infections of the upper respiratory tract presents the advantages of freedom from mechanical irritation, prolonged action at the site of infection and effective bacteriostatic action. In a controlled series of cases of subacute suppurative ethmoiditis the instillation of drops or the use of displacement showed that the sulfonamide compound reduced the amount and the duration of the discharge and decreased the incidence of complications. In cases of subacute sinusitis other than ethmoiditis, relief was prompt. In 8 of 11 cases of chronic maxillary sinusitis this condition was cured or improved by irrigation and filling with the microcrystals. Twenty-seven chronically suppurating ears were treated with the suspension, blown in through the auditory tube; in 5 the condition was cured and in 4 improved; in 18 there was no improvement. In all of these cases otitis had resisted other therapeutic methods. Local use of the microcrystals in operative wounds resulted in less drainage and tissue reaction and accelerated healing. No foreign body reaction was observed. Local application of sulfonamide compounds may obviate the necessity of oral administration.

Archives of Pathology, Chicago

39:351-424 (June) 1945

Poikilocytosis in Dairy Cattle. J. T. Reid, C. F. Huffman and C. W. Duncan.—p. 351.
Experimental Reproduction of Maduromycotic Lesions in Rabbits. D. Symmers.—p. 358.
Phialophora Jeanselmei Comb. N. from Mycetoma of Hand. C. W. Emmons.—p. 364.
Acute Agranulocytosis: Microscopic Study of Ulceronecrotic Gingiva of Bone Marrow in a Case. G. J. Anday and B. Orban.—p. 369.
Aortic Abnormalities in Dogs for Experimental Purposes. W. C. Hueper.—p. 375.
Combined Effects of an Estrogen and Anterior Hypophysial Extract on Skeleton of Growing Mouse. M. Silberberg and Ruth Silberberg. —p. 381.
Tularemia: Report of Laboratory Infection Fatal on Fifth Day, with Early Pulmonary Involvement; Autopsy. L. L. Ashburn and S. E. Miller.—p. 388.
Intracranial Vascular Tumors and Malformations. H. N. Noran.—p. 393.

Archives of Physical Medicine, Chicago

26:325-378 (June) 1945

*Observations on Muscle Spasm in Poliomyelitis: Electromyographic Studies on Effect of Various Forms of Thermal Therapy and of Prostigmine. A. L. Watkins and Mary A. B. Brazier.—p. 325.
Artificial Fever-Chemotherapy: IV. Prefever Preparation and Postfever Care. G. X. Schwemlein, H. W. Kendell and R. M. Craig.—p. 329.
Physical Medicine in Rehabilitation of Patients with War Neuroses. A. B. Knudson.—p. 336.
Functional Treatment of Fractures and Other Injuries. E. H. Wilson. —p 349.
Physical Medicine in Industry. J. M. Carlisle and R. O. McMorris. —p. 353.
Photographic Record of Joint Motion. G. D. Wilson and W. H. Stasch. —p 361.

Electromyographic Studies in Poliomyelitis.—Hypersensitivity or spasm of muscles has been emphasized as one of the most characteristic aspects of the acute stage of poliomyelitis. Watkins and Brazier studied the influences of single applications of a therapeutic agent on muscle spasm during the first weeks of the disease. All patients were in the early

infectious stage, and studies were restricted to adult patients. Six such patients were available for study. In all, 835 measurements were made, the first test usually being done within a few days after diagnosis had been established. Muscle spasm was measured by quantitation of the electrical discharges released on five seconds of passive stretching by known weights in order to test the effect of twenty minute applications of hot packs, infra-red radiation, luminous heat, short wave diathermy and the intramuscular injection of neostigmine (1.6 mg.) on this electrical component of spasm. Single applications of hot packs, infra-red radiation and diathermy had no effect. Luminous heat and neostigmine caused a decrease in spasm of approximately 25 per cent. This degree of change was not great enough to indicate a specific effect on spasm.

Bull. of New York Academy of Medicine, New York

21:281-334 (June) 1945

*Mass Sulfadiazine Prophylaxis of Respiratory Diseases in U. S. Navy. A. F. Coburn.—p. 281.
Distant Secondary Circulatory and Vasomotor Reactions to Accidental Electric Shock. G. H. Hyslop.—p. 302.
*Role of Bilateral Orchiectomy in Treatment of Carcinoma of Prostate Gland: Report of 82 Cases. W. W. Scott and J. A. Benjamin.—p. 307.

Mass Sulfadiazine Prophylaxis of Respiratory Diseases.—According to Coburn the first objective of this program was to check the rapidly rising respiratory infection morbidity rates in the winter of 1944 by preventing the implantation of pathogenic bacteria in the nasopharynx. Continuous chemoprophylaxis was selected as the most promising control measure. To test the applicability of chemoprophylaxis under controlled conditions and to determine a standard prophylactic dose of sulfadiazine, programs were designed for five large northern training stations with high respiratory disease rates. Groups of trainees were then selected to receive sulfadiazine prophylaxis and comparable groups to serve as untreated controls. Sulfadiazine prophylaxis has been administered to approximately 600,000 naval personnel, and approximately 300,000 similar personnel have been observed as controls. The institution of this measure was followed by a great reduction in the morbidity rates for respiratory diseases. The incidence of respiratory symptoms observed at sick call was significantly lowered. Hospital admissions for respiratory diseases were reduced from rates varying between 5 and 18 per thousand monthly to less than 1 per thousand monthly. Meningococcic infections were eliminated. The incidence of pneumococcic pneumonia was significantly lowered at most naval stations. Morbidity rates for respiratory diseases caused by filtrable viruses were unaffected. The most effective dosage tested was 1 Gm. daily. The administration of 0.5 Gm. of sulfadiazine daily was also found effective and was followed by fewer untoward reactions. Mild, untoward drug reactions were observed in about 0.5 per cent. Severe reactions occurred in 0.01 per cent of men taking 1.0 Gm. of sulfadiazine daily. Sensitization to sulfonamides and the development of sulfadiazine fast respiratory pathogens did not occur.

Orchiectomy in Carcinoma of Prostate.—Scott and Benjamin report the results obtained by bilateral orchiectomy in the treatment of 82 patients in various stages of carcinoma of the prostate gland. In the majority of patients the early response of metastatic symptoms was much more rapid and satisfactory than had been obtained by the methods in common use before its introduction. The early response of urinary symptoms was neither so frequent nor so satisfactory. A small percentage of patients received little or no benefit from this therapy. Most of the patients treated by this method were either dead or had lost its initial benefits within thirty-six months. In view of the discouraging end results following this therapy the authors believe that a follow-up radical perineal prostatectomy should be seriously considered in selected cases when the response to therapy is such that there is a reasonable chance for the removal of all or almost all of the primary lesion. As yet there is no substitute for radical perineal prostatectomy for cancer of the prostate when the patient's condition and the size and location of the lesion at the time of the first examination permit its complete removal.

Canadian Medical Association Journal, Montreal

52:445-542 (May) 1945

New Aspects of Virilism. L. Berger.—p. 445.
War Wounds: The Present Status of Their Treatment. R. I. Harris.—p. 450.
*Role of X-Rays in Diagnosis of Posterior Herniation of the Intervertebral Disk. A. E. Childe.—p. 458.
Infected Chest Wounds and Suction Drainage. K. D. Panton.—p. 470.
Radiologic Findings in Lesser Sac Effusion. M. C. Morrison.—p. 474.
Pathologic Manifestations and Anatomic Variations in Preenlistment Chest Roentgenograms. F. G. Stuart.—p. 477.
Postoperative Survival Periods in Gastrointestinal Carcinomata. L. H. Appleby.—p. 481.
Experiences with Pentothal During the First Hundred Days Following the Normandy Invasion. G. A. Wainwright.—p. 484.
Use and Abuse of Vitamins. L. B. Pett.—p. 488.
Some Problems of Neonatal Life. S. G. Ross.—p. 491.
Practical Methods of Supplying the Essential Vitamins of Childhood. Elizabeth C. Robertson.—p. 494.
Value of Orthoptics in Treatment of Strabismus. A. L. Morgan.—p. 498.
*Relief of Asthma by Sulfa Therapy: Report of 2 Cases. W. W. Bell.—p. 504.
Epidemic Jaundice (review of literature). H. Mitchell.—p. 505.

X-Rays in Diagnosis of Posterior Herniation of Intervertebral Disk.—At the Montreal Neurological Institute and at the No. 1 Canadian Neurological Hospital various methods have been used to diagnose herniation of the intervertebral disks. Since early in 1942 the injection of iodized oil, with subsequent aspiration, has become routine. During part of this period lipiodol has been the medium, but pantopaque is much to be preferred, not only because it is much more easily injected and aspirated but also because it moves more freely. There is the additional advantage that any small amount which may be left in place is gradually spontaneously absorbed. While it is not as radiopaque as lipiodol, it is sufficiently dense for practical purposes. Childe stresses that plain x-ray films should always be made first. These films usually are not diagnostic of such a herniation but may offer suggestive evidence and they help to exclude other lesions. Myelography when properly performed using pantopaque with subsequent aspiration is an accurate and safe method. Multiple disk herniations are not uncommon, and many unsatisfactory results may be explained on this basis if operation is undertaken without previous myelography. Herniation of sufficient size to produce great disability may cause only comparatively small deformities of the subarachnoid space. Hence the use of a relatively large quantity of oil is advisable, and multiple spot films should be made routinely to avoid missing minor deformities not readily seen under the fluoroscope. Myelography reveals that the size of some herniations undergoes change due to such factors as weight bearing, traction, muscular activity, flexion and extension. Herniated intervertebral disks in the cervical region are often complicated by hypertrophic bone formation. Tumors in the lumbar and sacral regions, and occasionally in the cervical region, may produce signs and symptoms which are clinically indistinguishable from those produced by herniated intervertebral disks. Myelography will usually differentiate between a tumor and a herniated disk.

Relief of Asthma by Sulfonamide Therapy.—Bell presents the histories of 2 patients with severe bronchial asthma each of whom was resistant to epinephrine and each of whom had paranasal sinusitis with streptococci as the main organism of infection. Both showed dramatic response to sulfonamide therapy. The first patient, a woman aged 48, was unable to retain sulfanilamide or sulfathiazole but tolerated sulfadiazine. The second patient, a man aged 58, responded to sulfathiazole. The author does not suggest that sulfonamides are a cure for asthma but states that 2 patients received great benefit and in the second patient it appeared to be a life saving agent.

Connecticut State Medical Journal, Hartford

9:413-502 (June) 1945

Present Day Problems of Hospital and Staff. G. C. Adie.—p. 418.
Cancer Organization and Propaganda: Suggestions for Its Improvement. C. L. Larkin.—p. 423.
Impact of Cancer Program on Medical Profession. A. N. Creadick.—p. 428.
Tropical Disease and Connecticut Physician. M. Tager.—p. 430.
Chemotherapy of Nasal Sinus Disease. E. J. Whalen.—p. 435.
Unusual Case of Scorbutus. C. H. Sprague.—p. 438.
Physical Examination at Induction Station (New Haven Recruiting and Induction Station, New Haven, Conn.). C. V. Verstandig.—p. 439.
Daniel Webster and Hay Fever. C. Barker.—p. 442.

Journal of Lab. and Clinical Medicine, St. Louis

30:475-558 (June) 1945 Partial Index

Nutritional Survey in Norris Point, Newfoundland J Metcoff, Grace A Goldsmith, A J McQueeney, R F Dove, Ellen McDevitt, Margaret A Dove and F J Stare —p 475
Parenteral Nutrition I Studies on Fat Emulsions for Intravenous Alimentation J M McKibbin A Pope, S Thayer, R M Ferry Jr and F J Stare —p 488
Timing of Phagocytic Changes in Malnutrition Esther Cottingham and C A Mills —p 498
Administration of Penicillin by Continuous Intramuscular Drip R O Smith and C G Harford —p 502
*Actinomycotic Infection of Soft Tissues of Neck Apparent Cure Following Large Doses of Penicillin Case Report J H McCrea, R A Stevens and O O Williams —p 509
Prothrombin in Preserved Blood R I Banfi A Tanturi and R Bay —p 512
Isolation of Hemolytic Streptococci from Throat Swabs II Efficiency of Human and Rabbit Blood in Streaked and Streaked Poured Plates R M Pike with technical assistance of Helen Leonard —p 518
Clinical Significance of Serum Protein (Albumin and Globulin) Changes E Muntwyler —p 526
*Use of Test Paper for Rapid Estimation of Sulfonamides in Blood and Other Body Fluids W V La Rosa —p 551

Actinomycosis of Neck Treated with Penicillin—The subject of the report by McCrea and his associates was a man aged 28 who developed soreness in the region of the lower molars A diagnosis of impaction of third molars was made and the teeth were extracted A localized area of induration remained in the soft tissue of the neck There was pain on motion of the right temporomandibular joint The patient developed an ischiorectal abscess, which was drained A subsequent swelling of the lower jaw subsided, but an indurated area persisted in the soft tissues inferior to the mandible Several months later there was an increase in swelling and tenderness The mass in the neck gradually enlarged A sinus developed inferior to the middle third of the right mandibular ramus A culture taken revealed Staphylococcus aureus Penicillin was given intramuscularly in doses of 20,000 units every three hours for three days but caused no appreciable improvement Pus obtained later contained yellow granules which on staining revealed mycelia and clubbing typical of actinomycosis Since small doses of penicillin had failed to effect cure on previous hospitalization, massive doses were now given, 7,000,000 units being administered over a period of fourteen days The initial dose was 120,000 units and the later doses were 80,000 units The status several months after this massive penicillin treatment indicated complete cure

Test Paper for Rapid Estimation of Sulfonamides.—The test described by La Rosa makes use of Ehrlich's reagent, p-dimethylamino benzaldehyde, in the formation of a Schiff base with primary aromatic amines, as first described by Kuhnan in 1938 The test paper contains this reagent with a sufficient quantity of oxalic acid to give a p_H of 2.5 when wet with serum or other biologic fluids By the use of the test paper the level of sulfonamide can be estimated directly in plasma, serum and other clear body fluids without the addition of precipitating or acidifying agents The orange yellow color produced is evaluated by comparison with an appropriate color chart or with colors produced simultaneously from solutions of known concentrations The test paper can be prepared from a good grade of white absorbent paper It can be stored in the dark in covered glass jars for from five to ten days The validity of this method has been demonstrated on 518 blood samples

Med. Annals of Dist. of Columbia, Washington, D. C.

14:193 238 (May) 1945

Psychiatry in Brazil O Camargo —p 193
Plans for Federal Employees' Health Service J W Cronin —p 199
Venereal Disease Prophylaxis N Belt —p 203
Penicillin Therapy in Ambulatory Gonorrhea Patients G W Creswell and L E Putnam —p 205
Sternal Transfusions in Infants Report of Fatal Case V J Dardinski —p 206

14:239 286 (June) 1945

The Future of Physical Medicine F H Krusen —p 239
Mental Health W Overholser —p 246
Studies on Neuromuscular Dysfunction VI Neostigmine Therapy of Neuromuscular Dysfunction H Kapat —p 248
Simple Method for Disposing of Direct Inguinal Hernia Sac O C Cox and H J Forrest —p 252

Minnesota Medicine, St. Paul

28:357-424 (May) 1945

Brief Review of Present Trends and Needs of Medical Practice J A Lepak —p 357
Ringworm of Scalp C W Laymon —p 363
Nursing in Rural Hospitals B C Ford —p 367
Local Health Service—Proposal of American Public Health Association H Emerson —p 370
Additional Data on Penicillin Administration W R Bagley —p 372

28:425-520 (June) 1945

Accumulated Experience of Department of Pathology, University of Minnesota, Neuropsychiatric Material II Brain Trauma R L Meller —p 449
Systemic Sarcoidosis J F Briggs —p 452
Stenosis of Sigmoid of Newborn W R Bagley and E C Bagley —p 455
Renal Rickets R E Nutting and A H Wells —p 458

New York State Journal of Medicine, New York

45:1153 1264 (June 1) 1945

Sudden and Unexpected Natural Death General Considerations and Statistics M Helpern and S M Rabson —p 1197
Pharmaceutic Treatment of Ringworm of Toes H Goodman —p 1202
Interpretation of Visual Fields in Neurotic Patients J F Gipner —p 1203
Myelography with Ethyl Iodophenylundecylate (Pantopaque) G H Ramsey J D French and W H Strain —p 1209
Wilms' Tumors A L Dean —p 1213
Significance of Hyposthenuria in Prostatism, with Special Reference to Nocturia Clinical Study J A Lazarus and M S Marks —p 1218

45:1265-1374 (June 15) 1945

Further Experiences with Surgical Treatment of Intractable Ulcerative Colitis J H Garlock —p 1309
*Hodgkin's Disease Salient Clinical Features and Relative Value of Various Methods of Treatment Based on Study of 319 Cases L B Goldman and A W Victor —p 1313
Anterior Poliomyelitis—The 1944 Epidemic at Meadowbrook Hospital J W Lansberg —p 1319
Coitus Impotentia and Angina Pectoris M M Melicow —p 1325
Report of 93 Cases of Meningococcus Infection Admitted to Station Hospital Camp Butner, North Carolina (from November 1942 to September 1943) R W Houseal and M J Gerbasi —p 1329
Vaginal and Endometrial Smear as Diagnostic Procedure in Cancer of Uterus G N Papanicolaou —p 1336
Roentgen Therapy of Arthritides I I Kaplan —p 1339

Hodgkin's Disease—Goldman and Victor report 319 cases of Hodgkin's disease The youngest patient in the group was 5 and the oldest 76 years of age A clinical diagnosis of Hodgkin's disease can frequently be made by palpation of the involved lymph nodes It is possible to count from 3 to 5 nodes in each of the involved groups The nodes may vary in size from 2 to 12 cm As a rule more than one area is involved Thirteen of the authors' patients showed involvement of the sternal nodes, never before mentioned in the literature The skin was involved in 39 per cent of the patients Roentgenographic findings in the chest characteristic only of this disease were never found There was a gradual transition from a bilateral thickening of the hilar areas to a widening of the mediastinum and invasion of adjacent lung fields Hodgkin's disease of the gastrointestinal tract was observed in only 2 patients It was unusual to palpate the spleen in ambulatory patients The abdominal form of Hodgkin's disease was observed in 27 patients They exhibited weakness, loss of weight, intermittent bouts of fever and a more rapid course Collapse of a vertebra may occur without symptoms of spinal cord compression The characteristic changes in the sternal marrow were a polymorphonuclear shift to the right with severe toxic granulation, increased eosinophilia of young myeloid elements and increase in the monocytic series Pregnancy occurred in 11 patients, therapeutic abortions were performed in 3, miscarriage resulted in 1, and the pregnancies were carried to term in the remaining 7 There was no evidence of Hodgkin's disease in the offspring Even under the most optimal conditions permanent arrest of the disease has not been obtained, but useful life has been prolonged for many years The patient should receive the smallest quantity of irradiation that is compatible with relative well-being, just sufficient to cause gross disappearance of involved lymph nodes The authors utilized a voltage of 200 kilovolts, a filtration of 0.5 copper and 1 aluminum, a port of 10 by 15 cm and a skin-target distance of from 40 to 50 cm Voltages that were either higher or lower produced inferior results In addition to the irradiation the patient should receive supportive hematinic therapy

North Carolina Medical Journal, Winston-Salem

6:265-308 (June) 1945

Recent Advances in Treatment of Cardiovascular Disease. E. S. Orgain. —p. 265.
Patent Ductus Arteriosus with Superimposed Subacute Bacterial Endarteritis: General Considerations and Report of Cure by Surgical Ligation. M. Dick and R. A. Broome Jr.—p. 274.
Intravascular Accident. W. H. Sprunt and S. W. Hurdle.—p. 278.
Increasing Incidence of Toxemias of Third Trimester of Pregnancy. R. B. Dunn.—p. 283.
Medical Management of Gallbladder Disease. S. F. LeBauer.—p. 285.

Ohio State Medical Journal, Columbus

41:513-588 (June) 1945

Questions and Answers Concerning the Fenestration Operation. C. E. Kinney.—p. 513.
Penicillin Therapy in Subacute Bacterial Endocarditis. S. A. Hatfield, D. L. Mahanna and H. H. Fertman.—p. 515.
Practical Application of Quantitative Serologic Tests for Syphilis. A. I. Weiner and Marie McNamara.—p. 517.
Identical Twins: Achondroplastic Dwarfs. S. J. Goodman.—p. 521.
Review of Allergy. J. Forman —p. 522.
Management of Addison's Disease. E. P. McCullagh and R. W. Schneider.—p. 528.
Peptic Ulcer as it Occurred at Station Hospital: Report of 207 Consecutive Cases. R. C. Kirk.—p. 532.
Fatal Hemolytic Reaction Following Transfusion with Incompatible Blood. A. J. Mantilla.—p. 534.
Medical Curiosities—Phosphorus. R. M. Watkins.—p. 537.

Quantitative Serologic Tests for Syphilis.—According to Weiner and McNamara the true potency (amount of reagin) of syphilitic serums may be determined, as in the Widal reaction, by quantitative titration of the serums. The recent trends in the rapid treatment of early syphilis have stimulated interest in the use of quantitative serodiagnostic tests. Quantitative serologic tests have been found essential to the optimum treatment of early syphilis and useful in the management of latent and tertiary syphilis. They are also of value in the study of suspected false positive reactions and in the interpretation of the status of the newborn of syphilitic mothers. Protracted seroresistance and clinical complications, especially neurosyphilis, occur predominantly in those patients with early syphilis who have experienced mucocutaneous relapse, a phenomenon usually preceded by a persistent rise in the serologic titer. Impending relapse, which is thus detected by quantitative serologic tests, can often be prevented by intensification or modification of the therapy which is being administered. The routine adoption of quantitative serologic procedures in early syphilis is urged. These tests are of more limited usefulness in other phases of syphilis.

Quarterly J. of Studies on Alcohol, New Haven, Conn.

6:1-130 (June) 1945

Biochemical and Electroencephalographic Changes in Delirium Tremens. M. A. Kennard, E. Bueding and S. B. Wortis.—p. 4.
Alcoholic Deaths in Canal Zone, 1904 to 1944. M. T. Hoekenga and B. H. Kean.—p. 15.
Relation of Pituitary Gland to Some Symptoms of Alcoholic Intoxication and Chronic Alcoholism. M. Gross.—p. 25.
Ecologic and Familial Factors Associated with Inebriety. Harriet R. Mowrer and E. R. Mowrer.—p. 36.
The Churches and Alcohol. R. H. Bainton.—p. 45.
Certain Expenditures on Account of Inebriety. B. Y. Landis.—p. 59.
Estimated Consumer Expenditures for Alcoholic Beverages in the United States, 1890-1943. B. Y. Landis.—p. 92.
Classics of Alcohol Literature: A Sixteenth Century English Alewife and Her Customers—Skelton's Tunnyng of Elynour Rummyng.—p. 102.

Rhode Island Medical Journal, Providence

28:333-396 (May) 1945

Erythroblastosis Fetalis. B. H. Buxton and H. C. McDuff.—p. 333.
Absenteeism in Industry. J. J. Wittmer.—p. 338.
Exodontia and Minor Oral Surgery. W. A. Daniels.—p. 347.
Tuberculosis Case Finding. J. J. Pickney.—p. 360.

28:397-480 (June) 1945

Recent Advances in Control of Infectious Diseases. F. G. Blake. —p. 409.
Medical Care in Rhode Island.—E. S. Wing.—p. 416.
Report of Case of Empyema Treated with Penicillin. L. I. Kramer. —p. 425.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

18:99-132 (April) 1945

Benign Tumor of Esophagus and Its Differential Diagnosis. R. A. K. Harper.—p. 99.
New Circuit with Special Applications in Gamma Ray and X-Ray Dosimetry. L. A. W. Kemp.—p. 107.
Review of 3 Gastric Cases with Positive Radiologic and Negative Laparotomy Findings. F. G. Nicholas.—p. 113.
Technic for Autoradiographs of Radium Containers. Dorothy F. Clephan.—p. 117.
War Wounds of Urinary Tract. D. B. McGrigor and E. Samuel. —p. 121.
*Protection Measurements on Operators and Workrooms in Radium Dial Painting Industry. J. C. Jones and M. J. Day.—p. 126.
Unusual Sequel to Fracture of Odontoid Process: Case Report. H. Davies.—p. 132.

Protection Measurements in Radium Dial Painting Industry.—Jones and Day review investigations that were carried out to determine how far safety regulations were successful in the radium dial painting industry. Owing to their low penetrating power, the alpha rays can cause damage to the tissues only by immediate contact. Although stopped by a few millimeters of most solid materials, the beta rays penetrate several meters of air, giving intense local ionization in the region of the source. The hands are subject to the greatest exposure from these rays. The harmful effects of general body irradiation by gamma rays are well known and the tolerance dose rate of 1 roentgen per week is generally accepted. The safety measures fall into two groups. First, precautions designed to reduce the unavoidable exposure to a minimum and to improve the general conditions of work. Second, direct examination of the operatives for indications of overexposure, entailing on the medical side routine blood testing, inspection of the hands for signs of local effects and attention to the general health of the workers, and on the physical side the wearing of beta and gamma ray sensitive photographic films and tests for radium in the body. Measurements carried out by the authors indicated that workers in most ordinary luminizing factories are not suffering from excessive exposure either from contamination of the atmosphere with radon or radium dust or by the direct action of beta and gamma rays from outside the body. In some cases the ventilation of darkrooms could be improved. Workers with larger quantities of radium, such as in the preparation of luminous compound, are exposed to greater risks. The authors regard the risk of the inhalation of radium dust as particularly important.

British Medical Journal, London

1:545-578 (April 21) 1945

*Two School Outbreaks of Streptococcal Throat Infection: Effect of Sulfonamide Lozenges on Carriers. R. L. Vollum and G. S. Wilson. —p. 545.
Surgery and Anesthesia of War Wounds of Abdomen. S. O. Aylett and A. F. Alsop.—p. 547.
Bacteriologic Examination of Infected Dental Pulp Canals and Use of Penicillin in Pulp Canal Therapy. F. E. Shaw, Evelyn Sprawson and H. B. May.—p. 551.
*Penicillin in Wounds of Chest. A. L. D'Abreu and J. W. Litchfield. —p. 553.
Case of Penicillin Reaction. W. Michie and H. W. C. Bailie.—p. 554.
Subglottic Stenosis After Exposure to High Concentration of Screening Smoke (Zinc Chloride). R. B. Lumsden and C. D. Weir.—p. 554.
Intestinal Obstruction by Gallstones. M. Lee.—p. 555.

Streptococcic Throat Infection.—Vollum and Wilson report an outbreak of scarlet fever due to Streptococcus pyogenes type 11 in a residential preparatory school for boys and an outbreak of sore throat accompanied by cases of scarlet fever due to type 1 in a residential public school for girls. Treatment of healthy and of convalescent carriers with 6 to 12 lozenges a day for five to seven days, each lozenge containing ½ grain (32 mg.) of sulfapyridine and ½ grain of sulfathiazole, had no apparent effect as compared with control carriers receiving either an antiseptic spray and hypochlorite gargle or no treatment at all in clearing the infecting type of streptococcus from the throat. Prophylactic treatment of healthy contacts with 6 lozenges a day had no effect in preventing streptococcic infection of the throat. Observations made on persons sucking

methylene blue tablets showed that only a fraction of the dye was deposited on the tonsils and none on the posterior pharyngeal wall. Lozenges containing sulfonamide drugs are not likely to be of value for the prophylaxis or for the cure of streptococcic infection of the throat.

Penicillin in Wounds of Chest.—Since penicillin has become available, over 500 penetrating wounds of the thorax have been treated. General parenteral treatment with penicillin was used only occasionally and has not supplanted the sulfonamide drugs, which may often be used with less distress to the patient, as they do not involve three hourly injections. Repeated intrapleural injection of penicillin without bacteriologic and radiologic check is unwise. Intrapleural injection of 60,000 units in 6 to 10 cc. (no more) at the end of the first two or three aspirations is advised by D'Abreu and Litchfield; this injection does not replace adequate aspiration. At the general hospital the uninfected hemothorax is treated by aspiration without intrapleural instillations except (1) when there is coexistent chest wall sepsis, (2) when there is pulmonary infection and (3) when at the conclusion of a thoracotomy for foreign body removal air has been drawn off by an artificial pneumothorax apparatus. Local use of penicillin in case of infection is advisable only in cases of infection by penicillin sensitive organisms. Bacteriologic checks are essential. Despite sterilization of an empyema cavity, operative treatment is necessary in certain cases for the purpose of removing clot and preventing excessive deposition of fibrin on the pleura.

Edinburgh Medical Journal

52:97-144 (March-April) 1945

Theory of Anaphylaxis and Therapeutic Possibilities in Rheumatism. W. M. Levinthal.—p. 97.
Functions of Stomach in Relation to Treatment of Peptic Ulcer. C. F. W. *Illingworth*.—p. 119.
Tomography. J. B. McDougall.—p. 127.
Clinical Value of Blood Sedimentation Diagram: Preliminary Report. H. Dugosz.—p. 132.

Lancet, London

1:487-518 (April 21) 1945

*Clostridial Infections in War Wounds. W. T. Cooke, A. L. P. Peeney, G. Thomas, and others.—p. 487
Atypical Pneumonia. R. W. D. Turner.—p. 493.
Distribution of Sulfamezathine in Body Fluids: Relation to Cranial Injuries. M. Kremer, C. G. Phillips and M. W. Stanier.—p. 496.
Local Action of Penicillin and Sulfamezathine and Penicillin-Sulfamezathine Mixture on Rabbit Brain. D. S. Russell and D. J. K. Beck.—p. 497.
*Fixation of Skin Grafts with Human Plasma and Thrombin. A. M. Clark, J. P. Todd and G. R. Milne.—p. 498.

Clostridial Infections.—The evacuation of a large group of wounded men from the Western Front from June to October 1944 afforded Cooke and his associates the opportunity of making clinical observations. Cases which showed a systemic reaction and gave evidence of clostridial infection were examined. From 2,680 wounded men a group of 76 cases with systemic reactions have been studied. All but 4 of this group showed evidence of clostridial organisms in their wounds. It is suggested that this group includes the majority of true and potential "gas gangrene" cases. The group has been further subdivided on the basis of the severity of the systemic reaction into four sections of increasing severity, the last consisting of 2 fatal cases. The 2 fatal cases, 7 of the severe and 18 of the moderate group gave a histopathologic picture of clostridial myositis. Possible significant features in the biochemical findings were low blood cholesterol and high urine creatine levels. While the hematologic studies showed evidence of a hemolytic process in some cases, severe hemolysis was not a feature in any case. Flocculation of chylomicrons occurred in a number of cases, but this is not specific for clostridial infection nor can it be attributed to the direct action of clostridial toxins. At necropsy in the 2 fatal cases extensive fat embolism of the lungs and other organs was demonstrated and demyelination was found in the central nervous system.

Fixation of Skin Grafts.—Clark and his associates employed a modification of the method of fixation of skin grafts described by Sano. Instead of withdrawing blood from the patient, they use citrated plasma and instead of Sano's cell extract they use thrombin solution. The plasma used is obtained from blood of a group AB donor. Plasma as supplied by the blood transfusion services should not be used, for this has been treated to remove the clotting elements. The raw surface of the graft is painted with the solution of thrombin before application, and it is then applied to the recipient area, which has been previously painted with the plasma. The authors have used this method successfully in the grafting of over sixty burns. They stress that complete and continuous contact of the skin and the underlying tissues is secured. Oozing of blood is controlled and the skin is fixed in position by means of a medium favorable for tissue growth. The method is quicker, since it largely obviates the need for stitching the graft in position. It is not necessary to obtain blood from the patient before grafting, for the materials are available from the local transfusion services.

1:519-550 (April 28) 1945

Order and Disorder in Large Intestine. T. L. Hardy.—p. 519.
Battle Casualties Treated with Penicillin. A. Innes and V. H. Ellis.—p. 524.
Effects of Sulfonamides on Bone Phosphatase. P. H. Silver and J. S. R. Golding.—p. 528.
Dermatitis from Cutting Oils. G. P. B. Whitwell.—p. 529.
Local Instillation of Penicillin in Lung Abscess. D. Pickering and R. Grenville-Mathers.—p. 530.
*Fatal Air Embolism During Blood Transfusion. E. G. Dolton, E. Gardner and W. D. Wylie.—p. 531.

Fatal Air Embolism During Blood Transfusion.—While a man aged 53 was undergoing an operation for carcinoma of the stomach, blood transfusion was begun through the left saphenous vein at the ankle. After two and one-half hours the blood transfusion, which had slowed considerably, was accelerated by raising the pressure in the bottle by means of a Higginson syringe, in accordance with routine practice. About fifteen minutes later the temporal pulse suddenly became impalpable and the patient rapidly became cyanosed. Inflation of the lungs with oxygen was substituted for the anesthetic mixture, but without improvement. At necropsy the right auricle was punctured under water which filled the pericardium, and from this puncture a number of air bubbles escaped. The inferior and superior venae cavae and the innominate and jugular veins were distended by large and small air bubbles and contained only a little red frothy blood. Though they have found no record of a similar accident, Dolton and his associates think that it can hardly be the first example. Probably some deaths attributed to shock of operation or status lymphaticus are actually due to air embolism, which goes unrecognized because routine postmortem methods do not reveal it. The method of forcing transfusion with a Higginson syringe is dangerous unless constant close supervision is exercised.

South African Journal Medical Sciences, Johannesburg

10:1-56 (Feb.) 1945

Behavior of Graafian Follicle of Elephantulus During Pregnancy, with Special Reference to Hormonal Regulation of Ovarian Activity. C. J. van der Horst and J. Gillman.—p. 1.
*Effect of Testosterone Propionate on Menstrual Cycle of Normal Female Baboons (Papio Porcarius) as Compared with Progesterone and Desoxycorticosterone Acetate. Christine Gilbert and J. Gillman.—p. 15.
Cell Masses in Forebrain of Elephant Shrew. M. K. Wright.—p. 19.
Reactions of Perineum of Pregnant Baboon, with Special Reference to Some Aspects of Hormonal Regulations of Pregnancy. Christine Gilbert and J. Gillman.—p. 51.

Effect of Testosterone Propionate on Menstrual Cycle.—Gilbert and Gillman show that testosterone propionate is capable of inducing premature deturgescence in normal baboons when administered in sufficient concentration in the first part of the cycle. The induced deturgescence may be succeeded by premature bleeding, and a new cycle is initiated thereafter. If the induced deturgescence is not followed by bleeding, menstruation may be postponed for ten to fifteen days. There are differences in effects on the normal female baboon between testosterone propionate and progesterone. Unlike desoxycorticosterone acetate, testosterone propionate, like progesterone, is incapable of producing bleeding twice within the span of a normal menstrual cycle. In 2 of the 9 animals testosterone propionate excited a reaction which is similar to that obtained after a single treatment with 5 mg. of estradiol benzoate in the first part of the cycle.

Policlinico (Sez. Prat.), Rome

52:1-32 (Jan. 1-31) 1945. Partial Index

*Functions of Bone Marrow in Some Forms of Chronic Hepatitis. M. Milela.—p. 1.

Bone Marrow in Chronic Hepatitis.—Milela reports microscopic observations on the bone marrow obtained by sternal puncture in 13 cases of chronic hepatitis. There were 4 cases of atrophic cirrhosis of the Laënnec type, 4 of syphilitic hepatitis, 1 of amebiasis of the liver, 1 of Hanot cirrhosis, 1 of Eppinger cirrhosis and 2 cases of chronic ascitogenic hypertrophy of the liver. Erythropoiesis was inadequate in all of the cases. The maturation of the erythrocytes was arrested at the level of the polychromatic phase. Anemia in chronic disease of the liver is apparently due to the toxic action of the diseased liver on the bone marrow.

Archivos de Neurocirugía, Buenos Aires

1:129-250 (April-June) 1944. Partial Index

*Acute Cerebral Edema and Mesencephalic Hemorrhages as Cause of Death in Metastatic Tumors. R. M. E. Carrea.—p. 228.

Acute Cerebral Edema.—Carrea points out the cause of death in intracranial hypertension due to metastatic cerebral tumors. There is either a mesencephalic hemorrhage from cisternal hernia or cisternal hernia alone. Mesencephalic hemorrhage is fatal, whereas cisternal hernia is curable. Cisternal hernia of the temporal lobe is frequent in cerebral tumors. It manifests itself by a sudden appearance of symptoms of acute cerebral edema leading to respiratory difficulty which may rapidly result in respiratory paralysis. Treatment consists in putting the patient to bed with the head at a lower level than the feet. Intravenous injection of hypertonic dextrose solution and continuous ventricle drainage or repeated evacuation by ventricular puncture and transfusions of human plasma are indicated. Hypertonic sodium chloride solution is contraindicated. Failure of the therapy calls for surgical intervention, either section of the neck of the hernia or temporal lobectomy. When respiratory failure occurs just before the operation, artificial respiration should be practiced as long as the heart beats. The author's patient died from an acute respiratory paralysis. The heart continued beating for about ten minutes. Death was due to acute cerebral edema with formation of a huge cisternal hernia at the temporal lobe and an associated mesencephalic hemorrhage.

Obst. y Ginecología Latino-Americanas, Buenos Aires

3:71-154 (Feb.) 1945. Partial Index

*Erythroblastosis of Newborn Infants and Rh Factor. M. A. Etcheverry, H. Linares Garzón and J. C. Pereyra.—p. 93.

Erythroblastosis of Newborn Infants.—Etcheverry and his collaborators report observations on a family of 4 erythroblastotic infants. The young parents were apparently normal. The mother had three normal deliveries and an induced abortion. The first child was born with sclerema and had had convulsions from infancy. The 2 following infants died within one and two weeks after birth from acute jaundice and from acute hemolytic anemia. In the course of the fifth pregnancy it was established that the blood of the mother belonged to blood group A and was Rh negative, whereas that of the father and of the child belonged to blood groups O and A respectively and was Rh positive. Anti-Rh agglutinins were not present in the blood of the mother during the first months of pregnancy. They appeared about the eighth month of pregnancy and increased with such rapidity that it was necessary to induce labor near full term. The infant girl was born apparently normal. Her blood was of group A and was Rh positive. The blood of the umbilical cord showed strong reticulocytosis, highly increased indirect bilirubinemia and a scanty number of erythroblasts. Microscopic study of the placenta showed abnormal persistence of the Langhans layer, intraplacental hematoma with erythroblasts, erythroblasts in the chorionic vessels, and edema and hyperplasia of the chorionic villi. The infant exhibited jaundice three hours after birth. Transfusion with O-Rh negative blood in amounts varying between 20 and 50 cc. each was made four hours after birth and at intervals of twelve hours during the first week of life of the infant. She had fever during the first three days and splenomegaly. Jaundice became acute during the first week and then subsided. During the second week of life of the infant transfusion of O-Rh positive blood was administered by mistake. Immediately afterward the infant presented symptoms of acute anemia, which became grave in four days. The hemogram confirmed the diagnosis. The condition was controlled by transfusions of A-Rh negative blood. It was given first daily, then every other day and at longer intervals in doses of 50 to 180 cc. The infant was normal when discharged from the hospital at the age of 3 months. The authors direct attention to the meaning of sclerema in the newborn, which suggests erythroblastosis of the newborn in the family. They also point to the importance of blood transfusion in the therapy of erythroblastosis of newborn infants. Transfusion with Rh negative blood belonging to the O blood group or to the blood group of the infant should be administered.

Nordisk Medicin, Stockholm

22:1051-1106 (June 9) 1944

Renal Cancer, with Special Reference to Diagnosis. M. Bjørneboe.—p. 1051.
Puerperal Tetanus Following Criminal Abortion. T. B. Andersen and I. Øster.—p. 1057.
Solitary, Not Parasitic, Hepatic Cysts. H. F. Helweg-Larsen.—p. 1057.
Do Tubal Cells Occur in Endometrium? T. Hølund.—p. 1059.

Hygiea

Introductory Investigations on Disturbances in Daily Periodicity of Chloride Elimination in Depressive Psychoses. B. Bjerner.—p. 1061.
Abscess of Brain After Adenotomy. S. Dahlstedt.—p. 1069.
*Report Concerning Therapy in Cases of Infantile Paralysis. S. Backman.—p. 1072.
Clinical Determination of Albumin in Cerebrospinal Fluid. S. Izikowitz.—p. 1074.
Present Gonorrhea Problem. H. Haxthausen.—p. 1093.
Exercise Treatment in Thrombophlebitis in Lower Extremities. H. Heckscher.—p. 1094.

Therapy in Cases of Infantile Paralysis.—Backman advocates early short wave therapy in poliomyelitis as a natural method believed to act favorably on contractures and rigidity as well as on pain. Parallel attempts with this simple treatment and the more laborious Kenny method are suggested.

22:1107-1150 (June 16) 1944. Partial Index

Origin and Further Fate of Urobilinoids in Organism: Review. T. K. With.—p. 1107.

Hospitalstidende

Fractionated Spinal Anesthesia According to Sebrechts. A. R. Madsen.—p. 1113.
*Paroxysmal Paralytic Hemoglobinuria. A. Louw and H. E. Nielsen.—p. 1116.
Studies on Vesicles in Zoster and Chickenpox. S. Dahl.—p. 1120.

Finska läkaresällskapets handlingar

Polycythemia, Anemia and Calcified Spleen in Same Patient. Peculiar Hematologic Case. J. Forsell.—p. 1123.

Hygiea

Breaking Down of Fats in Organism. A. Gammeltoft.—p. 1135.
Possibility of Transmission of Syphilis by Transfusion Preparation. B. Swedberg and G. Widström.—p. 1138.
So Called Myalgic Points of Pressure in Ischialgia. E. Sahlgren and O. Sjöqvist.—p. 1141.

Paroxysmal Paralytic Hemoglobinuria.—Louw and Nielsen found only 4 cases of paroxysmal paralytic myoglobinuria in the literature. Their case, the first in the Scandinavian literature, was in a boy aged 10, with history of repeated attacks of muscular pain and difficulty in walking since the age of 4, who was admitted for treatment during an acute attack. Spectroscopy showed excretion of myoglobin during the attack, when there was also pronounced creatinuria. The establishment of 8 cases of progressive muscular dystrophy in the boy's family suggests that this disorder and paralytic myoglobinuria may be different forms of the same condition, the latter representing the acute manifestation, the progressive muscular dystrophy the chronic form.

Book Notices

Penicillin Therapy Including Tyrothricin and Other Antibiotic Therapy. By John A. Kolmer, M.S., M.D., Dr. P.H., Professor of Medicine in the School of Medicine and the School of Dentistry, Temple University, Philadelphia. Fabrikoid. Price, $5. Pp. 302, with 22 illustrations. New York & London: D. Appleton-Century Company, 1945.

This monograph constitutes an attempt to correlate the available information on penicillin and other antibiotic agents for the medical and dental professions. With more and more penicillin becoming available for clinical use and with an expanding interest being manifested in antibiotics, such a review is timely. Kolmer has compressed much useful information within the covers of this compact volume. The first half of the monograph is devoted to the basic principles of therapy with antibiotics, with emphasis being placed on penicillin. The section on the principles of penicillin therapy summarizes the present status of the subject very well. In the sections devoted to the clinical use of penicillin for specific infectious diseases some of the recommendations will not be generally accepted. As an example, in the treatment of staphylococcic septicemia Kolmer advises that sulfathiazole should be administered simultaneously with penicillin. It remains to be proved whether this routine therapeutic combination has any advantage over the use of penicillin alone. Certainly there is the disadvantage that sulfathiazole not infrequently causes undesirable reactions and complications. One would also question the advisability of administering staphylococcus vaccine or toxoid to patients who have recovered from cellulitis and carbuncles. It is of interest that the author favors the combined use of the sulfonamides and penicillin in the treatment of several other types of infectious diseases, including streptococcic septicemia. Kolmer favors heparin as an adjuvant therapeutic agent in the treatment of subacute bacterial endocarditis with penicillin. He also would utilize sulfonamide therapy with penicillin in the treatment of this disease. The reviewer is in agreement with his recommendation that sulfadiazine and penicillin should be employed in the therapy of pneumococcic meningitis. An interesting and important development has been the treatment of syphilis with penicillin. That no final conclusions can be drawn at present concerning the optimal doses and ultimate therapeutic effects are reflected in the author's presentation of the subject. He appears to favor the combined use of penicillin and oxophenarsine hydrochloride. It is obvious that the clinician will not feel too confident in employing penicillin for the therapy of syphilis after reading this section.

The monograph is concluded by a discussion of tyrothricin, gramicidin S, streptothricin, patulin, chlorophyll and streptomycin. In his endeavor Kolmer has reviewed the literature on the subject, and references are appended to each chapter. The number of illustrations is relatively small and are not all reproduced too well. The illustration on page 46 is worthless. For those who wish to familiarize themselves with the practical aspects of antibiotic therapy this monograph is recommended.

Constitutional Medicine and Endocrinology. Edited by E. Pulay, M.D., A. P. Cawadias, O.B.E., M.D., F.R.C.P. and P. Lansel, M.D. Volume I. Cloth. Price, 10s. 6d Pp. 99. London: Frederick Muller Ltd., 1944.

This small volume consists of a series of essays on constitutional medicine in general and includes articles on addisonism or the hypotonic symptom complex, pathophysiology of the blood picture, hemopoiesis and constitution and the clinical aspect of the blood sedimentation rate. These are most inspiring and stimulating accounts of a dynamic, functional study of constitution and should be read widely by physiologists, internists and neuropsychiatrists. Their general trend may be gleaned by a quotation from the summary of the introductory article by Cawadias on constitutional medicine, metabolism and endocrinology: "Constitutional medicine, representing the contemporary conception of the internistic subspecialty known first as gastroenterology and metabolism and later as endocrinology and metabolism, is a well defined branch of internal medical research and practice distinct (with the reserve of overlapping inherent in the construction of medical specialties) from the other internistic subspecialties, neurology, cardiology, diseases of the chest, dermatology, epidemiology (fevers). Its object is the consideration in health and disease of the sum total of the chemical reactions through which the body utilizes protein, fat, carbohydrate, minerals and oxygen and of the regulators of these processes (digestive and nutritive regulators, genes, neuroendocrine system and general environmental factors). Its mode of approach to the patient consists in considering primarily the disturbance of the sum total of the biochemical processes and of their regulators, and from this point of departure considering the various organic localizations so as to arrive at the understanding of the whole of the patient and of the patient as a whole. It consists also in thinking not in terms of disturbance (hyperfunction, hypofunction, dysfunction) of a particular system or organ but of rupture of balance of the system integrating and correlating the body-mind. Its diagnostic technic is essentially clinical and in its general lines is based essentially on a careful history, symptomatology and consideration of the total reactions, instrumental and laboratory findings being assessed in the light of the total clinical picture, in the frame of the total reactions. Its therapeutic technic is based on the understanding of these total reactions and forms an endeavor to reestablish the balance of the system of integration of the body-mind through various psychotherapeutic, dietetic, physical and pharmacological procedures. Its special nosographical field is composed of the constitutional diseases known as endocrine-metabolic diseases, i. e. diseases predominantly of the regulators of the biochemical processes. These include the classical metabolic diseases, genetic diseases, neuroendocrine diseases and those digestive and renal disturbances connected with a neuroendocrine and metabolic imbalance. All these diseases must be approached with the special constitutional diagnostic and therapeutic technic, and not one of these groups can be separated from the general body of constitutional medicine."

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and Other Matters Connected with the Work of Surgical Dressers, House Surgeons, and Practitioners. Edited by Hamilton Bailey, F.R.C.S.Eng., Surgeon, Royal Northern Hospital, London. Fourteenth edition. Cloth. Price, $6. Pp. 628, with 724 illustrations. Baltimore: William Wood & Company, 1944.

This is the fourteenth edition of a book which has been popular and affectionately regarded in England since 1884. It appears now under the editorship of Hamilton Bailey, whose writings are highly thought of in present day surgical literature. The purpose of the work is and has been to serve as a practical guide to house officers and practitioners in the care of patients. It stresses, chiefly, minor surgical procedures, conditions encountered in the outpatient department and the preoperative and postoperative care of all types of surgical cases. The subject matter covered is extensive, authoritative and up to date. It is divided into eighty chapters written by forty-six contributors, all English, and naturally presents the accepted English point of view. The style and literary quality, in spite of the number of contributors, is uniform and terse and reads easily. A feature of this edition is the unusually large number of excellent and even beautiful illustrations, photographs, drawings and diagrams. These are intended to illustrate the technic pictorially, and they really do enhance the clarity of the text. This edition is an improvement on its predecessors, and the continued value and popularity of "Pye" is assured.

Contribuição ao estudo das gangrenas dos membros inferiores nos diabéticos. Por Hugo Ottati Perlingeiro. [Tese] Paper. Pp. 151, with 55 illustrations. Rio de Janeiro: Jornal do Commercio, Rodrigues & C., 1944.

In this monograph the author presents his experience in the diagnosis and management of diabetic patients with gangrene of the lower extremities. A detailed study of 39 cases is included. Oscillometric studies, histamine tests and Samuel's maneuver of induced plantar ischemia were carried out and found to be reliable. In order to rule out vascular spasm, Landis and Gibson's test and the intravenous injection of sodium nitrite were used, following the technic of Beck and Takats. The patients' conditions did not lend themselves to arteriography, although the author is aware of the value of this procedure in verifying the degree of diminution or occlusion of the arterial lumen.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PATERNITY TESTS

To the Editor:—Please advise necessary data and significance of tests required in legal paternity court procedure. Grouping: Rh positive and negative; Rh' positive and negative; Hr positive and negative; M positive; N positive and negative? Testimony accepted by physician as expert need not require actual performance of tests. M.D., New York.

ANSWER.—The expert called to perform blood tests in cases of disputed parentage must first properly identify the persons presenting themselves for the examination. This is done by having each affix his or her signature to the report forms, at the same time taking a thumb print with the aid of an ink pad. In the case of infants, a foot print or hand print may be taken. Photographs are also acceptable for identification purposes. It is not necessary for all the persons to be tested at the same time, but if they are they should be requested to identify one another. The date when the blood samples are drawn should be recorded, and any persons accompanying those involved in the dispute may be asked to sign the report as witnesses.

Blood tests can be used only to exclude parentage; if the findings conform with the established laws of heredity, this merely means that the individuals in question could be the parents but need not necessarily be the parents. In instances in which an exclusion of paternity or maternity is obtained, it is good practice to repeat the examination on fresh blood samples. Some courts have such reports rechecked by an independent investigator. With the tests now available, a man falsely accused of paternity can be cleared in more than half the cases. A complete test nowadays would include the four blood groups, the subgroups of A and AB, the M-N types, the eight Rh types, the Hr factor, the P factor and the secretor type. Tests on the saliva for the secretor type are usually omitted, however, because the slight additional chance of excluding paternity it affords is not worth the effort entailed in getting the saliva samples (especially in infants) and in testing them. Also the P factor is hardly ever tested for because of the lack of sufficient potent antiserums. As for the remaining tests, the person performing the tests should limit himself only to those with which he has had sufficient experience. Thus the completeness of the report will vary throughout the country, because not every state has physicians specializing in this subject.

Exclusion of parentage results if one or more of the following laws is broken by the results of the tests:

Tests for the four blood groups O, A, B and AB: 1. Agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents. 2. Group AB parents cannot have group O children, and group O parents cannot have group AB children. Failure of the tests to conform with either of these two laws is absolute proof of nonparentage.

Subgroups of groups A and AB: 1. No child can belong to subgroup A_1 or A_1B unless one or both parents possess agglutinogen A_1. 2. Parents of subgroup A_1B cannot have A_2 children, and parents of subgroup A_2 cannot have A_1B children. The reliability of these tests is not as great as the common blood grouping tests for the following reasons: 1. The subgroups are not fully developed at birth and are difficult to determine reliably until the infant is at least 1 month old. 2. Bloods exist which give reactions intermediate between A_1 and A_2, especially among Negroes. 3. The subgrouping serums give much weaker reactions than the better anti-A and anti-B serums, so reliable results are possible only with considerable experience. Exclusion of parentage by the subgroups should therefore be considered evidence only that parentage is highly improbable and not necessarily impossible.

Types M, N and MN: 1. The agglutinogens M and N cannot appear in the blood of a child unless present in the blood of one or both parents. 2. Type M parents cannot have type N children, and type N parents cannot have type M children. More experience is required for the accurate performance of these tests than for the common blood grouping tests. In the hands of experts, exclusions based on the M-N tests are absolute proof of nonparentage.

Rh types and Hr factor: 1. The factors Rh_0, Rh', Rh" and Hr cannot appear in the blood of a child unless present in one or both parents. 2. Hr-negative parents cannot have children of types Rh_2, Rh", Rh_0 and Rh negative, and parents of types Rh_2, Rh", Rh_0 and Rh negative cannot have Hr-negative children. When the tests are performed by experts, exclusions of parentage based on these new tests are fully as reliable as exclusions based on the common blood grouping tests.

No expert should testify on the basis of tests performed by another person but should insist on performing the tests himself before offering an opinion. In this way he would not assume responsibility for technical or clerical errors of some other individual but would base his conclusions on his own observations. If this is not possible he should qualify his conclusions, depending on the experience and reliability of the person who actually carried out the examination.

Under the present legal system these tests have the same standing in court as any other evidence introduced, and the judge and jury can give them as much or as little weight as they see fit. In states where blood test laws have been passed, the laws give the courts the power to compel persons involved in paternity disputes to submit to blood tests, on application by any party in the action, but the laws do not compel the acceptance of conclusions based on the tests once these have been performed. Therefore, scientific proof of nonpaternity does not guarantee a just verdict, because the verdict in some courts also depends on certain intangible factors, such as the manner in which the lawyer and the physician present the facts to judge and jury, the impression made by the defendant when he testifies, prejudices in the mind of judge or jury against dissolving a marriage, and sympathy for woman and child. In New York City the tests are performed most often for paternity disputes before the Court of Special Sessions, and in an experience with many hundred examinations, conclusions based on the blood tests have invariably been accepted as final.

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Wiener, A. S., and Sonn, E. B.: Heredity of the Rh Blood Types: IV. Medicolegal Application in Cases of Disputed Parentage, J. Lab. & Clin. Med. **30**: 395 (May) 1945.

URINARY INCONTINENCE FOLLOWING HYSTERECTOMY

To the Editor:—About three months ago I did a hysterectomy on a young woman. She made a splendid and satisfactory recovery from her operation and left the hospital about the twenty-first postoperative day, going home apparently well and in good condition. About a week later, four weeks following her operation, she woke up one night and found her bed quite wet and has continued to pass urine ever since. She returned to the hospital about ten days ago; after thorough examination and injection of methylene blue into the bladder, a diagnosis of urethral incontinence was made. Retention catheters have been used and posterior pituitary injection 0.5 cc. has also been given in an endeavor to tighten up the bladder muscles. She has made little or no improvement under this regimen.

R. E. Stivison, M.D., Topeka, Kan.

ANSWER.—Urethral urinary incontinence such as described is probably due to increased sagging of the bladder from a cystourethrocele which may have been present in lesser degree prior to the hysterectomy. For this there is no satisfactory treatment other than a vaginal correction of the cystocele together with reinforcement of the musculofascial supports of the urethra, preferably with sutures of fine silk. It is important to make certain that the incontinence is solely from the urethra, not from a vesical or urethral fistula. Further, before proceeding to operation it is always necessary to rule out incontinence ascribable to tabes or other cord lesions.

CONTACT ULCER OF LARYNX

To the Editor:—What is the best treatment, including climatic treatment, for contact ulcer of the larynx? M. C., A. U. S.

ANSWER.—"Contact ulcer of the larynx" refers to a superficial ulceration localized in the region of one or both vocal processes and involving the underlying cartilage. The chief predisposing cause is considered to be excessive or faulty use of the voice. The recommended treatment includes strict limitation of the voice to a few words a day for a prolonged period, sometimes several months. Removal of granulomatous tissue and superficial trimming of the ulcerated area with sharp cup forceps aids healing and permits biopsy. A warm moist climate is considered preferable to dry air. Other factors to be considered are the correction of faulty methods of voice production, elimination of chronic sinus or throat infection and avoidance of tobacco and alcohol.

INTRAVENOUS UROGRAPHY

To the Editor:—What are the contraindications to intravenous urography? What technical errors and pathologic conditions produce an absent or subnormal dye concentration in the intravenous urogram?

M.D., New York.

ANSWER.—Excretory (intravenous) urography may be contraindicated because of (1) extreme debility, (2) advanced age or (3) the presence of renal insufficiency. In individuals who have a known idiosyncrasy to iodine, the contrast medium should be administered slowly and in limited amounts. However, in most cases the organic form of iodine in the contrast medium causes comparatively little reaction.

Absence or subnormal concentration of the opaque medium in the excretory urogram may be caused either by technical errors or by pathologic renal lesions. The following technical errors may interfere with visualization of the urinary tract adequate for accurate interpretation: (1) inadequate preroentgenographic preparation of the patient, with resulting obscuration of the areas included in the urinary tract, (2) hyperperistalsis with very fragmentary visualization of any portion of the renal pelves or ureters and (3) inadequate amounts of medium injected intravenously, either because of intolerance on the part of the patient or because of diffusion of the injected medium into the extravenous tissues.

The pathologic conditions in the urinary tract which may prevent adequate visualization are (1) reflex inhibition of secretion in the presence of stone in either the kidney or ureter, (2) ureteral obstruction, such as occurs with hydronephrosis or subsequent to obstructing neoplasm in the kidney, ureter or bladder, (3) failure of excretion of the contrast medium caused by various pathologic lesions such as congenital hypoplasia, acquired renal atrophy, diffuse unilateral pyelonephritis, renal tumor and renal tuberculosis, and (4) congenital anomaly such as renal agenesia.

Failure of visualization in one kidney is sometimes observed without one's being able to determine any etiologic factor. Occasionally the renal pelves may not be visualized in one excretory urogram, but when repeated several days later a normal or slightly subnormal visualization may be present for which no adequate reason may be apparent.

A difference in the degree of visualization of the two kidneys is quite common and it may be difficult to determine the cause. Minor differences in degree of visualization may be of no clinical significance. However, when there is a constant, definite difference in concentration of the dye in the two kidneys or ureters, with some increase in size of the renal pelves, calices or ureters, some cause of the stasis usually is present as the result of active or recent factors.

ARTIFICIAL FINGER

To the Editor:—A young woman who is a pianist has lost the distal half of her right index finger. She is anxious to have the missing part artificially restored to enable her to follow her art. Is such a prosthetic restoration available or practical, and if so where can it be obtained?

Charles F. Noe, M.D., Amana, Iowa.

ANSWER.—The loss of only a portion of one finger ordinarily incapacitates a person so little that a prosthesis is not necessary. Most persons so afflicted will not use a prosthesis except for cosmetic reasons, as it interferes with function of the other fingers. The use of such an appliance in an art requiring the sense of touch and pressure and rapidly integrated motions would probably be a detriment rather than an aid.

Prostheses of plastics and latex of good cosmetic quality are available through such manufacturers as the John J. McCann Company of Burlington, N. J., and the John Eschen Company of New York.

MYDRIATIC FOR EXAMINATION OF FUNDUS

To the Editor:—What is the best and safest mydriatic for a general practitioner to use to examine the fundus? It should be quick acting and of short duration.

Joseph P. Sparks, M.D., Manito, Ill.

ANSWER.—A 2 per cent solution of euphthalmine, one drop in the eye every five minutes for two to four instillations, is recommended. Mydriasis is obtained in twenty to thirty minutes, sufficient for a thorough examination of the fundus. One of the great advantages of this drug is that there is but little effect on the ciliary muscle of accommodation (cycloplegic effect) and consequently the patient is not discommoded visually. But it must not be forgotten that the pupil must be contracted with 2 per cent solution of pilocarpine after the examination is completed to avoid the danger of acute glaucoma.

PROBABLE ATOPIC ECZEMA

To the Editor:—A man aged 21, 5 feet 10 inches (178 cm.) in height, and weighing 133 pounds (60 Kg.), has had a dry and cracking skin almost all his life. He has multiple skin reactions, but too many to be true allergies. Dietary treatment has been tried for a long time with no benefit. This last year his hay fever and asthma were controlled by "shots." In previous years he had reactions without adequate protection. He is just getting over a siege of impetiginous infection with fever which responded well to penicillin. The main problem is a tough dry skin. What is recommended for improving the condition of the oil and sweat glands? I would appreciate references. Intake of fats and oils has not helped.

L. E. Blachman, M.D., Cleveland Heights, Ohio.

ANSWER.—From the information given it would seem that this young man has had a generalized dryness and cracking of the skin all his life. Nothing is said about any localization or whether there is any relief during warm weather. The absence of this information suggests that the patient has a xeroderma or ichthyosis. Multiple skin reactions are spoken of and it could be assumed that these were responses to skin tests, but the ichthyotic skin, as a rule, does not give any such reactions. The history of hay fever and asthma suggests the probability of an atopic eczema. The impetiginous infection could be an infection of the excoriations of the latter disease. Atopic eczema is usually a flexural condition, although it can be generalized. It is usually worse in cold weather and has a history of asthma and hay fever in the individual and also in the family.

The condition is an extremely obstinate one and is often an individual problem because the patient frequently has numerous sensitivities to external and internal agents. The condition is well discussed in Becker and Obermayer's Dermatology under the heading of Neurodermatitis. These patients are often sensitive to soap and wool externally and possibly to eggs, chocolate and other agents in the food. The taking of fats and oils will not contribute to the relief of the dryness. The therapy problem is such an individual one that it would be difficult to outline specific treatment in this instance.

WATERY CYSTS OF CONJUNCTIVA

To the Editor:—What is the proper term for the small watery cysts which appear at the palpebral fissure in the conjunctiva over the sclera and consist of little blebs filled with water? They sometimes are single and sometimes appear in a string of four or five or six, each perhaps the size of a pinhead. Sometimes there are as many as ten to a hundred, usually all connected. When one is snipped off all, as a rule, are empty.

F. P. Thompson, M.D., Chicago.

ANSWER.—Such cysts are not uncommon and are usually seen in connection with a mild chronic catarrhal form of conjunctivitis. No particular name has ever been assigned to the condition, although it is described by W. Stewart Duke-Elder (Text-Book of Ophthalmology, St. Louis, C. V. Mosby, 1938, vol. II, p. 1773). As a rule, such cysts lie in the temporal portion of the palpebral fissure, most frequently below the midline, and usually disappear spontaneously as the conjunctivitis is relieved.

DERMATITIS FROM DIESEL FUEL OIL

To the Editor:—Having observed cases of dermatitis apparently caused by contact with fuel oil used in Diesel engines, I wish to learn if there is any prophylactic measure which can be taken to avoid this.

M. A. Stivers, M.D., Middletown, N. Y.

ANSWER.—Fuel oil used in Diesel engines can cause dermatitis by the fat solvent action on the skin of the light petroleum distillates which it contains; it may cause folliculitis and oil acne because of its content of the heavy petroleum distillates.

Prophylactic measures are directed toward keeping the oil off the skin or, if this cannot be done, allowing the oil to remain on the skin for as short a time as possible.

Protective clothing in the form of oil proof rubber gauntlets, oil impervious sleeves and aprons will keep the oil off the skin. Frequent washing of the hands and forearms, compulsory shower baths after work and a daily change to clean work clothes will reduce the time the oil comes in contact with the skin.

The use of suitable protective ointments on the exposed parts gives some safeguard. An ointment with a lanolin base tends to buffer the solvent action on the skin of the light petroleum distillates. An ointment leaving a dry oil repellent film on the skin tends to minimize contact with the oil. Such ointments are on the market.

Reference:

Schwartz, Louis: Protective Ointments and Industrial Cleansers, M. Clin. North America 26: 1195 (July) 1942.

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MORRIS FISHBEIN, M.D.

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Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1933. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

Acta chirurgica Scandinavica Stockholm
Acta dermato-venereologica Stockholm
Acta medica scandinavica Stockholm
Acta psychiatrica et neurologica Copenhagen
Acta radiologica Stockholm
American Heart Journal St Louis
American Journal of Clinical Pathology Baltimore
American Journal of Digestive Diseases Fort Wayne, Ind
*American Journal of Diseases of Children A M A, Chicago
American Journal of Hygiene Baltimore
American Journal of the Medical Sciences Philadelphia
American Journal of Obstetrics and Gynecology St Louis
American Journal of Ophthalmology Cincinnati
American Journal of Pathology Ann Arbor, Mich
American Journal of Physiology. Baltimore
American Journal of Psychiatry New York
American Journal of Public Health New York
American Journal of Roentgenol and Radium Therapy Springfield Ill
American Journal of Surgery New York
American Journal of Syphilis, Gonor and Venereal Diseases St Louis
American Journal of Tropical Medicine Baltimore
American Review of Soviet Medicine New York
American Review of Tuberculosis New York
Anesthesiology New York
Annals of Allergy Minneapolis
Annals of Internal Medicine. Lancaster Pa
Annals of Otology, Rhinology and Laryngology St Louis
Annals of the Rheumatic Diseases London
Annals of Surgery Philadelphia
Annals of Tropical Medicine Liverpool
Archiv fur klinische Chirurgie Berlin
*Archives of Dermatology and Syphilology A M A, Chicago
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*Archives of Neurology and Psychiatry A M A, Chicago.
*Archives of Ophthalmology A M A, Chicago
*Archives of Otolaryngology A M A Chicago
*Archives of Pathology A M A, Chicago
Archives of Physical Medicine Chicago
*Archives of Surgery A M A, Chicago
Archivos de neurocirurgia Buenos Aires
Archivos uruguayos de medicina, cirugia y especialidades Montevideo
Arizona Medicine Phoenix
Australian Journal of Experimental Biology & Medical Science Adelaide.
Australian and New Zealand Journal Surgery Sydney
Brain London
British Heart Journal London
British Journal of Dermatology and Syphilis London
British Journal of Experimental Pathology London
British Journal of Industrial Medicine London
British Journal of Ophthalmology. London
British Journal of Radiology London
British Journal of Surgery Bristol.
British Journal of Tuberculosis London
British Journal of Urology London
British Journal of Venereal Diseases London
British Medical Journal London
Bulletin of the Johns Hopkins Hospital Baltimore
Bulletin of the Los Angeles Neurological Society Los Angeles
Bulletin of the New York Academy of Medicine. New York
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Canadian Medical Association Journal Montreal
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Deutsche Zeitschrift fur Chirurgie Berlin
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Endocrinology Springfield, Ill
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Gastroenterology Baltimore
Hawaii Medical Journal Honolulu
Illinois Medical Journal Chicago
Indian Medical Gazette Calcutta
Journal of Allergy St Louis
Journal of the Arkansas Medical Society Fort Smith
Journal of Aviation Medicine St Paul
Journal of Bone and Joint Surgery. Boston
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Journal of Clinical Investigation Boston
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Journal of Laboratory and Clinical Medicine St Louis
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Journal of the Medical Association of the State of Alabama Montgomery.
Journal of the Medical Association of Georgia. Atlanta
Journal of the Medical Society of New Jersey Trenton
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Journal of the Michigan State Medical Society Lansing
Journal of the Missouri State Medical Association St Louis
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Journal of Pathology and Bacteriology Edinburgh
Journal of Pediatrics St Louis
Journal of Physiology. Cambridge
Journal of the South Carolina Medical Association. Florence
Journal of the Tennessee State Medical Association Nashville.
Journal of Thoracic Surgery St Louis
*Journal of Urology Baltimore
Kentucky Medical Journal Bowling Green
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Klinicheskaya meditsina Moscow
Klinische Wochenschrift Berlin
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Laryngoscope. St Louis
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Psychosomatic Medicine Baltimore
Public Health Reports Washington, D C

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Puerto Rico J. Public Health & Tropical Medicine San Juan
Quarterly Journal of Medicine Oxford
Quarterly Journal of Studies on Alcohol New Haven, Conn.
Radiology, Syracuse, N. Y.
Review of Gastroenterology New York
Revista chilena de pediatría Santiago
Revista de la Policlínica Caracas Caracas
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*War Medicine A. M. A., Chicago
Western Journal of Surgery, Obstetrics and Gynecology Portland, Ore.
West Virginia Medical Journal Charleston.
Wiener klinische Wochenschrift Vienna
Wisconsin Medical Journal Madison
Yale Journal of Biology and Medicine New Haven

SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "ab," abstracts; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Acad.—Academy
Am —American
A —Association
Coll —College
Commn —Commission
Comm —Committee
Conf —Conference
Cong —Congress
Dist —District
Found —Foundation
Hosp —Hospital
Indust —Industrial
Internat —International
M —Medical
Med —Medicine
Nat —National
Pharm —Pharmaceutical
Phys —Physicians
Soc —Society
Surg —Surgery
Surgs —Surgeons
S.—Surgical

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